

RESEARCH REVIEW

Research and Technology Transfer Administration

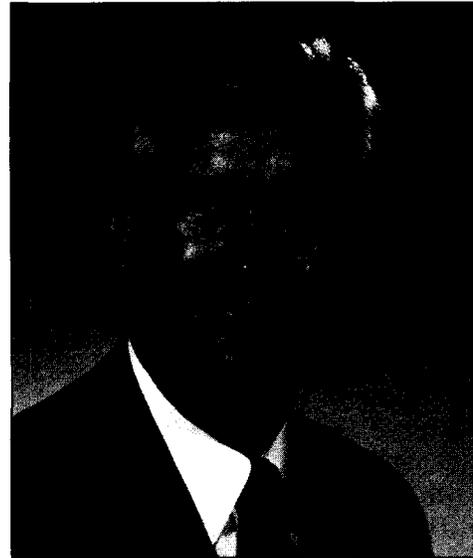
July, 1991

U of M Has Two New NAS Members

Two members of the University of Minnesota faculty were elected to the National Academy of Sciences at its annual meeting the last week of April. They are Daniel D. Joseph, professor of aeronautical engineering and mechanics, and Ronald L. Phillips, professor of agronomy and plant genetics. The two bring to 16 the number of University faculty members in the prestigious 1,625-member organization. They and 58 other scientists will be inducted into the Academy at next year's meeting.

Since joining the University in 1963, Joseph has published extensively on both the theoretical and experimental aspects of fluid mechanics, and he is credited with development of the theory of stability. Phillips joined the University in 1967 and since has become a leader in development of improved varieties of corn and in corn genetics research. Early in his career he helped develop the procedure for growing whole corn plants from cell cultures, expanding the possibilities for laboratory research on corn development and introduction of new traits through genetic engineering.

The two faculty members agreed to share their views on teaching, research and the current state of funding for science and engineering in the interviews beginning on page 8, Dr. Joseph, and page 12, Dr. Phillips.



Ronald L. Phillips, Ph.D.



Daniel D. Joseph, Ph.D.

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CUFS

The CUFS feature for this month is the 'Budget-to-Object Conversion chart' on page 20.

Administrative Services Center

Policy Changes

Effective July 1, 1991 additional policy changes are being made by the Administrative Services Center. The changes are:

1. Checking for available funds will *no longer* be performed centrally for accounts not monitored by ORTTA. ORTTA staff will continue to check for available funds on accounts monitored by them, as part of their approval process.
2. Funds will *no longer* be encumbered based on a requisition, but rather a purchase order *must be issued* in order for an encumbrance to be recorded.
3. Funds will *no longer* be encumbered based on the issuance of a non-specific blanket order.

Background information on each of these changes is available. For further information or questions please call Don Larson at 4-9374, Marilyn Surbey at 4-4850; or, for ORTTA, the appropriate grant administrator, or for Administrative Services, your business office representative.

RESEARCH REVIEW

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Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-0398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The rates for July 1, 1989 through June 30, 1990 are listed below. When budgeting for periods beyond 6/30/90, the 7/1/89-6/30/90 rates should be used. The rate agreement is dated March 28, 1988. This date should be used where required on proposal applications.

	07/01/89 06/30/90
Research	
On-Campus	44.0
Off-Campus *	21.5
SAFHL	86.6
Hornel	49.5

Other Sponsored Activity

On-Campus	33.4
Off-Campus *	16.8

Instruction

On-Campus	68.7
Off-Campus *	27.9

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call Vivian Fickling at 624-2009.

Current actual rates from January 1, 1991 through June 30, 1991 are:

Faculty	29.00
Civil Service	24.50

For proposals being submitted with start dates after July 1, 1991, the estimated fringe benefit rates to be budgeted are listed on pages 8 and 9 of the March, 1991 Research Review.

In using these rates to develop budgets for future projects, be sure to reflect the actual rate for each period of time rather than calculating an average for the entire budget period.

As rates change they will be reflected in this section.

National Academy of Sciences Members At the U of M

The National Academy of Sciences is a private organization of scientists and engineers that advises the federal government on matters of science and technology. It was established in 1863 by a congressional act of incorporation signed by Abraham Lincoln.

With the election of **Daniel D. Joseph** and **Ronald L. Phillips**, the number of National Academy of Sciences members at the University of Minnesota has risen to 16. The other members are:

John Borchert, Geography (Retired)
Bryce Crawford, Chemistry (Retired)
Margaret Davis, Ecology, Evolution and Behavior
Paul Gassman, Chemistry
Ralph T. Holman, Hormel Institute
Leonid Hurwicz, Economics
Izaak M. Kolthoff, Chemistry (Retired)
Willem Luyten, Astronomy (Retired)
Paul Meehl, Psychology, Psychiatry and Philosophy
Edward P. Ney, Astronomy (Retired)
Alfred Nier, Physics (Retired)
Vernon W. Ruttan, Agricultural and Applied Economics; Economics
James Serrin, Mathematics
Herbert Wright, Geology; Ecology, Evolution and Behavior; Botany (Retired)

Patent Costs Increasing

The Bush administration has made a proposal to increase the cost of obtaining patents. Under the proposal, universities would no longer be able to take advantage of some of the special rates for patent fees that are available to them now.

For most universities, the cost of filing and maintaining a patent would rise from \$3,495 to \$6,520. Higher-education officials note that today's fees are already 69 percent more than they were last year, so another increase would be particularly difficult. Critics add that the increase could discourage universities from filing patents.

Congress will consider the proposal this year as it reauthorizes the U.S. Patent and Trademark Office. Lawmakers have said they want to preserve the low rates for universities, but are unsure of how to do that without denying the patent office the money it needs to operate.

—From the Chronicle for Higher Education

New Young-Faculty Program at NSF

According to an article in *The Scientist*, July 10, 1991, the NSF has launched a new, highly selective program of research awards to young faculty. The Initiative, to be called the Presidential Science and Engineering Faculty Fellows program, will offer more money than, and have different ground rules from, those of the existing Presidential Young Investigators (PYI) awards, which will now be called simply the NSF Young Investigators Program.

The original PYI program may be receiving more than a name change. There are indications that the new title is a harbinger of significant revisions in a program that over the past seven years has given five-year, no-strings-attached research grants to more than 1,400 scientists and engineers starting out on their academic careers.

The new faculty fellows program will cost \$15 million annually, once it is fully implemented over the next five years, with funds coming from the original PYI program. The faculty program will offer fewer awards—only 30 the first year—in the belief that the 200 annual PYI awards were too many. The new fellows must be nominated by the president of their university, with a limit of two per institution. PYIs were nominated by their department chairs and it wasn't unusual for some universities to have a half-dozen or more young investigators in any one year.

The new program also drops the requirement that NSF funds be matched by private or industrial sources. The original PYI program offered \$25,000 each year and promised a dollar-for-dollar match of the next \$37,500, up to a total annual award of \$100,000. The new fellows will receive \$100,000 per year for each of five years with no matching funds required.

The status of the renamed NSF Young Investigators Program is unclear. The original purpose was to stop the cream of each year's Ph.D. engineers from forsaking faculty positions and taking better-paying industrial jobs, to foster cooperation between academia and industry, to promote research funding from the private sector, and to improve the research capability of the typical PYI's institution. A report prepared for NSF last fall by Westat, Inc. found that the program has not begun to fulfill the first two objectives and has made only minor progress on the third. However, according to the report, the program has improved institutional research capabilities.

In the short term, the program will remain the same—last month NSF named 220 young scientists as 1991 PYIs. The ultimate fate of the program will become clear over the next several months. Comments may be directed to Mary Clutter, assistant NSF director for the biological and behavioral sciences, who is chairwoman of the task force reviewing the PYI program.

Committee on the Use of Human Subjects in Research

Continuing Review of Research; Delinquency of Approval for Research Involving Human Subjects

The administrative office for the Committee on the Use of Human Subjects in Research has automated its system for maintaining records of research studies. This process has enabled the Committee's administrative office to monitor closely the status of research projects.

Each project reviewed by the full Committee or by expedited review procedures requires review on at least an annual basis. At times, based on the assessment of risk, the Committee will require more frequent review or more extensive reporting.

Notices for annual review and approval, based on the new computerized records, are typically sent to investigators six to eight weeks prior to the expiration date of approval. This time frame provides the investigator with an opportunity to address the brief questions raised in the "Continuing Review Form" and to attach a copy of the current consent form. Investigators who have allowed their approval status to lapse will receive a "second and final" notice of renewal. Failure to respond to two notices results in filing the study "inactive."

When an investigator allows research approval to lapse, s/he must re-initiate the study. Lapses in approval are extremely difficult to justify to regulatory or funding agencies. These lapses reflect a time when there is no approval for the use of human subjects in a research protocol. Subject data cannot be gathered under a lapsed protocol. The Committee office cannot provide justification or explanation to agencies seeking such information; the investigator must defend any lapses.

Science and Math Reports Available

A report by Project Kaleidoscope entitled, *What works: Building Natural Science Communities*, has been released recently. It is a blueprint to improve science and mathematics instruction on the nation's liberal-arts campuses and is the result of a two-year research effort supported by NSF. Preliminary recommendations detailed in the report were presented at a conference in February by a committee of liberal-arts educators. Copies of the report are available for \$15 each from Project Kaleidoscope, Independent Colleges Office, 1730 Rhode Island Avenue, NW, Suite 1205, Washington D.C. 20036.

A second report, *Resources for Strengthening Undergraduate Science and Mathematics*, will be available from the same office in the fall for \$11 per copy.

When a study is inactive and will not be continued, an investigator is asked to complete several portions of the Continuing Review form as a "final report" on the project.

Investigators are reminded that in order to process a request for continuing review of approval, *a copy of the current (in-use) consent form is required*. The consent form documents that the approved form is being used and that any changes that have occurred, or any reports of adverse events, have been incorporated into the current form. A review of the form allows staff to make suggestions for bringing the form up to current standards. Requests for continuing review not accompanied by the current consent form will be returned, resulting in processing delays.

Questions regarding the use of human subjects in research may be directed to Moira Keane at 624-1889.

PHS Policy Clarification

Program Income Earned Under Research Grants

Public Health Service (PHS) policy requires applicants for PHS grants to include in their grant applications an estimate of the amount and source of program income expected to be generated as a result of the project for which support is being sought. (The complete policy statement was printed in the January 1991 *Research Review*, page six.)

When originally received, ORTTA's interpretation of this policy was that it was applicable only to "research"-(R01) grant applications. On further discussion with NIH, however, ORTTA has learned that the policy extends to "program project" -(P01) and "institutional training grant" -(T32) applications as well.

The NIH Office of Grants and Contracts has stated: **any proposal submitted on a PHS 398 kit (new/renewal) or a PHS 2590 kit (non-competing continuation) should address program income on the OTHER SUPPORT page of the application.**

This policy was effective on February 1, 1991. If you have questions or need further information, call ORTTA Grants and Contracts at 624-5599.

“Our Challenge is to Reinvent the Classroom”

That challenge, issued by President George Bush after his May 21 visit to St. Paul's Saturn School, has already been taken up by the University of Minnesota. In fact, one of the innovative approaches Bush saw in use at the Saturn School is an interactive computer teaching system called DIS-

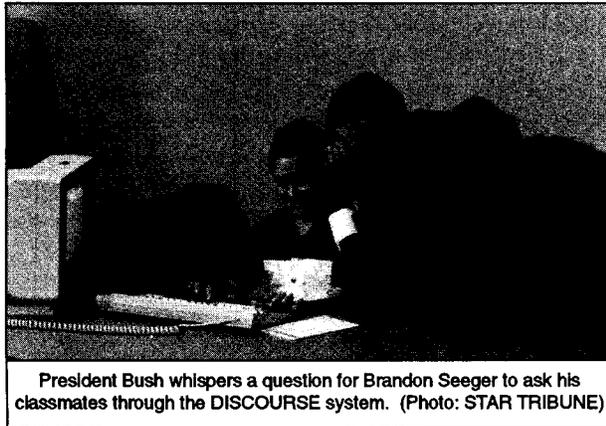
COURSE®. The President spent nearly 30 minutes, twice the allotted time, marveling over a teacher's ability to ask questions and receive instant feedback from each student through DIS-COURSE. Newspaper reports said that Bush found the DIS-

COURSE room to be the most interesting part of the tour, because he could interact with students through the system.

Unlike most use of computers as individual, learn-alone modules, DISCOURSE allows an entire class to interact and enables the teacher to receive answers from all students instead of just a few bold ones. This is possible because each student is provided with a keyboard and small display screen called a Studycom®. The Studycoms are attached to a central control unit called the Controlcom®. As the teacher asks questions, or as the students work through a computer-controlled or written lessons, each student's answers are displayed on the Controlcom. The teacher can track each student's progress and can provide instant feedback through the computer or orally. All responses may be immediately printed or saved for later review or grading.

DISCOURSE was invented by Jack Zawels, a cybernetics engineer who was working as a consultant to 3M. 3M acquired the rights to the system and developed it further during the 1980s. Despite internal and external enthusiasm for the system, 3M management decided it did not fit in the company's product line, and in 1989 the company gave all rights to DISCOURSE to the University of Minnesota as a gift. Dr. Steven L. Robinson, a research and evaluation specialist who directed DISCOURSE research supported by the Wilder Foundation in St. Paul, was hired by the University's College of Education and the Office of Research and Technology Transfer to continue development and research on the system's effectiveness. “We think this fits well with President Hasselmo's initiative to improve the quality of undergraduate education, and we felt it was something the University should help support, study, and make available as a tool to improve all areas of education and training,” says Tony Potami, associate vice president for research and technology transfer.

With major support from the Wilder Foundation, the 3M Foundation, and the St. Paul Public School System, a total of nine DISCOURSE systems are now in use across the spectrum of teaching levels. St. Paul's Saturn School, a science and technology magnet for grades 4 through 7, has two systems. Two St. Paul high schools and three elementary schools also use DISCOURSE. And at the University of Minnesota, DISCOURSE is used in the General College curriculum and in other classes and seminars taught by Robinson and other faculty of the College of Education.



President Bush whispers a question for Brandon Seeger to ask his classmates through the DISCOURSE system. (Photo: STAR TRIBUNE)

“It really broadens the arena of communication in the classroom,” Robinson says, “by providing a way for students to participate who aren't comfortable speaking out or raising their hand. Yet it doesn't stifle oral

communication, because the teacher can use responses from shy students to encourage them and draw them into the discussion. Also, DISCOURSE is the only computer technology I know of that allows students to enter answers in their own words, which encourages and supports written communication.”

Another feature of DISCOURSE that is highly appreciated by teachers is its ability to store and print out all student work. This makes grading and record-keeping more accurate and convenient. But more importantly, Robinson says, is it helps teachers to evaluate their own efficacy and to detect method or curricular problems much earlier. Teachers can use the report features to analyze student responses by individual, class, lesson, or for each question.

This level of feedback and student accountability gives DISCOURSE great potential beyond the formal education system as well, Robinson says. Billions of dollars are spent annually on corporate and military training, and a major problem with most training programs is that there is little trainee accountability outside of formal tests. “We are looking at the training market to see how DISCOURSE could provide quantitative and qualitative accountability and analysis for training programs,” he says.

Although research and development continue on DISCOURSE at the University, it has recently been made commercially available through an exclusive license to Interactive Communication Systems, Inc. The Minnesota company was started by Simmy Ziv-El, and it is working closely with the University and Robinson to explore markets for the system. As presently configured, a DISCOURSE software and hardware system consisting of one Controlcom and 32 Studycoms sells for about \$30,000.

New IRG Grant Review Procedures by NIH

Beginning this fall, the National Institutes of Health (NIH) will modify the voting procedures used by Initial Review Groups (IRGs) on grant applications.

NIH is responding to congressional suggestions that it modify its peer review system to provide more meaningful distinctions between applications that merit funding and those that do not. Beginning with this fall's round [October 1], IRG recommendations will center on two options. An application can be:

- **deferred**, meaning the review group defers an application because additional information is needed before a recommendation can be made, or
- **not recommended for consideration**, meaning that the merit of the proposed research is not significant and not substantial or that there are human subject, animal welfare or other concerns.

Decisions will be made by a majority vote. For all other applications, the IRG will discuss strengths and weaknesses according to the usual criteria (current priority ratings will remain in use), then each member will rate the application. Applications not recommended for further consideration will not be reviewed by the advisory boards and councils. Those applications will be notified immediately of the status of their application and they will receive a copy of the summary statement. In addition, the bottom third of all applications given priority ratings and scores will not go routinely to council. However, there will be flexibility to make exceptions based on program or policy considerations.

IRGs will continue to review direct costs only; however, total costs requested—including indirect costs—will be included in the summary statement. The review groups are being asked to scrutinize proposed budgets more closely and pay particular attention to:

- percent of effort in relation to work scope;
- possible overextension of research staff;
- justification for equipment;
- addition of personnel in future years; and
- potential overlap with existing grants.

Because of the changes, NIH no longer will refer to an "award rate;" instead, the term "success rate" will refer to the number of funded applications divided by the number of applications reviewed by IRGs.

National Institute of General Medical Sciences

Award Amounts and Duration

As part of the overall NIH plan to contain the cost of research grants, the National Institute of General Medical Sciences (NIGMS) [a component of the National Institutes of Health (NIH)] is implementing several new procedures for new and competing grant awards. Part of the plan involves containing the rate of increase in the average cost of grants. NIGMS, therefore, has developed the following procedures that permit controlled growth.

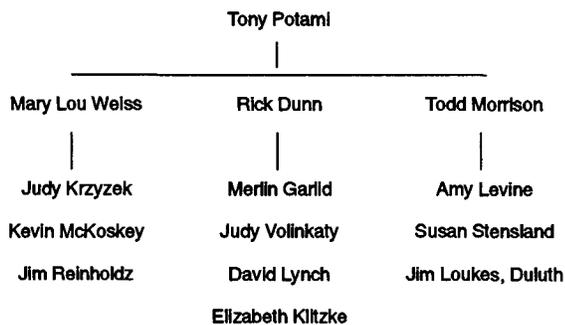
- Awards for competing renewals will be increased by an average of up to 10% over the amount awarded in FY '90; special consideration will be given to needs for equipment.
- Exceptions may be considered for awards for first renewals of grants to new investigators; these may be allowed a somewhat larger budgetary increase to support an expansion in scope of the project.
- In general, new grant awards will be adjusted such that their average cost does not exceed the average cost of such grants awarded in the last fiscal year.
- Because FIRST Awards have a fixed total budget, they will be paid without adjustment.
- Future year commitments will be calculated from the amount awarded in this fiscal year plus an inflationary increase of approximately 4%. These are intended as commitments and NIGMS will make every effort to pay them without further reduction.

NIH must also achieve an average length of award of approximately four years. Accordingly, the National Advisory General Medical Sciences Council has concurred with the following procedures for competing awards made in FY '91: NIGMS proposals recommended for five years by the initial review group will be funded for a four-year project period. Exceptions may be considered for FIRST Awards, program project grants recommended for five years, and any other grants specifically designated for a five-year award by the National Advisory General Medical Sciences Council.

New ORTTA Assistant Director

Todd Morrison has been appointed assistant director in the Division of Grants and Contracts, ORTTA, joining assistant directors Mary Lou Weiss and Rick Dunn. Todd has been with ORTTA grant administration since 1977, and has been acting assistant director since late last year. His areas of personal and supervisory responsibility include non-medical school DHHS, State of Minnesota, Local Government, and the U.S. Department of Commerce.

Based on Todd's appointment and the recent hiring of two new grant administrators, the lines of responsibility in the Grants and Contracts area are as follows:



A list of specific agency responsibilities for each grant administrator begins on page 21. Please keep in mind that due to space constraints *we cannot list every agency* and have included only the most common. For further information, call Grants and Contracts, 624-5599.



Susan Stensland

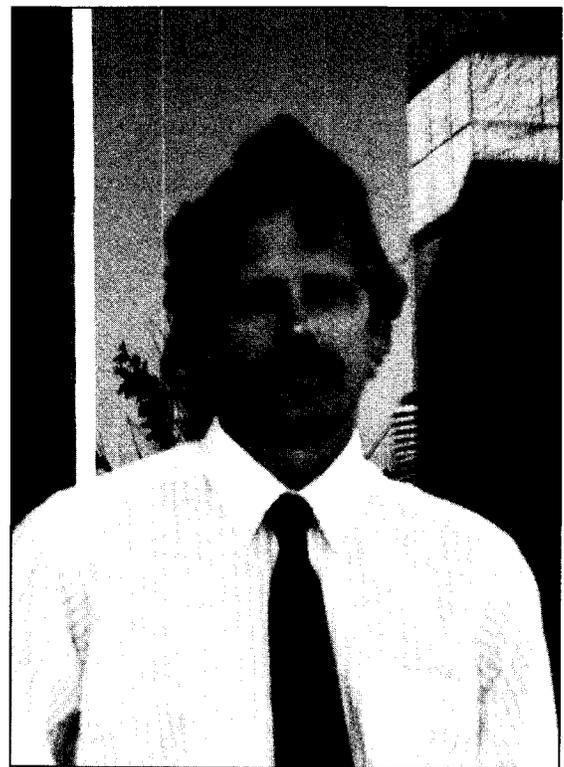
New ORTTA Grant Administrators

On May 20, two new grant administrators joined the ORTTA Grants and Contracts staff. They are **Susan Stensland** and **Jim Reinholdz**.

Susan Stensland is no stranger to ORTTA, having previously held a position as grant administrator from 1979 to 1984. Before coming to ORTTA originally, Susan worked for Hennepin County. In the years between, she has worked for the Department of Biometry; for the VEE Corporation, which creates live Sesame Street theatre productions; and as a self-employed real estate developer. She is also currently working on her M.A. in Higher Education Policy Analysis and Administration.

Susan will administer DHHS grants for non-medical school departments, the School of Nursing and the School of Public Health. She will also be responsible for grants from local government, states (other than Minnesota), and other universities.

Jim Reinholdz comes to ORTTA from the State of Minnesota, Department of Jobs and Training, where for the last eleven years he was a Program Manager. He has a B.A. in Business Administration from Gustavus Adolphus. Jim will be responsible for selected voluntary health agencies and health-related associations, including the American Heart Association and the American Cancer Society. He will also handle DHHS grants for selected medical school departments.



Jim Reinholdz

Daniel D. Joseph, Ph.D.

Daniel Joseph brings the perspective of a sociologist to his teaching and research in fluid mechanics. He manages to talk and work in a casual yet energetic fashion, and he conducts an aggressive search for answers to a wide range of theoretical, experimental, and practical problems while pursuing his first priority: have a little fun. His laboratory features a stimulating mixture of collaborating faculty, technical staff, graduate students, postdoctoral students, and undergraduates, all sharing a communal approach that Joseph credits with earning him the election to the National Academy of Sciences.

How did you come to your area of interest in fluid mechanics?

I started out as a sociologist, but I never did work in that area for one reason or another. In 1957 I went back to school at the Illinois Institute of Technology, and enrolled in a course in mechanical engineering. I studied hard but with no idea of going to graduate school, and I got essentially all A's. At that time the Russians had launched Sputnik, and there was suddenly a lot of money for scholarships and fellowships, and my professors identified me and encouraged me to go on to graduate school. Actually, one of the professors, Peter Chiarulli wanted to send me to Brown for applied math, but I had a family so I stayed at IIT, and I got a fellowship. My career then was in mechanical engineering and I had various professors in fluid mechanics. So my interest in fluid mechanics is basically a historical accident.

It's a very fascinating subject. In the early part of my career I was more on the mathematical side. I didn't really do any experiments in my graduate work or in the early part of my career. I did theory, a very elegant kind of thing; even calculus is a beautiful cultural or philosophical experience. It's astonishing to do applied math, to work certain things out on paper with symbols according to rules. To start with something physical and to do something entirely nonphysical with symbols and to come up in the end with something that fits very well with nature that you might never have dreamed about—it's like a beautiful toy.

Somewhere in the midpoint of my career I became very interested in doing experiments. Largely this was due to my association with Gordon Beavers (now Associate Dean of the Institute of Technology). We were both young faculty members in the department; he had a background in experiments and me in theory, and this combination worked so well that as time went on I couldn't get along without the experiments. Then he deserted me for the dean's office, so I was left on my own. Now we've begun to collaborate again.

What is the theory of stability that you're credited with?

In a kind of colloquial manner I could describe the theory of stability in this way: We know that in the course of our lives things go on in the normal way and then something happens to cause us to make a new adjustment. This is a physical principle that even could be described in terms of a plane curve; you go along a plane curve and you come to a place where another curve intersects it, it's a crisis curve. So physically you see, for instance in fluid mechanics, you have a situation in which you have a smooth laminar flow and then all of a sudden something abrupt happens and the flow begins to be turbulent and very mixing. In the old days, when people smoked, this was very easy to demonstrate. From your cigarette would come a very thin plume of smoke and then suddenly at a certain point it would break into violent fluctuations.

I can also describe it in a more scientific way: I'm in fluid mechanics, which is a branch of mechanics, and I consider that mechanics has two parts. The first part is the study of materials; I do some things in this area. The second part is dynamics, how things move and evolve. The study of stability falls in the regime of the study of dynamics. Say you have some system that consists of particles and fluids and so on and it may move in very different ways, depending on conditions. The study of the stability is the determination of all these ways in which the system may move, and the conditions under which you get one kind of motion or another. So you may say then, that a given dynamical condition of a system is stable if more or less it continues to operate in this manner as you change its conditions, and it's unstable if you reach a condition in which it dramatically changes.

Going back to sociology, various social events like revolutions and crises are descriptions of instability. I remember I had an argument with a referee in a journal about the stability of fluidized beds. We had a laboratory experiment in which a fluidized bed stayed *stable for a time* and I wrote that in my paper. The referee was very angry with me for saying that. He wrote to the editor that what Dan Joseph means is that it's *unstable* because it's only stable for a time. I wrote back to the referee that I meant just what I said; it's like the Roman Empire was stable *for a time*.

Stability in general has enormous implications. This is a central organizing ideal for science, period. All physicists, all engineers, all chemists have to deal with problems of stability; there's no avoiding this, it cuts across everybody's subject, basically because nothing runs smoothly.

What do you think led to your election to the National Academy of Engineering last year and then the National Academy of Science this year?

Well, the National Academy of Engineering told a reporter for the Star Tribune that I was nominated for conducting various ingenious and novel experiments in fluid mechanics, but I don't think that nomination has an explicit reference to my theoretical work. I think it relates to my perception of mathematics and its relationship to nature. I think it reflects the group I've developed here at the University. We have a philosophy that guides our lab, which is that we are very interested in theory, we're very interested in experiments and in numerical computations. We've developed sort of a no-holds attitude to research, where we come to answers whatever way we can. Cutting off experiments in numerical computations and doing only analysis would be like cutting off your hand. We have the highest regard for theory but are particularly devoted to applications.

This inspires my students greatly; they agree with this attitude. We form a community. And we have good times together, we have a very good social life here in the lab. I sign off my lectures when I don't have anything else to say, with the principles of our lab: have some fun, tell the truth, and do good research. For instance, this August I'm going to have what I call a pizza party/fluid mechanics/rheology workshop. We have about eight speakers—they are all my students or former students, and we're going to come together to have a good time and talk about our research.

It's great to have a community with students. I've found that now that I've reached this exalted state (laughs), that I'm older and doing a lot of mentoring, I've changed. I used to be very anxious about my career. I can't say I've stopped being anxious about my career, it's just that there's been a big change. I've gone from being mainly concerned about my own professional successes in research and so on, to being very concerned about my group and my students. As I get older and my powers diminish and I see these greatly endowed young people who come to my lab, I've come to realize that perhaps even more importantly than whatever present good or even great research results we can get, what we are making here is people. These people are the future for all of us.

In my group I have eleven Ph.D. students, three China Scholars, and one post-doc, and this summer five undergraduates are working in the lab. We get a lot of cooperation from our technical staff, particularly Dave Hultman, and our shop is a great asset to our research. From time to time other professors work with us, such as Professor Lundgren and Professor Beavers.

What are your views on the current discussions about formulating a state science and technology policy?

The state must have a science and technology policy, and it must have an institutional arrangement to deal with those questions. I wouldn't presume to say the manner in which they should deal with those questions, but when you consider what we have here in Minnesota, with 3M, Honeywell, the Minnesota Supercomputer Institute, and a thousand small innovative companies, it's clear that this is a technological community. This is a great state to have a scientific career in.

I do a lot of consulting, so I have a lot of contact with companies. Many of our centers have very deep roots with industry. Even in the Institute for Mathematics and Its Applications, a program on math in industry is thriving. I would think that the state science and technology policy should pay very much attention to those kinds of initiatives. Our meetings are not on a political level; we're doing the actual work of student and employee exchanges, and identifying and studying important problems. This is the sort of glue that holds academic science and engineering together with industry.

Your area of research has many practical applications and you've been an active discloser of ideas to the Office of Patents and Licensing. What is your view of the technology transfer process, and have your invention ideas been patentable and generated interest from industry?

I have to tell you that now I'm doing feasibility studies for manufacturing M&M Mars candy bars. They read my papers in the *Journal of Fluid Mechanics* on the method we invented of using water to lubricate heavy viscous crude oil as it moves along pipelines, to reduce the power required for pumping. We have a box of chocolate hearts in the lab and the idea is to melt these hearts and to drop them in a pipe surrounded by essentially sugar water, where the sugar content of the candy and the water are matched closely so that the candy will diffuse only very slowly into the water. You put it into the pipe when it's hot and you take it out when it's frozen, and because the sugar water doesn't freeze you take out a nice long piece of candy. If this works it could be that—strangely enough—water-lubricated pipelining of heavy viscous crude oil has an application in food processing.

I haven't patented anything to do with measuring the water-lubricated pipelines; we did laboratory work and theoretical work. But there are a lot of patents on this subject. In my book (*Two-Fluid Dynamics*, forthcoming) I have cited from patents that go back to 1906. I have been patenting things related to the oil industry—things such as effects of surfactants in formation and sterilization of emulsions, in which I currently have a patent application pending.

I don't have an overall view of technology transfer because I'm not involved in committees or task forces looking at the problem. I do technology transfer because I work closely

with a number of industries directly on their problems. So I guess the kind of technology transfer we do is rather ideal—less of a transfer and more of a collaboration.

I think the transfer of technology from universities to industry is a critical matter, and it is related to the question of science funding. It is very critical that our society work as one, that technical problems be addressed by the people who are best equipped to address them, and that the people who need these things done and the people who can get them done can find each other and work together as a team. University people shouldn't get highfaluting, and industry people shouldn't feel that academia is divorced from their needs. Those two attitudes, which to a certain extent were common in the past, are very detrimental to both science and industry.

Funding of research is becoming increasingly tight, especially for young scientists. What has been your experience in the funding arena, and how do you see it affecting your graduate students and colleagues?

I don't know how to be a prophet in this, but I do know that it was much easier when I was young. Of course, I came up in a special time when there was a great emphasis on funding young people in science and there was a great shortage of engineers. It's clear to me that technology is going to become more important, not less important in the future. The funding for young people has become a really serious situation, and there's a lot of agitation in the scientific community about this situation. A lot of it stems from selfish motives; not that selfish is bad, it's just become increasingly difficult for individual scientists to get individual grants. We all used to exist on individual grants and I still exist on individual grants, but in the past ten years there has been a tendency to answer criticisms of parochialism in science by funding huge centers. Now on campus we do have some of these centers, the Institute for Mathematics and Its Applications, the Army High Performance Computing Research Center, the Center for Interfacial Engineering, and these are very good centers. But many people perceive the money that goes to centers is taken away from individual investigators, and this is a questionable proposition. What's needed is a larger pie.

Certainly it's absolutely essential that young people be identified for funding—that young people who are doing good work be encouraged to continue their careers. This has been addressed by the Presidential Young Investigator program. I have a student, Kang Ping Chen, who recently received this award, and he is very deserving. But perhaps that program is even overfunded; certain talented individuals get a very great amount of money while other nearly as talented individuals have no money. It's a very serious and difficult problem to address. I have produced maybe 30 Ph.D.s. and I have funded their work on the basis of individual grants. If we suppose that all of these individuals pursue research ca-

reers, I would now have 30 new competitors for individual funding. So this won't work either.

The question is how you develop a cadre of technical competence that will address the needs of the country—and these needs are very abundant—without abusing the system, without falling into the rut of competing for grants to do the same thing all over again. I guess that all these people if they're well trained could be funded by a society like ours provided they were directed in productive avenues. I haven't done any science management yet on a political level, but I think this is one of the great problems of our time and our country. This is a role for the National Academy of Engineering and the National Academy of Science. There's no doubt that the scientific and engineering professions have to designate the people they consider responsible, and I suppose membership in these organizations is one such designation. Science and engineering management really has to be done by scientists and engineers and not by politicians.

What is your reaction and that of your colleagues to the budget cuts from the state, and to the overall subject of state funding for higher education and research?

It is especially hard on the young people, not getting any raises, and they're also having problems because of the contracting economy and difficulty getting funding for their research. So this is extremely discouraging. On the other hand I guess many people recognize that the state's in trouble and things must be done under the budget, but the University can't be a whipping boy. It has contributed a lot to the state. All of us have to do our share when times are hard. Certainly it's easy to cut the University and other academic institutions because basically we're powerless, we're a client of the state and the state just decides our budget.

I think (IT Dean) Jim Infante was correct in responding to Governor Carlson's cuts of some of our research centers by pointing out how foolish it is to cut \$8 million in state funding when that money brings in \$26 million in federal funding. I have to second Jim's attitude on this. I know for myself, I get good pay from the University—I can't complain. But in fact I pay myself and have done so for years through grants and overhead. I'm sort of a no-cost item. If I could get a bunch of professors like myself to form a university I could get very rich, so people oughtn't to pick on us.

I think absolutely we are approaching a point where younger faculty are going to perceive that the time has come to move on to an institution where they can get the support they need to succeed at their teaching and research. I think the state would profit greatly at not too great an investment by doing something to support the research of young people, even if it isn't a question of increasing their pay. If we're going to take seriously this state as a leading technological state, then we have to recognize that the young people on

the faculty are a very great resource. It could have a great payoff; people would want to come here if they know they will be treated with respect for their research role and that they will get some help. You can't replace federal funding with state funding, but for the young people in particular they need less than the older, established scientists. And they have longer to live and to contribute to the state's technological effectiveness.

If you were asked to describe your typical day to a legislator who has asked that faculty be audited for their use of time, what would you say?

I sleep six hours a night, I eat lunch on the run, I run for an hour to an hour and a half a day, I spend a little time with my wife and kids, family and friends, and I work all the rest of the time. I have the idea that there isn't a group in the state that's working harder than professors. Maybe (legislators) could do a little checking on it, but on the other hand, they ought to let us do a little checking up on them so we can make a comparison.

What has kept you at the University for 28 years?

My work has been a great pleasure but I have to say that my life in this state is great. I love it here. People are decent, civilized. In my department I have been encouraged to do my best to achieve what I could. To the extent that resources were available, they were made available to me. Individuals in our department were respected for whatever they could do. They were encouraged to do what they could do well. In general, I've seen a spirit of cooperation.

My personal life is very congenial here. I could walk to work but I drive in the winter and take my bicycle in summer. I'm a dedicated, slow runner. My whole life is a wonderful circle. I have wonderful concerts, wonderful theater, good stuff on the radio. I'm not that threatened by crime. It's just a super community here; I couldn't imagine a better one.

NSF Authorization Passed

The National Science Foundation (NSF) authorization bill has approved an FY 93 appropriations level of \$3.068 billion. The bill, which passed the House Committee on Science, Space and Technology early in June, also appropriated \$2.7 billion for FY 92.

Research and related activities in FY 93 would be authorized at about \$2.2 billion. Included in the \$2.2 billion are:

- Mathematics and Physical Sciences, \$731,460,000;
- Engineering, \$278,325,000;
- Biological, Behavioral, and Social Sciences, \$400,400,000;
- Geosciences, \$472,665,000;
- Computer and Information Science and Engineering, \$258,790,000; and
- Scientific, Technological, and International Affairs, \$68,360,000.

Other authorized categories for FY 93 include:

- Education and Human Resources, \$439,000,000
- United States Antarctic Program, \$210,000,000
- Academic Research Facilities Modernization Program, \$43,000,000;
- Academic Research Instrumentation Program, \$36,000,000;
- Salaries and Expenses, \$126,000,000; and
- Office of the Inspector General, \$4,000,000.

House Appropriates \$8.8 Billion for NIH

The House Appropriations Committee voted June 21 to approve slightly over \$8.8 billion for the National Institutes of Health (NIH) FY 92 budget—\$50 million above the president's request and \$548,147,000 or 6.6% above the comparable appropriation for FY 1991.

The bill, as approved by the House full Appropriations Committee, hits the mark established by the Labor, Health and Human Service, Education and Related Agencies (LHHS) subcommittee chaired by Rep William Natcher, D-KY. It reportedly contains sufficient funding for 6,000 new grants in FY 92—in keeping with the Financial Management Plan set out by the subcommittee last year.

The subcommittee's highest priority went to *women's health issues*, which, according to the committee report, received more than one third of the increases provided in the bill. The list includes research funding for breast and ovarian cancer, a new long-term clinical trial on women's health, reproductive health, women and HIV, osteoporosis, the link between oral contraceptives and breast cancer, and other additions for NIH's Office of Women's Health Research.

Ronald L. Phillips, Ph.D.

Ronald Phillips grew up with a first-hand knowledge of the value of corn and other crops. His father was district sales manager of a hybrid corn company and his mother was company secretary. So it was no surprise when, in 9th grade, he decided to work toward a career in plant breeding. He didn't know at the time the long challenge he had ahead, nor was he aware of the revolutionary discoveries being made in science that would soon provide the understanding and tools of molecular genetics to many scientists, including plant breeders. He also did not expect to be elected to the National Academy of Sciences for his work in plant genetics.

Besides your father and mother, were there certain people who inspired you in your academic pursuits?

On the academic side, I had some advice from high school vocational agricultural instructors that got me to Purdue University for my undergraduate degree. The real breakthrough, I think, came toward the end of my freshman year at Purdue. I was visiting with my botany instructor, telling him what I wanted to do and he said well, you really should be talking to Wayne Keim, who was a professor of genetics in the agronomy department. So I went to talk to him, and he was absolutely delighted; he said he'd never had a freshman come in before and say they wanted to be a plant breeder. I didn't quite end up a plant breeder; I'm a plant geneticist, but pretty close to it. Meeting Dr. Keim was lucky for me because he came from an academic family; his father was head of agronomy at the University of Nebraska, and the agronomy building there is now called Keim Hall. Keim influenced a lot of people with whom I later interacted. The person I did postdoctoral study with (Adrian Srb at Cornell) took his genetics from Keim, and my first department head here, Herb Johnson, was influenced to study at the advanced level by Keim. Wayne Keim is one of those people who has inherited the genes for encouraging students, and he had a vast influence on me. He asked me to join his research project, so I started as soon as I could, which was the start of my sophomore year, and I worked in the summers. In fact I lived in his home during the summer. He was like a second father. He shared a lot of philosophy with me; he had a lot of philosophy in him, and he passed it along. I still use much of it in my teaching. So that was a major factor, because he outlined very clearly what I had to do. One of the first things he said was you have to get a Ph.D. That was a surprise to me! (laughing) But he said it, so I thought well I'll follow his advice.

The next important person I met while I was at Purdue doing my master's degree with Wayne Keim, was Charles Burnham, who was a visiting professor from Minnesota. He is a professor emeritus now, and is in a nursing home. He still is actually directing some research from his nursing home bed; I have material in the field this summer for him, and there's a postdoctoral student here who's going to do

some crosses for him. He's 87 years old and still thinking about his work! When he was a visiting professor, the faculty at Purdue held him in very high regard, and he was about to publish a textbook which became very popular. He was internationally known and was one of the pioneers in the field of plant genetics. I decided to come here to do my Ph.D. with him.

Then I wanted to work on my postdoctoral studies with a person at Cornell University, Adrian Srb. His textbook on genetics was one of the most widely used at the time, and he was someone plant breeders called on to find out what was new in genetics. He was a fungal geneticist, but he often participated in plant breeding programs, talking about new kinds of mutations. I decided he would be a good person to work with, and I actually wrote to him and asked him if he would advise me in a study of transferring genes through genetic engineering; this was in 1966, so it was pretty early to be thinking about that. He wrote back and said he didn't feel competent to do that, but he did think there was a lot to be gained by understanding fungal genetics. This was a different form of genetics, haploid instead of diploid organisms; corn and humans have two sets of chromosomes, and the organisms he worked with had just one set, so the genetics was a little different. He offered me an NIH fellowship, so I spent a year with him. He was an excellent mentor, very knowledgeable, an excellent writer, very up to date, very supportive of innovative ideas. After a very productive year with him I was offered a job back here; that was in 1967.

I would say Keim and Burnham and Srb, who were my primary advisors, in each case were very supportive and helpful, each a little different in the way he saw science. I think the other thing that was an advantage for me, was that when I came up through my undergraduate days in genetics, it was a transition time between the classical and the new molecular. The structure and mode of replication of DNA was published by Watson and Crick in 1953, and I took my first genetics course in 1959. That year Wayne Keim had not yet given a lecture on DNA as part of his course. We had a visitor on campus for a seminar and he talked about DNA, so we started asking Keim questions about it afterward. He was throwing around these words and terms we hadn't heard, and finally he said, I tell you what, I'll give a lecture on it next week. So I came up through that transition time, and I've always felt that it was very much to my advantage, because I had the classical genetics coupled with learning about molecular genetics as it came about.

What was your reaction when you found out about your election to the National Academy of Sciences?

One of the first things I did was to write to all my former students to tell them about it. They obviously played a major role in this happening, because most of our research is done

through graduate and postdoctoral students. The second thing I did was to contact my mentors; the first was Wayne Keim, and the second was Charles Burnham. I went to the nursing home to tell him, and I believe he understood it and appreciated it. But after I told him and was sitting there visiting with him I started to think about his other students—I'm the third student of his who's been elected to the National Academy of Sciences. He was here on the faculty from 1938 until he retired. He was another person who obviously had the talent for mentoring from the scientific point of view. I was fortunate to have an undergraduate advisor and a masters advisor who gave me a lot of teaching philosophy, and a Ph.D. advisor who gave me a lot of scientific advice.

Another important event that I think affected my work greatly was when I came back here on the faculty. The department head, Herb Johnson, asked me if I thought the department should be involved in doing research on cell cultures. My immediate response was very easy because of a lecture I'd heard Adrian Srb give, in which he talked about how you could fuse animal cells and get hybrid cells; you couldn't get hybrid organisms but you could grow the hybrid cells in culture and study them. He said one day we'd be able to do this in plants, and it wasn't too long after that it was accomplished. He was pointing out how if you could manipulate plant species at the cell level, you'd have a very powerful system to do genetics and to do selections. So I had my mind made up before Herb Johnson ever asked the question, and he then gave us the opportunity to set up a postdoctoral program in this area. The postdoctoral student, Ed Green, and I then learned how to regenerate complete corn plants back from cells. That was a major breakthrough; it was the first time it had been done. Now that technology is being used all over the world, by public institutions and private industry. The basic idea is that your unit of selection is the cell, not the plant. So you can manipulate millions of cells in the test tube rather than millions of plants in the field. It's become a very valuable technology, and several new types of plants have been selected out of that.

That was an important decision the University made, to go into a whole new area in the department. The Department of Agronomy and Plant Genetics has a rich tradition. H.K. Hayes, the first department head, was a very famous plant breeder whose textbook was used around the world. He made some very significant contributions, in disease resistance in wheat and hybrid corn, and he brought statistics into the study of plant breeding, and also plant physiology. He really set a pattern to bring in the basic sciences to plant breeding and to be very progressive in the department. Today the program in plant breeding very much reflects the new genetics. All our course offerings, seminars, and exams require a good understanding of genetics. Yet one of the reasons our department has remained as strong as it has is that we've maintained our strength in the traditional areas and achieved a balance with the new biotechnology approaches.

Did you think as you were coming up with that early focus on genetics that it would take this long and be as difficult to get public acceptance for the use of genetic engineering in producing new plant varieties?

I guess at first we didn't anticipate the kinds of questions that would later be raised, first by scientists and then later by environmentalists. Once those questions were raised I think it was appropriate to take regulatory cautions. I think the reasons for these regulations have to be constantly monitored, because most of the cautions are based on conjecture. There's a lot of genetic exchange that occurs in nature, and we have to try to assess how this technology is different and what that difference might mean. At this point the technology seems to be working quite well, without any obvious dangers arising. So what I hope is that the regulatory process will reflect that; it's certainly caused additional procedures scientists have to go through in order to do their research. The University of Minnesota has yet to have a field test of a genetically engineered organism, but it will be coming. Certainly the industry field testing that's going on now is going to be helpful, because it will provide the first few years' data on transgenic plants in the field. This summer will be the first for transgenic corn plants to be grown in the field, a project approved at Plant Science Research, Inc., in Minnetonka. There were transgenic alfalfa plants grown the last couple years at Northrup King.

Before, we didn't have the opportunity to transfer genes between organisms sort of at will, so you didn't really think about these things. Certainly before in plant breeding there were some wide crosses made, and a lot of times these were very unstable, but because you could do it by natural means it didn't raise the ethical questions.

What is your view of the changing technology transfer process in agriculture, in which patenting of new varieties and licensing them is being emphasized as a more effective way of helping them be commercialized?

I think the bottom line is to have procedures where materials and information are transferred as readily as possible. There's going to be many ways that can happen, so it's going to be kind of a case-by-case situation to decide what is the most appropriate way. You have to keep track of the fact that we are a public institution. Even if you have funding for a project from private industry, your position, your students, the infrastructure itself are all comixed with that private funding, so you have to remember that. I think the idea of having the transfer process reflect the public good is the bottom line no matter where your funding is coming from.

Patenting itself has certain advantages to it in bringing about certain positive outcomes. I personally feel that if there is a product or procedure coming out of our work that has a limited market, and particularly if more development is

required to get it to that market, then it's not inappropriate to patent it and offer it on a restricted basis. Otherwise, there's a high risk of not getting it produced at all.

In the past, for example, you had corn as a commodity, and that was it. But now there's more and more specialty kinds of corn, and that requires a lot more handling and care in the process than you might think. The corn has to be grown separate so it doesn't cross, it has to be stored separately and transported separately, and that adds cost. Many crops couldn't stand that extra cost to get them to market. So when you start talking about a genetic change that's not a breeding change such as increased yield, but a change to produce a variety with higher protein content, which is what I've been involved in, there's definitely going to be added costs for handling that material. The question is whether the best way to get it out on the market is to give it some added value beyond the genetic change by giving some exclusivity to a company to make it profitable to bring it to market. I think there are reasons to give that kind of exclusivity for those kinds of products.

The problem is rationally deciding which products and processes fall into that category. In fact, we could use a better system here at the University for making those decisions. As a scientist you know your own area, but you don't know all the economic subtleties that come in. So as we get into this, we in fact have to develop a better system of analysis ourselves, and start setting some guidelines as to what triggers a decision to patent. I think patenting just as an attempt to raise funds is a poor reason—the reason should be to enhance the technology transfer process. To me the guiding principle is: Do the restrictions you can place on materials through patenting enhance the chances that it will actually be developed and marketed?

As genetics proceeds, and we start applying more of the new genetics to plant improvement, we're going to have more types of specialty crops available. It's something we're going to have to deal with here on. I'm in the process of applying for a patent, and I've reviewed every step of that process with all my graduate students, because I feel that whether they work for a university or industry or the government, they very likely are going to be involved in patenting. I'm trying to pass on what I'm learning.

One of the problems in plant genetics is that the development of new products involves directly the crossing of previously existing strains. The biggest concern about patenting in this area is that it will affect the exchange of germplasm to be used in the improvement of crops. It can do that, and has done it to some extent, but I don't think to as large an extent as some people think it has. Other people say, we'll still have the open exchange, it just won't be free of charge, and maybe that's the way we'll be doing business. The problem is that you can get so many different strains mixed up in a variety development program, that when you put something out on the market it's pretty complicated to

track all the restricted materials that went into it. And if you go international, as many of our materials do, that gets even trickier.

What have you seen in terms of funding for research in your field?

I don't see any great things on the horizon. I think if you're a careful scientist and really have a good program you're going to have support. The federal granting programs are going lower and lower in terms of the percentages of proposals they're funding, so you have to be really good to compete there. Companies also try to go with the best laboratories there. Companies also try to go with the best laboratories for their projects, so if you are part of a good program you will be able to find funding, but you're probably going to have to work harder to find it and to write more proposals and have more projects going on simultaneously. I'm sure I have five or six different sources of funding, and that in itself can be difficult because you're then dealing with five or six entities to keep that funding going.

Funding for agricultural research is very low; the grants tend to be small and for shorter periods than in other fields. Compared to medical research—to which in my view agricultural research should have equal status—it isn't even close. Take the human genome project, which by the time it is done will cost more than \$1 billion. The plant genome project is funded for \$11 million for competitive grants and \$4 million for USDA to use through their Agricultural Research Service.

There's just so much to be done in agricultural research; there is no shortage of ideas. The food supply really is our preventive medicine, where in large part the health sciences are an after-the-fact thing, to cure our ills. I've heard it said that agriculture should be called the health sciences, and the health sciences called the sick sciences. We've enjoyed a very healthy agriculture in this country; if that changes I guess then we'd see the funding change.

Plant sciences in general is a very exciting field. Certainly when you get into plant genetics, it's the golden age. You can now apply most of the technologies associated with microorganisms and genetics to higher plants. You can grow them at the cell level, you can get the plant back from the cells. The power now is fantastic, there is a tremendous amount to learn. I think from this point it's going to get even more exciting and stay exciting for a long time. You can transfer genes now, but in terms of what genes we can get our hands on now, it's just a small percentage compared to what will be discovered through the genome mapping projects.

It's a very rewarding field because your research can end up in something that's really an improved food. You need only look at the more than 100 new crop varieties that have come out of the research of the University and its experiment stations, and then see what that means in terms of the state's

economy, and you get a picture of that satisfaction. Yet there doesn't seem to be a lot of public recognition of the tremendous investment agricultural funding is.

Scientifically, from a teaching and research point of view, it's very exciting, but from a funding point of view, I don't see any bright spots. The increase in funding for the current projects, no matter how good they are, has been pretty level with inflation for the past 20 years, yet research costs have gone up much faster than inflation. The only reason the projects have survived is because they've been successful at getting federal grants or private funding. That's worked for now, I guess, but there is a limit to what we can do at this level. I think there is a good base of support from the state, but the whole field could be enhanced a lot. I think what's lacking from a public and legislative perspective is a vision of what's possible with increased funding. We've got a good strong University in this regard and the return could be enhanced tremendously. I truly believe that.

Are enough young people being attracted to agricultural research to do the work necessary in coming years?

I think it's true across all fields that we don't have a good system for letting young people know the options. They know there's agriculture, but they don't know there's plant genetics and cell biology, etc. The problem is that people have an image, and then they don't look further. They don't realize that within agriculture you can satisfy almost any need you have, whether it's journalism or science or business or engineering, whatever your interest is it can be found in agriculture, and there are tremendous opportunities for contributions to society. People come through our labs and they say they had no idea this was going on in agriculture.

I don't think we're doing our young people a service by keeping this kind of thing quiet. But I don't think it takes too much for students to find out what is available if they take a little initiative to look into various areas. The University is good at helping to direct students toward areas of interest, and I think the undergraduate initiative of having all freshmen be part of a general Academy of Arts, Sciences, and Engineering, and learn about different areas is a good approach. But to get that initiative and awareness started at early levels, we're still not doing a very good job of that as a society.

How are you and your colleagues feeling about the University's current funding reductions, and about the reallocation taking place?

I've been on the faculty since 1967, and in my experience there is just no squandering of funds here. With the retrenchments and the reallocations that we've had, if you could ever have argued that there is fat in the system, it's not here now. Now what we're doing is cutting good programs off

one end in order to expand or start good programs on the other. The problem is, when you get rid of good programs, you've lost something; it's not a positive result. This process that we've had to go through because of funding reductions has required that we look at ourselves and reevaluate programs and redirect, and all that's good. But, in my opinion, where you're taking the money from is out of good solid programs.

I think the faculty morale, at least in our department, is pretty balanced. I see kind of a balancing between the excitement of the science and the really valuable contributions we're making, against trying to figure out how to balance the budget. I don't sense any great pessimism, but I think it could well come to that. Like the salary freeze this year; generally across the University people are accepting it, but I don't think they will next year. We're on a fine line.

A large part of keeping morale as high as possible is making sure faculty have a major opportunity for input in how the reallocation is done. I think our administration is giving us that opportunity to be involved in decisions, and in helping us deal with some of the problems the funding situation has caused. We're in the process of filling an endowed chair, for which we raised \$1.5 million outside of the University and earned the PUF match, and we've made an offer to a person for whom the entire faculty in the department voted, and we've had a lot of cooperation from administration and other programs to be able to put together an attractive offer. We've also had a recent retention case for a person who would be a major loss for the University, and the administration has been very helpful there as well. So things are being done to keep things as positive as possible.

One of the questions that was posed by the state legislature is what exactly do University faculty do with their time. How would you describe your day?

I think it is not very well known how different types of faculty spend their time. I have a 20 percent teaching (graduate students) and 80 percent research appointment. There is this simplistic view that all professors should be teaching largely, and that research is some kind of hobby rather than a positive activity. It just isn't that way, it's a very professional activity that has an enormous impact on the state's and the nation's well-being. Doing research and educating at the graduate level is very time-consuming. It's very much a tutorial process to train the researchers and the faculty of the future. It requires considerable discussion about procedures and interpretation of results. It's not a straightforward thing where you're going to do this experiment and get the data and it's going to tell you something. It just doesn't work that way. We're constantly evaluating our data and modifying our hypotheses. And in our projects we have major laboratory activity as well as major field activity. There's a lot of interaction; I have about 20 people in my lab, and I interact with a number of other professors and their students. I'm here on campus from before 8 a.m. until 6 p.m. or so.

So a lot of my day is spent interacting, talking about this program or that research project, or conducting classes; there's just a zillion things you can be doing. There's so much of this activity, in fact, that I have to do all of my writing at home in the evenings or weekends, because those are the only times I can block out enough time to think and do a good job of preparing journal articles, research reports, and proposals for new or continuing grants.

To be on the cutting edge in research today means bringing together many subdisciplines, and that means interacting with other faculty and students. That takes time and it's a lot of work. You have all that plus national and state activities, plus taking part in making decisions in the department and at the University. For example, last week I was part of a committee evaluating President Hasselmo's performance. Every day's different, you get the opportunity to do new things all the time. You go from teaching, to out in the field planting corn, to reviewing the president (laughs).

What has kept you at the University for 24 years?

Well, first of all I enjoy the variety of interesting activities I do every day, as I was just saying. But I think the bottom line for me is the excitement I get when a graduate student comes up with a new result and we work together to interpret it and then you walk out of the laboratory realizing that you've just discovered something new and important. That truly is a high for me; I experience a physiological change.

I had a chance some time ago to go to Washington, D.C. for half a year to review grant proposals in plant genetics. I thought it would be very exciting to read all these new ideas coming from all over, but I never had a real sense of excitement that I get in my lab. I've been asked to apply for a lot of jobs, and I always come back realizing how lucky I am to be at the University and to have such great interaction with my colleagues. Life's pretty short; if you don't enjoy who you're working with it can be time wasted.

I consider myself very lucky. My election to the National Academy of Sciences very much reflects on the students and colleagues I've worked with in my career.

Program Information

National Institute of Environmental Health Sciences and the National Institute of Allergy and Infectious Diseases

Studies on the Interactions Between Environmental Toxicants and the Immune System

The National Institute of Environmental Health Sciences (NIEHS), and the National Institute of Allergy and Infectious Diseases (NIAID) are accepting grant applications (R01s and R29s) to study the interactions between environmental substances and their effects on immune function (PA-91-66). The objective is to promote research at the molecular and cellular level to better understand mechanisms of environmentally induced aberrations within the immune system in order to gain insight into approaches to mitigate the effects of such agents. These agents are substances that may be present in the natural environment or have been added by human activities and are known or thought to induce illnesses that affect or involve the immune system.

The effects of environmental toxicants may be divided into three broad categories: suppression/inhibition of immunological competence; initiation or triggering of autoimmunity; and stimulation of allergic/hypersensitivity reactions. Although NIEHS and NIAID have overlapping interest with respect to each of these categories, NIEHS interest centers on the effects of chemical/physical agents that suppress or reduce the capacity of the immune system. The interests of NIAID are more focussed on the actions of chemical/physical agents that precipitate or lead to autoimmune and allergic disorders. Both institutes are interested in approaches that may mitigate the noxious effects of environmental agents and in the development of improved animal and *in vitro* models for studying the effects of noxious substances.

This is an ongoing program with annual deadline dates of **February 1, June 1, and October 1**. Guidelines are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Blandin Foundation

Early Stage Technology Development Fund

The Office of Research and Technology Transfer is currently accepting proposals for the third round of funding for the Blandin Foundation Early Stage Technology Development Fund.

The Fund has been established to develop discoveries emanating from faculty research toward commercialization, primarily in non-metropolitan Minnesota. It provides funding to produce project prototypes, create business plans, coordinate market analyses, and carry out research and development activities to enhance commercially-viable University discoveries to the point where they can be licensed to existing companies or picked up by venture capitalists. The outcome of the research should be preserved in a form useful to a licensee of the discovery.

Faculty are invited to submit proposals, preferably between five and ten pages in length, for projects to be considered by the Fund. Proposals are subject to customary departmental and collegiate review procedures applicable to industry-sponsored projects and must be accompanied by a BA23. Awards will be made for periods of six months to one year.

Each proposal should contain: 1) a description of the discovery to be developed; 2) a plan, in reasonable detail, for developing the discovery towards commercialization; 3) a discussion of the discovery's commercial potential and marketability; 4) a discussion of the feasibility of commercializing the discovery in non-metropolitan Minnesota; 5) a budget for developing the discovery; 6) a current *curriculum vitae* of the principal investigator; and 7) other information and attachments that would be helpful in evaluating the proposal.

Proposals may be submitted at any time. However, to allow for timely review by the Advisory Review Committee, the date of **July 26, 1991** has been established as the deadline for the submission of all proposals for this third round of funding.

Proposals should be sent to A.R. Potami, Associate Vice President, ORTTA, 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415. Questions may be referred to Mr. Potami at 624-1648 or to Bob Hicks at 626-1585. A detailed copy of the Fund's guidelines may be requested by calling 626-1585, or by sending a note through the bulletin board.

International Human Frontier Science Program

The Human Frontier Science Program (HFSP) aims to promote basic research on the complex mechanisms of living organisms, including man, through international collaboration. Applications are currently being invited for support of research grants, fellowships, and workshops for research in brain function and in biological functions at the molecular level.

- Brain Function
 - Perception and Cognition
 - Movement and Behavior
 - Memory and Learning
 - Language and Thinking
- Biological Functions Through Molecular Level Approaches
 - Expression of Genetic Information
 - Morphogenesis
 - Molecular Recognition and Responses
 - Energy Conversion

Research Grants are carried out jointly by research teams in different countries. The principal investigator must be from one of the eligible countries (Canada, France, Germany, Italy, Japan, Switzerland, U.K., U.S.A., and non-summit, European Community member countries).

Fellowships are offered for researchers from eligible countries who wish to do research in foreign countries, or for researchers outside the eligible countries who wish to do research in one of the eligible countries. Fellowships are either long-term (3 months-2 years) or short term (up to 3 months).

Subsidies are also offered for international workshops organized by researchers from the eligible countries.

There are no application deadlines for short-term fellowships and workshops. The application deadline for research grants and long-term fellowships is **September 30, 1991**. ORTTA has written to the agency requesting guidelines/applications, although application forms will not be available until after September 1. If you would like further information, call 624-9004 or send a note through the bulletin board and, when available, material will be sent to you. The agency address is: International Human Frontier Science Program Organization (HFSP), Tour Europe, 20 place des Halles, 67000 Strasbourg, France; telephone (France 33) - 88-32-88-33; fax (France 33) -88-32-88-97.

McKnight-Land Grant Professorships

Departmental nominations are being invited for the 1992 class of up to twelve, two-year McKnight-Land Grant Professorships. This program offers career development awards to junior faculty and was named for a significant gift from the McKnight Foundation combined with a share of the Permanent University Fund, created by the original Land Grant to the University.

Eligibility

The emphasis is on faculty in the very early years of their professional careers, therefore those eligible must have received the Ph.D. after January 1, 1986. Nominees must hold a tenure-track position in which they have completed no more than three years at the University of Minnesota by the end of the 1990-91 academic year. Faculty are not eligible if they are not yet resident at the University by the fall nomination, nor are they eligible if they are being recommended for tenure in the year of their nomination.

Terms of Award

The McKnight-Land Grant Professorship appointment will be for two years, beginning July 1, 1992 and extending through June 30, 1994. Each professor will be awarded a \$16,500 research grant for each of the two years, to be used at the recipient's discretion for expenditures directly related to the research project. In addition, each professor will be given either a year's leave to pursue research, with full pay, during the second year of the award, or an additional research grant of \$15,000.

In accepting a McKnight-Land Grant Professorship, a faculty member will agree to remain at the University for the full two years of the Professorship, plus one year. If this condition is not met, the recipient will be required to repay the value of the Professorship in full. Each department may nominate one candidate.

Application Procedures

Nominations must be accompanied by the following materials in six copies.

1. A half-page, double-spaced layman's abstract of the research.
2. A statement of up to three pages from the nominee—written not for the specialist but for an all-University review committee—describing the research to be conducted during the two-year appointment.
3. A list of sources and amounts of external grant support, as well as a list of pending grant proposals.

4. A *curriculum vitae* of the nominee.
5. Three letters of reference by referees familiar with the research, at least two of which, preferably, come from scholars outside the University.

The nominations will be reviewed by a faculty committee which will make recommendations to the Dean of the Graduate School. Nominations are due **October 15, 1991**; winners will be announced in January 1992. For further information or questions, please call Myrna Smith at the Graduate School, 625-3394.

National Institute on Aging

The Health and Effective Functioning of Older Rural Populations

The National Institute on Aging (NIA) invites research and research training grant applications on the social, economic, psychological, environmental, and biomedical factors affecting the aging processes and the health and effective functioning of older people in rural areas. A research agenda is needed for examining the life-long experience, the current circumstances, and the special physical and social nature of rural life as they affect the health, well-being, and functioning of nonmetropolitan older people. Although many research topics are worthy of consideration, NIA consultants and staff have identified five as requiring special attention:

- The changing social, economic, demographic, and epidemiologic characteristics of the older rural population;
- The occupational and physiochemical environment;
- The aging population of rural communities;
- The availability, utilization, and quality of health-care and other services;
- Aging rural people as resources.

Available award mechanisms for this program are: Research project grants (R01), FIRST (R29), fellowships (F32, F33), and research career development awards (K04). The program is ongoing with annual deadline dates of February 1, June 1, and October 1 for R-awards, and January 10, May 10, and September 10 for F-awards. Guidelines are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

The Retirement Research Foundation

The Retirement Research Foundation is a private philanthropy with primary interest in improving the quality of life of older persons in the United States. The Foundation concentrates its resources on these objectives:

1. To increase the availability and effectiveness of community programs designed to maintain older persons in independent living environments and to enable the disabled aged to function independently;
2. To improve the quality of nursing home care;
3. To provide new and expanded opportunities for older persons to engage in employment and volunteer services;
4. To support selected basic, applied, and policy research that seeks causes and solutions to significant problems of the aged.

Deadline application dates are **February 1, May 1 and August 1** annually. Guidelines are available from ORTTA and may be requested by calling 624-9004. The agency may be contacted at: The Retirement Research Foundation, 1300 West Higgins Road, Suite 214, Park Ridge, Illinois 60068; 708/823-4133.

Robert Bosch Foundation

The Robert Bosch Foundation of Stuttgart, Germany, sponsors 15 young American professionals in full-time work internships in Germany each year. During the nine-month program (September-May), the Fellows have the unique opportunity to live in Germany while working in branches of the federal government as well as in high-level internships relating to their professional experience.

Applicants should have outstanding credentials, including advanced degrees or equivalent work experience in the following fields: journalism, public affairs, mass communications, law, economics, political science, and business administration. There is no strict age limit, although the program is primarily intended for those near the start of their careers. Proficiency in German is not required at the time of application, but is required of all selected Fellows by the start of the program. (Language training may be provided for by the Foundation when necessary).

The application deadline for the 1992-1993 program is **October 15, 1991**. For further information or an application, contact: The Robert Bosch Foundation Fellowship Program, c/o CDS International, 330 Seventh Avenue, 19th Floor, New York, NY 10001; 212/760-1400.

Research Corporation

The Research Corporation offers several programs on an annual basis:

Research Opportunity Awards are for scientists of demonstrated productivity and creativity seeking to explore new areas of experimental research. The chair of Ph.D.-granting physics and chemistry departments in the U.S. may make two nominations annually from among tenured faculty members who are without major research funding. Applications will be invited from these nominees. Nomination deadlines are **May 1 and October 1** of each year.

Cottrell College Science Awards support programs of research in Astronomy, Chemistry and Physics that will enhance undergraduate participation in research-oriented teaching programs. Scientific significance and originality are the prime criteria in evaluating grant applications. Routine proposals are not encouraged and investigations of an applied nature will not be considered. Application deadlines are **May 15 and November 15**, annually.

Partners in Science supports grants made to a college or university to undertake collaborative summer research between a high school chemistry or physics teacher and a science faculty mentor.

Department Development Grants are accepted by invitation only. The Corporation will seek out promising candidates in private or public undergraduate chemistry and physics departments in institutions that have the potential to join a group of other institutions that have been conspicuously successful at producing science graduates.

In addition to the above programs, Research Corporation is open to opportunities within their fields of activity that fall outside regular programs. Proposals for support of projects that will enhance science research or that bear on the infrastructure of science can be considered. Prospective applicants should submit a concise preliminary letter proposal.

Guidelines for the above programs are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board. The agency contact is: Brian Andreen, Grants Program Coordinator, Research Corporation, 6840 East Broadway Boulevard, Tucson, AZ 85710-2815; 602/296-6771.

CUFS: Budget-to-Object Conversion Chart

With the conversion to CUFS coming on November 1, 1991, ORTTA has developed the following chart to map budget numbers used on sponsored programs in the current accounting system to the new corresponding object numbers in the CUFS accounting system. At conversion, October 31 fund balances residing in the budgets of a current account (fund/department) number will automatically transfer to the corresponding object in the CUFS account (fund/area/organization) number.

ORTTA has already begun using these new budgets in setting up recent awards. The closer your current account distribution matches the CUFS object code definitions, the easier the conversion of these accounts will be. However, for awards that have already been set up, we expect it to be easier to wait until after the conversion to realign your budgets. We strongly encourage you to begin using these object codes to define budget categories when developing budgets on new, renewal and continuation proposals. Feel free to contact any of your ORTTA grant administrators if you have any questions.

Budget	Object	Description
01	7000	Academic Salaries
02	7300	General Operating Support and Service
04	8500	Indirect Costs
06	8200	Equipment
07	7600	Travel—Domestic
08	7910	Reserve—ORTTA
09	8270	Building and Structures
10	7900	Subcontract #1
11	7010	Civil Service Salaries
12	7100	Fringe Benefits
14	8600	Institutional Allowance
16	7800	Stipends and Tuition
17	7610	Travel—Foreign
19	7430	Hospital—Inpatient
20	7440	Hospital—Outpatient
22	7330	Computer Software
24	7200	Consultant Fees
26	7210	Consultant Expenses
27	7620	Trainee Travel
28	7400	Participant Expenses

Budget	Object	Description
30	9405	General Investment Pool
32	7320	Lab/Med Support and Services
34	7220	Professional Services—Fees
36	7230	Professional Services—Expenses
38	8030	Rents/Leases—Space and Equipment
39	7450	Medical/Dental/Health Care
40	9405	Temporary Investment Pool
42	7310	Printing/Duplicating/Binding
46	8210	Computer Equipment
50	7901	Subcontract #2
52	7340	Mailing
60	7902	Subcontract #3
62	7350	Telephone
70	7903	Subcontract #4
72	7410	Miscellaneous
80	7904	Subcontract #5
82	8020	Repair and Maintenance
91	7000	Work Study Salaries
92	8100	Minor Equipment and Furniture

Grants and Contracts Staff by Agency Responsibility

ORTTA's Division of Grants and Contracts has revised the agency responsibilities assigned to grant administrators to include Susan Stensland and Jim Reinholdz, who have recently joined the staff. The following lists major funding agencies and the grant administrator responsible for each. Responsibility for some larger agencies is assigned to more than one grant administrator. For further information on these assignments *or for agencies not included on this list*, please call ORTTA's Division of Grants and Contracts, at 612/624-5599. (See telephone numbers on page 26.)

<u>Agency Name</u>	<u>Grant Administrator</u>
Agency for International Development	Garlid
Agricultural Associations	Garlid/Klitzke
Agriculture, U.S. Department of	Garlid/Klitzke
USDA-Cooperative State Research Service	
USDA-Economic Research Service	
USDA-Forest Service	
USDA-Extension Service	
USDA-National Agricultural Library	
USDA-North Central Forest Experiment Station	
USDA-Pacific Northwest Experiment Station	
USDA-Science and Education Administration	
USDA-Soil Conservation Service	
Air Force, Department of the	Garlid/Lynch
Alcohol, Drug Abuse and Mental Health Administration	McKoskey/Morrison/Weiss/Krzyzek/Reinholdz/Stensland
ADAMHA-National Institute of Mental Health	
ADAMHA-National Institute on Alcohol Abuse and Alcoholism	
ADAMHA-Office of Substance Abuse	
ADAMHA-Office for Treatment Improvement	
ADAMHA-National Institute on Drug Abuse	
American Cancer Society	McKoskey/Reinholdz
American Chemical Society	Dunn
American Heart Association	Reinholdz
Army, Department of the	Garlid/Lynch
Associations/Societies	Garlid/Klitzke/Dunn/Lynch
Business and Industry	Dunn/Lynch/Volinkaty
Centers for Disease Control	McKoskey/Morrison/Weiss/Krzyzek/Reinholdz/Stensland
CDC-National Institute for Occupational Safety and Health	
Cities	Stensland
Colleges and Universities	Stensland
Commerce, U.S. Department of	Levine
DOC-National Oceanic and Atmospheric Administration	
DOC-Office of Sea Grant Programs	
Counties	Stensland
Defense, Department of	Garlid/Lynch
DOD-Defense Advanced Research Projects Agency (DARPA)	
DOD-Defense Communication Agency	
DOD-Defense Nuclear Agency	
DOD-Department of the Air Force	
DOD-Department of the Army	
DOD-Department of the Navy	
DOD-National Security Agency	
DOD-Strategic Defense Initiative Organization	
DOD-U.S. Marine Corps	
Education, U.S. Department of	Klitzke
DE-Office of Education	
DE-National Institute of Education	
DE-Fund for the Improvement of Post-secondary Education	
DE-National Institute on Disability and Rehabilitation Research	
DE-National Institute for Handicapped Research	
DE-Rehabilitation Services Administration	

Energy, Department of	Dunn
Environmental Protection Agency	Klitzke
Federal Agencies, Miscellaneous	Klitzke
Federal Emergency Management Agency	Klitzke
Food and Drug Administration	McKoskey/Morrison/Weiss/Krzyzek/Reinholdz/Stensland
Foreign Entities (non-industry)	Garlid
Foreign Industry	Volinkaty
Foundations, Local	Krzyzek
Foundations, Private and Corporate	Krzyzek/McKoskey
Greater Minnesota Corporation	Dunn
Health Agencies, Voluntary	McKoskey/Krzyzek/Reinholdz/Weiss
Health and Human Services, Department of	McKoskey/Morrison/Weiss/Krzyzek/Reinholdz/Stensland
DHHS-Administration on Development Disabilities	
DHHS-Health Care Financing Administration	
DHHS-Office of Human Development Services	
OHDS-Administration on Aging	
OHDS-Administration on Children, Youth and Families	
DHHS-Social Security Administration	
Health Resources and Services Administration	McKoskey/Morrison/Weiss/Krzyzek/Reinholdz/Stensland
HRSA-Bureau of Health Care Delivery	
HRSA-Bureau of Health Professions	
HRSA-Bureau of Maternal and Child Health and Resources Development	
HRSA-Indian Health Service	
Housing and Urban Development, Department of	Dunn
Industrial Sponsors	Volinkaty/Lynch/Dunn
Information Agency, U.S.	Garlid
Interior, U.S. Department of	Lynch
USDI-Bureau of Indian Affairs	
USDI-Bureau of Mines	
USDI-Bureau of Outdoor Recreation	
USDI-Bureau of Reclamation	
USDI-Bureau of Sports, Fisheries and Wildlife	
USDI-U.S. Geological Survey	
International Organizations	Garlid
(World Bank, World Health Organization, etc.)	
Justice, U.S. Department of	Klitzke
Labor, U.S. Department of	Klitzke
Minnesota Medical Foundation	Krzyzek
Minnesota, State of	Levine/Morrison
Miscellaneous Federal Agencies	Klitzke
National Aeronautics and Space Administration	Volinkaty
National Foundation on the Arts and Humanities	Klitzke
NFAH-Institute of Museum Services	
NFAH-National Endowment for the Arts	
NFAH-National Endowment for the Humanities	
National Institutes of Health	McKoskey/Morrison/Weiss/Krzyzek/Reinholdz/Stensland/Weiss
NIH-Division of Research Resources	
NIH-Fogarty International Center	
NIH-National Cancer Institute	
NIH-National Center for Nursing Research	
NIH-National Eye Institute	
NIH-National Heart, Lung and Blood Institute	
NIH-National Institute of Allergy and Infectious Diseases	
NIH-National Institute of Arthritis and Musculoskeletal and Skin Diseases	
NIH-National Institute of Child Health and Human Development	
NIH-National Institute of Deafness and Other Communications Disorders	
NIH-National Institute of Dental Research	
NIH-National Institute of Diabetes and Digestive and Kidney Diseases	
NIH-National Institute of Environmental Health Sciences	

NIH-National Institute of General Medical Sciences	
NIH-National Institute of Neurological Disorders and Stroke	
NIH-National Institute on Aging	
NIH-National Library of Medicine	
National Science Foundation	
U/M Institute of Technology Departments	Dunn/Lynch
All other Departments	Klitzke
Navy, Department of the	Garid/Lynch
Nuclear Regulatory Commission	Dunn
Private Agencies, Agricultural Related (Non-Industry)	Garid/Klitzke
Private Agencies, Others (Non-Industry)	Dunn/Garid/Klitzke/Lynch
Public Health Service, U.S.	
See:	
Health & Human Services	
Alcohol, Drug Abuse and Mental Health Administration	
Centers for Disease Control	
Health Resources and Services Administration	
Health Care Financing Administration	
National Institutes of Health	
Food and Drug Administration	
Small Business Administration	Klitzke
Smithsonian Institution	Klitzke
State Justice Institute, U.S.	Klitzke
State (non-Minnesota) and Local Governments	Stensland
State, U.S. Department of	Garid
Transportation, U.S. Department of	Lynch
Treasury, U.S. Department	Klitzke
Veterans' Administration	Dunn
Voluntary Health Agencies	McKoskey/Krzyzek/Reinholdz/Stensland/Weiss

Faculty Research Awards

This section contains statistics on proposals and awards recently processed by ORITA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award, he would like mentioned in a future Research Review, please call Mike Moore at 724-9398.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
May, 1991	334	\$ 43,467,405
Awards Processed		
May, 1991	145	9,191,378
Proposals Submitted		
July, 1990 - May, 1991	3,360	472,969,095
Awards Processed		
July, 1990 - May, 1991	2,567	211,019,017
Proposals Submitted		
July, 1989 - May, 1990	3,409	567,419,006
Awards Processed		
July, 1989 - May, 1990	2,404	264,064,728

Climate History from the Paleosalinity of Lakes in the Northern Great Plains

Daniel R. Engstrom, Geology and Geophysics
 Sherilyn C. Fritz, Geology and Geophysics
 National Science Foundation
 \$375,000 / 03/91-02/94

Modeling and Experimental Studies of Oxide Covered Metal Surfaces

William H. Smyrl, Chemical Engineering and Materials Science
 J. Woods Halley, School of Physics and Astronomy
 Richard A. Oriani, Chemical Engineering and Materials Science
 U.S. Department of Energy
 \$341,055 - 11/90-10/91

Myocardial Perfusion in the Hypertrophied Heart

Robert J. Bache, Medicine
 NIH, NHLBI
 \$213,276 - 05/91-04/92

Maternal/Child Health Program

Amos S. Deinard, University Hospital and Clinic
 Robert W. Ten Bensel, School of Public Health
 Byron Egeland, Educational Psychology
 St of MN - Department of Human Services
 \$179,185 - 02/91-06/91

Functions and Regulation of Expression of A. Tumefaciens Virulence Genes

Anath Das, Gray Freshwater Biological Institute
 NIH, NIGMS
 \$145,303 - 04/91-03/92

Atrial Natriuretic Factor and Adrenergic Nerves

George J. Trachte, Pharmacology, Duluth
 NIH, NHLBI
 \$122,597 - 06/91-05/92

C2-Symmetric Macrocyclic Dimer Synthesis

Thomas R. Hoye, Chemistry
 NIH, NIGMS
 \$118,683 - 05/91-04/92

Surface Stability and Overlayer Growth on High Temperature Superconductors

John Weaver, Chemical Engineering and Materials Science
 USDOD, Navy
 \$110,000 - 01/91-12/93

Professional Training for Community Interpreters

Bruce T. Downing, Center for Urban and Regional Affairs
 St of MN - Department of Human Services
 \$104,761 - 01/91-12/91

Maize and Oat Transformation

David A. Somers, Agronomy and Plant Genetics
 Ronald L. Phillips, Agronomy and Plant Genetics
 Irwin Rubenstein, Genetics and Cell Biology
 Purdue University
 \$100,000 - 01/91-12/91

Behavioral Effects of Prenatal Cocaine Use on Children

Travis Thompson, Psychology
 DHHS
 \$67,106 - 01/91-09/91

Applications of Advanced Technologies in Transportation

Richard P. Braun, Center for Transportation Studies
 St of MN - Department of Administration
 \$10,000 - 09/90-12/91

Modeling Internal Radiative Transport in Crystal Growth Processes

Jeffrey J. Derby, Chemical Engineering and Materials Science
 NASA
 \$64,999 - 05/91-04/92

Direct Measurement of the Forces of Adhesion Between Solid Polymer Films

Matthew V. Tirrell, Chemical Engineering and Materials Science
 3M
 \$12,500 - 01/91-12/91

Research Experiences for Undergraduates in Chemistry

Wayland E. Noland, Chemistry
 National Science Foundation
 \$40,000 - 03/91-08/92

Estimating Freeway Origin-Destination Flows

Gary A. Davis, Civil and Mineral Engineering
 St of MN - Department of Transportation
 \$17,481 - 04/91-11/91

Herbicides in Rain in Minnesota

Paul Capel, Civil and Mineral Engineering
 St of MN - Department of Agriculture
 \$6,500 - 03/91-12/91

Study of Multilayer Thin Film Recording Media

Jian-Gang Zhu, Electrical Engineering
 IBM
 \$34,764 - 03/91-02/92

Partial Differential Equations and Applications

Avner Friedman, Institute for Mathematics and Its Applications
 National Science Foundation
 \$45,480 - 07/91-12/92

Ultrasonic Range Sensor Ring

Max Donath, Mechanical Engineering
 Advances Technology and Research Corporation
 \$15,000 - 02/91-08/91

Partial Differential Equations and Harmonic Analysis

Eugene B. Fabes, School of Mathematics
 National Science Foundation
 \$49,000 - 05/91-10/92

Predicting Soil Nitrogen Availability

Gyles Randall, Soil Science
 Michael A. Schmitt, Soil Science
 Gary L. Malzer, Soil Science
 Greater Minnesota Corporation
 \$60,000 - 03/91-12/92

Methane Generation from Agricultural End Products

David D. Walgenbach, Southern Experiment Station, Waseca
 Greater Minnesota Corporation
 \$99,200 - 03/91-12/92

Use of Soybean Oil in Swine Diets

Mark E. Wilson, Southern Experiment Station, Waseca
 Minnesota Soybean Research and Promotion Council
 \$5,000 - 12/90-08/91

Formation and Disruption of Biofilms in Meat Processing Systems

Edmund A. Zottola, Food Science and Nutrition
 National Livestock and Meat Board
 \$40,000 - 04/91-03/92

Wild Rice as Antioxidant and Water-Binder for Precooked Beef

Paul B. Addis, Food Science and Nutrition
 Richard J. Epley, Food Science and Nutrition
 Minnesota Beef Council
 \$29,931 - 01/91-12/91

Improving Establishment of Forage Legumes

George W. Rehm, Soil Science
 Craig C. Sheaffer, Soil Science
 Mel Wiens, Soil Science
 Greater Minnesota Corporation
 \$28,578 - 02/91-12/92

Improving Ridge-Till Planting Systems

George W. Rehm, Soil Science
 Greater Minnesota Corporation
 \$39,450 - 02/91-12/92

Spatial Variation in Soil Properties

James L. Anderson, Soil Science
 U.S. Department of Agriculture
 \$38,100 - 04/91-01/93

Textile Trade and Masquerade Among the Kalabari of Nigeria

Joanne Eicher, Design, Housing and Apparel
 National Geographic Society
 \$5,512 - 02/91-06/91

Fellowship for Faculty Scholars in Nutrition

Joanne L. Slavin, Food Science and Nutrition
 Pew Memorial Trust
 \$29,368 - 06/91-05/92

Effects of Arm Movement on Subclavian Vein Indwelling Catheters and Permanent Pacemaker or Defibrillator Leads

Jean Magney, Cell Biology and Neuroanatomy
 Cardiac Pacemakers, Inc.
 \$17,850 - 04/91-12/91

Lipid Lowering Effects of Oat Bran—A Meta-Analysis

Joseph Keenan, Family Practice and Community Health
 Quaker Oats Company
 \$13,118 - 01/91-06/91

Multicenter Study Evaluating Oral 256U87 for Treatment of Herpes Zoster

Henry H. Balfour, Jr., Laboratory Medicine and Pathology
 Burroughs Wellcome Company
 \$19,000 - 03/91-12/91

A Transgenic Murine Model of Pulmonary Fibrosis

Joan M.K. Fox, Medicine
 Peter B. Bitterman, Medicine
 NIH, NHLBI
 \$33,800 - 05/91-04/92

Cellular Proliferation and Differentiation Capacities via Internal and External Autocrine Loops

Bruce R. Blazar, Pediatrics
 Cancer Research Foundation of America
 \$28,000 - 01/91-12/92

Identification and Characterization of Bone Marrow Cells Populations Responsible for the Graft vs Leukemia Phenomenon

John Wagner, Pediatrics
 Leukemia Research Foundation
 \$17,494 - 05/91-09/91

Cardiovascular Calcification, Pathophysiology and Treatment

John E. Foker, Surgery
 Richard W. Bianco, Surgery
 University of Michigan/NIH Prime
 \$85,732 - 01/91-12/91

Sulfhydryl Protected Pro-Drugs of Y-L-Glutamyl-L Cysteine

Herbert T. Nagasawa, Medicinal Chemistry
 Allergan Pharmaceutical
 \$33,000 - 04/91-03/92

Interventions to Decrease Disruptive Behaviors in Dementia

Ellen Egan, School of Nursing
 Mariah Snyder, School of Nursing
 Ken Burns, School of Nursing
 Sigma Theta Tau, Inc.
 \$1,000 - 05/91-05/93

Cardiovascular Nurses' Decisions: Processes and Outcomes

Sheila Corcoran, School of Nursing
 Sigma Theta Tau, Inc.
 \$1,000 - 05/91-05/93

GLJSP Summer Advanced Level Institute: Minnesota/Wisconsin

John J. Cogan, Curriculum and Instruction
 Japan Foundation
 \$15,000 - 05/91-12/91

Minnesota Sea Grant Program: Degradation of Trichloroethylene and Other Pollutants by Ammonia-Oxidizing Bacteria

Alan B. Hooper, Minnesota Sea Grant Institute
 U.S. Department of Commerce/Sea Grant
 \$26,840 - 01/91-12/91

Project Seed, 1991

Joseph J. Latterell, Division of Science and Mathematics, Morris
 American Chemical Society
 \$1,200 - 05/91-09/91

Monitoring Bird Populations in Minnesota's National Forests

Gerald Niemi, Natural Resources Research Institute, Duluth
 Joann M. Hanowski, Natural Resources Research Institute, Duluth
 USDA, North Central Forest Experiment Station
 \$40,000 - 05/91-12/93

Retrospective Conversion Microfilming Project

Bruce H. Bruemmer, Charles Babbage Institute
 Joel F. Wurl, Charles Babbage Institute
 Research Libraries Group, Inc.
 \$20,059 - 09/90-08/91

Archives Preservation Microfilming Project

David Klaassen, Wilson Library
 Research Libraries Group, Inc.
 \$25,668 - 09/90-08/91

Title and/or Area of Responsibility

Name

Number

Fax Number (612) 624-4843

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Research Review Mailing List Information

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- The *Research Review* is automatically mailed to all faculty on the Faculty Mail List holding the rank of Assistant Professor and above.
- To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS)
- Please check with your departmental office or AIS (624-9000) if you need assistance.

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 - c) off-campus
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RESEARCH REVIEW

Research and Technology Transfer Administration

August, 1991

University's Research Indirect Cost Rate Drops to 40 Percent

Recently completed negotiations with the research indirect cost rate auditor from the Department of Health and Human Services have resulted in a provisional reduction of the University of Minnesota's rate from 44 percent to 40 percent. (See page 2 for the new rates to use in developing research and training proposals.) When finalized later this year, the reduction will result in a significant loss of revenue—between \$3 million and \$4 million dollars in fiscal year 1991-92. Indirect cost recovery reimbursements are used by the University to support new research initiatives, to help fund the costs of setting up laboratories for new faculty, and for the administration of sponsored programs.

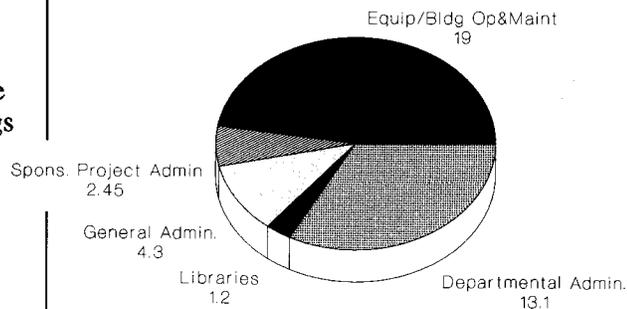
This year's indirect cost rate reduction reflects the fact that the University's research enterprise is growing, while at the same time the costs defined as indirect—primarily buildings and space allocated to research—have remained stable. Much of this can be attributed to state budget reductions that affect the University, especially the delay of capital building requests. The indirect cost rate likely would have remained the same or increased if the University had been successful in obtaining state funding for building requests made over the past five years.

Another reason for the lower rate was the auditor's questioning of the University's methodology for determining the amount of space allocated to research. This is an area that must be addressed in future years to ensure that the University receives an equitable return necessary to maintain its research infrastructure. The Office of Research and Technology Transfer will be studying and considering this and other methods to make sure that future indirect cost rates are developed reasonably and equitably.

It should be noted that during the auditing and negotiation process the DHHS representative did not uncover any significant disallowances like the problems uncovered at other

institutions and mentioned in recent news accounts. However, to some extent the reduction of the University's indirect cost rate did result from a more rigorous scrutiny resulting from the recent national attention to indirect cost recoveries at colleges and universities.

Indirect Cost Rate Components Provisional Total = 40.00



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Levels and Trends

The FY 1990 *Levels and Trends in Sponsored Programs* publication and its appendix were distributed to departments and external organizations in July. Departmental breakdowns of data are contained in the appendix. A limited number of copies are available and may be obtained by calling 624-0583.

Addressing Mail to ORTTA

Campus mail delivers daily to the Office of Research and Technology Transfer. To be deliverable, campus mail envelopes must have the following information:

(Person or division name)
ORTTA
Suite 201
1100 Washington Avenue South

If sending mail through the U.S. Postal Service, the address is as follows:

(Person or division name)
ORTTA
1100 Washington Ave. South, Suite 201
Minneapolis, MN 55415-1226

Proposals and other documents may be dropped off between 8 a.m. and 4:30 p.m., Monday through Friday. ORTTA is located on the second floor of the Minnesota Technology Center, which is at the corner of Washington Avenue South and 11th Avenue, next to the Minnesota Supercomputer Center. Visitor parking is available in front of the building, just off the 11th Avenue entrance.

RESEARCH REVIEW

Volume XXI/Number 2

August, 1991

Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/91-6/30/94 rates should be used. **The rate agreement is dated July 1, 1991.** This date should be used where required on proposal applications.

	07/01/91
	<u>06/30/94</u>
Research	
On-Campus	40.0
Off-Campus *	21.0
SAFHL	60.0
Hormel	53.0
Other Sponsored Activity	
On-Campus	20.0
Off-Campus *	10.0
Instruction	
On-Campus	52.0
Off-Campus	16.0

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call Vivian Fickling at 624-2009.

Current actual rates from January 1, 1991 through June 30, 1991 are:

Faculty	29.00
Civil Service	24.50

For proposals being submitted with start dates after July 1, 1991, the estimated fringe benefit rates to be budgeted are listed on pages 8 and 9 of the March, 1991 Research Review.

In using these rates to develop budgets for future projects, *be sure to reflect the actual rate for each period of time rather than calculating an average for the entire budget period.*

As rates change they will be reflected in this section.

NIH to Unveil Strategic Plan

The National Institutes of Health, under Director Bernadine Healy, is engaged in internal planning to develop a strategic plan that will be presented to the scientific community in February 1992. An early draft of the NIH mission statement reads:

"Science in pursuit of knowledge to extend healthy life and reduce the burdens of illness."

The mission statement includes four goals:

- To foster innovative research strategies designed to advance the nation's capacity to improve health.
- To provide the scientific base that will strengthen the nation's capability to deliver more effective health care in order to enhance the quality of life of its citizens.
- To provide the scientific base that will strengthen the nation's economic competitiveness and ensure a continued high return on the public's investment.
- To be a model for public accountability, scientific integrity, and social responsibility.

Promising areas slated to be addressed in the strategic plan include: molecular medicine; aging and chronic diseases; vaccine development; neuroscience and behavior; population-based studies; health of minorities, women and underserved populations; reproductive biology and development; infant mortality; structural biology; biotechnology; prevention and health education.

NIH says the planning team will consider 13 guiding principles while developing the strategic plan:

1. Basic biomedical and behavioral research are the foundation for progress in health and are advanced through promoting a diversity of ideas.
2. Clinical research is a critical complement to basic research in developing knowledge to improve the health of the nation.
3. Special innovative, pilot or demonstration projects strengthen the research enterprise.
4. A long-term investment in training talented and dedicated scientists and in fostering their career development is vital in ensuring the creativity and momentum of biomedical and behavioral research.
5. It is crucial that there be increased participation by underrepresented groups, women and minorities in the biomedical and behavioral research enterprise, including in positions of leadership.

6. A stable research environment and a strong infrastructure are essential to nourish cutting-edge research.
7. The Intramural Research Program plays a critical role in the nation's research effort and serves as a leader for the world in scientific excellence.
8. Technology transfer is being fostered in order to secure for the public the benefits of its investment in biomedical and behavioral research.
9. The research enterprise is accountable to the public and is vigorously pursuing research priorities that are in the public interest.
10. The aim of biomedical and behavioral research is to increase the span of healthy life of every American, free from disabling diseases, conditions and serious injuries, through research that leads to effective strategies for health promotion, disease prevention and rehabilitation.
11. Academic and other private sector institutions and the NIH are partners in the continuum of research, and this relationship is being enhanced as the national research enterprise continues to evolve.
12. In addressing national health needs, the biomedical and behavioral research enterprise also strives to achieve economic competitiveness and cost effectiveness.
13. Biomedical research provides a foundation for enhanced national productivity through coordination with and complementary support of research in other sectors.

Eligibility Requirements Change for Fogarty Fellowships

The Fogarty International Center (FIC) has announced a change in eligibility requirements for all of the FIC-sponsored fellowship programs. FIC, in line with other NIH Fellowship programs, now requires that all fellowship recipients hold the doctoral level degree (e.g., Ph.D., M.D., D.D.S., D.V.M., and O.D.) prior to the award of the fellowship—usually made within nine months of submission. The previous requirement stated that the degree must have been obtained prior to submission of the fellowship application. This notice applies to all applicants for fellowships sponsored by Fogarty and was effective as of July 5, 1991.

Workshop to be Held on Animal Welfare

The National Institutes of Health, Office for Protection from Research Risks, Division of Animal Welfare, and the University of Washington are cosponsoring an animal welfare education program entitled, "*Resolving the Ethical Dilemmas in Animal Use Protocol Review: How to Increase Humaneness Without Weakening the Science.*" The one-and-a-half-day workshop will be held September 12-13 in Seattle.

Casuistry, a tool used by philosophers to solve ethical problems, will be introduced and applied to protocol reviews involving transgenic animals, withholding treatment from controls, and the use of death as an end point in studies.

The agenda will also include presentations from Public Health Service and U.S. Department of Agriculture representatives on policies and regulations relating to the humane care and use of laboratory animals.

The workshop is open to institutional administrators, institutional animal care and use committee members, laboratory animal veterinarians, scientific investigators and other institutional staff who share responsibility for the management of a sound animal care and use program. For further information, contact: University of Washington, Continuing Medical Education, 800/869-2633 or 206/543-1050; fax: 206/543-3195.

National Institutes of Health

NIDDK and NHLBI Hematology Fellowships

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and the National Heart, Lung, and Blood Institute (NHLBI) offer support for promising investigators in hematology research and its clinical applications.

The NIH institutes offer postdoctoral fellowships with stipends ranging from \$18,600 to \$32,300 per year for three years to younger scientists who wish to receive training that will enable them to pursue hematologic research. More experienced investigators may apply for senior fellowships, with financial support not exceeding \$32,000 per year. Areas of interest include the normal and pathological function of blood cells, iron metabolism, the role of growth factors in blood cell formation, transplant biology, and gene therapy.

Application deadlines are **January 10, May 10 and September 10**. For more information, contact Walter Stolz, Director, Division of Extramural Activities, NIDDK, 301/496-7277; or Ronald Geller, Director, Division of Extramural Affairs, NHLBI, 301/496-7416.

NIH Rates FIRST Awards Over RO1s for Young Researchers

Several advantages exist in favor of First Independent Research Support and Transition (FIRST) awards when compared with RO1s, according to "NIH Peer Review Notes," a publication by the National Institutes of Health, Division of Research Grants. NIH established FIRST awards in 1986 as a mechanism to provide support for newly independent biomedical investigators.

On average, the project period of a FIRST award is approximately one year longer than RO1s awarded to first-time applicants. FIRST awards also have a higher approval and success rate, with investigators younger than 36 years of age having the best success rate. The awards have a higher percentage of applications approved in the 20th percentile or better groups. In fiscal year 1990, 24 percent of FIRST awards were in the 20th percentile or better, compared to 16 percent for new RO1s. Furthermore, FIRST awards support a higher portion of women and have approximately the same percentage of MDs and PhDs as RO1s.

In fiscal year 1990 NIH awarded 2,083 FIRST grants worth \$191.5 million. Of that, 424 were competing awards totaling \$40.3 million. The average direct cost for a FIRST award in fiscal year '90, was \$61,500. Although the overall program for FIRST awards has grown due to their advantages, the number of competing awards as well as the number of reviewed applications for the awards has declined, NIH reported.

Change to NIH Physician Scientist Awards

The National Institutes of Health (NIH) will discontinue payment of the sponsor's salary on competing Physician Scientist (K11) and Physician Scientist Program (K12) awards beginning with awards from fiscal year 1992 funds.

Initial review groups will be advised to disregard requests for a sponsor's salary in Physician Scientist Award applications submitted for the February 1 and June 1, 1991 receipt dates. Applications for Physician Scientist Awards submitted for the October 1, 1991 and subsequent receipt dates may not contain a request for the sponsor's salary.

NIH will continue to pay existing commitments regarding the sponsor's salary on K11 and K12 awards made before fiscal year 1992.

Committee on the Use of Human Subjects in Research

Announcing New Federal Regulations for the Use of Human Subjects in Research

The Office of Science and Technology Policy has accepted the "Final Federal Policy for the Protection of Human Subjects" in the form of a common rule. The rule was established to foster uniformity in federal regulations, rules, and policies with respect to the use of human subjects in research. As with previous policies, the new rule applies to all research conducted at the University of Minnesota or by its faculty, staff, and students, and applies to both behavioral science research and biomedical research. More than fifteen federal agencies have agreed to the fundamental principles of the common rule.

The common rule was modeled after the Office for Protection from Research Risks (OPRR) policy, 45 CFR 46. The Regents' policy on the Protection of Human Subjects in Research is modeled after those pre-existing requirements. The University of Minnesota has filed formal "assurance of compliance" documents with OPRR assuring that we will uphold the requirements of that policy. The new rule, therefore, will not dramatically affect the underlying policies and practice at the University. Subtle changes will have an effect on the conduct of research; some changes will evolve as implementation is begun and determination is made on how the new policies will affect procedure.

Changes in the Exemptions

A significant change has occurred in the "exemptions" to the policy. Research that involves minimal risk to the study subject has, since 1983, been eligible for "exemption" from Committee review. At this institution, research falling into the six categories of exemption are reviewed by the administrative office for the Committee and filed as "exempt" from Committee review. Therefore, while a full review of the research is not required, a screen for exemption takes place, assuring that the exemption is correctly applied and that basic informed consent is planned and executed.

The new policy will allow for a minor expansion of the exemption categories to include taste and food quality evaluation. The categories of exemption have been changed and the numbering system has been adjusted. Therefore, as of August 19, 1991, the former exemption categories will not apply. The Committee will require the completion of new forms to claim any exemption. New exemption categories are outlined in the Committee's revised forms, (see box at right.)

Researchers are reminded that the exemptions do not apply to vulnerable populations including: the mentally handicapped, prisoners, fetuses, pregnant women, and human *in-vitro* fertilization. Children are excluded from the exemp-

tion for survey interview research. The Policy Subcommittee of the Committee on the Use of Human Subjects in Research will consider the inclusion of children in the food and taste test evaluation section. At this time, researchers should consider that category to extend to adult subjects only.

Emphasis on the Research Team

Another change in the research regulation worthy of noting at this time is the shift in emphasis from the "principal investigator" to the research team. In keeping with other federal regulations on scientific misconduct and the emerging concerns over conflict of interest, this subtle change becomes very significant. The emphasis in the past on *the* Principal Investigator has been consistent among federal regulatory agencies and the principal investigator is still ultimately responsible for the research project; however, the rhetoric has changed and the responsibility for the execution of the research project is now described as a shared responsibility of the entire research team. Individuals are encouraged to identify themselves with projects worthy of their participation and to identify themselves only with projects in which they have a reasonable opportunity for participating in the decision-making process.

Updates on other changes in federal regulations will be forthcoming.

To receive a copy of the entire policy, or if you have questions, please call Moira Keane at 612/624-1889, [moira@ortta.umn.edu].

New Application Forms for Human Subjects Committee Review

All research involving human subjects that is conducted by University staff, faculty, or students *must* be reviewed by the Committee on the Use of Human Subjects in Research prior to its initiation.

The Committee has revised its application forms to better reflect the expectations of new federal regulations. Sample consent forms and guidelines are included in the new information/application packets.

New forms may be obtained by calling the Committee office or by transmitting an electronic message to: "colleen@ortta.umn.edu". Please recycle all old forms; they should no longer be used.

Advisory Panel Reviews VA Health Research

A Department of Veterans Affairs Advisory Committee for Health Research Policy released a report earlier this summer recommending a \$280 million budget for VA research for fiscal 1992; President Bush had requested \$216 million in his budget submitted to Congress earlier in the year. The Advisory Committee was asked by VA Secretary Edward Derwinski to recommend a budget for VA research and to address the following questions:

- Is VA research appropriately balanced among health research subject areas?
- Is VA research appropriate to the role of the VA in providing medical and other health care services to veterans?
- Are the VA research programs appropriate vis-a-vis the role of other federal agencies, including the National Institutes of Health?
- What is the overall quality of the VA research program?

According to the panel, VA's health mission is to provide medical care for veterans; to teach medical students, residents, and other health professionals; and to carry out active research programs. The report expressed concern that recent budget cuts in VA medical research threaten the vitality of the academic medical model in VA medical centers as well as threatening the quality of care achieved through VA affiliations with medical schools.

In response to the first question, the panel said that, while the VA research is appropriately balanced, it is inadequately funded to achieve its goals. The allocation of funds should be reviewed periodically to assess scientific significance and relevance to the VA mission, the panel recommended. The panel also agreed with a 1977 recommendation by the National Academy of Sciences that the VA secretary should create a Health Research Advisory Council made up of scientists from preclinical, clinical, and other scientific disciplines relevant to VA research.

The panel addressed the second question by noting that VA research and academic training programs provide unique opportunities to improve clinical care for veterans, because VA is a single organization with access to a large number of patients suffering diverse illnesses who can be followed over long periods of time. The report linked this patient population asset to the increasing importance of VA research support for clinically relevant studies. Fully 75 percent of NIH funding is awarded to non-clinician Ph.D. scientists, while 75 percent of VA-funded investigators are M.D.-scientists, the committee reported.

The committee noted a diversity of opinions about the appropriateness of VA research in light of that funded by other

agencies, especially NIH. The report pointed out that the mission of NIH is to foster the highest quality health research and training for the country at large, while the primary mission of VA research is to foster high-quality research within the VA medical centers. Better coordination between NIH and VA in funding and conducting clinical trials may improve the missions of both agencies, the report said.

The panel said the quality of VA research is exceptionally high as measured by five indicators:

- On-site reviews reveal that VA's research system is on a par with the NIH, and the excellence of VA's peer review program is a major achievement of the last decade.
- Total external funding of more than \$163 million was received for 4,240 VA projects in FY 1989, with more than \$116 million awarded through peer-reviewed grants from federal agencies. The largest amount, \$83 million, came from NIH and the Alcohol, Drug Abuse and Mental Health Administration.
- Nobel Prizes have been received by two VA researchers, and many have received other prestigious honors.
- VA's Cooperative Studies Program has generated more than 300 landmark publications defining state-of-the-art contemporary medical practice over the past 13 years.
- Supplementary salary support has been provided to VA investigators by affiliated medical schools, which "attests to the high quality of research undertaken by VA researchers and is a recognition of their role as educators and health professionals," the committee stated.

The committee concluded its report by noting that budget constraints have reduced the number of newly funded research proposals and investigators significantly since 1986. In that year 722 of 1,140 proposals were funded (63.3%) and 125 were approved but not funded (10.9%). In 1990, 542 of 1,250 proposals were funded (43.4%) and 608 were approved but not funded (48.6%). "The number of meritorious but unfunded proposals has increased by more than fourfold," said the report.

The committee recommended that the VA Medical Research Program annually fund 700 Merit Review projects, 150 awards to new VA clinicians as start-up research awards, and 100 career development awards. The program will need \$280 million to achieve this goal in FY 1992, the committee reported.

McKnight Foundation Gift Establishes Arts and Humanities Endowment

The University of Minnesota has established a major endowment program to enhance scholarship and creative activities in the arts and humanities; development of new knowledge and creative endeavors in these fields is central to the mission of the University. The funding for the endowment comes from the allocation of \$5.5 million, the final portion of a generous \$10 million 1986 Minnesota Campaign gift from the McKnight Foundation. (Other allocations are \$3 million for PUF-McKnight Land-Grant Professorships, \$500,000 for Bakken MD/PhD Scholarships, and \$1 million for diversity programs).

The University of Minnesota McKnight Arts and Humanities Endowment has two major goals. First, it will supplement the very limited external funding available in the arts and humanities, thus allowing faculty in these areas to pursue their scholarly and creative work in a more supportive environment. The educational outcome of such support will be to enrich both our undergraduate and graduate programs. The second goal is to enhance our ability to recruit and retain outstanding arts and humanities faculty by demonstrating, through this ongoing financial support, the seriousness of our commitment.

The program will have an advisory committee of distinguished arts and humanities faculty appointed by Anne H. Hopkins, Vice Provost for the Arts, Sciences and Engineering. The Committee will develop specific guidelines and application processes for the three components of the program: the McKnight Fellows Program, the McKnight Travel and Support Fund, and the McKnight Special Events Fund.

- **The McKnight Fellows Program** — Fellows will receive summer support to engage in their scholarly or creative pursuits. Selection will be competitive and based on peer review; funds will be used for summer salary, for travel or supplies, and for hiring research assistants. Fellows will also participate in campus-based programs during the following academic year.
- **The McKnight Travel and Support Fund** — This fund will be available to arts and humanities faculty who need financial assistance in carrying out their artistic and humanistic creative activities and scholarship. Funds might be requested for travel which is essential to the activity but for which there are no existing resources; funds might also be sought to cover the costs of supplies and equipment essential to creative activities and humanistic scholarship. Faculty requests for support from this fund will be reviewed by peers but will be handled expeditiously, so that faculty can proceed quickly with their activities.

- **The McKnight Special Events Fund** — The intent of this fund is to support and encourage creative, broadly-based programming in the arts and humanities at the University. While events will vary in size and type, they might include such programs as a seminar series, an exhibit, a concert or other performance, a major conference, or some combination of similar activities.

The advisory committee is making recommendations for these programs encompassing five general areas. They will first look into the initial structure and guidelines for the Endowment's programs listed above. Second, they will establish the framework for the annual allocation of the Endowment funds, approximately \$250,000 per year. Third, they will establish the criteria for eligibility. Fourth, they will set the program evaluation guidelines. And fifth, they will make any changes needed in the program or direction of the Endowment mission they deem appropriate. The members of this committee will act as the advisory group through the first round of funding. A separate committee will be appointed to review applications and make the awards. Further guidelines for all of the program components will be available by January of 1992.

Any suggestions or ideas for using the endowment should be communicated to the U of M/McKnight Arts and Humanities Endowment Advisory Committee, Office of the Vice Provost for Arts, Sciences and Engineering, 12 Morrill Hall.

ORTTA Employee Has Seen Many Sides of Research

by Melinda Reeder

Insulin-dependent diabetes has brought many changes to Sister Marion Goetzke's life, but it has never conquered her. With each new challenge, she has chosen the alternative that would let her stay in control. In doing so, she has helped advance the fight against diabetes and participated in several aspects of medical research at the University of Minnesota. Currently, she is a senior office assistant in the effort certification division of ORTTA.

Sister Marion's diabetes was diagnosed when she was 33, while teaching at Saints Peter and Paul in Mankato. She taught for a total of 30 years, but by the time she turned 50, the severity of her diabetes locked her out of the classroom. After serving a year as full-time librarian in the Shakopee Area Catholic Schools, she faced the end of her teaching career. But rather than give in to diabetes, Sister Marion decided to help conquer it. She volunteered to participate in clinical research conducted by Jose J. Barbosa, M.D., professor of medicine at the University of Minnesota. She felt that as a nun, she had more time to devote to volunteering than do most people with diabetes. She soon learned just how difficult and time-consuming clinical research can be.

Since her first day of volunteering at the University, Sister Marion has contributed countless hours to diabetes research. She stayed for many weeks in the Clinical Research Center, where volunteers can be intensively monitored as they participate in nutritional or therapeutic studies. Her body was poked, pricked and prodded while her blood-glucose level and other vital signs were checked continually.

Sister Marion also helped pioneer the use of the world's first implantable drug infusion pump.

In the mid-1970s, a new external pump that administers insulin at specific time intervals had just been approved for clinical testing, and Sister Marion became one of the first to see how the external pump would work with a person's daily life schedule. Dr. Barbosa hooked her up to one of the external pumps and both she and Dr. Barbosa excitedly kept watch on her body's response, especially her insulin levels. Because of that testing, some people with diabetes now use insulin pumps to provide accurately timed doses of insulin throughout the day without having to give themselves shots. The result is more normal blood-glucose control, which is

thought to help prevent some of the long-term health effects of diabetes.

The University of Minnesota is currently one of more than 20 sites around the U.S. and Canada that are part of a 10-year study called the Diabetes Control and Complications Trial. It involves thousands of patients and is evaluating



Sister Marion Goetzke

whether good blood-glucose control can prevent or reduce the severity of long-term complications of diabetes such as eye, kidney, nerve, and heart disease.

Sister Marion also helped pioneer the use of the world's first implantable drug infusion pump. Called the Infusaid, it was invented by a group of mechanical engineers and surgeons led by Henry Buchwald, M.D., Ph.D., professor of surgery and biomedical engineering in the Medical School. After extensive testing in animals, Dr. Buchwald performed the first implantation of the pump in 1975, in a patient who required intravenous heparin (blood anticoagulant) therapy.

Sister Marion participated in evaluations of the pump's ability to safely deliver insulin to people with diabetes. Before it could be implanted in patients, the physician-researchers needed to test the pump externally. They did this by first inserting a catheter from the pump directly into Sister Marion's bloodstream. Drs. Buchwald and Barbosa closely monitored her blood glucose level as the device pumped insulin slowly and steadily into her blood for many hours, providing hope that it could someday serve as an artificial pancreas.

The researchers later found that the implantable pump was suited more to delivering blood thinners, antibiotics, and can-

cer drugs than it was for insulin, which tends to crystallize when kept at body temperature. But through her participation in its early testing, Sister Marion helped pave the way for the pump to be implanted in more than 20,000 patients, freeing them from months of hospitalized intravenous therapy. Researchers in Dr. Buchwald's Implantable Devices Laboratory continue work on an artificial pancreas, trying to perfect blood glucose sensors that could trigger the release of appropriate amounts of insulin throughout the day.

The research that began with the Infusaid pump led Dr. Buchwald's group to invent a bi-valved catheter. This is a slim tube like that used to carry medication out of the Infusaid, but with two valves at the end that is inserted into the patient's vein. Called the Buchwald-Wigness catheter (Bruce Wigness is a senior surgical scientist who helped invent it), it enables medical staff to both administer intravenous drugs and obtain blood samples for many weeks, without the need to repeatedly stick the patient with needles and find new veins. Like the Infusaid, the catheter was patented by the University of Minnesota. It was licensed to the Strato Medical Corporation in Massachusetts and was recently approved by the Food and Drug Administration for clinical use.

“Sister Marion’s dedication and effort gave us insight into the genetic data we lacked in diabetes research,” Dr. Barbosa said.

Another area in which Sister Marion devoted many volunteer hours was the collection of genetic information on people with diabetes and their families. This included telephone interviewing of people from across the nation, organizing blood tests for entire families, and lecturing for American Diabetes Association groups of Minnesota. Today that genetic research has made Dr. Barbosa a leader in his field and the University of Minnesota renowned for its research and treatment of diabetes. Dr. Barbosa says that genetic research is pinpointing the causes of diabetes and leading to possible cures, such as the University's pancreas transplantation program, the nation's largest.

“Sister Marion’s dedication and effort gave us insight into the genetic data we lacked in diabetes research,” Dr. Barbosa said. “It was fantastic to find someone as devoted to diabetes research as I was.”

Genetic research discoveries and the invention of the internal and external pumps, along with the development of meters people with diabetes can use to quickly and accurately test their blood glucose level, have helped Sister Marion and others take control of their lives. Previously, they had to rely on urine tests to estimate their current blood-glucose level; for many this was an ineffective way of preventing insulin reactions and diabetic coma, and it was

even less successful at giving them the information they need to balance food, exercise, and insulin to maintain near-normal blood glucose levels.

Sister Marion's assistance has helped both Dr. Barbosa and Dr. Buchwald to achieve major accomplishments in their fields, but more importantly she helped assist and educate people with diabetes about the disease, showing through her own example how they could lead a normal life.

After seven years as a research volunteer, Sister Marion decided to work on research projects from a different angle. In 1984 she joined the Office of Research and Technology Transfer, putting her knowledge of research procedures to work in the area of effort certification. The effort certification system is mandated by the federal government and provides reports on individual distribution of time devoted to sponsored research and training projects. The system must confirm that salary charges made to sponsored projects are supported by a corresponding amount of research activity, which is audited according to federal requirements. Sister Marion's responsibilities include keeping track of and organizing the files of all University faculty, staff and students working on research grants. In fact, when she first began working at ORTTA, one of Sister Marion's first tasks was to weed out her own outdated effort cards from the master file.

Sister Marion says her participation in diabetes research has given her an understanding of ORTTA's clients, especially principal investigators like Dr. Barbosa and Dr. Buchwald. “I know how busy you can get, and that's often why things don't turn up at our office when they should,” Sister Marion said. “When you're researching for cures, there is never enough time.”

American Cancer Society

Institutional Research Grant

The American Cancer Society (ACS), through the University Dean's Committee for the ACS Institutional Research Grant, announces the availability of individual Institutional Research Grants. The stated goal of the American Cancer Society is to "foster meritorious research on cancer that cannot be supported through other available types of support." The purpose of the individual grants is to provide "seed" money to permit the initiation of promising new projects or novel ideas by junior faculty investigators.

The amount of individual awards is \$15,000 in direct costs. Eligible applicants must be faculty members at the level of Assistant Professor or Instructor and *must not* have received a prior ACS Institutional Research grant or have a current competitive national research grant.

Grants are available to anyone engaged in cancer-related research at the University of Minnesota who meets the above criteria. Cancer-related research *includes* analysis of developmental biology, gene regulation, or alteration of intracellular or extracellular processes which may lead to an improved understanding and/or therapy of potential or actual oncogenic events in prokaryotic or eukaryotic cells.

The application deadline is October 1, 1991. Instructions and application forms are available from the Pediatric Oncology Office, D-557 Mayo Building, 626-2778.

Biomedical Science Scholar Awards

Searle Scholars and Pew Scholars

The Searle Scholars Program and the Pew Scholars Program are two programs which provide scholar awards in the biomedical sciences. Since these programs stipulate that a limited number of applications may be submitted from an institution, the Graduate School is coordinating all submissions. The Searle Scholars Program will accept only two nominations and the Pew Scholars Program only one nomination from any institution.

The internal deadline for submission to the Graduate School is **August 12, 1991**. Information and application forms have been sent to college offices. Questions may be directed to Lori Wallin, Graduate School Research Office, 625-2356.

The McKnight Foundation

Arts General Support Program 1991-1992

The McKnight Foundation has authorized a five-year, \$28 million commitment to the arts in Minnesota. The commitment has two primary purposes. The first is to help maintain and enhance the quality and creativity of the arts in Minnesota; the second is to broaden community access to, participation in, and understanding of the arts. The commitment is comprised of several components, including:

- General operating, project and capital support for eligible medium and large nonprofit arts and cultural organizations, available directly through the Foundation;
- Support for small or community-based organizations, available through the Foundation and regional art agencies throughout Minnesota;
- Fellowship support to individual artists awarded and administered by seven of Minnesota's artist service organizations; and
- Support designated each year for a special focus—in this first year, arts education and criticism.

The University of Minnesota is eligible for funding. Even though the guidelines state maximum funding of \$100,000 per institution per year, McKnight recognizes the diversity and complexity of the University and is willing to consider multiple requests. However, in order to prevent McKnight from being inundated with proposals from the University, it is requested that Kate Kinney of the University Foundation be notified of an intent to submit at least one month before the letter of inquiry due dates. (120 Morrill Hall; 624-3333). McKnight has emphasized that proposals should be clear priorities of the campus, collegiate unit or art program.

Initial submission to McKnight should be two copies of a letter of inquiry. Due dates for letters of inquiry are **August 15, 1991, November 15, 1991 and March 16, 1992**. Complete guidelines are available from the University Foundation or from ORTTA and may be requested by calling 624-3333 or 624-9004, respectively. The agency contact is: Neal Cuthbert, The McKnight Foundation, 600 TCF Tower, 121 South 8th Street, Minneapolis, MN 55402; 333-4220.

March of Dimes Birth Defects Foundation

Innovations and Research in Health Education and Service Delivery to Prevent Birth Defects and Promote Perinatal Health

As part of its Campaign for Healthier Babies, the March of Dimes Birth Defects Foundation (MOD) has issued a one-time Request for Proposals entitled, "Innovations and Research in Health Education and Service Delivery to Prevent Birth Defects and Promote Perinatal Health."

MOD supports service demonstration, health education, professional training and policy analysis activities that are designed to reduce the behavioral risks associated with birth defects, low birth weight and related mortality and morbidity indicators. The Foundation is particularly interested in careful considerations of how to evaluate such activities. This Request for Proposals invites health promotion and birth defects prevention experts to submit grant applications for the support of:

- 1) community-based service interventions that demonstrate innovative approaches to improving the birth outcomes for women at risk for poor pregnancy outcomes, especially as related to adult and adolescent high-risk populations and life-style risks;
- 2) efforts to identify and reduce reproductive, psychosocial or behavioral hazards in the work-place;
- 3) efforts to identify adolescent reproductive risk as related to preconceptional health promotion;
- 4) smoking, alcohol and drug use cessation and reduction efforts during and following pregnancy;
- 5) the integration of physicians into behavior-based efforts to prevent birth defects;
- 6) education and training of professionals and lay health workers to deliver effective services to pregnant women;
- 7) efforts to ameliorate the poor pregnancy outcomes; and
- 8) policy analyses that identify original and innovative approaches to improve health care access.

MOD will support programmatic activities such as community demonstrations, the development of health education materials, professional conferences and programs, and pol-

icy analyses or meta analyses that address pertinent issues. MOD is also interested in exploring the possibility of inter-agency or institutional coordination and/or collaboration on efforts requiring substantial financial support.

The application deadline is **September 20, 1991**. Guidelines are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Contraceptive Research and Development Program

The Contraceptive Research and Development (CONRAD) Program of the Eastern Virginia Medical School, in cooperation with the United States Agency for International Development (USAID), is soliciting proposals from foreign and U.S. institutions for applied research projects in the field of fertility regulation. The objective of the CONRAD Program is to develop new technology appropriate for the use in developing countries by supporting research on synthesis and/or evaluation of new chemical entities, evaluation of naturally occurring substances and their analogues, design and testing of devices and drug delivery systems, testing for safety and efficacy in animal models, and phase I and II clinical studies.

Examples of approaches which can be supported include: laboratory, animal or human investigations leading to the development of methods that interfere with the maturation processes of sperm or ova either at the local or central level; interfere with the transport of gametes; interfere with the process of fertilization; are suitable for lactating women. Because the focus of the CONRAD program is to develop drugs and devices for fertility regulation in developing countries, CONRAD is interested in technology that minimizes: the need for physician services; the need for frequent administration; the need for high levels of motivation; supply and distribution problems and costs.

CONRAD supports three types of proposals. Pilot Studies (**may be submitted at any time**) for short-term studies from which formal research proposals may develop, not to exceed \$15,000 for a period of one year or less. Informal Proposals (**may be submitted any time**) as a preliminary to formal proposals—encouraged but not mandatory. Formal Proposals (**due May 1 and November 1 annually**).

Guidelines are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

National Heart Lung and Blood Institute

Clinical Investigator Development Award (PA-91-78)

The National Heart, Lung, and Blood Institute (NHLBI) announces the availability of the Clinical Investigator Development Award (CIDA). The CIDA includes features of and replaces the Physician Scientist Award and the Clinical Investigator Award. The CIDA is intended to allow greater flexibility in developing a program suited to the experience and capabilities of the candidate. The objectives of NHLBI in supporting the CIDA are to:

- Encourage research-oriented physicians to develop independent research skills and gain experience in advanced methods and experimental approaches in the basic and applied sciences relevant to heart, blood vessel, lung, blood diseases, and transfusion medicine;
- Increase the pool of physician investigators who can use advanced technologies to address the major problems in heart, blood vessel, lung, and blood diseases, and transfusion medicine.

The CIDA will provide research development opportunities for physicians with varying levels of research experience. The award will enable candidates holding health professional doctoral degrees (such as the M.D., D.O., D.V.M., or equivalent degrees) to undertake three to five years of special study and supervised research with the goal of developing into independent investigators. For individuals with M.D. or D.O. degrees, it is required that at least two years have elapsed since the granting of the doctoral degree *at the time an award is made*.

The CIDA *may not* be used to support clinical training or duties, but the award may be interrupted or suspended to allow for the completion or continuation of clinical training followed by resumption of CIDA support for the completion of the research development program.

Annual application receipt dates are **February 1, June 1** and **October 1**. A complete copy of the guidelines is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the Bulletin Board.

National Institutes of Health

Pediatric AIDS

The National Institutes of Health offer a variety of funding opportunities for the study of pediatric AIDS. AIDS in children differs from the disease in adults in its means of transmission, symptoms, and care, and therefore requires

separate studies. Areas of special interest include AIDS-related developmental and behavioral disorders, early infection of the nervous system, accurate methods for assessing psychological or neurological damage in children, therapies especially suited for use with children, and mental health services for infected children and their families.

Applications for individual research project grants in pediatric AIDS may request support for up to five years. As in other AIDS programs, an expedited application and review process is in effect for study proposals on pediatric AIDS. Applications are accepted on an ongoing basis; annual deadlines are **January 2, May 1** and **September 1**.

For more information, contact the Division of Research Grants, NIH, Westwood Building, Room 449, 5333 Westbard Avenue, Bethesda, MD 20814; 301/496-7441.

National Institute of General Medical Sciences

Structural Biology as Applied to the Problem of Targeted Drug Design, with Potential Applicability to the Treatment of AIDS

GM-91-02

The National Institutes of Health (NIH) is interested in receiving applications to apply modern techniques of molecular structure determination and analysis for the purpose of developing new approaches to drug design with potential applicability to the treatment of HIV infection and AIDS.

Broadly, the research goals are to stimulate the organization of multidisciplinary groups centered around studies related to structural biology in order to develop approaches to targeted drug design. The central disciplines are those such as X-ray crystallography, NMR, and theoretical chemistry as related to molecular modelling. To be effective, these must be aided and, to some degree, guided by modern research in molecular biology and pharmacology.

The mechanism of support will be the program project grant (P01). It is expected that three or more investigators, all pursuing independent but interrelated projects, will be involved.

It is anticipated that six to ten applications will be funded for a total project period not to exceed five years. The application deadline is **March 18, 1992** with an award date of **September 1, 1992**. Copies of the RFA are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Agency for Health Care Policy and Research

Small Grant Applications

The Agency for Health Care Policy and Research (AHCPR) announces priority areas for small grant applications for health services research, including conferences, and invites applications for such grants. Small grant applications are those with total requested direct costs of \$50,000 or less over the project period. AHCPR is particularly interested in receiving small grant applications from individuals new to the health services research field. The priority areas are:

- 1) Research on health care services for underserved/disadvantaged populations, e.g. minority health issues, rural health issues, methods to improve access;
- 2) Research on costs, access and quality of care for the uninsured/underinsured;
- 3) Research on health care services for individuals infected with HIV, including issues related to costs, access, and quality of care delivered to such individuals;
- 4) Research on medical liability issues, e.g., determinants of, or alternative approaches to reduce medical liability;
- 5) Research on clinical practice-oriented primary care that describes the natural history and the management of conditions commonly encountered in primary care practice; and
- 6) Conferences on the areas specified above as well as other health services research topics of general interest.

Applications in the areas identified above will be accorded an accelerated review; AHCPR will notify applicants of funding decisions approximately six months after receipt of applications.

This is an ongoing program. Annual deadlines are **January 15, May 15 and September 15**; the first available deadline is **September 15, 1991**. Guidelines are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the Bulletin Board.

Agency for Health Care Policy and Research

Conference Grant Applications

The Agency for Health Care Policy and Research (AHCPR) announces procedures and criteria for health services and medical effectiveness research conference grants and invites applications for such grants. AHCPR awards grants for conferences and workshops related to general health services research and medical effectiveness research. In particular, AHCPR is interested in supporting conferences that further the following types of activities:

- 1) Exchanging information on innovations in health services delivery and technology and developing and improving methods of disseminating findings and information resulting from health services research activities of AHCPR;
- 2) Promoting the dissemination and adoption of medical practice guidelines, clinical research findings, and health services data-related products;
- 3) Improving health services research design and methods;
- 4) Developing research agenda for addressing significant health services problems.

Proposals requesting \$50,000 or less may apply under the Small Grants guidelines; these proposals will be given an accelerated review process. Annual deadlines are **January 15, May 15 and September 15**, with the first available deadline being **September 15, 1991**.

Proposals requesting \$50,000 or more will be reviewed under standard peer review procedures. Annual deadlines for these proposals are **February 1, June 1 and October 1**, with the first available deadline being **October 1, 1991**.

Application guidelines are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the Bulletin Board.

Faculty Research Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please call Mike Moore at 624-9398.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
June, 1991	337	\$ 80,514,211
Awards Received		
June, 1991	201	17,305,830
Proposals Submitted		
July, 1990 - June, 1991	3,697	553,483,306
Awards Received		
July, 1990 - June, 1991	2,768	228,324,847
Proposals Submitted		
July, 1989 - June, 1990	3,409	567,419,006
Awards Received		
July, 1989 - June, 1990	2,550	275,297,207

A Colon Cancer Prevention Research Unit

John D. Potter, School of Public Health
 NIH, NCI
 \$1,347,327 - 06/90-05/91

Promoting Cardiovascular Health with Children

Cheryl L. Perry, School of Public Health
 NIH, NHLBI
 \$1,230,000 - 04/91-03/92

Demonstration Cancer Control Project for Farmers

Jack S. Mandel, School of Public Health
 CDC, NIOSH
 \$1,044,081 - 06/91-05/94

Radiolabelled Anticholinergics for the Diagnosis of Alzheimer's Disease

S. Mbua N. Efange, Radiology
 Nihon Medi-Physics Company, Ltd.
 \$300,000 - 05/91-04/94

Cray Research Equipment Grant

Donald G. Truhlar, Chemistry
 Cray Research, Inc.
 \$240,000 - 02/91-01/93

Development of an Ability-Based Selection Instrument

Richard P. Braun, Civil and Mineral Engineering
 Phillip Ackerman, Psychology
 Ruth Kanfer, Psychology
 State of Minnesota
 \$232,402 - 01/91-12/92

Title VI National Resource Center, Comprehensive, Western Europe

John K. Munholland, Institute of International Studies
 U.S. Department of Education
 \$216,392 - 08/91-08/92

Regional Assessment of Soil Tests in Iowa, Minnesota and Wisconsin

Gyles Randall, Southern Experiment Station, Waseca
 Michael A. Schmitt, Soil Science
 USDA
 \$191,000 - 05/91-04/92

Cell Interactions and Development in Myxococcus Xanthus

Martin Dworkin, Microbiology
 NIH, NIGMS
 \$175,680 - 06/91-05/92

Translocating Bacteria: Role in Postsurgical Sepsis

Carol L. Wells, Laboratory Medicine and Pathology
 David L. Dunn, Surgery
 Stanley L. Erlandsen, Cell Biology and Neuroanatomy
 NIH, NIAID
 \$173,616 - 04/91-03/92

How Does K Reduce and NaCl Increase Hypertensive Injury?

Louis Tobian, Jr., Medicine
 NIH, NHLBI
 \$173,192 - 05/91-04/92

Low-Input Agriculture, Minnesota

Pierre Robert, Soil Science
 Wallace W. Nelson, Southwest Experiment Station, Lamberton
 USDA
 \$164,952 - 06/91-05/93

Neuronal Proteoglycans and Adhesion to Fibronectin

Paul C. Letourneau, Cell Biology and Neuroanatomy
 James B. McCarthy, Laboratory Medicine and Pathology
 NIH, NIGMS
 \$138,004 - 05/91-04/92

Atrial Natriuretic Factor and Adrenergic Nerves

George J. Trachte, School of Medicine, Duluth
 NIH, NHLBI
 \$122,597 - 06/91-05/92

Role of Earthworm Macropores in Preferential Flow of Water and Anticongestants

Satish C. Gupta, Soil Science
 John Moncrief, Soil Science
 USDA
 \$119,670 - 09/91-08/94

Grants for Two-Year Programs of Schools of Medicine/Osteopathy

James G. Boulger, School of Medicine, Duluth
 HRSA
 \$116,042 - 07/91-06/92

Development of Field Calibration of a Microcosm Protocol To Assess the Survival and Ecological Effects of Introduced Microorganisms

Lyle Shannon, Biology, Duluth
 Melbourne Whiteside, Biology, Duluth
 EPA
 \$105,102 - 03/91-03/92

Metropolitan Concepts and Statistics Project

John S. Adams, Geography
 USDOC
 \$18,000 - 04/91-12/91

Nonprofit Organizations and Their Funding Environments

Joseph J. Galaskiewicz, Sociology
 Yale University
 \$11,313 - 06/91-12/91

Vibration Attenuation of the NASA Langley Evolutionary Structure

Gary J. Balas, Aerospace Engineering and Mechanics
 NASA
 \$45,000 - 05/91-04/92

Some Problems in the Mechanics of Solids with Phase Mixtures

Roger L. Fosdick, Aerospace Engineering and Mechanics
 USDOD, Army
 \$25,000 - 06/91-11/91

US-Japan Cooperative Research: Block Polymers Confined on Two-Dimensional Surfaces

Matthew V. Tirrell, Chemical Engineering and Materials Science
NSF
\$10,442 - 04/91-03/93

Interactions of Nutrient/Hormone/Growth Rate/Form Change in Carrot Embryo Development

Wei-Shou Hu, Chemical Engineering and Materials Science
Emil J. Staba, Medicinal Chemistry, Pharmacy
NSF
\$73,890 - 04/91-09/92

Development of Parallel, Direct Methods for Electronic Structures

Jan Almlof, Chemistry
IBM
\$53,000 - 06/91-05/92

A Field Tracer Method for Large Soil Samples

E. Calvin Alexander, Jr., Geology and Geophysics
USDA
\$74,200 - 06/91-05/93

Plastic Deformation of Analogue Materials of Deep Mantle Minerals

Shun-Ichiro Karato, Geology and Geophysics
NSF
\$49,181 - 03/91-08/92

Plasma Pyrolysis of Hazardous Wastes from the Paint and Photographic Processing Industries

Emil Pfender, Mechanical Engineering
Joachim V. Heberlein, Mechanical Engineering
Hypertherm, Inc.
\$11,000 - 05/91-11/91

Number of Defining Equations, Local Cohomology

Gennady Lyubeznik, School of Mathematics
NSF
\$53,850 - 06/91-11/93

Resistivity Anomalies in Metals at Very Low Temperatures

Walter V. Weyhmann, Physics and Astronomy
Research Corporation
\$24,662 - 07/91-06/92

Validation of Weed Management Expert Systems for Corn and Soybeans

Robert P. King, Agricultural and Applied Economics
Bruce Maxwell, Agricultural and Applied Economics
USDA
\$80,000 - 05/91-09/93

EPA Wastewater Needs 1990 Update

Thomas Stinson, Agricultural and Applied Economics
USDA
\$12,000 - 04/91-09/92

Sugarbeet Root Aphid in Minnesota: Biology, Damage and Management

William D. Hutchison, Entomology
Sugarbeet Research and Educational Board of MN and ND
\$35,000 - 04/91-03/92

Surveying Bears in BWCA on Islands Where Caribou May Calve

Peter A. Jordan, Fisheries and Wildlife
North Central Caribou Corporation
\$2,675 - 06/91-11/91

Inelastic Light Scattering from Superfluid Helium-F

Michael Korth, Science and Mathematics, Morris
Research Corporation
\$19,500 - 06/91-05/93

Chamber Measures of Methane Flux from Bog Lake Peatland

Kenneth Brooks, Forest Resources
USDA
\$4,800 - 06/91-06/93

Remote Sensing Approach to Avian Conservation

Lloyd P. Queen, Forest Resources
Francesca J. Cuthbert, Forest Resources
St of MN - Dept of Natural Resources
\$5,500 - 04/91-12/91

Adolescent - Parent Daily Emotional Dynamics

Harold D. Grotevant, Family Social Science
NIH, NICHD
\$34,772 - 06/91-05/92

Effects of Rice Bran on Physiological Parameters in Normal Human Subjects

Joanne L. Slavin, Food Science and Nutrition
Farmers Rice Cooperative
\$8,267 - 04/91-03/92

Human Spectrin Genes

John C. Winkelmann, Medicine
March of Dimes Birth Defects Foundation
\$35,000 - 04/91-03/92

Gene Expression in the Growing Kidney

Mark Rosenberg, Medicine
NIH, NIDDK
\$89,868 - 05/91-04/92

In Vivo Susceptibility of Borrelia burgdorferi, 297 to Cefixime and Other Antimicrobials

Russell C. Johnson, Microbiology
Lederle Laboratories
\$20,000 - 03/91-03/92

Neuronal Migration in the Developing Brain: Cloning and Characterization of the Cell Adhesion Molecule Astroactin

Margaret E. Ross, Neurology
Minnesota Medical Foundation
\$11,224 - 06/91-05/92

Sandimmune Ophthalmic Ointment Study No. K-203 Keratoconjunctivitis Sicca

J. Daniel Nelson, Ophthalmology
Sandoz, Inc.
\$10,000 - 04/91-10/91

SCID Mouse Models for Cancer and AIDS

Fatih Uckun, Therapeutic Radiology
Minnesota Medical Foundation
\$7,500 - 05/91-05/92

Regulation of Plant Gene Expression in Response to Infection

Janet L. Schottel, Biochemistry (CBS)
NSF
\$49,948 - 07/91-12/92

Dispersal and Group Dynamics of Chimpanzees and Baboons at Gombe

Craig Packer, Ecology, Evolution and Behavior
Anne E. Pusey, Ecology, Evolution and Behavior
NSF
\$94,296 - 05/91-10/92

Teaching Outlines for Adult Farming Systems Management

Edgar A. Persons, Vocational and Technical Education
St of MN, Board of Vocational Technical Education
\$24,306 - 14/91-12/91

Analysis of Heart Rate and Body Temperature in Gray Wolves

Terry J. Kreeger, Ecology, Evolution and Behavior
John R. Tester, Sr., Ecology, Evolution and Behavior
Advanced Telemetry Systems, Inc.
\$10,000 - 01/91-01/92

Effects of Fatigue on Gait Analysis in the TB Racehorse During Maximal Treadmill Exercise

Raymond Geor, Large Animal Clinical Sciences
Calvin Kobluk, Large Animal Clinical Sciences
Minnesota Racing Commission
\$15,808 - 05/91-12/92

Flow-Volume and Pressure-Volume Relationships in Horses

Mathur S. Kanna, Veterinary Biology
Minnesota Racing Commission
\$10,114 - 05/91-12/92

Algorithms for VLSI Design

Clark Thomborson, Computer Science, Duluth
NSF
\$57,750 - 05/91-10/91

Compulsive Gambler Profile, Pull Tab, and Other Adult Gambling

J. Clark Laudergeran, Sociology/Anthropology/Geography, Duluth
Dennis Brissett, Sociology/Anthropology/Geography, Duluth
Gary L. Davis, Sociology/Anthropology/Geography, Duluth
St of MN, Dept of Human Services
\$9,000 - 05/91-06/91

Research Related Ads

ORTTA will place brief advertisements in the *Research Review* that are directly related to the research needs of individual investigators. These might include requests for biological materials or samples, offers to share equipment, or indications of interest in specific research collaborations.

All contacts and financial arrangements will be the responsibility of the interested parties. If you have a prospective advertisement, please send it to Mike Moore, Editor, *Research Review*, ORTTA, Administrative Services Center, 1919 University Avenue, 5th Floor, St. Paul, MN 55104.

Index to Research Review

An *Index* to Volume XX (July, 1990 — June, 1991) of the *Research Review* is now available. Please call 624-9004 or 624-0061 to request a copy.

The Sponsored Project Information Network (SPIN) is a computerized locator system of funding opportunities (federal, nonfederal, and corporate) for faculty and institutional research, development, and education program support. It is available to University faculty and staff through ORTTA.

Based on a description of your research areas and/or the type of support sought, ORTTA staff will search the SPIN Keyword Index to identify sources within specific areas of interest. The Keyword Index, a taxonomy developed by SPIN to catalog funding sources, is divided into the following ten major classifications:

- Agriculture/Food/Forestry
- Arts/Culture/Humanities/Communications
- Business/Economics/Management
- Education
- Health/Medical Sciences
- International Affairs/Area Studies
- Miscellaneous/Other
- Science/Technology
- Social/Behavioral Sciences
- Social Welfare/Public Affairs

The result of a search is a set of profiles of applicable funding sources that provides: 1) the sponsor's name; 2) the sponsor's contact address and telephone number; 3) deadline dates; 4) program titles; 5) objectives or interest areas of the sponsor; and 6) restrictions that would affect the submission of a proposal. This set of profiles is sent to the requestor.

SPIN searches are done free of charge to the requestor. A survey of users of SPIN indicates that the information received from a SPIN search was targeted to their request and a reasonable response time was effected.

For further information regarding the SPIN system or to request a search, please contact ORTTA at 624-9004

SPIN searches are also available through the Research and Development Office in the College of Liberal Arts; the Agricultural Experiment Station; the Research Support Office at Duluth; and the Grants Development Office at Morris.

Effective September, 1990 the SPIN indexes became available for on-line review through ORTTA's Electronic Bulletin Board (See the September, 1990 *Research Review* for information on Bulletin Board contents and access instructions.) The Bulletin Board contains a section devoted to SPIN and offers users the opportunity to review the Keyword Index alphabetically or within the topics shown above.

Since the Bulletin Board is accessible anytime, faculty and staff can browse the indexes at their convenience and find *keyword codes* of interest to them. From within the Bulletin Board they can then forward a note to the Bulletin Board Editor requesting a SPIN search based on the chosen keyword codes (Limit, 20 keywords).

Title and/or Area of Responsibility

Name

Number

Fax Number (612) 624-4843

Office of Research and Technology Transfer Administration

Associate Vice President, ORTTA Tony Potami 624-1648
 Communications Coordinator/Research Review Editor Mike Moore 624-9398
 Administrative Coordinator Carol Perusse 624-6389

Grants and Contracts

Information 624-5599
Assistant Director Rick Dunn 626-2265
Assistant Director Mary Lou Weiss 624-5856
Assistant Director Todd Morrison 624-5066
 DHHS, Army Contract, Voluntary Health Mary Lou Weiss 624-5856
 DHHS, State of MN Todd Morrison 624-5066
 DHHS, Foundations, Voluntary Health Kevin McKoskey 624-1521
 USDA, DOD, AID, USIA, Agricultural Associations, Foreign Merlin Garlid 624-0288
 NSF, USDI, DOD, Business/Industry, Associations/Societies David Lynch 624-5571
 NSF (IT), DOE, Greater Minnesota Corp, Business/Industry Rick Dunn 626-2265
 NSF (non-IT) USDE, USDA, EPA, Agricultural Associations, Misc Fed Elizabeth Klitzke 626-7718
 DOC, St of MN Amy Levine 626-7441
 Private/Corporate Fdns, Voluntary Health, MN Med, DHHS Judy Krzyzek 624-2546
 NASA, Business and Industry Judy Volinkaty 624-3317
 DHHS, Cities/Counties, Colleges/Universities Susan Stensland 625-3515
 DHHS, Voluntary Health Jim Reinholdz 625-3415

Patents and Licensing

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Director John Thunte 624-2816
 Technology Licensing (IT) Tony Strauss 624-0869
 Technology Licensing (Health Sciences/Ag) Jim Severson 624-0262
 Trademark Licensing Robert Hicks 626-1585
 Technology Licensing Paul McDowall 625-8826

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 Effort Reporting, Indirect Cost & Other Rate Development Liz Warren 624-2040
 Financial Reporting, Accounting Questions Sandy Kenyon 624-6026

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- To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS)
- Please check with your departmental office or AIS (624-9000) if you need assistance.

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RESEARCH REVIEW

Research and Technology Transfer Administration

September, 1991

The Roads Will Have Eyes

by Michael P. Moore

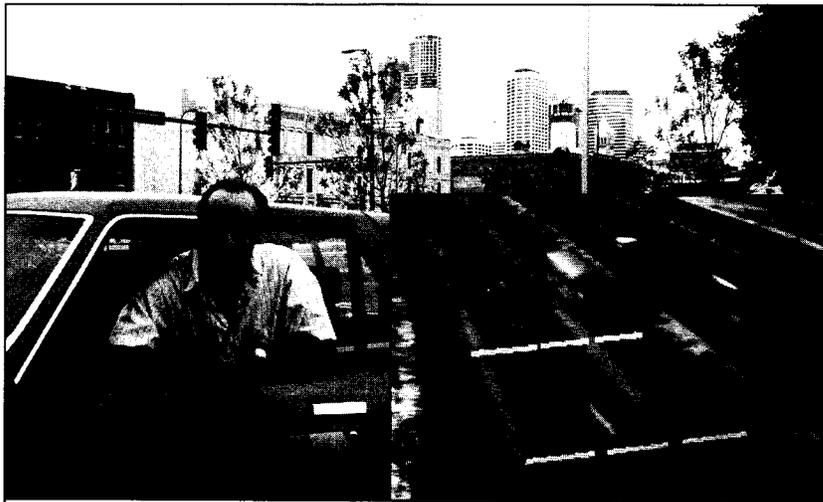
The concept of "intelligent" highways that can control traffic flow and even guide private automobiles to their destinations is gaining momentum as a national transportation goal. Now, after seven years of research and development efforts supported by the Minnesota Department of Transportation (MnDOT), the Federal Highway Administration, and the University's Center for Transportation Studies, streets and highways will gain the first technology needed to make them smart: video "eyes" to gather data and computer "brains" to analyze it and direct traffic control decisions.

The technology is called Autoscope™ Vehicle Detection System, and it was invented by a team led by Professor Panos Michalopoulos, Department of Civil and Mineral Engineering. The device accepts input from up to four video cameras and digitizes it into a format that can be analyzed in 48 separate detection zones within the area of roadway being monitored. It gives traffic engineers the first real-time data they need to be able to predict traffic flow, detect problems as they occur, and direct traffic control devices to get people to their destinations as quickly and safely as possible. As an intersection sensing device, it could replace inductive loops now embedded in roads to detect vehicles and feed information to traffic signals. As anyone knows who has sat at a left-turn signal waiting for a turn arrow that never comes, these loops sometimes malfunction. Traffic engineers estimate that more than one-third are not working or reporting inaccurately at any one time, and they are expensive and disruptive to traffic to install and replace. Even when working, highway lane loops sometimes show "open road" during rush-hour gridlock.

The idea for the technology behind Autoscope was first disclosed by Michalopoulos to the University's Office of Patents and Licensing in 1984. An authority on traffic modeling and theory, he was frustrated by the lack of precise

means for gathering actual traffic data to test theories and to predict traffic flow. The lack of such data makes it difficult to meter freeway ramps, plan new roadways, and estimate the potential effectiveness of traffic control improvements. The only way to assess the performance of improvements

Autoscope, Continued on Page 10



Professor Panos Michalopoulos, with inset showing digitized photo used by Autoscope™ to analyze traffic.

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Want Ads

Collaborator Wanted:

D.L. Mooradian, Laboratory Medicine and Pathology/Biomedical Engineering Center, would like to collaborate with individuals having an interest in cell/biomaterial interactions. Interest centers on the use of biological response modifiers (e.g., polypeptide growth factors, cell adhesion-promoting glycoproteins) to enhance biomaterial performance. Particularly interested in possible collaborations with individuals having access to unique biomaterials. Call 612/626-7084 or write D.L. Mooradian, 6-159 Jackson Hall, 321 Church Street, Minneapolis, MN 55455.

ORTTA Staff Now Available Through the INTERNET

The Office of Research and Technology Transfer has installed Pegasus Mail, an electronic mail system for Novell NetWare, and staff members are now available through the INTERNET. INTERNET addresses have been added to the telephone list inside the back cover of the *Research Review*. If you would like the INTERNET address for any other ORTTA staff member, please call Kim Makowske at 624-9004.

RESEARCH REVIEW

Volume XXI/Number 3

September, 1991

Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/91-6/30/94 rates should be used. The rate agreement is dated July 1, 1991. This date should be used where required on proposal applications. Please call Marilyn Surbey at 624-4850 with questions on Indirect Costs.

	07/01/91	06/30/94
Research		
On-Campus		40.0
Off-Campus *		21.0
SAFHL		60.0
Hormel		53.0
Other Sponsored Activity		
On-Campus		20.0
Off-Campus *		10.0
Instruction		
On-Campus		52.0
Off-Campus		16.0

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call Vivian Fickling at 624-2009.

Current actual rates from July 1, 1991 through June 30, 1992 are:

Faculty	25.50
Civil Service	25.00
Graduate Assistant	29.50

For proposals being submitted with start dates after July 1, 1992, the estimated fringe benefit rates to be budgeted are:

Faculty	28.00
Civil Service	29.50
Graduate Assistant	31.00

As rates change they will be reflected in this section.

U of M Technology Transfer

New Strategy Calls for Fewer Patent Filings, Earlier Licensing

by John Thuente

Like other units at the University, the Office of Patents and Licensing has been asked to maintain an active program on a reduced budget. We are committed to fulfilling our obligation to perform patent and licensing services for present and future inventions. However, in order to obtain the greatest benefit from the funds available, we must modify our strategy somewhat and incur only those expenditures that demonstrate the most potential for producing the royalty revenues needed to insure the future of the University's patent and licensing program.

In past years we have basically been breaking even on patenting costs (not including staff) versus the University's one-third share of royalty income, which is used to support future patent and licensing endeavors. As the number of U.S. patents applied for and issued has increased over the past five years, so have the costs of maintaining those patents. Also, the United States Patent and Trademark Office recently raised the fee structure for small inventors, including universities, by nearly 80 percent and Congress is considering additional increases this year. Also, mounting expenses have been incurred as we sought foreign patent protection for more of our technologies. These foreign costs can mount into the hundreds of thousands of dollars for complex technologies protected by several patents worldwide.

The recent reductions in state appropriations to the University have made it necessary for the University to remove the staff of the Office of Patents and Licensing from personnel supported by state funds. Coming on top of the increasing patenting costs, this has made necessary a strong move to protect the future viability of the University's technology transfer program.

In an effort to reduce our expenses to a level that can be sustained by royalty income, the Office of Patents and Licensing is implementing three strategic changes: 1) sharply reducing costs for foreign patent applications, 2) reducing the number of U.S. patent filings we initiate without a corporate partner, and 3) increasing our efforts to quickly find licensees for faculty technology disclosures and encouraging those licensees to pay the costs of patent protection.

The first strategic step is to reduce foreign patent activity on existing invention disclosures, except in cases where there is a licensee who is reimbursing the University for foreign expenses or where foreign protection is critical for successful licensing. To prosecute an application in a foreign country we must retain foreign patent counsel for each country. At a stage in the foreign patent prosecution a translation must be made into the various national languages. Additionally, virtually all foreign countries have substantial yearly patent maintenance fees. In total, these foreign costs have, in our

experience, far exceeded royalty revenues from foreign sales. We recently analyzed past and present University patents that have enjoyed some measure of success in the marketplace. A number of those patents have corresponding foreign patents and have had foreign sales of products. In only one case have foreign sales exceeded the cost of maintaining the foreign patents.

The second step, reducing U.S. patent filings, also is made necessary by increasing costs of obtaining patent protection. We have been filing about 50 patent applications annually for the past three years, and we have received over 40 patents per year for the past two years. Unfortunately, many of these patented inventions have not attracted a licensee, although we continue to present them to companies through letters, meetings, publications, and the Minnesota Project Outreach database. It is difficult to judge the potential commercial possibilities of many University inventions because they come out of laboratory research that is years ahead of the marketplace. However, because of increasing patent costs and decreasing funding, we need to reduce our patent filings at least temporarily.

The third strategic step will in time enable us to reimplement the aggressive patenting program needed to best protect the public's investment in inventions that come out of university research. We have stepped up our efforts to obtain licensees for newly disclosed inventions before we apply for patent protection. In so doing, we hope to both reduce our costs and increase upfront payments and patent support from licensees so that we can initiate patent filings on as many inventions as possible. We have enlisted the help of a private firm, Bernard Wolnak and Associates, to help us in finding potential licensees. They have a great deal of experience in, and many contacts with, the pharmaceutical and drug production industries. They will look at technologies on a case-by-case basis. Faculty will be consulted on cases in which Wolnak thinks it can assist in licensing.

Also as part of the more aggressive licensing strategy, we are currently interviewing to hire an additional licensing staff person and a manager of new business development. The new licensing associate will increase our ability to serve the health sciences and agricultural departments, from which we think there is great potential for increased technology transfer activity. The manager of new business development will increase the University's ability to start up new companies to commercialize inventions that do not attract interest from existing industry, but that have some po-

New Strategy, Continued On Page 7

Committee on the Use of Human Subjects in Research

Special Notice to Investigators

Certifications for Non-Competing (Type 5) Continuation of PHS grants

Researchers submitting applications for non-competing (Type 5) continuing support for Public Health Service (PHS) grants *must* include documentation of current IRB approval for the project. **NO GRACE PERIOD IS ALLOWED.** The typical sixty-day grace period described below cannot be invoked for Type 5 continuations. Approval information *must* be submitted with the application. Documentation is noted on the face page of the application. Delay in submitting the required certification will result in "substantial delays in the award process," —(READ: potential disallowance). The prohibition from use of grace period applies to human subject *and* animal certification.

Therefore, it is not allowed to show "pending" status or to use a delinquent approval date (one year or more old).

All research involving human subjects is reviewed prospectively and requires continuing review. Forms for renewal are sent to the investigator by the Committee on the Use of Human Subjects in Research six to eight weeks prior to the due date for renewal. This system allows time for appropriate review and processing. Prompt response to renewal forms is required for future consideration of grant renewals.

The new common rule for the Protection of Human Subjects in Research is based on, and replaces, Subpart A of the 1981 DHHS regulations at 45 CFR 46. Other subparts remain unchanged and are still invoked.

Since the new regulations are based on the model used by the University of Minnesota in formulating institutional policies, not many changes will be required to remain in compliance with federal authority. **New regulations are effective August 19, 1991.**

Researchers are reminded that new application forms are required for submitting proposals to the Committee on the Use of Human Subjects in Research.

Exemption Changes

Section 101 (b), "Exemptions" have been combined, reworded, and renumbered. Investigators are cautioned to cite the correct exemption number for grant certification purposes. New "Administrative Review of Research Exempt from Committee Review" forms are available from the Committee office. These forms include a list of new exemption categories. Researchers are reminded that the determination of exemption from Committee review is made by the Administrative Office of the Committee in concert with the Policy Subcommittee of the Committee on the Use of Human Subjects in Research. Decisions on exemption are not made at the departmental or collegiate levels. All research conducted at the University of Minnesota by its faculty, staff, or students is subject to these regulations.

Cooperative Research

Section 114 states that cooperative arrangements must be approved by the department and agency head. Any researcher proposing to conduct research at another site must submit evidence of written approval from the local IRB.

This documentation should be submitted to the Committee on the Use of Human Subjects in Research. If the cooperative institution does not have an IRB, a formal agreement describing cooperation and compliance with federal regulations must be submitted to, and approved by, the Office for Protection from Research Risks (OPRR). The format for these "Single Project Assurances" can be obtained from the Committee on the Use of Human Subjects in Research administrative office. These arrangements are subject to prospective and continuing review by the Committee.

Sixty-Day Grace Period

In the past, NIH has allowed a sixty-day grace period from the date of a grant application to the date at which certification of IRB approval must be filed. Since the University of Minnesota holds a "Multiple Project Assurance" with OPRR, NIH will continue, under the new regulations, to accept a sixty-day grace period for institutions holding this type of assurance. Therefore, on *most* grant proposals the sixty-day grace period applies. This provision is allowable under new applications and competing applications (Types 1 and 2). (See exception in box, above).

Researchers are encouraged to carefully review the guidelines for AIDS research and some special project requests. Funding agencies, including NIH, may waive their own grace period in the interest of an expedited review process and may require that documentation of full IRB approval accompany the grant application. The timelines for IRB review are very tight; *NO* exceptions can be made to the rotating schedule of IRB meetings. Special "emergency meetings" cannot be called in response to the threat of loss of funds—the guidelines prohibit such conflicts.

If you have questions, please call Moira Keane at 612/624-1889, [moira@ortta.umn.edu].

Fringe Benefit Rates

Since January, 1991 the Office of Budget Management and Controller has been negotiating with the federal government on Indirect Cost Recovery and fringe benefits rates. These negotiations are still not concluded, however a *provisional* rate structure has been approved by the negotiator.

The *Provisional* Fringe Benefit Rates shown below will be charged against salaries during the period July 1, 1991 through June 30, 1992

	<u>ACADEMIC %</u>		<u>CIVIL SERVICE %</u>		<u>GRADUATE ASST %</u>
Health Plan	5.18	(H)	10.11		6.70
Unemployment Compensation	.02	(U)	.22		.00
Worker's Compensation	.00	(W)	2.47		.00
Tuition Benefits	.06	(T)	.44		22.80
Group Life and Disability	.30	(G)	.00		.00
Retirement	12.77	(R)	4.57		.00
F.I.C.A.	7.17	(F)	7.19		.00
TOTAL	25.50		25.00		29.50

The very notable shifts from current rates are due to the attribution of the tuition benefit to graduate assistants as a separate group (previously, the cost of the tuition benefit was attributed over the entire academic employee group). The negotiator's interpretation of the regulations in this area continue to be challenged.

It should be pointed out that in the past, the University has been able to carry any over or under recovery of fringe benefits forward to future reporting periods in an effort to provide some level of predictability to the rates. The negotiator does not find this practice acceptable, and as a result this practice can no longer be followed. Since the rates noted above include the adsorption of current over and under recovery balances, a substantial increase to the rates effective July 1, 1992 is predicted.

<u>ACADEMIC %</u>	<u>CIVIL SERVICE %</u>	<u>GRADUATE ASST %</u>
28.00	29.50	31.00

If you have any questions regarding fringe benefit rate development, please call Vivian Fickling, Accounting Records and Services, 624-2009.

The following rates should be used for budgeting on sponsored project proposals for periods beyond June 30, 1992. These rates are provisional.

	<u>ACADEMIC %</u>		<u>CIVIL SERVICE %</u>		
NONSTUDENTS					
0-74%	7.66	(UWF)	15.04	(UWRF)	
75-99%	14.88	(HUWTF)	29.50	(HUWTRF)	
100%	28.00	(HUWTGRF)	29.50	(HUWTGRF)	
 STUDENTS					
25-100%	31.00	(HWT)	(Classes 9511; 9521; 9531)		
25-74%	23.77	(WT)	(Classes 9538; 9539; 9553; 9554; 9557)		
75-100%	30.90	(HWT)	(Classes 9538; 9549; 9553; 9554; 9557)		
75-100%	7.22	(HWT)	(Classes 9540; 9546)		
25-74%	31.40	(WTF)	(Class 9554)		
75-100%	38.53	(HWTF)	(Class 9554)		

Please call Vivian Fickling, Accounting Records and Services, 624-2009 with questions regarding fringe benefit rate development

U = Unemployment; W = Workers' Compensation; T = Tuition Benefits; H = Health Insurance; G = Group Life; R = Retirement; F = F.I.C.A.;

Federally Funded Research: Decisions for a Decade

The issues and challenges facing the nation's research system will call for a combined effort from Congress, the executive branch, and the research performer, reports the Congressional Office of Technology Assessment (OTA) in its report titled, *Federally Funded Research: Decisions for a Decade*. The following is a summary of the issues raised in this report.

Four pressing challenges will face the nation's research system in the 1990s:

- Setting priorities in funding
- Understanding trends in research expenditures
- Preparing human resources for the future research work force
- Supplying appropriate data in all areas of research projects

Nancy Carson of OTA, the principal architect of the report, summarized the nation's research system as "A system constantly in tension." Carson said, "We want careful, responsible grant funding, and we want researchers to take risks." However, the funding decisions are widely desegregated, and the impacts of those decisions can create conflicts. "Training more researchers creates more competition for funds; training fewer raises issues for the future," concludes Carson.

Because federal research expenditures have increased more rapidly than the rate of inflation, setting priorities in funding is one of the topics to be addressed at the federal level in this coming decade. OTA suggests that direct containment of research costs by the research agencies may not be the appropriate federal role. Instead, OTA would like to see greater cost accountability encouraged by the executive branch and Congress. In particular, the federal government should seek to eliminate the confusion regarding allowable indirect costs of research. This is especially important since indirect costs, along with salaries, account for the largest and fastest increasing share of federal research expenditures. In fact, more researchers than ever before are now supported by the federal government. Better estimates of future expenditures, specifically for megaprojects, need to be available.

OTA also refuted the validity of the assertion that federal research costs are rising. "For policy purposes, research costs equal expenditures. If the federal government continues to provide more funds, costs will go up," Carson said. OTA suggested that the government needs to focus not on whether costs are rising, but rather on how reasonable the projected costs are for each research budget. This is not to diminish the increasing demand for federal agencies to fund research programs, however. Research universities and laboratories are an invaluable resource for the United States;

but, the government must devise mechanisms for coping with realistic research expenditures as one of its central challenges.

Not only must the federal government keep up to date on rising research expenditures, but OTA's report summarized ways for Congress to track upcoming trends in research expenditures that may result in needed congressional action. For the federal government to be aware of changing research trends, OTA suggested that Congress retain responsibility for making final decisions and initiating any action, while placing some coordination responsibilities at the executive level. OTA also advised that congressional hearings, legislation and oversight should first address crosscutting and within-agency priorities at the national level.

OTA proposed that this be achieved by establishing biennial hearings with the Office of Science and Technology Policy (OSTP) and the Office of Management and Budget (OMB) in an effort to coordinate budget plans with analyses of all scientific disciplines and research areas. These hearings could keep track of trends in three areas. During one set of hearings, emphasis could be placed on expanding the research system through the strengthening of education and human resources. A second set of hearings could explore cost accountability efforts both at the research agencies and throughout the research system. The final set of hearings would then examine the state of data on the research system, and how to improve and inform Congress in order to influence decision making.

The third challenge emphasized in the report from OTA is how to prepare human resources for the future research work force. Answering projections of a shortage of Ph.D. researchers in the mid-1990s, OTA stated that "the likelihood of these projections being realized is overstated and the projections alone are poor grounds on which to base policy." Demand predictions must account for enrollment and immigration trends, anticipated career shifts and retirements, shifting federal priorities, and available research funding; all are subject to change and may vary by institution, field, and region of the country.

OTA stressed the value of interesting and preparing increasing numbers of mainstream and diverse students in the grades of K-12 and at the undergraduate level for science and engineering careers. OTA would also like to see graduate students prepared for career paths in or outside of research while possibly providing retraining grants, if necessary, to researchers so they can move more easily between fields.

Continued on Next Page

Total participation in science and engineering can be increased if opportunities and motivation for groups such as women, minorities, and researchers in specific geographical locations are addressed, writes OTA. Federal legislation has always and must continue to play a crucial role in recruiting and retaining these groups. OTA contends that both set-aside programs, which offer competitive research grants to targeted groups, and mainstream programs are tools that can enlarge, sustain and manage the diversity of people and institutions in the research system.

OTA reported that "Research in many fields of science and engineering is moving toward a larger, more 'industrial' model, characterized by larger research teams [led by] a principal investigator who spends more time gathering funds to support full-time junior researchers than in actual research." This model seems to enhance productivity and allow research teams to tackle more complex research problems by assigning specialized responsibilities within the research team and by sharing infrastructure. "The federal government may wish to acknowledge changes in the composition of research groups and to enhance opportunities and rewards for groups such as postdoctorates and non-tenure track researchers," OTA advised.

The importance of supplying appropriate data in all areas of research projects is the final issue addressed in the report. OTA defined four categories of data that would be helpful in decision making:

1. How research monies are allocated and spent
2. Personnel characteristics of the research work force
3. The research process: how researchers spend their time and what materials they need to perform their research
4. The final results of research

Presently, extensive data are available on dollars spent for research, enrollment size, degrees in what fields, and publications and citations. However, almost no consistent data exist on the size and composition of the research work force in any typical agency, institution or team, or, on what portion of research is supported by federal funds across federal agencies. Most analysts must rely on National Science Foundation (NSF) and National Institutes of Health (NIH) data, potentially generalizing results and trends that might not apply to other agencies. OTA contends that in order to affect policy, information must be available and presented to those in a position to effect change by allocating or redirecting resources.

In conclusion, funding priorities, trends in research expenditures, human resource preparation and data supply are the top four challenges facing the nation's research system, said the report issued by OTA. OTA sees the federal level priori-

ties currently falling short of addressing these top issues in three ways. First, the criteria used in selecting various areas of research and megaprojects are not made explicit and vary widely from area to area. Second, no mechanism exists for evaluating the federal government's total research portfolio in terms of progress towards many national objectives. And third, the principal criteria for selection of research projects—scientific merit and mission relevance—are, in practice, coarse filters. OTA would like to see their report and guidelines examined and followed at the federal level so that the nation's future research system will be able to respond to the challenges facing research in the next decade.

Research Fair

As part of Campus Kick-Off Days, The Office of New Student Programs is holding a Research Fair and reception from noon to 3:00 P.M. on Wednesday, September 25 in 324 Coffman. About twenty exhibits are planned.

If you are interested in participating, call Julie Aga or Joe Keenan, New Student Programs, 4-0666.

New Strategy, Continued From page 3

tential to be worthwhile and profitable products if nurtured by a devoted entrepreneur, possibly with assistance from venture capital and/or federal Small Business Innovation Research grants.

Again, we hope that the first two of these strategic steps will be only temporary setbacks in the University's technology transfer program, which has attained a position among the nation's leaders over the past five years. It is noteworthy that only a handful of U.S. universities are breaking even or making money on their patents and licensing efforts. This is because of the basic nature of university inventions and the years of research and development it often takes before they generate royalties; a recent study by the University of California found that it takes an average of eight years for a university invention to generate royalties.

We feel that we are about three years away from a situation in which the University's share of royalties will fully support or exceed the expenses of the technology transfer program. Until that time, we must reduce our costs while stepping up our efforts to form partnerships with companies

Proposal and Award Activity—FY 1991

The trouble with receiving a \$66 million award is that it's hard the following year for the University to avoid the impression that proposal and award levels have decreased. Well, they have—but they haven't. If you remove the five-year award amount for the Army High Performance Computing Research Center from the fiscal year 1990 totals, award amounts increased by \$24 million in fiscal year 1991. Numbers of proposals fell by 44 in 1991, but the number of awards rose by 275. The table below shows the distribution of proposals and awards among University colleges.

UNIVERSITY OF MINNESOTA Proposal and Award Activity — FY 1991

	Proposals Submitted		Awards Received	
	Number	Amount	Number	Amount
Medical School	1,158	\$ 175,215,429	883	\$ 87,962,393
School of Dentistry	70	9,706,587	44	3,492,181
College of Pharmacy	54	4,924,737	44	1,815,850
School of Nursing	29	2,773,928	15	753,003
School of Public Health	169	75,184,633	152	31,099,559
College of Veterinary Medicine	119	7,756,689	72	3,794,618
UMD-School of Medicine	37	4,749,605	24	1,754,045
Health Sciences Administration	2	204,970	1	182,489
Total Health Sciences	1,638	280,516,578	1,235	130,854,138
Institute of Technology	764	121,112,917	570	39,550,687
College of Biological Sciences	187	35,433,952	135	10,193,555
College of Liberal Arts	140	18,208,089	100	7,721,056
College of Architecture & Landscape Architecture	9	381,595	8	704,935
General College	10	1,111,085	6	914,557
Total-Arts, Sciences, Engineering	1,110	176,247,638	819	59,084,790
College of Agriculture	252	31,938,549	173	7,052,371
College of Natural Resources	102	6,988,615	74	1,714,865
College of Human Ecology	40	3,069,793	23	1,625,805
Other IAFHE Programs	34	2,329,036	43	2,045,326
Total IAFHE	428	44,325,993	313	12,438,367
College of Education	131	17,716,798	123	10,164,501
UM-Duluth	138	14,477,398	86	3,342,287
Graduate School	19	1,976,435	54	4,670,293
Carlson School of Management	18	1,458,902	9	756,813
HHH Institute of Public Affairs	27	4,544,539	19	4,449,107
UM-Morris	25	382,623	20	336,789
UM-Crookston	22	580,731	12	398,491
UM-Waseca	6	267,087	7	171,288
Law School	5	304,554	3	162,610
Continuing Education and Extension	36	785,127	33	1,016,612
Other Units	92	9,898,903	92	5,000,006
Grand Total	3,696	\$ 553,483,306	2,825	\$ 232,846,092

Licenses Negotiated

April - June, 1991

1. **Title:** **Monoclonal Antibody Specific for Human B-Cells**
Purpose: Therapy and monitoring targeted to cells affected by a type of leukemia.
Licensee: University of Minnesota Hospital and Clinic (UMHC); non-exclusive
Inventors: Faith Uckun, Therapeutic Radiology
2. **Title:** **Apple Tree: Honeycrisp**
Purpose: A new variety of tree with fruit that ripens two to three weeks ahead of other Minnesota varieties and is sweet, juicy, and crisp.
Licensee: Bedford Farms, Delano, MN; non-exclusive
Inventors: David S. Bedford, James Luby, Horticultural Science and Landscape Architecture
3. **Title:** **"Thermo" (Software)**
Purpose: Educational courseware for physics students.
Licensee: American Institute of Physics, New York, NY; non-exclusive
Inventors: Kurt Wick, Philip Johnson, Physics and Astronomy
4. **Title:** **Condensation-Growth Particle Scrubber**
Purpose: For removal of small (submicron) particles in pollution control equipment.
Licensee: MSP Corporation, Minneapolis, MN; exclusive
Inventors: Ben Liu, Peter McMurry, Jinjun Sun, Mechanical Engineering
5. **Title:** **L-A-K Activation of T-I-L Cell Populations**
Purpose: Experimental cancer therapy.
Licensee: Oncotherapeutics, Inc., Minneapolis, MN; exclusive
Inventors: Augusto Ochoa, formerly Laboratory Medicine and Pathology; Fritz Bach, Barbara Alter, Laboratory Medicine and Pathology
6. **Title:** **Liposomes Immunoadjuvants Containing IL-2**
Purpose: Experimental cancer therapy.
Licensee: Oncotherapeutics, Inc., Minneapolis, MN; exclusive
Inventors: Peter M. Anderson, Pediatrics; Arnold Leonard, Cynthia Loeffler, Surgery; Augusto Ochoa, formerly Laboratory Medicine and Pathology
7. **Title:** **Method of Cytokine Augmentation for Immunotherapy and Use in Hepatic Metastasis**
Purpose: Experimental cancer therapy.
Licensee: Oncotherapeutics, Inc., Minneapolis, MN; exclusive
Inventors: Peter M. Anderson, Pediatrics; Cynthia Loeffler, Surgery; Augusto Ochoa, formerly Laboratory Medicine and Pathology
8. **Title:** **Method of Enhancing the Immunotherapeutic Activity of Immune Cells by Depletion/Positive Selection of Cell Subsets**
Purpose: Experimental cancer therapy.
Licensee: Oncotherapeutics, Inc., Minneapolis, MN; exclusive
Inventors: Fritz Bach, Robin Geller, Laboratory Medicine and Pathology; Augusto Ochoa, formerly Laboratory Medicine and Pathology
9. **Title:** **Vehicle Detection Through Image Processing for Traffic Surveillance and Control**
Purpose: To improve data gathering for traffic management and to provide input for intersection signal switching.
Licensee: Image Sensing Systems, Inc., St. Paul, MN; exclusive
Inventors: Panos Michalopoulos, Civil and Mineral Engineering; Robert Fitch, Richard Fundakowski, Triple Vision, Inc.
10. **Title:** **Quasi-Arbitrary Subregion Real Time Averager for Video Images**
Purpose: Formatter for data gathered by vehicle detection system.
Licensee: Image Sensing Systems, Inc., St. Paul, MN; exclusive
Inventors: Panos Michalopoulos, Civil and Mineral Engineering; Robert Fitch, Richard Fundakowski, Triple Vision, Inc.
11. **Title:** **Oil Absorption with Surface-Modified Rubber**
Purpose: To use discarded tires as raw material for cleaning up oil spills on water and land.
Licensee: Environmental Research and Development Trust, St. Paul, MN; exclusive
Inventors: Wilhelm Reindl, Mineral Resources Research Center

12. **Title:** **Process for Surface and Fluid Cleaning**
Purpose: To clean microscopic particles from surfaces without damaging the surface.
Licensee: MSP Corporation, Minneapolis, MN; exclusive
Inventors: Ben Liu, Kang Ahn, Mechanical Engineering
13. **Title:** **Paint Spray Analyzer**
Purpose: To help maximize effectiveness of paint sprayer applicators.
Licensee: MSP Corporation, Minneapolis, MN; exclusive
Inventors: Ben Liu, Mechanical Engineering
14. **Title:** **Method for Treating Alcohol Addiction**
Purpose: Potential therapy for alcoholism using opiate-receptor blocking compounds.
Licensee: Indiana University, Bloomington, IN; patent and marketing agreement
Inventors: Philip Portoghese, Medicinal Chemistry

U.S. Patents Issued

April - June, 1991

1. **Title:** **Phospholipase A2-Resistant Liposomes**
Purpose: Drug delivery method that extends the time liposomes can carry medication in the body without being broken down.
Inventors: Kumar V. Vedantam, Wolfgang J. Baumann, Hormel Institute
2. **Title:** **Prosthetic Devices Coated with Polypeptides with Type IV Collagen Activity**
Purpose: A heparin-binding composition that promotes cellular adhesion and might be used to enhance biocompatibility of prosthetic implants, percutaneous devices, and bandages.
Inventors: Photini-Effie C. Tsilibary, Leo T. Furcht, Laboratory Medicine and Pathology
3. **Title:** **Split-Gate Field Effect Transistor**
Purpose: To accelerate electrons and thereby decrease electron transit time, increasing speed and operation frequency of field-effect transistors in semiconductor devices.
Inventors: Michael Shur, formerly Electrical Engineering
4. **Title:** **Crystalline Saponin-Containing Complex**
Purpose: A relatively pure plant extract for use as an intermediary in producing saponogenin animal growth stimulants.
Inventors: Thomas J. Holmes, Barbara Nygaard, Medicinal Chemistry
5. **Title:** **High Stability Porous Zirconium Oxide Spherules**
Purpose: For use in inorganic oxide-based chromatography; reverse-phase, high-pressure liquid chromatography; and ion-exchange, high-pressure liquid chromatography.
Inventors: Peter Carr, Eric F. Funkenbusch, Douglas A. Hanggi, Chemistry; Martin P. Rigney, Patrick L. Coleman, Wes A. Schafer, 3M
6. **Title:** **Fluid Regulator Valve**
Purpose: An energy-saving vacuum/pressure regulator for use in pumps, such as those in milking machines.
Inventors: Jinglu Tan, Agricultural Engineering
7. **Title:** **Time Symmetric Pulse to Uniformly Rotate Magnetization Vectors by an Arbitrary Angle in the Presence of Large B1 Inhomogeneities and Resonance Offsets**
Purpose: A method to improve editing capability of images generated by magnetic resonance imaging and spectroscopy.
Inventors: Kamil Ugurbil, Biochemistry (MS); Michael Garwood, Radiology
8. **Title:** **Polypeptides with Fibronectin Activity**
Purpose: A composition that binds heparin and promotes cellular adhesion and neurite outgrowth and might be useful in cell cultures and medical devices such as implants and catheters.
Inventors: James B. McCarthy, Leo T. Furcht, Laboratory Medicine and Pathology
9. **Title:** **Surface Instability Detection Apparatus**
Purpose: A compression test apparatus for materials such as rock and concrete, to measure stress displacement characteristics of the failure zone.
Inventors: Ioannis G. Vardoulakis, Joseph Labuz, Euripides Papamichos, Civil and Mineral Engineering

and to measure traffic behavior was through actual observation, which has its own human failings.

Michalopoulos and his associates saw video-linked computer technology as the way to fill the need. Michalopoulos presented the idea to MnDOT and in 1985 received funding for a feasibility study to compare traffic data obtained through visible light and infrared video cameras. That pilot study showed that visible light video worked just as well for vehicle detection as infrared, and at a fraction of the cost. And their projections of the cost of a video intersection monitoring system showed it to be less expensive than inductive loops.

Because the technology needed extensive applied research and development before it could be commercialized, the Office of Patents and Licensing licensed the rights to the technology to Image Sensing Systems, Inc. (ISS), a company founded by Michalopoulos. In 1989, a patent filed in 1987 was issued, and after five years of development and field testing the Autoscope showed that it could provide the real-time traffic data needed to improve freeway and intersection traffic management.

That's when things started getting very interesting, says Richard Magnuson, an ISS director and consultant until 1990, when he accepted the challenge of taking the company from dormancy into the marketplace as its president. Several years of discussions with large corporations failed to produce a partner as eager as ISS was to "productize" the technology. "The large companies were moving slowly, debating whether to make or buy the various components for the detector," Magnuson says. "We felt that the big opportunity was in applications: cities and states are not going to buy detectors, they're going to buy solutions to their traffic problems. So we decided to market ourselves and develop the technology as a standard others would have to try to measure up to."

ISS hired a small staff of engineers and accountants and began to develop a business plan, financial projections, and

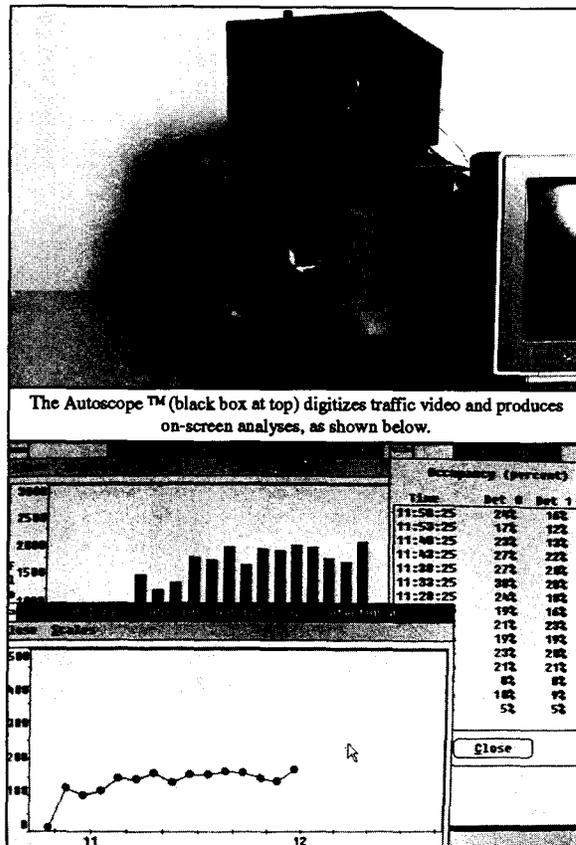
estimate of capital needs, with the intent of launching a public stock offering. Iraq's invasion of Kuwait and the financial downturn that followed put an end to that idea. Instead, ISS decided to find a partner from among the smaller companies specializing in products for the transportation industry. The most interested was Econolite Control Products, Inc., of Anaheim, California, a major producer of signal controls and reflective signs that was looking for new technologies to propel it into the 21st century, Magnuson says.

With assistance from Paul McDowall, an assistant director in the Office of Patents and Licensing, a complex but satisfactory license agreement was reached this spring to transfer the technology. Econolite signed a contract with ISS to help develop the first commercial Autoscope device and obtained exclusive rights to market the systems in the United States, Canada, Mexico, and the Caribbean. ISS retained all other international rights. Royalties will flow through to ISS and all its founders, and to the University, which agreed to devote half its share to supporting the Center for Transportation Studies in return for MnDOT's rights based on its funding of the R&D testing.

It sounds complicated, but Magnuson calls it a prime example of how a public-private partnership can and should work. "We're planning to develop this as a case study of technology transfer and write it up as a White Paper to show what can be accomplished," he says. Indeed, although there were rough points along the way, the complex path from a research-based technological idea to a valuable new product was successfully negotiated, thanks mostly to close collaboration between MnDOT and the

University of Minnesota.

That University-State relationship was built by former MnDOT commissioner Richard P. Braun, director of the Center for Transportation Studies since 1987. While at MnDOT, he noted the University's lack of faculty and classes devoted to pavement engineering, one of Minnesota's most pressing transportation problems. That led him to become involved with the University in establishing the Center, which he has built into one of the nation's leading programs for transportation education and research. The Center brings together 8 to 12 multidisciplinary faculty in each of four major research areas: transportation and the economy, transportation safety and traffic flow, transportation infrastructure, and transportation and the environment.



Braun also is a leader on the national transportation scene. He was one of the charter members of Mobility 2000, the national forerunner of Intelligent Vehicle Highway Society (IVHS) of America. Braun chairs the IVHS America Coordinating Council, and he says the organization's goal is to apply technology to make highways and streets more efficient and safer. Employing an evolving group of technologies, intelligent vehicle/highway systems will comprise the following four functional areas:

- Advanced Traffic Management Systems (ATMS) permit real-time adjustment of traffic control systems and variable signing for driver advice. Their application in selected corridors has reduced delay, travel time, and accidents.
- Advanced Traveler Information Systems (ATIS) let drivers know their location and how to find desired services. ATIS permit communication between driver and ATMS for continuous advice regarding traffic conditions, alternate routes, and safety issues.
- Commercial Vehicle Operations (CVO) select from ATIS those features critical to commercial and emergency vehicles. They expedite deliveries, improve operational efficiency, and increase safety. CVO will be designed to interact with ATMS when ATMS is fully developed.
- Advanced Vehicle Control Systems (AVCS) will apply additional technology to vehicles to identify obstacles and adjacent vehicles, thus assisting in the prevention of collisions and in safer operation at high speeds. AVCS will interact with the fully developed ATMS to provide automatic vehicle operations.

Minnesota has its own program to implement IVHS technologies. Called GuideSTAR, it is a series of traffic management and traveler information systems designed to increase safety and, by keeping traffic flowing, reduce economic waste and air pollution from traffic jams. GuideSTAR is supported by a \$1 million appropriation from the Federal Highway Administration, and through several MnDOT-sponsored research projects at the University its goal is to develop the video detection and communications technology to support in-vehicle information systems by 1995.

Autoscope is a small piece of the GuideSTAR and IVHS concept, "but it's a very vital piece, because you can't implement virtually any of this unless you have good real-time base data," Braun says.

That's what ISS and Econolite say Autoscope will provide when it goes on the market early next year. Autoscope uses advanced machine-vision pattern-recognition algorithms to detect vehicles in areas specified by the user through interactive graphics. It provides a wealth of traffic data: volume, occupancy, flow, headway, speed of individual vehicles, av-

erage speed, and classification of vehicles as automobiles, single-unit trucks, or tractor-trailers.

Michalopoulos and ISS are currently working to refine Autoscope's ability to recognize special traffic situations and to provide input for automatic incident detection. Software refinements are also underway to provide more information at controlled intersections, such as avoiding a signal change from green to yellow when a vehicle is in the "dilemma zone" in which the driver must decide to stop or go; this is a major cause of rear-end collisions.

Presently the goal for ISS and Econolite is to make sure the Autoscope systems have the reliability required of a commercial product. That productization already has created some economic impact in Minnesota: ISS has contracted with EI Microcircuits in Mankato to build the electronic boards and interfaces for Autoscope. And commuters to the Twin Cities should soon begin to enjoy the benefits of better traffic flow monitored by Autoscope. Although early testing was done with MnDOT on sections of I-35W, the first large-scale deployment of Autoscope will be along three miles of I-394 west of downtown Minneapolis. A total of 38 cameras will monitor that section of freeway, making it one of the world's largest field laboratories for testing new transportation technology.

The first large-scale deployment of Autoscope for intersection control will take place next year in Oakland County, Michigan, which will install Autoscope systems at 24 intersections to compare their traffic-signal switching performance with that of intersections controlled by embedded inductive loops. Improving intersection control is a major concern in many other countries as well, and ISS has submitted a proposal to the European Commerce Commission to produce uniform technology for all its member countries. The list of cities that have contacted Michalopoulos expressing the need for the technology includes just about every international giant: Athens, Barcelona, Hong Kong, Seoul, Sydney, Toronto and Taipei, from which he recently returned. Autoscope is especially attractive for these crowded urban areas because it can be installed without having to tear up streets or erect poles.

In the United States, there are positive signs that the Bush Administration and Congress are going to reverse the decade-long decline in federal funding for transportation planning and innovation. Legislation currently being proposed calls for \$50 million in federal funding for state transportation R&D projects. Of that total \$10 million is targeted for each of the two major projects involving Autoscope, the Oakland County, Michigan intersection project and MnDOT's GuideSTAR program. By 1995, MnDOT plans to have approximately 200 video cameras monitoring nearly 300 miles of freeways and major arterial roads, setting the stage for an IVHS system that, with other safety initiatives is expected to reduce Minnesota's traffic fatality rate by as much as 50 percent by the year 2000.

American Cancer Society

Institutional Research Grant

The American Cancer Society (ACS), through the University Dean's Committee for the ACS Institutional Research Grant, announces the availability of individual Institutional Research Grants. The stated goal of the American Cancer Society is to "foster meritorious research on cancer that cannot be supported through other available types of support." The purpose of the individual grants is to provide "seed" money to permit the initiation of promising new projects or novel ideas by junior faculty investigators.

The amount of individual awards is \$15,000 in direct costs. Eligible applicants must be faculty members at the level of Assistant Professor or Instructor and *must not* have received a prior ACS Institutional Research grant or have a current competitive national research grant.

Grants are available to anyone engaged in cancer-related research at the University of Minnesota who meets the above criteria. Cancer-related research *includes* analysis of developmental biology, gene regulation, or alteration of intracellular or extracellular processes which may lead to an improved understanding and/or therapy of potential or actual oncogenic events in prokaryotic or eukaryotic cells.

The application deadline is **October 1, 1991**. Instructions and application forms are available from the Pediatric Oncology Office, D-557 Mayo Building, 626-2778.

National Cancer Institute

Education Programs in Cancer Prevention and Control

The National Cancer Institute (NCI) invites grant applications to support educational programs aimed at developing investigators with new research skills focused on the design and implementation of cancer prevention and/or control intervention research.

A major goal of this RFA is to broaden the research infrastructure of cancer prevention and control by increasing the number of well-trained scientists in the field. A parallel goal is to develop a cadre of clinical oncologists proficient in the use of public health approaches and behavioral techniques for the development and/or implementation of interventions designed to prevent cancer and to increase the early detection and diagnosis of cancer. Lastly, an objective is to orient health professionals already schooled in areas of public health, the behavioral and social sciences, nursing, and biostatistics toward careers in cancer prevention and control research by providing them with basic knowledge in

cancer biology, prevention and control, and the skills necessary for intervention trials.

These cross-disciplinary educational programs are likely to involve active collaborations or special arrangements between institutions and/or departments such as those with Cancer Center Support Grants (P30), schools of public health, departments of community and preventive medicine, and other departments and institutions that have the necessary expertise and resources to fulfill the objectives of the RFA.

The award mechanism will be through the National Cancer Institute Cancer Education Program (R25). A non-binding, optional Letter of Intent may be submitted by September 15; the final proposal deadline is **November 13, 1991**. A complete copy of the RFA is available from ORTTA and

National Cancer Institute

Breast Cancer Diagnosis, Management, and Sequelae in Older Women

The National Cancer Institute (NCI), in conjunction with the National Center for Nursing Research (NCNR) and the National Institute on Aging (NIA), invite applications for research directed at breast cancer management in women ages 65 and over. Applications must address diagnostic evaluation, treatment, or follow-up of older patients with breast cancer. Major objectives are 1) to identify factors that impact on appropriate diagnosis and state-of-the-art cancer care for this age group; and 2) to develop and test interventions to enhance appropriate oncologic care.

Projects concerning breast cancer diagnosis must address patient attitudes towards symptoms, access to specialized oncologic care, or physician practices in diagnosis and/or staging elderly patients. Treatment projects must focus on physician attitudes and practices in recommending treatment, impact of comorbid medical problems on therapy, patient-physician interactions in decision-making, supportive care during cancer treatment, or early and late sequelae of disease and treatment. Screen/early detection projects in asymptomatic women and terminal care or hospice interventions for elderly women receiving only comfort measure are excluded.

The award mechanism is the grant-in-aid (R01). A letter of intent is requested by September 16; the application deadline is **November 27, 1991**. A full copy of the RFA is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

National Science Foundation

Mid-Career Fellowship Opportunities in Environmental Biology

This program provides opportunities for experienced doctoral-level scientists to pursue innovative and imaginative research ideas in environmental biology.

The program is directed specifically toward those researchers who wish to pursue independent research in a new environment, learn new techniques, or address a fresh problem. Research problems or approaches that depart significantly from the investigator's traditional field are particularly encouraged. The fellowships are appropriate for those who plan to work abroad or spend extensive periods of time in the field, or for those who are currently affiliated with a nonresearch academic institution.

Projects in the following unde areas are encouraged: microbial ecology and specifically rhizospheric community structure and function, plant adaptation to nutrient deficiencies, riverine ecology, molecular phylogenetics, evolutionary morphology, systematics or endangered tropical biotas, biosphere/atmosphere/geosphere interactions, and landscape ecology, especially that involving the linkage of geographic information systems and remote sensing technologies. Efforts to develop innovative conceptual linkages among currently disjunct subdisciplines are especially encouraged.

The program is open to U.S. citizens who have had the Ph.D. for at least 10 years prior to the deadline date. Change of institution is required. Affiliation can be established with any recognized nonprofit academic or research institution in the world.

The fellowship provides a stipend (up to \$47,500 per six months), a special allowance (\$1,000/month) a relocation allowance (\$3,000), and an institutional allowance (\$300/month). The fellowship duration will be for a minimum of six months and a maximum of 15 months; a maximum of 10 awards will be made.

The application deadline is November 1. ORTTA has written to the agency requesting guidelines/application materials. If you would like further information, call 624-9004 or send a note through the bulletin board and, if available, the material will be sent to you. You may also call NSF at 202/357-7332.

Postdoctoral Research Fellowships

The purpose of this program is the same as above, excepting, the following disciplines are appropriate: systematics; evolutionary biology at, or above, the organismal level; population biology and population genetics; physiological

ecology; community ecology; and ecosystem studies. In general, only projects focused on terrestrial, inland aquatic, and estuarine habitats or organisms are included.

These fellowships will be offered only to persons who: 1) are U.S. citizens at the time of application; 2) have had the doctoral degree conferred no earlier than 4 years prior to the application deadline or who will have earned this degree by the start date of the fellowship and no later than 1 year after the application deadline; and 3) have not previously been an investigator or co-investigator on an NSF conventional research or fellowship award.

Preference will be given to an applicant moving to a new institution or research environment with which s/he has not had prior affiliation, or with which s/he will have been affiliated for not more than three months prior to the start of fellowship tenure. Affiliation may be established with any recognized nonprofit academic or research institution in the world.

Each fellowship provides a stipend (\$2,200/month), a special allowance (\$500/month) and an institutional allowance (\$200 per month of tenure); awards will be made for either 12 or 24 months. A maximum of 20 awards will be made.

The application deadline is November 1, 1991. ORTTA has written to the agency requesting guidelines/application materials. If you would like further information, call 624-9004 or send a note through the bulletin board and, if available, the material will be sent to you. You may also call NSF at 202/357-7332.

USDA - Agricultural Research Service

The United States Department of Agriculture's Agricultural Research Service is seeking 100 research associates to assist in projects such as global change and genetic engineering at its nationwide network of laboratories.

Appointments will last up to two years and carry a base annual salary of \$31,116 to \$37,294. Applicants must hold doctoral degrees and have less than four years of postdoctoral experience.

Now in its 11th year, the research program teams veteran ARS researchers with young scientists. New projects include research on human fetal nutrition and gene transfers to produce disease-resistant animals and plants.

The application deadline is December 31, 1991. For more information, contact Nancy L. Bakes, Personnel Division (P), USDA-ARS, 6305 Ivy Lane, Room 139, Greenbelt, MD 20770; 301/344-2796.

National Science Foundation

Visiting Professorships for Women

NSF has announced the availability of 1992 awards for its ongoing program entitled Visiting Professorships for Women. The objectives of this program are 1) to provide opportunities for women to advance their careers in engineering and in the disciplines of science supported by NSF, and 2) to encourage female students to pursue careers in science and engineering by providing greater visibility for female scientists and engineers employed in industry, government, and academic institutions. The program enables a female scientist or engineer to undertake advanced research at a host institution—a university or four-year college that has the necessary facilities. She also undertakes lecturing, counseling, and other interactive activities.

An applicant must: 1) hold the doctorate in a field of research supported by NSF, 2) have independent research experience in an academic institution, industry, or the public sector, 3) be currently or recently affiliated with an institution of higher education, research institute, government or industry in the U.S., and 4) not have a salaried position, or the promise of one, with the proposed host institution, nor be receiving funds from a research grant distributed through that institution, at the time of application.

Funds may be requested for salary (based on the home institution salary), travel, relocation costs (up to \$3,000), and research support. The usual award will be for 12 months for a full- or part-time professorship. Awards for one academic semester will be considered, as will proposals for periods of up to 24 months.

The application deadline is **November 15, 1991**. ORTTA has written to the agency requesting guidelines/application materials. If you would like further information, call 624-9004 or send a note through the bulletin board, and, if available, the material will be sent to you. You may also call NSF at 202/357-7734, or write: Program Director, NSF Visiting Professorships for Women, Room 1225, National Science Foundation, 1800 G Street, Washington, DC 20550.

State of Minnesota

A System of Technology to Achieve Results

The State of Minnesota, Minnesota Governor's Advisory Council on Technology for People with Disabilities, is requesting proposals for the STAR Program (A System of Technology to Achieve Results). By 1995, using federal, state, and private resources, the STAR program intends to create a statewide, consumer responsive, comprehensive approach to provide technology-related devices and services for people of all ages with disabilities. Proposals are being accepted in two categories.

The purpose of Category 1 is to encourage the expansion of existing community-based technology-related assistance programs and the creation of new programs that will provide technology-related assistance to unserved/underserved people with disabilities throughout the state. Examples of such programs are: 1) Computer Resource Centers; 2) Assistive Device Loan Programs; 3) Used Equipment Referral Services; 4) Recreational Programs that Utilize Adaptive Equipment; 5) Device Demonstration Sites; 6) Device Training programs.

The purpose of Category 2 is to expand the delivery of assistive technology devices and services to unserved or underserved populations in all geographic areas of the state. Successful applications will identify a problem, include a definition of why a population is unserved or underserved, and how the proposed project will meet the needs identified. The Grantee must demonstrate the ability to serve a minimum of 200 individuals per year in integrated community-based settings including, but not limited to, centers for independent living, senior citizen centers, and schools.

Each grant is anticipated to average \$5,000 to \$25,000, with funding from January 1, 1992 through December 1, 1992. A workshop is planned for Thursday, September 19, 1991 to answer questions about the program.

The application deadline is **October 11, 1991**. The contact person at the State is Susan Rest, STAR Program, 300 Centennial Building, 658 Cedar Street, St. Paul, MN 55155; 612/296-2771.

The Newberry Library

Fellowships offered for work at The Newberry Library provide support for scholars working in the field of American Indian history, including the history of Indian-White relations, Indian languages, treaties, and tribal history. The Library seeks to support both Indians and non-Indians on the belief that both will profit from the systematic study of their mutual past.

Indian-White relations has received much emphasis in the literature, but new techniques and attitudes require re-examination of these relationships. There are far too few individuals, Indian or White, who are prepared for research and writing in the field of Indian History or for teaching this subject on a graduate, undergraduate, or secondary level.

The Library seeks to foster systematic thought and effort in the preparation of adequate study materials and guides for teaching at all three levels, and to apprise Indian tribes and organizations of Newberry resources pertinent to local, regional and national Indian affairs. The Library also conducts graduate and postdoctoral seminars in American Indian history, and an annual conference on Indian affairs.

Rockefeller Foundation Postdoctoral Fellowships

These fellowships range in amount from \$22,000 to \$30,000 per year and are open to scholars in any discipline working on topics in or that draw substantially on Indian history. Junior Fellowships of 11 months in duration are intended for scholars in Indian history who are at the early stages of their careers; Senior Fellowships for up to 11 months in duration are available for established scholars wishing to develop a new competence in Indian history or who are already working on a topic in Indian history. The application deadline is **February 1**.

D'Arcy McNickle Memorial Fellowships

These fellowships are intended for tribal Indians working on some aspect of Indian history. The program is flexible and seeks to accommodate Indian students at any stage of graduate study, adults who can spare only a short period from community commitments, tribal historians and librarians and archivists of tribal cultural centers. Length of tenure and stipends vary and include round-trip travel to the Library. The application deadlines are **February 1** and **August 1** annually.

Frances C. Allen Fellowships

These fellowships are offered to women of Indian heritage pursuing academic programs beyond the undergraduate

level. Awards are based on duration of the visit, but will cover living and travel expenses of each visit. Length of tenure and stipends vary and include round-trip travel to the Library. Application deadlines are **February 1** and **August 1** annually.

For further information contact: Ruth Hamilton, Assistant Director, Research and Education, Newberry Library, 60 West Walton Street, Chicago, Illinois 60610; 312/943-9090 x267.

Cooperative Institute for Research in Environmental Sciences

The Cooperative Institute for Research in Environmental Sciences (CIRES) sponsors Visiting Fellowships in Environmental Sciences that allow scientists of any nationality to pursue their own research programs and participate in research seminars at the Institute. Candidates may be of any level of their careers, recent recipients of the Ph.D. through senior scientists, including faculty on sabbatical.

CIRES conducts multidisciplinary studies in atmospheric chemistry, atmospheric and climate dynamics, environmental chemistry and biology, remote sensing, global change, environmental measurements and instrumentation, and enhancements of air and water quality. This includes theoretical studies, laboratory experimentation, and field investigations.

The results of research should bear on such practical societal problems as acid precipitation, destruction of the earth's ozone shield by pollutants, deterioration of air and water quality, prediction of weather and climate fluctuations, and frost protection.

Awards average \$26,500 for 12 months, and are based on the fellow's research experience. 1-year appointments may begin at any time of the year and are renewable for an additional year in special cases. Contact with scientists at the Institute is suggested prior to submitting applications. The application deadline is **February 15, 1992**, with *those received by December 1 receiving first consideration*. Write: Dr. Robert Sievers, Director, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Campus Box 216, Boulder, Colorado 80309-0216; 303/492-1143 or 8020.

Faculty Research Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please call Mike Moore at 624-9398.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
July, 1991	214	\$ 50,559,821
Awards Received		
July, 1991	212	12,851,905
Proposals Submitted		
July, 1990	236	34,672,736
Awards Received		
July, 1990	301	23,189,550

Host Regulation of IGE Synthesis in Murine Hybridomas

Ambika Mathur, Oral Sciences
 NIH, NIAID
 \$504,000 - 08/91-07/96

Agricultural Products Research Program

C. Eugene Allen, Animal Science
 USDA
 \$474,000 - 06/91-05/93

Hearing Aid VLSI Design

Gerald Sobelman, Electrical Engineering
 House Ear Institute
 \$414,321 - 05/91-04/94

Demonstration Cancer Control Projects for Farmers

Jack S. Mandel, School of Public Health
 Center for Disease Control
 \$370,819 - 06/91-05/92

CompMech Stream System Project

Ira R. Adelman, Fisheries and Wildlife
 Raymond M. Newman, Fisheries and Wildlife
 Anne R.D. Kapuscinski, Fisheries and Wildlife
 Electric Power Research Institute
 \$307,000 - 04/91-03/95

Rectal Administration of Diazepam for Acute Repetitive Seizures

James C. Cloyd, Neurology
 NIH, NINDS
 \$252,662 - 05/91-01/93

Minnesota Dental Research Center for Biomaterials and Biomechanics Membership Fund

William H. Douglas, Oral Sciences
 3M
 \$250,000 - 01/91-12/95

Remacemide Inpatient Seizure Evaluation Trial

Ilo E. Leppik, Neurology
 Robert J. Gumnit, University Hospital and Clinic
 NIH, NINDS
 \$203,106 - 04/91-07/92

Timber Prices, Timber Values and Public Forest Investment in Minnesota

Marc E. McDill, Forest Resources
 Howard Hoganson, Forest Resources
 Melvin J. Baughman, Forest Resources
 Blandin Foundation
 \$193,000 - 07/91-06/93

Minnesota Dental Research Center for Biomaterials and Biomechanics

William H. Douglas, Oral Sciences
 3M
 \$179,952 - 01/91-12/91

Application of Vector Processor Supercomputers to PowerSystem Analysis

Bruce F. Wollenberg, Electrical Engineering
 Electric Power Research Institute
 \$150,000 - 04/91-02/93

Prevention of Fowl Typhoid With Salmonella Gallinarum Outer Membrane Proteins

Delane E. Welsch, College of Agriculture
 Agency for International Development
 \$147,011 - 06/91-06/95

Instrumentation and Materials Evaluation for MN/ROAD

David E. Newcomb, Civil and Mineral Engineering
 Andrew Drescher, Civil and Mineral Engineering
 John L. Nieber, Agricultural Engineering
 USDOD - Army
 \$125,000 - 08/91-01/93

Climate History from the Paleosalinity of Lakes in the North

Daniel R. Engstrom, Geology and Geophysics
 Sherilyn C. Fritz, Geology and Geophysics
 NSF
 \$125,000 - 03/91-02/92

Grants for Two Year Programs of Schools of Medicine/Osteopathy

James G. Boulger, School of Medicine, UMD
 DHHS
 \$116,042 - 07/91-06/92

Lyme Disease Spirochetes in Tick Organ and Cell Culture

Timothy J. Kurti, Entomology
 Ulrike G. Munderloh, Entomology
 NIH, NIAMS
 \$111,520 - 07/91-06/92

Dissemination and Follow-Up Proposal for the Global Environmental Challenge—Poland

Zbigniew Bochniarz, HHH Institute
 Ford Foundation
 \$110,000 - 04/91-03/93

Acquisition of an Inductively Coupled Plasma Mass Spectrometer

William E. Seyfried, Geology and Geophysics
 NSF
 \$110,000 - 05/91-11/93

Agricultural Commodity Utilization Research Projects

Mrinal Bhattacharya, Agricultural Engineering
 USDA
 \$100,000 - 03/91-02/93

Aerodynamics of Microbursts

Thomas S. Lundgren, Aerospace Engineering and Mechanics
 NASA
 \$17,915 - 06/91-06/92

Pressure Swing Adsorption in Hollow Fibers

Edward L. Cussler, Jr., Chemical Engineering & Materials Science
 American Chemical Society-Petroleum Research Fund
 \$40,000 - 05/91-08/93

Theory of the Structural Properties of Semiconductor Clusters, Liquids and Disordered Solids

James R. Chelikowski, Chemical Engineering and Materials Science
American Chemical Society-Petroleum Research Fund
\$40,000 - 09/91-08/93

Theory of Polymer-Metal Interfaces

Jose L. Martins, Chemical Engineering and Materials Science
H. Ted Davis, Chemical Engineering and Materials Science
American Chemical Society-Petroleum Research Fund
\$40,000 - 05/91-08/93

Elastic Modulus Backcalculation Shortcourse

David E. Newcomb, Civil and Mineral Engineering
St of MN: Department of Transportation
\$7,200 - 07/91-07/91

Tire Comminution Machine for Surface Modified Rubber

Steven L. Crouch, Civil and Mineral Engineering
Malcolm Hepworth, Civil and Mineral Engineering
Wilhelm Reindl, Civil and Mineral Engineering
St of MN: Pollution Control Agency
\$30,000 - 06/91-06/92

Analysis and Modeling of Metro Activated Sludge Process Data

Water J. Maier, Civil and Mineral Engineering
Metropolitan Waste Control Commission
\$9,100 - 05/91-12/91

Active Integrated Optical Circuits

Anand Gopinath, Electrical Engineering
NSF
\$47,648 - 04/91-09/92

Digital Signal Processing

Kevin M. Buckley, Electrical Engineering
3M
\$15,000 - 06/91-05/92

Magnetic Measurements of Single Crystal Titanomagnetites

Bruce M. Moskowitz, Geology and Geophysics
Barbara J. Wanamaker, Geology and Geophysics
NSF
\$77,828 - 06/91-11/93

Engineering REU Site: Undergraduate Research in Mechanical Engineering

David B. Kittelson, Mechanical Engineering
NSF
\$61,418 - 06/91-11/92

Evaluation of Alternative Fuel Options for Transit Vehicles

David L. Hofeldt, Mechanical Engineering
Regional Transit Board
\$16,975 - 03/91-03/92

Knowledge Bases for Continual Process Improvement

Kevin John Dooley, Mechanical Engineering
John C. Anderson, Mechanical Engineering
3M
\$60,000 - 06/91-05/92

Real-Time Tool Condition Monitoring in Turning Center with Intelligent Inserts

Subbiah Ramalingam, Mechanical Engineering
Fastman, Inc.
\$90,000 - 06/91-09/92

Development of Energy-Efficient Fertilizer Recommendations for Canola

Daniel H. Putnam, Horticultural Science
Michael A. Schmitt, Horticultural Science
Greater Minnesota Corporation
\$40,000 - 05/91-12/92

Monolithic Integration of Semiconductor and Superconductor Components

Allen M. Goldman, Physics and Astronomy
Honeywell, Inc.
\$30,936 - 06/91-05/92

Scientific and Engineering Support for the Ulysses/STO Instrument

Paul J. Kellogg, Physics and Astronomy
NASA
\$69,000 - 06/91-09/95

Development of Soil Thermal Property Database

Raymond L. Sterling, Underground Space Center
American Society of Heating Refrigeration & Air Conditioning
\$70,000 - 04/91-03/92

Institutional Innovations for Sustainable Agricultural Development

Vernon W. Ruttan, Agricultural and Applied Economics
Rockefeller Foundation
\$97,600 - 07/91-06/92

Revitalization of Rural Forested Areas: Assessment of Government Infrastructures

Paul V. Ellefson, Forest Resources
USDA
\$10,000 - 05/91-06/92

Native American Child Welfare Services Contract

Nancy Johnston, Social Work
St of MN: Department of Human Services
\$16,600 - 06/91-06/92

Genetically Engineered Therapeutic Antibodies

Christopher A. Pennell, Laboratory Medicine and pathology
Minnesota Medical Foundation
\$20,000 - 07/91-06/92

Fluconazole v. Miconazole: Treatment of Candidal Vaginitis

Doris Brooker, Laboratory Medicine and Pathology
Pfizer Pharmaceutical Company
\$11,281 - 05/91-11/91

Port of Houston Applicators/Grainworkers

Vincent F. Garry, Laboratory Medicine and Pathology
University of Texas
\$29,000 - 05/91-08/91

Role of CD28 in Co-stimulation Required for T Cell Activation

Julia G. Johnson, Microbiology
Arthritis Foundation
\$18,500 - 07/91-06/92

Role of CD28 in T Cell Activation

Marc K. Jenkins, Microbiology
Cytomed, Inc
\$35,000 - 04/91-04/92

Support of Liver Failure with Cultured Hepatocytes in a Three-Compartment Hollow Fiber Bioreactor

Scott L. Nyberg, Surgery
Frank B. Cerra, Surgery
Society of University Surgeons
\$25,000 - 07/91-06/92

The Development of Ethnic Specific Schools

John J. Cogan, Curriculum and Instruction
Otto Bremer Foundation
\$20,000 - 07/91-06/92

Origin & History of Glacial Deposits in West-Central MN

James F.P. Cotter, Science and Mathematics, UMM
NSF
\$40,000 - 06/91-11/92

The Sponsored Project Information Network (SPIN) is a computerized locator system of funding opportunities (federal, nonfederal, and corporate) for faculty and institutional research, development, and education program support. It is available to University faculty and staff through ORTTA.

Based on a description of your research areas and/or the type of support sought, ORTTA staff will search the SPIN Keyword Index to identify sources within specific areas of interest. The Keyword Index, a taxonomy developed by SPIN to catalog funding sources, is divided into the following ten major classifications:

- **Agriculture/Food/Forestry**
- **Arts/Culture/Humanities/Communications**
- **Business/Economics/Management**
- **Education**
- **Health/Medical Sciences**
- **International Affairs/Area Studies**
- **Miscellaneous/Other**
- **Science/Technology**
- **Social/Behavioral Sciences**
- **Social Welfare/Public Affairs**

The result of a search is a set of profiles of applicable funding sources that provides: 1) the sponsor's name; 2) the sponsor's contact address and telephone number; 3) deadline dates; 4) program titles; 5) objectives or interest areas of the sponsor; and 6) restrictions that would affect the submission of a proposal. This set of profiles is sent to the requestor.

SPIN searches are done free of charge to the requestor. A survey of users of SPIN indicates that the information received from a SPIN search was targeted to their request and a reasonable response time was effected.

**For further information regarding the SPIN system or to request a search, please contact ORTTA at
624-9004**

SPIN searches are also available through the Research and Development Office in the College of Liberal Arts; the Agricultural Experiment Station; the Research Support Office at Duluth; and the Grants Development Office at Morris.

Effective September, 1990 the SPIN indexes became available for on-line review through ORTTA's Electronic Bulletin Board (See the September, 1990 *Research Review* for information on Bulletin Board contents and access instructions.) The Bulletin Board contains a section devoted to SPIN and offers users the opportunity to review the Keyword Index alphabetically or within the topics shown above.

Since the Bulletin Board is accessible anytime, faculty and staff can browse the indexes at their convenience and find *keyword codes* of interest to them. From within the Bulletin Board they can then forward a note to the Bulletin Board Editor requesting a SPIN search based on the chosen keyword codes (Limit, 20 keywords).

Office of Research and Technology Transfer Administration

Fax Number (612) 624-4843

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Research Review Mailing List Information

Faculty:

- The *Research Review* is automatically mailed to all faculty on the Faculty Mail List holding the rank of Assistant Professor and above.
- To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS).
- Please check with your departmental office or AIS (624-9000) if you need assistance.

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- ORTTA maintains a supplemental mail list for:
 - a) academic staff not included in the above faculty list;
 - b) staff; and
 - c) off-campus
- Additions/changes/deletions to this supplemental list may be initiated by filling out and sending ORTTA the following:

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RESEARCH REVIEW

Research and Technology Transfer Administration

October, 1991

Ready ... Set ... Run With CUFS!

With the November 1 implementation of the College and University Financial System (CUFS) fast approaching, following is information concerning a number of grant-related CUFS issues.

- All documents requiring ORTTA approval (except type 38 journal vouchers) *must* be received in ORTTA by *noon on October 23* to allow sufficient time for ORTTA review, approval and transmission to Financial Operations prior to the October 24 cutoff date. Please read the instructions from Financial Operations concerning October processing carefully.

All type 38 journal vouchers must be received in ORTTA by *noon on October 21*. Type 38s not accompanied by effort cards, and for which ORTTA does not already have cards on file, will not be processed.

All documents received after these dates will be returned to the originating department, will have to be redone on CUFS forms, and will be considered November business.

- Please note that the second page of ORTTA's Notice of Grant Award has been updated to reflect a few changes in the object codes. ORTTA encourages the attachment of a separate budget page with proposal submission (page will not be submitted to the agency) that is "CUFS friendly" in order to expedite the budget set-up process in CUFS if the proposal is awarded.
- ORTTA has used the CUFS system for set-up of funds since July 1 and recommends that departments review the account numbers given to internal service organizations (ISOs), such as Research Animal Resources, since the budget numbers used previously may have to be changed. For example, RAR funds were set up under the 02 budget but are now set up under the 32 budget to prepare for CUFS implementation. Review and notification to the ISO of proper budget numbers will eliminate

deficit budgets from occurring, which would require later adjustments under CUFS.

- The information currently required on ORTTA documents such as dates of service, benefit to project, and reason for cost transfer *are still required in CUFS*. If the form does not have a place designated for such information, the DTEX form must be used and should be stapled to the document. The routing process for documents will remain unchanged in CUFS. All documents affecting ORTTA accounts should be transmitted to ORTTA.
- Documents with ORTTA account numbers mapped to CUFS numbers were distributed in September for all accounts on the books as of July 31, 1991. The CUFS

CUFS, Continued on Page 11

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National Science Foundation

Mailing Address for Submitting Proposals

In an effort to improve the handling of proposals at NSF, the proposal processing unit has requested that the publication number, announcement number, or solicitation number be included in the mailing address. For example:

Proposal Processing Unit - Room 223
NSF 91-xxx (proposal, solicitation, or announcement number)
National Science Foundation
Washington, DC 20550

This information is already required at the top of the NSF application form. Although it is ORTTA's responsibility to mail proposals, please keep this requirement in mind.

Correction

The final sentence was inadvertently truncated in last month's article entitled "U of M Technology Transfer: New Strategy Calls for Fewer Filings, Earlier Licensing" (*Research Review*, September 1991, page 7). The complete final paragraph should have read as follows:

We feel that we are about three years away from a situation in which the University's share of royalties will fully support or exceed the expenses of the technology transfer program. Until that time, we must reduce our costs while stepping up our efforts to form partnerships with companies committed to commercializing the fruits of our researchers' ingenuity.

RESEARCH REVIEW

Volume XXI/Number 4

October, 1991

Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1160 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/91-6/30/94 rates should be used. **The rate agreement is dated July 1, 1991.** This date should be used where required on proposal applications. Please call Marilyn Surbey at 624-4850 with questions on Indirect Costs.

	07/01/91	06/30/94
Research		
On-Campus		40.0
Off-Campus *		21.0
SAFHL		60.0
Hormel		53.0
Other Sponsored Activity		
On-Campus		20.0
Off-Campus *		10.0
Instruction		
On-Campus		52.0
Off-Campus		16.0

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

As of September 23, the *Research Review* publication date, new fringe benefit rates had not yet been released, but were expected momentarily.

Please check ORTTA's bulletin board for the correct rates; the new rates will be published in next month's *Research Review*.

Extension Granted for Graduate Assistants' Fringe Rates

On September 13 ORTTA was notified by the Department of Health and Human Services that the University will be granted an extension until June 30, 1993, on its practice of charging fringe benefits for graduate students working as research assistants. This will postpone a tripling of the rate for graduate assistants and a slight reduction in the rate for academic personnel (see rates published in Research Review, September 1991, page 2), which would have resulted from a ruling by the DHHS auditor reviewing the University's indirect cost recovery procedure.

Here is some background on this issue, provided in a memo to deans, directors, and department heads from E.F. Infante, senior vice president for academic affairs and provost; and Robert T. Holt, then dean of the graduate school:

"In 1983 the Task Force on Graduate Education and Research recommended that the University cover the tuition costs for graduate assistants. In 1985 the Legislature made an appropriation to cover the costs of the program for assistants on State funds. The money for tuition costs for graduate assistants on grants and contracts would be covered by the appropriate grant or contract. Exactly how to make this charge was problematic. The obvious way—to make the tuition payment a fellowship—was not acceptable to the Federal government. After much thought and analysis it was decided to make the tuition payment a formal fringe benefit. At the same time we converted the Regents' Scholarship Program for civil servants into a fringe benefit and created a similar benefit for all academic personnel. As there was now a single fringe benefit for all employees we averaged the cost of the program over all academic employees, as we did for all civil servants. In the mid-1980s four other universities—MIT, Columbia, Stanford, and CalTech—adopted essentially the same approach.

"The policy of paying tuition for graduate assistants had a most positive effect on graduate education and research at the University. Both the number and the quality of graduate assistants went up significantly and the University became more competitive in our recruitment. Coincidentally, our total income from sponsored research began increasing more rapidly.

"The Federal auditors from the Department of Health and Human Services, however, were never comfortable with our way of charging the fringe benefit (the above mentioned other institutions being audited by the Office of Naval Research). And when other universities such as the University of Chicago, which has the same auditors as we have, proposed a plan much like ours they refused to permit its implementation."

This spring the DHHS auditor working with the University ruled that we must change our way of charging tuition by having a benefit rate for each class of employee that reflects

the actual cost of the tuition fringe benefit for that class. Marilyn Surbey, ORTTA assistant director for financial reporting, and Tony Potami, associate vice president for research and technology transfer, protested this ruling, citing the existing practice's benefit to graduate training and research, and the harm that will be done to the University's federally sponsored research programs and their ability to employ graduate assistants. In response to extensive negotiations with DHHS by Potami, federal officials granted the extension of the current practice through FY 1992 and 1993.

Please watch the ORTTA electronic bulletin board and future issues of Research Review for fringe rates to use in budgeting multi-year grant proposals. These rates are now being calculated. Also, feel free to consult the appropriate ORTTA grant administrator regarding budgeting for fringe rates on external support proposals.

NASA Says Life Sciences Opportunities Will Grow

Members of the scientific community will have more opportunities to become grantees or participants in life sciences programs at the National Aeronautics and Space Administration (NASA), a spokesperson from NASA's Life Sciences Division told Washington Fax news service.

Although there is still a delay in gaining access to space flights for life sciences experiments, NASA has set a goal of being able to assure that a doctoral candidate could formulate a space life sciences experiment and get the information back in sufficient time to write a thesis. NASA facilities such as the proposed space station would serve the NIH researcher as a type of national laboratory where the flight would be built into grant applications, the spokesperson said.

NASA has improved its peer review process and support for life sciences research partly in response to a 1988 report, "Exploring the Living Universe: A Strategy for Space Life Sciences." Prepared by a committee chaired by Frederick Robbins and including Bernadine Healy, now director of NIH, the report criticized the general weakness of NASA's biomedical research program, which was supported at that time by \$70 million out of a \$10 billion total budget. The current life sciences budget is about \$126 million. For fiscal year 1992, President Bush requested \$163 million, and the Senate appropriated \$138 million.

The average size of a Life Sciences extramural grant is \$70,000 to \$90,000 per year, the spokesperson said. He encouraged biomedical researchers to become familiar with the program by writing to: Life Sciences Division, NASA Headquarters, Washington, DC 20546. Researchers should be specific about their fields of interest so inquiries can be directed to the right department.

Guidelines for Research Investigators and Creative Artists

These guidelines are a companion document for the January, 1989 document entitled "University of Minnesota Policies and Procedures for dealing with Fraud in Research," a revision of which will be voted on by the Board of Regents at their October Meeting.

Introduction

Science, scholarly inquiry, and artistic creation are traditionally conducted in an atmosphere free from interference as a part of the natural course of academic freedom. While benefiting from the contributions of other scientists, scholars, and artists, a key major objective of research and artistic creativity is to develop new information. Society benefits from these activities while expecting that the ethical standards guiding all faculty and students will fulfill the highest standards of individual conduct. The University of Minnesota endorses these principles and expects all faculty and students to conduct their activities in accordance with this commitment.

Each professional field defines the standards of conduct of its members by traditions which have been established and accepted through the practice of their work. It would be difficult to codify effectively uniform standards which apply to all professions. However, society expects to be assured that faculty, entrusted with the rights and privileges of their professions, will reinforce through practice and education the standards which assure the highest quality of the products of their research and scholarship. Therefore, it is vital that faculty and students actively reflect upon the ethical bases which guide their judgments in order to warrant the public trust.

To merit public trust and avoid misconduct, including fraud and plagiarism which compromise the research and scholarly objectives of the investigator and the university, it is necessary to review obligations of supervision, peer review and individual responsibility. Each faculty member and each academic unit is responsible for maintaining awareness and compliance with the standards of their professions.

Prevention of misconduct in research and scholarship is dependent upon careful fulfillment of responsibilities for supervision and peer review, for data gathering and retention, and for authorship.

Principles of Supervision

Careful supervision of new investigators by their preceptors is in the best interest of the institution, the preceptor, the scholar, and the scientific community. The complexity of scientific methods, the necessity for caution in interpreting possibly ambiguous data, and the need for advanced statistical analysis, all require an active role of the preceptor in the guidance of new investigators. In humanistic and artistic

units of supervision, there is growing recognition of the advantages of mentoring at all levels of faculty and student interactions. There are personal and shared responsibilities for assuring that the supervision will be effective and complete.

Recommendations:

1. The provision of supervision should be established and apparent in each research and academic unit. Responsibility for supervision should be clear to both faculty and students.
2. The ratio of trainees to preceptors should be small enough that close interaction is possible for scientific interchange as well as oversight of the research at all stages. The burden of such interactions should also be assessed to allow genuine and continuous use of mentors. The privileges of responsibility for supervision should not exceed the ability to fulfill that role.
3. The primary investigator should supervise the design of experiments and the processes of acquiring, recording, examining, interpreting and storing data. In all academic units, senior faculty should be available to offer aid in conducting scholarly or artistic work, and should include regularly scheduled meetings with faculty and students whom they supervise. Such aid should be collegial and advisory and avoid the attributes of excessive direction or control.
4. Regular and recurring collegial discussions among all preceptors and trainees constituting a research or other academic unit is desirable, both to contribute to the scientific and scholarly efforts of the members of the group and to provide informal peer review of projects.
5. The chair, preceptor, or mentor (as indicated by unit policy) should provide each new investigator, whether student, postdoctoral fellow, or junior faculty, with applicable governmental and institutional requirements for conduct or studies involving healthy volunteers or patients, animals, radioactive or other hazardous substances, and recombinant DNA.
6. Senior investigators, whether teachers dealing with graduate students or colleagues dealing with junior members, have an obligation to make the research experience a learning experience. The training and apprenticeship should include appreciation of proper research protocol and ethical consideration of subjects or those affected by it.

Data Gathering, Storage, Retention

The retention of accurately recorded and retrievable results is of utmost importance for the progress of scientific in-

quiry. A scientist must have access to his/her original results in order to respond to questions including, but not limited to, those that may arise without any implication of impropriety. Moreover, errors may be mistaken for misconduct when the primary experimental results are unavailable. In addition, when statistical analysis is required in the interpretation of data, it should be used in the design of studies as well as in the evaluation of results. All research records are the property of the University of Minnesota and must be retained in accordance with Public Health Service (PHS) rules which require that complete and original records be maintained by the University for a minimum of three years after completion of the funding of the project under the guidelines of PHS. These guidelines will also apply to all other research records at the University of Minnesota.

Recommendations

A. Laboratory Experimental Data Recommended Procedures

1. Custody of all original primary laboratory data should be retained by the unit in which they are generated. An investigator may make copies of the primary data for his/her own use.
2. Original experimental results should be recorded, preferably in bound books with numbered pages. An index should be maintained to facilitate access to data.
3. Computer output should be affixed to or referenced from the laboratory notebook.
4. Primary data should remain in the laboratory at all times and should be preserved as long as there is any reasonable need to refer to them. The chief of each research unit must decide whether to preserve such primary data for a given number of years or for the life of the unit. In no instance, however, should primary data be destroyed while investigators, colleagues, or readers of published results may raise questions answerable only by reference to such data.

B. Other Units

Teaching-research or teaching-creative units should also consider periodically the appropriateness of archiving and/or maintaining data and possible reconstruction of the history of a project or artistic creation. Where there are known disciplinary practices or codes establishing norms for maintenance of records, probationers should be informed of their existence and units should periodically review how they have been followed. (The time of outside review of the unit might be an appropriate point to assess this.)

Authorship

Multi-authored or collaborative studies may lead to the publication of papers for which no single author is prepared to take full responsibility. Two critical safeguards in the publication of accurate, scientific reports are the active participation of each co-author in verifying that part of a manuscript that falls within his/her specialty area, and the designation of one author who is responsible for the validity of the entire manuscript.

Recommendations:

1. Criteria for authorship of a manuscript should be determined by each unit or group of investigators. Each co-author should have made a significant intellectual or practical contribution to the work. The concept of "honorary authorship" is deplorable. Senior faculty who demand *ex officio* authorship violate academic freedom as well as principles of justice. Omission of a contributor is clearly an improper appropriation of intellectual property.
2. The first author should review all the primary data on which the report is based, and be prepared to provide a brief description of the role of each co-author. (In multi-institutional collaborations, the senior investigator in each institution should be prepared to provide such descriptions.)
3. Each co-author should review and approve the manuscript to the extent possible, given individual expertise. The senior author should assume responsibility for resolving issues that arise during such reviews.
4. Where disciplines have rules and procedures for determining authorship, those shall be called to the attention of all faculty and students.
5. Investigators should review each proposed manuscript with these principles in mind. Publication practices to be avoided include: the rapid publication of data without adequate tests of reproducibility or assessment of significance, the publication of fragments of a study, and the submission of multiple similar abstracts of manuscripts differing only slightly in content.

Faculty Research Information as Public Data

University of Minnesota researchers and the Office of Research and Technology Transfer routinely receive requests for research information by parties citing either the federal Freedom of Information Act or the state Minnesota Data Practices Act. It is important that before releasing information to any person or group, the releaser make sure that he/she is authorized to release the information, and that any nonpublic documents, such as data pertaining to research in progress, private information on research subjects, and proprietary information on new technologies, be deleted or withheld.

The following sections describe University procedures for the two general types of research information requests: data or documents held in ORTTA's proposal and award files, and data or documents gathered or created during a research project.

ORTTA Data Release Procedures

The Office of Research and Technology Transfer routinely receives requests for information about faculty research projects. These requests come from both within the University and from outside parties. In general, requests fall into three categories: 1) data on levels of external funding for research, training, and public service projects at the University or within a specific college or department; 2) blanket requests for information about research projects funded by specific agencies, companies, foundations, or all of the preceding; and 3) requests for specific research files or groups of files, typically made under the Minnesota Data Practices Act, or, if the information is in the hands of a federal agency, the Freedom of Information Act.

ORTTA's Communications Policy calls for the release of data and information to enhance the University's research and technology transfer programs, and to increase public awareness of the extent and importance of these programs. These objectives are carried out through the publication of the *Research Review* and *R&D Outreach* newsletters, the Levels and Trends in Sponsored Programs annual report, the ORTTA Electronic Bulletin Board, and presentations to various private, public, and governmental groups.

When the above publications do not respond sufficiently to requests for information, ORTTA's Division of Information Services can prepare computer reports with basic information on the approximately 4,000 currently active research projects. The University is legally required to acknowledge the existence of all externally supported research. In response to specific requests for information, ORTTA routinely provides the following:

- titles
- sponsors
- amounts
- dates
- principal investigator names
- departments

Because of the proprietary nature of research proposals submitted to external sponsors, as well as the increasingly competitive and fast-paced nature of research funding, ORTTA takes, and encourages faculty to take, a narrow view of what information must be released from proposal files. Proposals, either prior to being funded or if funding has been refused, are *NOT* subject to either the Minnesota Data Practices Act or the Freedom of Information Act, and they will not be released. However, funded proposals are considered public documents, and when a federal agency or ORTTA receives a request for a copy of a funded proposal, this procedure is followed:

- The request must be made in writing;
- The principal investigator is notified that the request has been made;
- The principal investigator is given the opportunity to review the file and delete such portions that can be protected under the law, such as personal information and proprietary or trade secret information.

The statutes under which information can be requested have a very short time frame—10 days under the Freedom of Information Act—within which to respond to the request. Therefore, if any faculty member becomes aware of a request for his/her research information, s/he should *immediately* contact either Winifred Schumi (624-5750) or John Thuente (624-2816) at ORTTA to assist in preparing an appropriate response.

A Special Note on Potentially Patentable Information

Recent court decisions have found that inclusion of potentially patentable information in a proposal constitutes a publication of that information at the time the proposal was submitted, unless that information is protected by a notice of confidentiality on the cover page and on relevant pages of the proposal. Therefore, the Office of Patents and Licensing strongly suggests that if proprietary or confidential information is made part of a proposal, it be so marked at the time of submission to ORTTA for forwarding to a funding agency. Failure to do so could result in the invalidation of any subsequent patents arising out of the sponsored research. The notice on the adjacent page is suggested:

CONFIDENTIAL

This document, or portions of it, contains confidential information that is or may become the subject of a United States patent application and that is important to future commercial efforts based on such confidential information. Accordingly, this document and the confidential information is exempt from disclosure under the Freedom of Information Act, Sections 552(b)(3) and (b)(4) of Title 5 of the United States Code and corresponding regulations of United States Government agencies.

Suggestions for Faculty Who Receive Requests for Release of Research Data

Faculty members receive frequent requests for published research, and the University encourages the exchange of this information in the interest of academic freedom. For this reason, the University accepts no funding for research from any organization that prohibits or seeks to control the publication of results of the research. Faculty members are therefore free to make public or otherwise disseminate any portion of their own research that they so choose, except where such disclosure would constitute an invasion of personal privacy (i.e., identification of human subjects without their permission or release of personnel or medical records).

Occasionally however, faculty may receive requests for *all* data gathered while conducting a research project that is still in progress, or contained in a proposal submitted for funding. These requests violate academic standards necessary for the appropriate conduct and reporting of research, and as such should be denied. The University Attorney and ORTTA will support faculty who decline to release information or data from a non-funded research proposal or from any ongoing research project. Following the completion of projects, it also is necessary to remove any personal or proprietary information or documents from files being released as public data.

ORTTA suggests that the following procedure be followed when releasing data:

- The request must be made in writing and must be specific enough to adequately define the documents being requested.
- Data should be released only by the principal investigator, or with the full awareness and consent of the principal investigator.
- Before release, all personal and proprietary information must be deleted or withheld. This includes data specific-

ally exempted from disclosure by statute, such as information contained in a patent application, and data comprising trade secrets and commercial or financial information that is privileged or confidential.

- Provisions should be made with the requestor for a reasonable timetable for release of information to allow for review and copying of documents, as well as for reimbursement for copying charges at commercial rates.
- Faculty approached by a representative of the media are encouraged to contact University Relations for advice and assistance.
- Faculty who become aware of a request for research information are encouraged to contact either Winifred Schumi, ORTTA assistant director for information services (624-5750), or John Thuente, ORTTA director of patents and licensing, for assistance in preparing a timely and appropriate response.

Academic Computer Programs Honored

EDUCOM, a consortium of 629 colleges and universities and 110 corporations, has held a competition since 1987 to encourage faculty members to develop educational software.

This year, the fifth annual EDUCOM Higher Education Software Awards competition was open to programs in engineering, the humanities, law, and mathematics. One of the 10 programs honored—"Park's Evidence Exercises"—was created by Roger Park of the University of Minnesota Law School. The software combines traditional tutorials on rules of evidence with comprehensive simulations showing how the rules can play out in actual cases. The awards judges cited the program for its scope and detail, as well as for the combination of tutorial and simulation strategies.

The 1992 competition will be for programs in the natural and social sciences and accounting. For more information, contact Gail D. Miller, Computer Science Center, Room 3355, University of Maryland, College Park, MD 20742; 301/405-7534; gmiller@cristal.umd.edu.

Biomedical Engineering Center

First Annual Medical Science Careers Camp

By William Hoffman

The lake country near Annandale, Minnesota has been a favorite summer hideaway for Twin Citians since the 1920s. Today, it is also serving as an incubator for future transplant surgeons, medical examiners, and biomedical engineers.



The first annual Medical Science Careers Camp, sponsored by the University's Biomedical Engineering Center (BMEC), was held July 14-20 at the Chi Rho Camp and Retreat Center on Lake Sylvia, about 60 miles northwest of the Twin Cities. There were 38 students ranging in age from 9 to 14 years, plus eight student counselors. Most of the students were from the Twin Cities area. Nine students from Willard Elementary School in North Minneapolis (a science-mathematics-technology magnet school) attended the camp, as did four members of the "Soaring Eagles," a local American Indian organization.

The camp was a blend of learning sessions featuring talks and demonstrations by health-care professionals, model building projects by the students, recreational activities such as canoeing, boating, swimming, and volleyball, and campfires in the evenings.

The camp is the brainchild of Jim Holte, a biomedical engineer in the Department of Electrical Engineering. It is patterned after a "Science and Technology Careers Camp" at Chi Rho that he launched in 1990. This past summer, in addition to the Medical Science and Science and Technology camps, Holte organized a week-long "Environment" camp in response to the growing interest in the natural world and the environment among children and teenagers.

"The original idea was to identify youngsters at risk—either from socioeconomic conditions, a lack of family support, or for other reasons—and provide them with an opportunity to learn about the world of work, about different careers," Holte said. "I am convinced that what really helps in the growth and development of children is for people to show an interest."

Holte led a discussion of the "hospital experience" on Sunday, the first day of the camp. He described the growing role of medical technologies in patient treatment and care such as medical imaging, laser surgery, and orthopedic devices. He also described how antibiotic drugs fight infection, and the role of prescription drugs in modern medical care. Students were encouraged to relate their own experiences in hospitals and clinics and how they dealt with fears and anxieties about medical treatment.

On Monday, George Bloom, an instructor in the Department of Physiology, explained how the fundamental laws of physics and chemistry impose limits on the structure and function of animals and humans. One example is the way the body handles heat generated by metabolic processes.

Tuesday morning Dr. Ron Brown, an emergency medicine specialist at Health One in Buffalo and the medical examiner for Wright County, explained the responsibilities of a medical examiner. He described how injured people are cared for at the site of an accident and transported to the hospital. By the end of his talk, which was accompanied by slides of people injured in automobile accidents, the students understood "basic mechanisms of injury" and "hemorrhage control" and how seat belts save lives.

The program for Tuesday afternoon focused on the human musculoskeletal system. The featured speaker was Holly Cashin, a physical therapist from Eden Prairie. By using a variety of neuromuscular stimulators, plus an oscilloscope, the students gained a basic understanding of the role of electrical signals in muscular activity and how external electrical stimulation causes involuntary movement. Cashin also explained how the neuromuscular system breaks down in people with certain diseases such as amyotrophic lateral sclerosis, otherwise known as Lou Gehrig's disease.

Dr. Allen Cheung, a fellow in the University's Department of Surgery, gave the students an introduction to the world of operating rooms and organ transplantation on Wednesday. He was accompanied by Ann Muller, a registered nurse involved in organ donor recruitment. Cheung took the students through the educational process of a transplant surgeon beginning with college (four years), medical school (four years), surgical residency (five years), and ending with a specialized residency in transplantation (one-two years).

Cheung then took the students on a slide tour of the world of transplant surgery that included color illustrations of the body's major organs and vessels, pictures of diseased kid-

Camp, Continued On Page 15

Combining Research Administration and Practice

An Interview with Professor Mark Brenner

Mark Brenner is a professor in the Department of Horticultural Science and the Department of Plant Biology. He was Director of Graduate Studies in the Department of Horticultural Science and Landscape Architecture for nine years before accepting the position of Associate Dean of the Graduate School in 1989. He has been the Staff Officer of the Research Executive Council starting three months after its inception in 1989. Prior to that time he served as Chair of the Faculty Consultative Committee from 1988 to 1989.

Professor Brenner was interviewed by Research Review editor Michael Moore on September 3, 1991.

I'd like to have you start by explaining the mission and composition of the Research Executive Council.

The Research Executive Council (REC) began in May 1989 as the academic/administrative body to coordinate research policies for the University. Prior to REC, these policy decisions were made on an *ad hoc* basis as issues arose. With increasing competitiveness for federal funding for research, and with increasing federal and state requirements on conducting research activities, it became quite apparent that there was a need to have an ongoing coordinating system. I think it's been a big step forward. When I had the opportunity to participate as the Staff Officer to assist this group, I looked at it as an important way to help in this mission.

REC was chaired by Graduate School Dean, Robert Holt, until he stepped down as dean on September 13. The new chairperson will be the Vice President for Research—a new position for which a search is hopefully in its final phase. That person will also serve as Dean of the Graduate School. Other members of REC include the Senior Vice President for Academic Affairs, Jim Infante; the Interim Vice President for Health Sciences, Cherie Perlmutter; the Vice President for Agriculture, Forestry, and Home Economics, Gene Allen; the Vice Provost for Arts, Sciences, and Engineering, Anne Hopkins; and the Associate Vice President for the Office of Research and Technology Transfer Administration, Tony Potami. This group meets monthly.



There is also a staff group that meets every seven to ten days. This group has been chaired by Dean Holt, and will be chaired by the new Vice President for Research and Dean of the Graduate School. The staff group includes a representative from Academic Affairs (to be identified); Management Planning and Information Services, David Berg; the Office of Research and Technology Transfer Administration, Tony Potami; the Institute of Agriculture, Forestry, and Home Economics, Dick Skok; Health Sciences, Neal Gault; Arts, Sciences, and Engineering, Peter Zetterberg; Federal Relations, President's Office, Dick Caldecott; and me as Associate Dean of the Graduate School.

What has REC accomplished in its first two years of operation?

The foremost responsibility of REC is to establish policies that will help enhance the research activities of the University. The first major item accomplished was the policy on the distribution of indirect cost recovery (ICR) income. Soon thereafter, REC established the policy on major matches for large grants. There is an increasing trend of requiring large institutional matches to secure major center grants, and the University needed to have some consistency in how it deals with these. In a similar manner, there has been discussion on establishing an analogous policy for smaller matches—for individual investigators.

REC has also spent a considerable amount of time working on the Policy and Procedures for Dealing with Misconduct in Research and Scholarly Activities. This had been referred to as the "fraud policy," but since fraud relates to personal property losses, we now use the word "misconduct" to follow in line with the federal Office of Science and Integrity version of this policy. REC has been working on a version to replace the University's interim policy on scientific misconduct. We hope to have a revised policy passed through the governance system and administration at the University this fall. Currently in place, though, is a position paper titled, "Guidelines for Research Investigators and Creative Artists" (see page 4). This was developed by a subcommittee chaired by Medical School

Dean David Brown, with Professor of Political Science Samuel Krislov as the main author. Also assisting were

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Reminders About Certain NIH/ADAMHA Policies

Inclusion of Women in Study Populations

The National Institutes of Health (NIH) and the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) recognize that most researchers adequately and appropriately consider gender representation in clinical research design. Nevertheless, the following statement is published as a reiteration of the existing NIH/ADAMHA policy concerning inclusion of women in study populations.

Public concern requires that clinical studies include both genders in such a way that results are applicable to the general population; exceptions would be those diseases or conditions that occur only in one gender. Therefore, applications/proposals for NIH/ADAMHA support of clinical research should employ a study design with gender representation appropriate to the known incidence/prevalence of the disease or condition being studied. If inclusion of women is impossible or inappropriate with respect to the purpose of the research, the health of the subjects, or other reasons, or if in the only study population available there is a disproportionate representation of one gender, these reasons for excluding women or men must be well explained and justified by the applicant. Similar justification is required if women will not be included in numbers appropriate to the incidence/prevalence of the disease.

In conducting peer review for scientific and technical merit, members of Initial Review Groups (IRGs)/Technical Evaluation Groups (TEGs) will be instructed to evaluate the proposed gender composition of the study population. NIH/ADAMHA funding components will not fund/award grants or contracts that do not comply with this policy.

Minorities in Study Populations

NIH/ADAMHA require that applications/proposals for clinical research must give appropriate attention to inclusion of minorities in study populations, unless compelling scientific or other justification for not including minorities is provided. While the focus of this policy is on inclusion of minorities in general population studies, NIH/ADAMHA also encourage attention to gaps in knowledge about specific U.S. racial/ethnic minorities and health problems that significantly affect them. Examples of these problems include but are not limited to: cancer, substance abuse, heart disease and stroke, homicide and accidents, diabetes, infant mortality, and AIDS. Addressing these gaps may be appropriate justification for focusing in a particular study on a single racial/ethnic group.

NIH/ADAMHA funding components will not fund/award grants, cooperative agreements or contracts that do not comply with this policy.

Responsible Conduct of Research in NRSA Training Programs

National Research Service Award (NRSA) institutional training grant applications submitted to NIH and ADAMHA have been revised "to require that a program in the principles of scientific integrity be an integral part of the proposed research training effort." This policy was effective with all competing training grant applications received after July 1, 1990.

Most universities and academic institutions have practices and procedures to ensure the responsible conduct of research. These may include informal seminars and presentations on conflict of interest, data recording and retention, professional standards and codes of conduct, responsible authorship, institutional policies and procedures for handling allegations of misconduct, policies regarding the use of human and animal subjects, etc., or formal courses on bioethics, research conduct, the ideas of science, etc.

Descriptions of formal or informal activities related to incorporation of efforts relevant to the responsible conduct of research should be as explicit as possible. No application will be awarded until a description of the institution's plan to provide instruction on ethics in research and research training is furnished.

National Institute of Allergy and Infectious Diseases

Beginning with the October 1, 1991 application receipt date, the National Institute of Allergy and Infectious Diseases (NIAID) will *no longer* accept new or amended applications for the NIAID Immunologic and Infectious Diseases Academic Award (K07). However, NIAID *will* continue to receive new and amended applications for the other career award programs, namely the Clinical Investigator Award (K08), the Physician Scientist Academic Award (K11), and the Modified Research Career Development Award (K04).

This decision was reached because of the paucity of applications received for the K07 award in recent years, and the desire of NIAID to focus its career award resources to the K04, K08, and K11 mechanisms, particularly in keeping with its efforts to increase the recruitment and retention of minority and women scientists in biomedical research.

National Institutes of Health

Estimated Total Costs of Proposed Projects

In response to the House of Representatives and Senate Appropriation Reports (101-591 and 101-516, respectively), NIH has developed a financial management plan to increase stability and predictability in funding biomedical research. One element of this plan is for National Advisory Councils and Boards, in their review of applications, to consider not only scientific merit and programmatic issues, but also *total costs of proposed projects*.

In order to consider this information as part of their review, Councils/Boards must be provided with an estimate of the total costs for each application reviewed. To provide Councils/Boards with this information, each summary statement will include an estimate of the total costs of the proposed project. This will begin with summary statements for applications reviewed during the October-November, 1991 round of Initial Review Group (IRG) meetings.

Previously, only requested and recommended direct costs for each budget period were included on summary statements.

Calculation Method

Estimated total costs will be based on information provided in the applications as well as on the direct costs recommended by the IRG for applications where negotiated indirect cost rates are applicable. The following calculation method will be used to estimate total costs:

1. Total Costs Required for Entire Project will be divided by Total Direct Costs Requested for Entire Project;
2. This figure will then be multiplied by the Direct Costs Recommended for Each Year.

Total costs requested and total direct costs requested are provided in the application.

Applicability

Estimated total costs will be included on summary statements for the first year, all future years, and for the total project period (competitive segment). These data will be helpful to Councils, Boards, and institute staff primarily for applications at or near the margin of fundability. Where total costs could be a determining factor in the funding decision, a more precise calculation will be made using actual base and rate information. This will be done before any final funding decision is made.

numbers for new accounts established in August and September will be transmitted in mid-October. Beginning in October, ORTTA will be assigning both old account numbers and CUFS numbers to new awards.

- To assure that the proper area is reflected on a new sponsored account, you are encouraged to put the area number on the BA23 form. The department name must be clearly identifiable to a CUFS area number if the number is not on the form.
- Since CUFS permits only one "Orgn Manager," ORTTA will be assigning the first principal investigator listed on the BA23. The first principal investigator's area will also be assigned the account unless otherwise instructed.
- ORTTA is aware of the need to set up grant awards as soon as they are received. The process can be expedited by making sure ORTTA has been supplied all necessary information, including: 1) a proposal with a BA23 form; 2) a "CUFS friendly" budget for identification of the objects which need to be established, and 3) the agency notice of award if it was sent directly to the Department/PI. Expenditure and Revenue Budgets will be established when the CUFS number is assigned in order to allow expenditure documents to be processed as soon as the number is received. Questions or problems with award set-up should be directed to the appropriate grant administrator.
- Departments should be aware that only expenditure information will be available in CUFS after implementation. Budget balance information may not be available until the middle of December. Consequently, ORTTA will not be able to review expenditure documents for fund availability during this period and departments will be responsible for determining that sufficient funds are available.

If you have questions concerning this information or CUFS as it relates to sponsored programs, please contact an appropriate grant administrator or call Marilyn Surbey at 624-4850.

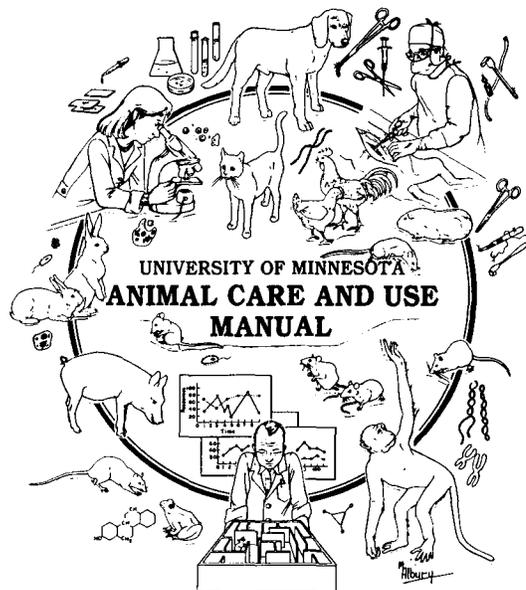
University Animal Care and Usage Committee

Editor's Note: Because of recent changes to the federal law governing care and use of animals, as well as organizational changes in the University's oversight of animal care facilities and programs, Research Review will begin publishing monthly columns devoted to this subject. Anyone with questions about animal care and use or with suggestions for topics that could be covered in this column is encouraged to send them to Richard Bianco, Chairman of the Animal Care and Usage Committee, Box 495 Mayo; or Michael Moore, Office of Research and Technology Transfer, 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415.

The University of Minnesota Animal Care and Usage Committee is a federally mandated committee authorized to review all procurement, care, and use of animals in research, teaching, and service functions. The Committee's purview includes all University of Minnesota campuses and satellite facilities. The following guidelines (revised 9/90) outline the Committee's membership, responsibilities, and procedures for review of animal care and use.

A. Administrative Organization

1. The University Animal Care and Usage Committee shall be a University-wide Committee appointed by the President. The Committee will report its findings and recommendations to the Assistant Vice President for Health Sciences.
2. The Committee shall consist of a maximum of 15 members. Membership will be composed as follows: representatives of Health Sciences (3) one of which shall be from the College of Veterinary Medicine; College of Agriculture (1); College of Liberal Arts (1); College of Biological Sciences (1); Environmental Health and Safety (1); Duluth Campus (1); student (1); community representative (1); civil service (2); one at large selected from Morris and Hormel (1); the director of Research Animal Resources or the director's designee (1); and a representative from the Center for Biomedical Ethics(1). At least one member of the Committee shall be a non-scientist. If a member cannot be found for any of the above units, a member at large may be appointed. Committee members must be faculty or academic professionals, except the representatives from Environmental Health and Safety, civil service and student.
3. All members, except the student member, shall be appointed for staggered terms of three years and may be reappointed for an additional three-year term. The student member shall be appointed for a one-year term and may be reappointed for one additional year. Terms shall begin at the first regularly scheduled meeting in September.
4. Selection of Members
 - a. The Committee shall provide names of candidates to fill vacancies to the Assistant Vice President for Health Sciences for appointment by the President.
 - b. The Committee should consider the following means for identifying candidates to fill vacancies: Candidates for Committee membership may be obtained by recommendation from Committee members and other university faculty and staff; notices in various University publications and announcements before faculty and student assemblies; the University Brief; the ORTTA newsletter [*Research Review*]; request nominations from deans, department heads, faculty assemblies, student assembly and Committee members. The Committee will continue to function while candidates are being selected provided that there is a minimum of 9 active members.
5. The chair or co-chairs of the Committee shall be elected by the Committee annually at its first regularly scheduled meeting in September.
6. The Committee shall meet as often as necessary to conduct its business but not less than once quarterly.
7. Executive Subcommittee



- a. The Executive Subcommittee consists of the chair and at least two other members appointed by the chair. One member of the Executive Subcommittee shall be an RAR veterinarian. If any members of the Executive Subcommittee are unavailable at a time and a decision must be made, the chair may appoint temporary members.
- b. The function of the Executive Subcommittee is to act for the University Animal Care and Use Committee when, in the judgment of the chair, a decision must be made that does not allow time for convening the full Committee. The full Committee membership will be notified and given the opportunity to require full Committee membership review prior to having the recommendations of the Executive Subcommittee go into effect. All actions of the Executive Subcommittee will also be noted at the next regularly scheduled meeting.
- c. When a quorum is not present at a regularly scheduled Committee meeting, an Executive Subcommittee will be convened with the members present. A list of protocols to be reviewed will have been sent to all members 3-4 days previously. A member who will not be able to attend a Committee meeting but who wishes full Committee review for any protocol, instead of Executive Subcommittee review, must notify the secretary by 24 hours after the scheduled meeting. Otherwise, the decisions of the Executive Subcommittee will take effect at that time.

B. Duties and responsibilities of the Committee shall include:

1. The Committee shall collaborate with the director of Research Animal Resources in formulating recommendations to the Assistant Vice President for Health Sciences regarding University policies and standards governing procurement, and care and use of animals employed in research, teaching, and service functions.
2. The Committee shall evaluate the University's animal care programs and facilities. The Committee shall:
 - a. review at least once every six months the institution's program for humane care and use of animals using the *NIH Guide for the Care and Use of Laboratory Animals* as a basis for evaluation;
 - b. inspect at least once every six months the institution's laboratory animal facilities (including satellite facilities) using the *Guide* as a basis for evaluation;
 - c. prepare reports of the Committee's evaluations and recommendations and submit the reports to the Assistant Vice President for Health Sciences;
 - d. provide assistance to the director of Research Animal Resources in education and training of faculty and staff in matters related to animal care and usage;
 - e. make recommendations to the Assistant Vice President for Health Sciences regarding any aspect of the institution's animal program, facilities, or personnel training.
 - f. review and approve, or withhold approval (and require modifications to secure approval) of those activities related to the care and use of animals;
 - g. review and approve, or withhold approval (and require modifications to secure approval) of proposed significant changes regarding the use of animals in ongoing activities;
 - h. be authorized to suspend any activity involving animals which is not being conducted in accordance with applicable provisions of the Animal Welfare Act, the *Guide*, the institution's assurance or other applicable policies; and
 - i. perform other functions as required by federal laws, Public Health Service and University policies.
3. The Committee shall provide assistance to the Director of Research Animal Resources in education and training of faculty and staff in matters related to animal care and usage, in all kinds of services offered by the Director and the Research Animal Resources staff, and in the research benefit obtained from the use of quality animals.
4. The Committee shall consult with the director of Research Animal Resources regarding professional personnel needs of that unit.

Animal Care, Continued On Page 28

USDA Likely to Retain Indirect Cost Cap

It appears that for the third straight year the U.S. Department of Agriculture will impose a maximum 14 percent indirect cost rate on projects it funds. The 14 percent limit is part of the report of the House Rural Development, Agriculture, and Related Agencies appropriations bill for fiscal year 1992. While the limit is not part of the companion appropriations subcommittee in the Senate, it is expected that the Senate will accept the House language during conference committee deliberations, reported the Washington FAX news service.

The House funded USDA's Competitive Research Grants Program at \$99 million, an increase of \$26 million over FY 91 but \$26 million below the President's budget request of \$125 million. The Senate bill provides \$103 million for the program, and withholds an additional \$25 million to be made available for competitive research grants on Sept. 20, 1992. The differences between the House and Senate bills must be resolved by a conference committee.

For the USDA's special research grants program, which funds clearly defined research at named institutions, the House subcommittee appropriated \$58.2 million, \$26 million more than the President's request. It also instructed USDA to begin working with recipients to develop matching funds from non-federal sources. The House subcommittee, chaired by Rep. Jamie Whitten, D-Mississippi, took exception to a USDA proposal that recipients in the special grants program not be allowed to compete for grants in the competitive program.

The House subcommittee reported that it will not support funding for new medical research facilities under the USDA bill. "The Committee has been contacted regarding funding for a number of new medical facilities. These research facilities generally have a secondary component to their medical research involving agriculture, rural health or nutrition. While these proposals appear to be well justified and should likely be funded, the Committee feels it would be inappropriate to fund them in this bill," the report said. The House subcommittee also instructed USDA's Animal and Plant Health Inspection service to direct resources to better enforce animal welfare rules and regulations, which have been prepared and finalized over the past several years.

The Senate subcommittee, chaired by Sen. Quentin Burdick, D-North Dakota, allotted \$5 million for funding of projects under a new "Alternative Agriculture Research and Commercialization Act." The act would help fund research, development, commercialization, and marketing of new non-food, nonfeed uses for traditional and new agriculture commodities. However, neither the House nor the Administration provided funding for this program.

Forest Resources Scientist Receives Lindbergh Award

Dr. Robert D. Martin, Jr., Research Associate, Remote Sensing Laboratory, Department of Forest Resources, has been awarded a 1991 Lindbergh Grant by the Charles A. Lindbergh Fund for his project entitled, "Development of Methods for Monitoring Earth's Natural Resources with the Next Generation of Earth-Observing Satellites."

Martin was one of ten individuals selected as recipients of this year's Lindbergh Grants. Chosen from more than 225 applications from the U.S. and other countries, his project was selected for its potential to balance the advance of technology with the preservation of the natural/human environment.

Martin's grant was made possible by a gift to the Lindbergh Fund from the Carl A. Weyerhaeuser Charitable Trusts. Following is a summary of the project.

A set of earth-observing satellites, scheduled to be launched by NASA in the mid-to-late 1990s, will enable the first global monitoring of our natural environment. These new satellites will provide valuable data for tracking changes on the land, in the sea, and in our atmosphere. Dr. Martin seeks to bridge the gap between newly retrieved data that these satellites will make available and our understanding of that data. He will be developing methods in advance of the satellites' deployment that will enable meaningful, biological interpretations of high resolution spectral reflectance measurements taken by the satellites' sensors. Our ability to monitor our natural resources through this remote sensing technology will prove critical to our future achievement of a global balance between technological growth and environmental preservation.

The awarded amount for Dr. Martin's project is \$10,580, a symbolic figure representing the cost of Lindbergh's *Spirit of St. Louis* airplane in 1927. Since the program's beginning in 1978, almost \$1.25 million in Lindbergh Grants has been presented to over 125 men and women from the U.S. and other countries. Grants are made in numerous areas of special interest to Lindbergh—aviation/aerospace, agriculture, the arts and humanities, biomedical research and adaptive technology, conservation of natural resources, exploration, health and population sciences, intercultural communication, oceanography, waste disposal management, water resources management, and wildlife preservation.

"Seeking a balance between advancing technology and preservation of our fragile environment is and will continue to be a central issue of the '90s on local, regional, national, and global scales," said Clare Hallward, Chairman of the Lindbergh Fund Grants Selection Committee.

Rosemount, Inc. Donates Biotech Controller

On August 26 Rosemount Inc. celebrated three and a half decades of partnership with the University of Minnesota by presenting two major gifts to the University. At a ceremony held in the Rosemount World Center in Eden Prairie, Vernon H. Heath, Rosemount Chairman and Chief Executive Officer, donated the Rosemount System 3™ Distributed Process Control System to the University's Biological Process Technology Institute. Charles Knight, Chairman and Chief Executive Officer of Emerson Electric Inc., Rosemount's parent company, followed with the announcement that Emerson is endowing the Vernon H. Heath Chair in the Carlson School of Management's Department of Strategic Management and Organization.

Heath is retiring 35 years after co-founding Rosemount Engineering with University of Minnesota colleagues Frank D. Werner and Robert Keppel. He was business manager and they were scientists at the Aeronautical Research Laboratory of the University's Rosemount Research Center. Werner and Keppel had invented a gas temperature probe as part of an Air Force-sponsored research project. After the University assigned its rights back to the inventors, the three founded Rosemount Engineering to commercialize the device. Various Rosemount probes and sensors are now widely used on jet aircraft and spacecraft, and Rosemount has grown into an international producer of control systems for the aerospace and manufacturing industries, with annual sales of over \$1 billion and more than 10,000 employees.

The donation of the Rosemount System 3 came about partly as a result of consulting sessions between staff of the Biological Process Technology Institute (BPTI) and Rosemount employees who were engineering the company's entry into the biological process control market. This industry is growing rapidly as biotechnology research leads to products produced through complex fermentation processes that must be very precisely monitored and controlled. The system is the company's top-of-the-line process control system and is valued at over \$130,000.

According to BPTI Director Michael Flickinger, the unit will be the only one of its kind available for training students and carrying out academic research at a U.S. university. It will give BPTI the dual advantage of being able to train undergraduate and graduate students on the same control system currently being installed at major biological process manufacturing plants, as well as allowing researchers from throughout the University to carry out new types of fermentation research that have not been feasible with current systems.

neys and kidney dialysis machines, and diagrams of the role of the immune system in organ rejection and how rejection can be suppressed through the use of drugs such as prednisone and cyclosporine. Finally, Cheung and Muller demonstrated how a surgical team prepares for and performs an operation. They dressed in surgical garments and used authentic instruments in performing mock surgery on one of the students.

Thursday's program was highlighted by a visit from Rose Haag, Annandale Ambulance Coordinator, and Brian Haag, Annandale Fire Marshall. They explained the technologies and other features of a modern, fully-equipped ambulance and demonstrated how injured people are treated on the scene and transported to a hospital emergency room.

The students got a "hands-on" laboratory experience on Friday, the final day of the camp, when they actually performed surgery on sheep organs brought to the camp by Don Georgi, an engineer from Medtronic-Biomedicus, Inc. In his talk, Georgi described traditional engineering careers (electrical, mechanical, and chemical) and passed around devices produced by engineers in each discipline (an electric circuit board, a blood pump, and toxicity meter based on microporous hollow-fiber membrane technology). Georgi then described developing engineering fields, including biomedical and genetic engineering. He also explained what blood pumps do, why they are needed, and showed how the unique blood pump made by Biomedicus works.

Karel Zuzak, a graduate student of Holte's, directed the camp program and Chad Kratzke of Hopkins, a recent education graduate of Mankato State University, coordinated the counseling staff. The student counselors were Mark Anderson of Jordan, Joanna McLaughlin of Rochester, Andrea Wehrmacher of Prior Lake, Chad Meyer of Little Falls, Kyle Blakeborough of Prior Lake, Terri Lynn Smith of Brooklyn Center, and Daniel Shetler of Prior Lake.

The Chi Rho Camp and Retreat Center is owned and operated by St. John's Lutheran Church in Minneapolis. Holte, a member of the congregation, said that the outlook for using the facility as an educational retreat for children is promising. "We are hoping to use Chi Rho on a year-round basis," he said. Besides summer camps, the center could be made available to school districts as an academic retreat during the school year. It can accommodate some 60 students and is fully winterized.

By providing educational opportunities for children in a unique environment, Holte hopes to save the Chi Rho from being sold. He has established a network of contacts among businesses, trade unions, public agencies, and in the school systems in the Twin Cities to help him in his goal of transforming Chi Rho into an educational resource for the scientists, doctors, naturalists, artists, and scholars of tomorrow.

Committee on the Use of Human Subjects in Research

New Federal Regulations and Their Effect on the University's "Multiple Project Assurance"

The University of Minnesota holds a "Multiple Project Assurance" with the Office for Protection from Research Risks (OPRR). This assurance document outlines the means by which the University will comply with the requirements set forth in 45 CFR 46, the PHS Guidelines for the use of human subjects in research. These guidelines were recently revised by the federal agencies (effective August 19, 1991) and a revised Assurance document is being prepared for OPRR.

In addition to establishing a basis for the ethical conduct of research, holding and maintaining this assurance affords the University a "shorthand" privilege when documenting certification of Institutional Review Board approval of projects involving human subjects in research, a benefit at grant submission intervals. Researchers are reminded that the assurance states that *all research involving human subjects, conducted at the University, or by its faculty, staff, or students will comply with federal regulations, irrespective of funding source.*

Research in Foreign Countries

Section 101 (h) contains a provision that allows the Office for Protection from Research Risks, (OPRR) to determine whether procedures described by a foreign institution afford protections that are at least equivalent to U.S. regulations. The agency is permitted to approve the substitution of foreign procedures. Claims that foreign regulations are substantially equivalent to current regulations must be submitted to the Committee on the Use of Human Subjects in Research for confirmation and approval prior to forwarding that request to OPRR.

Events at NIH and Their Impact on the University

Due to findings in a recent self-audit by NIH where incidents of non-compliance with federal regulations have caused embarrassment and accusations of misconduct, NIH has established an **Office of Human Subjects Research**. This NIH office will oversee a "parent" Institutional Review Board. This internal IRB is charged with taking urgent and immediate action to rectify non-compliance with federal regulations and to *strengthen surveillance of research conducted by NIH scientists.* (Emphasis added).

While the report focused on internal scientists, the audit was triggered by failure of NIH sponsored scientists to comply with regulations regarding international AIDS research. The focus is not directed at this time to institutions like the University of Minnesota, but researchers are reminded that the Multiple Project Assurance document enters the University of Minnesota into a collaborative agreement with NIH whereby we have agreed to uphold all of the federal regulations pertaining to human subjects in research. University researchers are also reminded that, particularly when federal funds are involved in research, NIH considers the researcher to be an NIH collaborator and an agent of the NIH institution. NIH is held accountable for the actions of its agents as the University is held accountable for the actions of its researchers.

The focus of the recent audit was on the lack of documentation for international collaboration and deficiency in the systems monitoring the use of reagents, biological materials or devices used in human subjects research. The report has highlighted concerns surrounding the failure to require written agreements describing collaborative efforts and ensuring that co-authors understand their mutual commitment to ensure that adequate protections are in place for human subjects.

Human Ecology Dean Mary Heltsley, and Pat Swan, my predecessor, who is now Vice Provost for Research and Advanced Studies at Iowa State University. I think these guidelines are an excellent statement of how to avoid misconduct, and I am sure that if people follow these guidelines, we will have less need to deal with situations under the misconduct policy.

This past year REC has also been involved in revising the policy for Disclosure of Financial Arrangements with Industry. I was perhaps the catalyst for this, and John Thuente, Director of the Office of Patents and Licensing, did a beautiful job with the revision. This policy, now called "*Disclosure of Conflict of Interest*," has been passed by the University Senate, and will go before the Board of Regents in October for approval. The University clearly leads the country in having a good policy in this area.

REC has also been involved in health and safety issues. Working with the Department of Environmental Health and Safety, REC implemented a procedure this past year for improved handling of radioisotopes—on the acquisition end of it. There had been some misplacement of materials that cost the University a substantial amount of money. The interesting spin-off is that not only was a policy developed that I believe will assure better handling, but also the new procedures will save investigators money at the same time.

In the policy-making activities, REC has made a great effort to consult with the faculty governance structure. I worked very closely this past year with the Senate Research Committee, especially with Chair, John Sullivan, and when appropriate I have made presentations to the Faculty and Senate Consultative Committees. Therefore, as policies are being developed, REC had input and valuable contributions from the Senate structure. I very much appreciate the need for involving the people who will be impacted by a policy *early on in the process*, rather than just laying it on them once it is developed.

Another policy REC has developed recently is a policy dealing with the appropriate use of indirect cost recovery funds to rent off-campus research space. In general, the policy says that it must be clearly demonstrated that there is no space on campus for the research to take place, and that there is sufficient income flow related to an external grant to cover the rental costs, or the department or college must be responsible to pay the rental costs.

REC's distribution of indirect cost recovery funds is an important administrative function; can you describe how those distribution decisions are made?

One of the major aspects of REC's administrative responsibilities is handling the distribution of indirect cost recovery (ICR) funds. The ICR distribution policy says that when dollars are collected as reimbursement for the indirect costs of

research, they go into a central pool of funds to support research. This pool is called the Research Support Fund (RSF). In fact, these are dollars specifically authorized by the Minnesota Legislature to invest in support of research activities at the University. The State retains an offset of \$6.5 million of all the ICR generated, but the remaining funds are under the control of REC, and approved by the President's Cabinet. For the current fiscal year, the fund should be about a \$38 million fund. After deducting the offset and distribution of funds generated directly by such off-campus units as the Hormel Institute and the St. Anthony Hydraulics Laboratory, there is about \$32 million with which to work for the current fiscal year.

The RSF dollars are spent in many different ways. Firstly, this fund supports a number of activities, classified as System-Wide Activities. These are long-term commitments, including research administration, the Graduate School Grant-in-Aid program which directly supports faculty research activities, computing, research animal resources, radiation and environmental health, and technical shops. Another category of funding from the RSF is support for activities on the Twin Cities campus, including a chemical facility, library acquisitions, and support for the Vibration-Free Facility addition to Shepherd Laboratories, which has just been completed. A new responsibility for the RSF is debt-service for the research portion of new buildings, which has resulted from the legislation requiring the University to finance one-third of the cost of new capital building programs.

The RSF also provides funds that go back to units (usually to the collegiate dean), on a formula basis. The formula is based on a three-year rolling average of the ICR earned by the respective unit. Thus, the amount of money that goes back to a unit is a reflection of its prior grant activity. Additional funds go back to units based on the same three-year average for support of administrative costs of research activities, such as effort-certification.

The remaining RSF category is discretionary funds, which total about \$12 million this year. Some of these funds are distributed at the vice presidential or collegiate level (called block grants), for specific needs such as set-ups of research laboratories for new faculty, small grants for faculty members when matches to external grants are required, and other research-related activities. Major matches, in which an institutional match is required in order to be competitive for a major grant, come out of this pool. Out of this fund, REC also provides a limited number of seed grants, in which an institutional investment will position a unit to get a major grant for a new research center, for example. In some instances, REC has provided funds necessary to get the right people together to write major multi-disciplinary grants. For example, several years ago this kind of effort resulted in the Center for Interfacial Engineering. A more recent exam-

ple is the Geometry Supercomputing Center. Other dollars are allocated for rent of research space off-campus, if the need has been justified under the new rental policy.

REC has tried to use the philosophy that it is important to have a sizable portion of RSF dollars for discretionary purposes, without long-term commitments. This enables the University to invest in and sponsor activities that will lead to increased externally-supported research.

What will be the impact on this type of investment if the proposed reduction in the University's ICR rate from 44 to 40 percent is upheld? (See Research Review, August 1991, page 1.)

The RSF for FY 1992 will be smaller than for FY 1991 because of the lower ICR rate. Also, there is a smaller carry-over balance from the prior fiscal year (\$2.1 million from FY 1991 compared to \$4.5 million from FY 1990). Again, the total fund for FY 1992, after deducting the state offset and direct return to managing areas, is estimated to be \$32 million. This past year REC, through the Office of Research and Technology Transfer Administration, has been involved in negotiating with the representative of the Department of Health and Human Services for the University's new ICR rate for the next several years. Although the final rate has not been decided (because the University is appealing the proposed rate), it is quite likely that the new rate will be lower by a few points.

REC has played a role in the University's involvement at the national level in discussions regarding changes to the methods under which the indirect cost rate is compiled. REC has endorsed letters written by Tony Potami in opposition to the proposal to cap administrative costs, because this would be an arbitrary ceiling rather than setting rates based on actual indirect costs. REC has also taken the position that rates should be set by the Office of Management and Budget, not by Congress or individual agencies.

REC has also been involved in the fringe benefit rates. The concept of spreading the cost of tuition benefits for graduate assistants over the entire employee group is something that was championed by the University. Unfortunately, this is not consistent with the OMB Circular A-21 guidelines for calculating the indirect cost recovery rate. The University is still taking the position that this is a wise practice because it maximizes grant dollars for the support of graduate students. We are perhaps the only public university that has done this, but several private universities, including MIT, have had a similar program for several years. We have just been granted an allowance to keep our current fringe benefit rates until June 30, 1993, after which we will have to comply with the A-21 guidelines.

What are your research and graduate training interests that you combine with your administrative work?

I have been at the University of Minnesota for 22 years now, and I have moved up the ranks to Professor in the Department of Horticultural Science. Two years ago my appointment was split, and now I am also in the Department of Plant Biology academically. My current appointment is 50% in the Graduate School, 37% in the Department of Horticultural Science, and 13% in the Department of Plant Biology. My research activities focus on plant growth and development, with the purpose of improving plant growth efficiency for agricultural purposes. Specifically, I am involved with hormonal regulation of plant growth and development. I have championed the development of appropriate analytical methods for plant hormone analysis, and I now have one of the few laboratories in the country dedicated to plant hormone analysis.

Throughout my career, I have been supported by the Minnesota Agricultural Experiment Station. Like many faculty, I was fortunate to receive start-up money from the Graduate School. I have been supported by two federal agencies - U.S. Department of Agriculture, and the National Science Foundation. I am thrilled that I have just received another NSF grant, "The Role of Gibberellins on Pea Fruit Growth," which is a project that has been funded twice. At times in my career, I have received funding from the agricultural industry, but that funding has dried up because of hard economic times. I also have a U.S.D.A. international grant under which I have been doing collaborative work with a colleague in Israel.

As an active researcher, I knew that there were many things that should be done to improve the research environment of the University, and I became committed to trying to help. For example, my research involves the use of isotopes, a number of solvents, and genetically transformed plants. Therefore, I have to be a good practitioner of many of the issues that relate to health and safety in research, and I think I can make it easier for other faculty to do the same.

I have trained 25 graduate students. When I had a big laboratory group, it was as many as 10 graduate students and two post-doctoral fellows; now I work directly with two post-docs, a technician, and three graduate students.

The struggle to balance the teaching and research missions of the University is an ongoing one. How do you view that challenge?

The University's role as a research university is special. We have the charge in this state to be the generators of new knowledge—to challenge the forefront of science and scholarly activity. The products of that work should directly benefit our teaching. Our students should be exposed to the most current thinking and the basis for that thinking. While students learn what is topical today, they should also obtain a firm base in the background of the respective areas of study so they know from where the work arose. From my own experience, and from talking with many other faculty,

teaching the principles of a topic, as well as integrating them with the current information, more often than not helps one be a more effective researcher. My own NSF grant is a product of my having taught what was once considered a miserable area of plant science. Trying to put the topic in a rational manner for students helped change my thinking of how to approach the problem, and ultimately turned out to be the basis of a series of successful grant proposals. I can clearly claim that teaching has helped my research. And reciprocally, the products of my research have allowed me to add some clarity to a previously almost incomprehensible topic.

To me, that is what a research university is all about. Students are interacting with the people who are moving forward the fields of scholarly activity. They are exposed to disciplined thinking that must be directed toward problems, and they are exposed to the most current views on topics in the respective field. The benefit to the students is that they are taught not only what is in the textbook today, but what is likely to be in the textbook five or ten years from now. We are challenging people to be prepared to be current and to assimilate ever-increasing knowledge. That is an important aspect of a research university.

A research university can have tremendous benefits to the economy of the state. More often than not there can be many exciting spin-offs; some may be the basis of applied research, others may come from basic research for which, at the outset, there was no idea that a practical product might result, or that there would be economic benefit. Often we engage in these research activities simply because they appear to be the most appropriate questions to pursue.

How do you feel about the increased focus on technology transfer at the University?

Although assisting in technology transfer may require some time away from the laboratory work, it often gets one involved in side-activities that may in turn have some rather exciting benefits to one's research work. When a researcher tries to translate his/her research findings into practical experiences, he/she often gains some insight on the subject. It may also open doors to interactions with industry which can benefit the researcher's work.

I personally got involved with something like that 12 years ago. I saw the need for improving the methodology of my laboratory applications, and I ended up interacting with a Minneapolis company, Systec, Inc. They commercialized a product to automate high-performance liquid chromatography (HPLC), based on a need that I was able to define for them, and with some direction I provided as a consultant. The time spent on this project was time away from my research project, but ultimately it allowed me to bring back to my laboratory technology that was five years ahead of my colleagues. I had one of the first automated HPLC controllers, and it helped me to be exceedingly competitive in the grants world. As a consequence of the new technology, we

increased the capacity to analyze plant samples by more than ten fold.

The point is, from my experience, and I have seen it for others, technology transfer can be a two-way street. To a small degree, my efforts probably helped the local economy, helped a small company succeed, and it also helped my group and other researchers who came to use the automated HPLC. I think we have to promote the idea that the faculty's first responsibility is their teaching and research. But at the same time, we are a state-supported institution, and when a faculty member sees an opportunity to help a company, it is probably worth it to the University, the State, and the faculty member personally.

You have to understand that I come out of the College of Agriculture, where it has long been our tradition that what we do is to help the agriculture industry. I find it very reasonable and logical that, where appropriate, we ought to be doing that in an analogous manner throughout the University. Technology transfer is not just patents and licensing, it is also assisting when appropriate. Whether that should be done as we do it through the Minnesota Extension Service, or on a fee basis, or on a royalty basis depends upon the situation. There are some faculty who are more attuned to this than others, and I don't think it should be expected of all our faculty. I think that for those faculty who are capable of doing outreach, we ought to encourage and recognize it. There are universities in other states that are really trying to move much more actively in this area, notably in my mind are Missouri and Michigan State.

I think it is appropriate that faculty be aware of these opportunities and responsibilities. It is important that department heads support technology transfer. Presumably, department heads are aware of discoveries by their faculty, and if there is some commercial potential, they can be advocates for disclosing the idea to the Office of Patents and Licensing. Currently the staff in this office are spread so thinly that we need more networking.

An exciting new program to help technology transfer is Minnesota Project Outreach, which is a computerized data base system to help companies identify faculty expertise. We will have to see how Minnesota Project outreach works - whether it leads to more of these types of interactions and whether it will bring things back to the University. I am convinced it will.

How would you characterize the morale among University researchers at this point?

While I generally like to look at the positive side, it is clear that faculty are feeling squeezed. External grants are getting exceedingly difficult to obtain. Funding rates from federal agencies have dropped from being in the high 20s or the low 30s percentile, to being in the low 20s or high teens. I was in one round where only the top 3 percent of applicants were funded. Faculty going through so much work to

prepare proposals with such vicious odds is very depressing. At the same time, we are feeling an institutional squeeze. We are facing declining resources, and are seeing it happen at multiple levels (i.e. state funding cut backs and the need to reallocate within the University), and this has had a negative impact on many of the faculty. They are hanging on. There really are not that many opportunities right now, or we might be seeing a greater exodus.

In my mind, not only is it depressing for our faculty who are tenured, it is scary for our tenure-track faculty who in many cases feel, or are told, that they need to get a grant in order to make tenure. In fact, I think it is outrageously intimidating to our graduate students and post-docs, who see this whole scientific enterprise depressed. I see some of these really gifted young people leaving the field, just at a time when demographers have documented that more people are needed in the academic, scientific, and engineering job markets.

What do you think are the greatest challenges for University researchers right now?

One thing that is on my mind, and has been for a long time, is the challenge to cut across departments and disciplines for our research and teaching. I find the University of Minnesota to be an exciting place to be, but I do not think we have realized the potential of the institution. Largeness is a virtue if we take advantage of it; if not, it can be an oppressive, overwhelming bureaucracy. We need to find ways of exploiting some of the outstanding attributes we have here that are really unique. The fact that we have over 3,000 faculty members is truly exciting, but it is shameful how minimal the interactions are among our faculty at times.

The Graduate School has long been the saving grace in this regard, in that our graduate programs are not exclusively departmentally-based, but are free-standing. We have a marvelous constitutional structure that allows us to operate this way. This is relatively unique among most schools in this country. However, we still fall far short of having some means of identifying other people within the institution who might be able to interact and help our research. In my general area of research, biological science, we have about 1,200 faculty members who, in one way or another, might call themselves a biological scientist. Yet the opportunity to tap into this expertise is often limited to boundaries of collegiate units, if not vice presidential units.

That is why I am very excited about the faculty interest data base being developed by Winifred Schumi in the Office of Research and Technology Transfer. I really hope this will work as an easily-accessible way to find others who have similar research interests, or who might have the expertise needed to shed light on a research question, or even provide a different approach. The bottom line is that we have some interdisciplinary activities, but in my mind we should be doing a lot more. Further, this should not be at the expense

of strong discipline-based departments; it should be add-ons that will enhance the disciplinary programs.

For a while many of the federal agencies were trying to put their dollars toward this activity. When they talked about centers, they often meant centers that would bridge academic units. Unfortunately, federal funding for research centers got into trouble because it was done at the expense of individual investigator grants. I am a stalwart of the support of individual investigators, and centers are something that should be built on top of that. They both have a role. Our tenure and promotion practices are such that it is best to have a base of support for each investigator, then allow faculty to have some additional flexibility to work with colleagues by being members of research centers or institutes.

I feel that I made giant strides professionally and academically when I started interacting with several other colleagues. But I was always fortunate to have a base of support. The federal agencies, at least NSF and NIH, are changing their funding distribution and are now budgeting more money for funding individual researchers. NASA is a different story; they are clearly going after "big science." The Human Genome Project is "big science," but it is going to fund individual investigators. I do not want to belittle the value of funding centers. I think the University has benefited by having some centers. It is unfortunate that we have only recently tried to become competitive in this approach to science.

Do you think the University has been successful in explaining the importance of research to its many constituencies?

REC had a meeting this spring to discuss promoting research results. We invited Marcia Fluer, Director of University Relations, to discuss their efforts in this area. I think we are doing better in getting the word out, and in many ways University Relations has implemented an excellent plan, but I would like to see more. I think we really need a theme to convince or explain to people of Minnesota what a marvelous research machine we have here in our state. It is an impressive activity that can be stronger yet. I wholeheartedly agree that having greater visibility, to help people understand what a research university is all about, is very important. I am especially anxious that we should embark on a program to help the people of the state understand the unique role the University plays as a research university. While we often promote research results, we need to describe more fully the important role our faculty, graduate students, and staff play in accomplishing the mission.

National Library of Medicine

Agency Profile

The National Library of Medicine (NLM) is the world's largest research library in a single scientific and professional field. The Library collects materials exhaustively in all major areas of the health sciences and to a lesser degree in such areas as chemistry, physics, botany and zoology. The collections today stand at 4.5 million items—books, journals, technical reports, manuscripts, microfilms, and pictorial materials. Housed within the Library is one of the world's finest medical history collections of old (pre-1914) and rare medical texts, manuscripts, and incunabula.

The Library's extensive collections and information services may be used by health professionals and health-science students. Books and journals may be consulted in the reading room; they may also be requested in interlibrary loan. Medical audiovisual materials may be viewed in the Library's Learning Resource Center and also may be borrowed on interlibrary loan. (There is a fee for all interlibrary loan transactions.)

NLM serves as a national resource for all U.S. health science libraries. Lending and other services are provided through a Regional Medical Library Network consisting of 4,000 "basic unit" libraries (mostly at hospitals, 125 Resource Libraries (at medical schools), 7 Regional Medical Libraries (covering all geographic regions of the U.S.), and NLM itself as a national resource for the entire Network.

MEDLARS®

The Library's computer-based Medical Literature Analysis and Retrieval System (MEDLARS) was established to achieve rapid bibliographic access to NLM's vast store of biomedical information. Historically, it was a pioneering effort to use the emerging computer technology of the early 1960s for the production of bibliographic publications and for conducting individualized searches of the literature. MEDLARS continues to be used for preparing and photocomposing bibliographic publications. *Index Medicus*® — the monthly subject/author guide to articles printed in nearly 3,000 journals — is the most well known of these but some 40 other specialized medical bibliographies and databases are produced as well. These databases can be referenced for cataloging and serials information, toxicological and chemical data, information on audiovisual materials, and information on cancer and other specialized areas of health and disease. Through communications networks, search services are available online to individuals and institutions throughout the world.

The Library's newest component, the National Center for Biotechnology Information, has assumed a leadership role in developing information services for biotechnology—the task of storing and making accessible the staggering amounts of data about the human genome resulting from genetic research at NIH and laboratories around the nation.

Toxicology Information Program

The Toxicology Information Program (TIP) was established at NLM in 1967 to provide national access to information on toxicology. The program is charged with setting up computerized databases of information from the literature of toxicology and from the files of both governmental and non-governmental collaborating organizations.

Among the databases developed by TIP are: TOXLINE® (Toxicology Information Online), CHEMLINE®, a chemical dictionary file, and TOXNET® (Toxicology Data Network), a system of toxicologically oriented data banks, including the HSDB® (Hazardous Substances Data Bank), useful in chemical emergency response and other applications. TIP also supports the Toxicology Information Response Center, which provides reference services to the scientific community.

Grant Programs

The extramural (grant) programs of the National Library of Medicine were originally authorized to provide better health information services through grant support to the nation's medical libraries. Since extended by Congress, support now offers assistance for library resources, research in biomedical communications, biomedical publications, and Regional Medical Libraries.

Fact Sheets

The National Library of Medicine has printed more than 70 "Fact Sheets" describing its publications, databases, programs and policies. It has also published a *Catalog of Publications, Audiovisuals, and Software*. Faculty and staff may review this information at ORTTA any time during the normal business day. Other information may be requested from NLM at: Public Information Office, National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894; 301/496-6308, or, for health professional inquiries, 1-800-272-4787.

National Institute on Aging

Leadership and Excellence in Alzheimer's Disease

RFA: AG-91-12

Congress has authorized the National Institute on Aging (NIA) to make one or more awards to senior researchers who have made distinguished achievements in Alzheimer's Disease and related dementias. The objectives of this program are to help strengthen the capabilities of established senior investigators who have distinguished records in biomedical research on Alzheimer's Disease by providing up to seven years of support to allow the recipients time to devote to research and to the development of outstanding but less established biomedical investigators who are interested in working on Alzheimer's Disease and related dementias.

It is hoped that this award will stimulate the recipient institution(s) to develop substantial continued support such as endowed chair(s) for Alzheimer's Disease and related dementias of aging when this award is terminated.

Applications must include the following three components:

- A. Salary support for the applicant.
- B. Salary support for at least one, but not more than three, junior researchers who demonstrate exceptional promise to conduct research in the area of aging and Alzheimer's Disease and related dementias.
- C. Research support. The primary intention of this component is to support the research program(s) of the senior investigator in the following ways:
 - Expansion of the scope of currently funded research into new lines of inquiry through novel techniques or approaches and by the addition of personnel.
 - Support of expansion of the research of the junior investigator(s) for up to three years.
 - Support of innovative or opportunistic research on aging and Alzheimer's Disease and related dementias as pilot studies of no more than two years duration.

No more than \$1,000,000 total cost per year for seven years will be committed to specifically fund each award made in response to this RFA. Up to three awards may be granted. The mechanism of support is the grant-in-aid (R35). Applications will not be accepted from institutions that have received a Leadership and Excellence in Alzheimer's Disease (LEAD) award.

The application deadline is **January 15, 1992**. A copy of the RFA is available from ORTTA and may be requested by calling 624-9004. Direct inquiries regarding programmatic issues may be directed to: Carl Banner, Ph.D., Neuroscience and Neuropsychology of Aging Program, NIA, NIH, Building 31, Room 5C35, Bethesda, MD 20892; 301/496-9350.

U.S. Department of State

U.S. Man and the Biosphere Program

The National Committee for the U.S. Man and the Biosphere Program (U.S.MAB) announces its priorities and criteria for the selection of original research proposals and projects that will receive funding in FY 1992. The mission of U.S. MAB is to foster harmonious relationships between humans and the biosphere through an international program of policy-relevant research which integrates social, physical, and biological sciences to address actual problems.

U.S.MAB will give priority consideration to proposals which directly complement the objectives of the U.S. MAB directorate programs. Interested scientists and individuals should write to the U.S. MAB Secretariat to receive copies of the full Directorate Mission Statements on:

- High Latitude Ecosystems
- Human Dominated Systems;
- Marine and Coastal Ecosystems;
- Temperate Ecosystems; and
- Tropical Ecosystems.

During FY 1992 U.S. MAB intends to concentrate the majority of its available resources on the development of major core research programs, therefore only a relatively modest amount of funds (approximately \$250,000) will be available to individual scientist investigators or small groups of scientists.

A preliminary proposal (prospectus) is due at U.S. MAB by **November 4, 1991**. A copy of the Federal Register announcement describing prospectus guidelines is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board. The agency address is: U.S. MAB Secretariat, OES/EGC/MAB; Room 608, SA-37; U.S. Department of State; Washington, DC 20522-3706.

National Science Foundation

Instrumentation & Laboratory Improvement

The National Science Foundation has announced its FY 1992 Instrumentation and Laboratory Improvement (ILI) Program. The purpose of the program is to improve the quality of undergraduate instruction by supporting the acquisition of instruments for laboratory courses in science, mathematics, or engineering.

"Laboratory" for ILI purposes means any setting affording students active participation in learning subject matter; the setting may involve an observatory, the field, or a computer room, as well as the traditional laboratory. ILI provides matching grants in the range of \$5,000 to \$100,000 for instrumentation that serves as the basis for undergraduate instructional improvement at universities and two-year and four-year colleges in the U.S. and its territories.

The specific objectives of ILI are to encourage and support the:

- Use of modern instruments to improve the education of undergraduate students, both majors and non-majors, in science, mathematics, and/or engineering.
- Introduction of new instrumental technology into science, mathematics, and engineering instruction.
- Development of new experiments or applications for instruments that extend the instructional capabilities of the equipment.
- Establishment of equipment-sharing via consortia or centers.

ILI seeks projects that will produce models for the use of instructional instrumentation. Innovative methods for using laboratory activities to improve student understanding of basic principles are especially sought. Dissemination of project results via published laboratory manuals or experiments, software, scholarly papers, and presentation at scientific meetings is expected.

The application deadline is **November 15, 1991**. For further information, contact: Division of Undergraduate Science, Engineering, and Mathematics Education, National Science Foundation, 1800 G Street NW, Washington, DC 20550; 202/357-7051. Bitnet: Undergrad@NSF. Internet: Undergrad@NSF.GOV. Preliminary guidelines are also available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

The National Council for Soviet and East European Research

Annual Research Competition

The National Council for Soviet and East European Research invites proposals for funding under its program of research and related activities for 1992. Appropriate fields of research for proposals include, but are not limited to:

1. The nature, causes and consequences of long-term trends and current developments in the Soviet and East European societies and their parts, and the forces at work or latent. (Support for studies of east Germany is limited to issues of its communist experience.)
2. Studies in the social sciences and humanities designed to contribute to comprehension of the contemporary societies of the USSR and Eastern Europe, including historical, geographic and environmental studies.
3. Studies of relationships among those societies and between them and others, past, present and potentially future, as well as intentions, objectives, and policy options.

Research proposals may include related activities such as: meetings and workshops; research-specific training, especially involvement of graduate students in research projects; contact among scholars and specialists in government and private enterprise; development of data banks and other research aids; and dissemination of research data, methodology, and findings.

Eligibility for principal investigators is limited to scholars at the post-doctoral level for academic participants and to an equivalent degree of maturity and relevant professional employment for those from other fields.

The Council has removed its \$50,000 limit on awards for new projects, but its funds are still limited and applicants are encouraged to seek financial support from other sources as well, especially for projects with large budgets. Cost sharing at a minimum of 10% in any combination of direct and/or indirect costs, from non-Federal funds, is mandatory. The Council will look with special favor on proposals which include further cost sharing of both direct and indirect costs.

The application deadline is **November 1, 1991**. Application forms and guidelines are available from: The National Council for Soviet and East European Research, 1755 Massachusetts Avenue, NW, Suite 304, Washington, DC 20036; 202/387-0168.

Dow Chemical Company

Cooperative Research

For over a decade, Dow and universities have been forming partnerships in discovery through Cooperative Research. Cooperative Research fosters mutually beneficial relationships between academic and Dow scientists, providing an opportunity for Dow to support specific projects that may be important to present or future company activities. The major technological areas of interest to Dow include engineering, as well as chemical and material science.

In addition to Cooperative Research, Dow has other mechanisms dedicated to increasing interactions with academia, including: Dow's University Relations Program, research support from individual Dow laboratories, The Dow Chemical Company Foundation's educational programs, and active participation in the Council for Chemical Research.

Personal non-confidential discussions between Dow representatives and university faculty members are recommended to identify exploratory research of possible interest. An interested faculty member should submit the following information:

- A brief description (a page or two) of the research area of interest. This description should *not* be in the form of a proposal, and *no confidential information* should be included.
- A selection of pertinent reprints/preprints.
- A curriculum vitae.

This material will be circulated to appropriate technical personnel at Dow for identification of potential areas for further interaction. In the event that a strong overlap of interest is identified, further discussions may lead to the definition of a project for funding.

Funding typically covers the expenses of a graduate student or postdoctoral scientist, plus expendables and a modest amount of university overhead. Funding is on a one-year basis with potential for renewal.

Inquiries may be made at any time. Contact: The Dow Chemical Company, Cooperative Research, 1801 Building, Midland, Michigan 48674; 517/636-0590.

Department of Education

Fulbright-Hays

The U.S. Department of Education has announced two annual Fulbright-Hays Programs: Faculty Research Abroad and Doctoral Dissertation Research Abroad.

The Faculty Research Abroad Program (84.019) offers opportunities to faculty members of institutions of higher education for research and study abroad in modern foreign languages and area studies. The estimated range of awards is \$8,000 to \$60,000 with an average size of \$28,000. An estimated 30 awards will be made for project periods of 3 to 12 months. The application deadline is **November 1, 1991**.

The Doctoral Dissertation Research Abroad Program (84.022) provides opportunities for graduate students to engage in full-time dissertation research abroad in modern foreign languages and area studies. The estimated range of awards is \$4,000 to \$50,000 with an average size of \$17,500. An estimated 90 awards will be made for project periods of 6 to 12 months. The application deadline is **November 1, 1991**.

Absolute preference under both programs is given to projects which focus on Africa, East Asia, Eastern Europe and the USSR, Near East, South Asia, Southeast Asia and the Pacific, or the Western Hemisphere. A competitive preference is further extended to applications that focus on the Near East, Sub-Saharan Africa or Eastern Europe, and which emphasize one of the following disciplines or types of activity: Anthropology (except the Near East and Sub-Saharan Africa), economics, geography, political science, or 19th and 20th century history.

For applications or information, contact: Mrs. Merion Kane (Faculty Research Abroad) 202/708-8763, or Ms. Vida Moattar (Doctoral Dissertation Research Abroad) 202/708-9291, Department of Education, Center for International Education, 400 Maryland Avenue SW, Washington, DC 20202-5331.

United States Institute of Peace

The United States Institute of Peace announces the 1992 cycle of its Solicited Grant competition. This year's topics are:

1. Middle East
 - a. The likely future course of political/social dynamics in the Arab world and in major Arab countries
 - b. Ways to enhance prospects for a peaceful settlement of the Arab-Israeli conflict
 - c. Potential and prospects for increased Turkish influence in Middle East political and economic affairs, including Arab-Israeli relations;
 - d. Long-range security requirements in the Persian Gulf region, including the roles of Iran, Saudi Arabia, and other regional actors.
2. Arms Control
 - a. Export control administration and supplier cooperation in limiting weapons proliferation;
 - b. Regional arms control;
 - c. International arms control.
3. Ethnicity and Conflict
 - a. Recurrent sources of violent ethnic conflict and steps that may be taken to ameliorate such conflict by regional and international organizations;
 - b. The theoretical and practical meaning of self-determination and the role and desirability of self-determination or of varieties of regional or local autonomy in ameliorating conflict;
 - c. Alternative legal approaches and systems of governance as well as policies on language, education, religion and culture, to promote ethnic accommodation.

Applications must be received by January 1, 1992. Contact: Hrach Gregorian, United States Institute of Peace, 1550 M Street, NW, Suite 700, Washington, DC 20005-1708; 202/429-3840.

American Heart Association, Minnesota Affiliate

The Minnesota Affiliate of the American Heart Association has announced its programs and deadlines. The goal of the American Heart Association is to acquire new knowledge regarding the cardiovascular system and the causes, prevention, treatment and control of cardiovascular diseases and stroke. This new knowledge comes from research in accordance with the scientific method. This implies the formulation of a hypothesis, methods to test the hypothesis, acquisition of evidence and publication of results.

The programs and deadlines of the Minnesota Affiliate are:

Post-Doctoral Research Fellowships: Awards are to beginning researchers seeking to work with established Minnesota investigators on cardiovascular research projects. The term of award is one to two years, subject to annual review. Stipends are \$24,000—\$19,000 for salary with \$5,000 which can be used for salary or for the project. The deadline is **December 15, 1991**.

Grants-In-Aid, Beginning: These awards are available to investigators for clinical and basic science research in cardiovascular and related fields. Awards are primarily intended to be of help to the independent investigator establishing a research program at a rank of Assistant Professor or lower. Senior investigators who are changing fields are also eligible for these awards. The term of award is one to two years, subject to annual review. The award is \$24,000 maximum, yearly and the deadline is **December 15, 1991**.

Grants-In-Aid, Standard: These awards are available to investigators pursuing independent research in cardiovascular and related fields. Awards are primarily intended to be of help to the independent investigator at a rank of Assistant Professor or above. The term of award is one to two years, subject to annual review. The award is \$24,000 maximum, yearly; the deadline is **December 15, 1991**.

For application information contact: American Heart Association, Minnesota Affiliate, 4701 West 77th Street, Minneapolis, MN 55435; 612/835-3300.

Faculty Research, Training, and Service Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award she would like mentioned in a future Research Review, please call Mike Moore at 624-9396

Proposal and Award Summary

	Number	Amount
Proposals Submitted August, 1991	289	\$ 28,812,120
Awards Processed August, 1991	177	16,551,348
Proposals Submitted July, 1991 - August, 1991	503	79,371,941
Awards Processed July, 1991 - August, 1991	389	29,403,253
Proposals Submitted July, 1990 - August, 1990	487	75,419,583
Awards Processed July, 1990 - August 1990	580	45,810,111

Management Training and Economics Education for Central and Eastern Europe

G. Edward Schuh, Humphrey Institute
Zbigniew Bochniarz, Humphrey Institute
USDS, Agency for International Development
\$1,494,462 - 07/91-06/92

Teaching Excellence and Teaching for Diversity: A Proposal For Faculty Development at the U of M

Carol Carrier, Curriculum and Instruction
Bush Foundation
\$600,000 - 07/91-06/94

Pathogenesis of Refractoriness to Platelet Transfusion

Douglas J. Christie, Laboratory Medicine and Pathology
American Heart Association
\$234,501 - 07/91-06/96

Knowledge Dissemination and Utilization

Robert H. Bruininks, Educational Psychology
David R. Johnson, Educational Psychology
U.S. Department of Education
\$200,000 - 09/91-08/92

Molecular and Biochemical Properties of the Glucagon Receptor

Victoria Iwanij, Genetics and Cell Biology
NIH, NIDDK
\$199,186 - 05/91-04/92

Testing a Model for Hospital to Home Transition

Margaret J. Bull, School of Nursing
NIH, NCNR
\$199,054 - 05/91-04/92

Base Stable and Composite Ceramic Supports for HPLC

Peter W. Carr, Chemistry
Michael C. Flickinger, Bioprocess Technology Institute
Alon V. McCormick, Chemical Engineering and Materials Science
NIH, NIGMS
\$184,615 - 08/91-07/92

Transitions, Defects and Whiskered Microstructures

Mitchell Luskin, School of Mathematics
Richard D. James, Aerospace Engineering and Mechanics
USDOD, Air Force
\$175,638 - 07/91-06/92

Food and Agricultural Sciences National Needs Graduate Fellowship

Irwin Rubenstein, Genetics and Cell Biology
USDA
\$162,000 - 09/91-08/96

Prenatal Cocaine Exposure and Social Development in Young Children

Scott McConnell, Educational Psychology
Mary McEvoy, Educational Psychology
U.S. Department of Education
\$146,936 - 09/91-08/92

Type IV Collagen Peptides-Receptors in Corneal Function

Leo T. Furcht, Laboratory Medicine and Pathology
NIH, NEI
\$129,906 - 05/91-04/92

Basic Research on the Improvement of Magnetostrictive and Shape Memory Materials

Richard D. James, Aerospace Engineering and Mechanics
USDOD, Navy
\$128,000 - 07/91-07/94

Pancreas Transplantation and Diabetic Nephropathy

Michael W. Steffes, Laboratory Medicine and Pathology
S. Michael Mauer, Pediatrics
David E. Sutherland, Surgery
NIH, NIDDK
\$120,851 - 05/91-04/92

C. Elegans Embryonic Development

Jocelyn E. Shaw, Genetics and Cell Biology
NIH, NICHD
\$117,287 - 08/91-07/92

Training Personnel for the Education of the Handicapped

Jennifer York, Educational Psychology
U.S. Department of Education
\$113,678 - 09/91-08/92

FY 1991 Minnesota Water Resources Research Institute Program

Patrick L. Brezonik, Civil and Mineral Engineering
USDI, Geological Survey
\$104,574 - 07/91-06/92

DNA Dynamics in Strongly Interacting Solutions

Victor A. Bloomfield, Biochemistry (CBS)
NSF
\$103,000 - 07/91-12/92

Growth and Protein Expression of Eukaryotic Cells

Friedrich Sreenc, Bioprocess Technology Institute
NSF
\$102,104 - 07/91-10/92

Motor Control of Bimanual Movement Sequences

John F. Soechting, Physiology
NSF
\$91,115 - 07/91-12/94

Beta-Adrenergic Mechanisms & Myocardial Ischemia

David C. Homans, Medicine
American Heart Association
\$87,780 - 07/91-06/93

Asymptotic Solutions of Differential Equations

Yasutaka Sibuya, School of Mathematics
NSF
\$37,500 - 06/91-11/92

Efficiency Rounds for Semiparametric Discrete Choice Models

T. Scott Thompson, Economics
NSF
\$21,119 - 07/91-12/92

Evaluation of Pyrus for Tolerance to Environmental Stresses

Harold Pellett, Horticultural Science

USDA
\$18,900 - 06/91-05/93

The Bill of Rights and Political Tolerance

John L. Sullivan, Political Science

National Council for the Social Studies
\$7,899 - 07/91-12/91

NCR Communication and Cooperation Technology Laboratory

Marshall Scott Poole, Speech-Communication

NCR Corporation
\$30,639 - 06/91-05/92

In-Situ Measurement of Interfacial Mass Changes with Chemically Milled AT-Cut Quartz Crystals

Michael D. Ward, Chemical Engineering and Materials Science

NSF
\$40,000 - 09/91-02/93

Microsphere-Induced Aggregate Cultures

Wei-Shou Hu, Chemical Engineering and Materials Science

Solvay Animal Health, Inc.
\$27,300 - 06/91-06/92

Bioremediation of Contaminated Soils - Aquifers on Reilly Site

Walter J. Maier, Civil and Mineral Engineering

ST of MN, Pollution Control Agency
\$70,000 - 07/91-06/93

Silicon Processing with X-Ray Lithography

Anand Gopinath, Electrical Engineering

Greg Cibuzar, Electrical Engineering

Stephen A. Campbell, Electrical Engineering

Semiconductor Research Corporation
\$40,000 - 05/91-12/91

Novel Topology DC-DC Converter with Bidirectional Power Flow

Ned Mohan, Electrical Engineering

Electric Power Research Institute
\$53,545 - 08/91-07/92

Effects of Salt Additives on Concrete Degradation

Iwao Iwasaki, Mineral Resources Research Center

Ji Won Jang, Mineral Resources Research Center

St of MN, Dept of Transportation
\$35,000 - 06/91-06/93

A Theoretical Study of Time-Dependent Magnetosphere-Ionosphere Coupling on Intermediate and Small Scales in the Auroral Zone

Robert Lysak, School of Physics and Astronomy

NASA
\$51,277 - 05/91-04/92

Incorporation of Resistance to Green Peach Aphid

Edward B. Radcliffe, Entomology

Florian I. Lauer, Entomology

David W. Ragsdale, Entomology

USDA
\$36,165 - 06/91-05/92

Molecular Analysis of Stamen-Specific Gene Function During Tomato Pollen Development

Alan G. Smith, Horticultural Science

NSF
\$80,000 - 07/91-12/92

Plasmalemmal Currents in Malignant Hyperthermia

Esther M. Gallant, Veterinary Biology

American Heart Association
\$44,000 - 07/91-06/92

Establishment of a Soybean Genome Database

Nevin Dale Young, Plant Pathology

USDA
\$50,000 - 07/91-05/94

Effect of Three Herbicides on Nontarget Forest Plants

Marna Butler-Fasteland, Forest Resources

Edward I. Sucoff, Forest Resources

USDA, Forest Service
\$16,000 - 05/91-09/92

Assessment of Current Status of State Regulation of Private Forestry Practices

Paul V. Ellefson, Forest Resources

USDA
\$17,000 - 05/91-09/92

North Central Tree Volume Equation Data Base

Thomas E. Burk, Forest Resources

USDA, Forest Service
\$11,500 - 07/91-06/92

Molecular Mechanism of Calcium Transport

David D. Thomas, Biochemistry (MS)

American Heart Association, MN Affiliate
\$24,000 - 07/91-06/92

Purine Nucleoside Phosphorylase Gene Insertion and Expression

R. Scott McIvor, Institute of Human Genetics

March of Dimes
\$40,000 - 07/91-06/92

Study of Gene Methylation in the Chromosomal Translocation Associated With Chronic Myelogenous Leukemia

Craig Litz, Laboratory Medicine and Pathology

American Society of Hematology
\$30,000 - 07/91-06/92

Mechanisms of A-LAK Target Recognition and Killing

Jeffrey Miller, Medicine

Philip B. McGlave, Medicine

NIH, NHLBI
\$33,800 - 07/91-06/92

Extracellular Matrix Composition in the Kidney in Type I Diabetes

Dan Zhu, Pediatrics

S. Michael Mauer, Pediatrics

Juvenile Diabetes Foundation
\$28,000 - 07/91-06/92

Aerosol Penetration Behavior of Respirator Valves

Lisa M. Brosseau, School of Public Health

CDC, NIOSH
\$18,102 - 06/91-05/92

Red River Region Economic Developers Network Planning/Strategy

Bruce Brorson, Division of Business, Crookston

Northwest Minnesota Initiative Fund
\$8,255 - 07/91-12/91

Evaluation of Multiple Methods of Assessing Core Body Temperature

H. Hofstrand, School of Medicine, UMD

Richard G. Hoffman, School of Medicine, UMD

Lorentz E. Wittmers, Jr., School of Medicine, UMD

Duluth Clinic Education and Research Foundation
\$13,297 - 08/91-07/92

Lichens and Air Quality in Minnesota and Missouri

Clifford M. Wetmore, Plant Biology

USDA
\$12,500 - 07/91-10/92

5. The Committee shall review grievances, complaints and other concerns regarding the care and use of animals in research, teaching or service.
6. The Committee shall submit reports to the Assistant Vice President as required by applicable policies.

C. Review and Care and Use of Animals Used in Research, Teaching and Service Functions.

1. In order to use animals in research, teaching or service functions, an animal use protocol shall be submitted to the Committee for review and approval using an Animal Usage Form (BA22) prior to the beginning of the study.
2. In order to approve a new animal use protocol or significant changes in an ongoing protocol, the Committee shall conduct a review of those components related to the humane care and use of animals and determine that the protocol is in accordance with applicable policy. In making this determination, the Committee shall confirm that the protocol will be conducted in accordance with the Animal Welfare Act insofar as it applies to the proposed animal usage, and that the protocol is consistent with the *Guide* unless acceptable justification for a departure is presented.
3. Routing of Animal Usage Forms (BA22's) and review procedures.
 - a. Animal Usage Forms (BA22's) received by the Committee secretary that have satisfied all administrative requirements (all applicable questions completed, assurances on file, personnel health program requirements met, signature affixed, etc.) are sent to RAR for initial review.
 - b. BA22's in category "A" (except studies using nonhuman primates) are reviewed initially by RAR veterinarians. A list of these is presented to the Committee membership when the Committee next convenes. The list includes, for each protocol, the principal investigator, department, project title, protocol number, animal species and annual usage. These protocols are usually acted upon as a group, but any Committee member may request Committee review of any study. The review may then be conducted by the full Committee or by the Executive Subcommittee as described in A.7.
 - c. BA22's in category "B" and all nonhuman primate studies are also reviewed initially by RAR veterinarians and their recommendations or comments are made available to the Committee. The protocols are then reviewed by the Committee. En masse, reviews are generally performed on continuing projects previously approved by the Committee and projects eliciting no significant concerns from initial RAR review. Individual review is usually performed on new projects and studies in which initial RAR reviewers express concerns. Individual Committee members may request Committee review of any project.
 - d. BA22's in category "C" receive initial RAR review and full Committee review.
 - e. Animal studies cannot begin until the protocol is approved by the Committee or the Executive Subcommittee.
 - f. Further, the Committee shall determine that the protocol conforms with the institution's assurance and meets the following requirements:
 - i. Procedures involving animals will avoid or minimize discomfort, distress, and pain to the animals, consistent with sound protocol design.
 - ii. Procedures that may cause more than momentary or slight pain or distress to the animals will be performed with appropriate sedation, analgesia, or anesthesia, unless the procedure is justified for scientific reasons in writing by the investigator.
 - iii. Animals that would otherwise experience severe or chronic pain or distress that cannot be relieved will be euthanatized at the end of the procedure or, if appropriate, during the procedure.
 - iv. The living conditions of animals will be appropriate for their species and contribute to their health and comfort. The housing, feeding, and nonmedical care of the animals will be directed by a veterinarian or other scientist trained and experienced in the proper care, handling, and use of the species being maintained or studied.

- v. Medical care for animals will be available and provided as necessary by a qualified veterinarian.
 - vi. Personnel conducting procedures on the species being maintained or studied will be appropriately qualified and trained in those procedures, and shall have participated in the Occupational Health Program.
 - vii. Methods of euthanasia used will be consistent with the recommendations of the American Veterinary Medical Association (AVMA) panel on euthanasia, unless a deviation is justified for scientific reasons in writing by the investigator.
4. Prior to the review, each Committee member shall be provided with a list of proposed protocols to be reviewed. Animal Usage Forms (BA22's) shall be available to all Committee members, and any member of the Committee may obtain, upon request, full Committee review of those protocols. The chair, with Committee approval, shall designate one or more qualified Committee persons to conduct the review and make recommendations to the Committee for approval, require modifications (to secure approval), or full review by the Committee.

Full Committee review will be conducted for, but not limited to, those protocols which involve: 1) nonhuman primates; 2) multiple survival surgical procedures; 3) major survival surgical procedures on nonrodents; 4) pain and distress not relieved by sedatives, anesthetics or analgesic. If full Committee review of any protocol is requested by any member, approval of that protocol may be granted only after review at a convened meeting of a quorum of the Committee and with approval vote of a majority of the quorum present.

No member may participate in review or approval if they are personally involved or personally may benefit from approval of a particular project, nor may a member who has a conflicting interest contribute to the constitution of a quorum. Any member of the Committee who has been involved in the development of the proposal and/or has or will be involved in the implementation of a protocol shall make that information known to the Committee; the member may participate at the discretion of the Committee.

5. Protocols will be approved for a period of no longer than three years and may be reviewed, at the Committee's discretion, anytime during this period.
6. The Committee may invite consultants to assist in the review of complex issues. Consultants may not vote with the Committee unless they are also members of the Committee.
7. The Committee shall notify investigators and the institution in writing of its decision to approve or withhold approval of those activities related to the care and use of animals, or of modifications required to secure Committee approval. If the Committee decides to withhold approval of an activity, it shall include in its written notification a statement of the reasons for its decision and give the investigator an opportunity to respond in person or in writing.
8. The Committee shall conduct continuing review of activities covered by PHS (NIH) policy at appropriate intervals as determined by the Committee.
9. The Committee may suspend an activity that it has previously approved if it determines that the activity is not being conducted in accordance with applicable provisions of the Animal Welfare Act, the *Guide*, Regents' policy, or the institution's assurance. The Committee may suspend an activity only after review of the matter at a convened meeting of a quorum of the Committee and with suspension vote by a majority of the quorum present.
10. If the Committee suspends an activity involving animals, the Assistant Vice President for Health Sciences or designee, in consultation with the Committee, shall review the reasons for suspension, take appropriate corrective action and report that action with a full explanation to the appropriate agencies (e.g., USDA, OPRR, etc.).
11. Protocols that have been approved by the Committee may be subject to further appropriate review and approval by an official of the institution. However, those officials may not approve an activity involving the care and use of animals if it has not been approved by the Committee. Similarly, an institutional official (e.g., department head, RAR director) may administratively suspend an activity previously approved by the Committee. Such a suspension must be immediately reported to the Committee.

The Sponsored Project Information Network (SPIN) is a computerized locator system of funding opportunities (federal, nonfederal, and corporate) for faculty and institutional research, development, and education program support. It is available to University faculty and staff through ORTTA.

Based on a description of your research areas and/or the type of support sought, ORTTA staff will search the SPIN Keyword Index to identify sources within specific areas of interest. The Keyword Index, a taxonomy developed by SPIN to catalog funding sources, is divided into the following ten major classifications:

- **Agriculture/Food/Forestry**
- **Arts/Culture/Humanities/Communications**
- **Business/Economics/Management**
- **Education**
- **Health/Medical Sciences**
- **International Affairs/Area Studies**
- **Miscellaneous/Other**
- **Science/Technology**
- **Social/Behavioral Sciences**
- **Social Welfare/Public Affairs**

The result of a search is a set of profiles of applicable funding sources that provides: 1) the sponsor's name; 2) the sponsor's contact address and telephone number; 3) deadline dates; 4) program titles; 5) objectives or interest areas of the sponsor; and 6) restrictions that would affect the submission of a proposal. This set of profiles is sent to the requestor.

SPIN searches are done free of charge to the requestor. A survey of users of SPIN indicates that the information received from a SPIN search was targeted to their request and a reasonable response time was effected.

For further information regarding the SPIN system or to request a search, please contact ORTTA at 624-9004

SPIN searches are also available through the Research and Development Office in the College of Liberal Arts; the Agricultural Experiment Station; the Research Support Office at Duluth; and the Grants Development Office at Morris.

Effective September, 1990 the SPIN indexes became available for on-line review through ORTTA's Electronic Bulletin Board (See the September, 1990 *Research Review* for information on Bulletin Board contents and access instructions.) The Bulletin Board contains a section devoted to SPIN and offers users the opportunity to review the Keyword Index alphabetically or within the topics shown above.

Since the Bulletin Board is accessible anytime, faculty and staff can browse the indexes at their convenience and find *keyword codes* of interest to them. From within the Bulletin Board they can then forward a note to the Bulletin Board Editor requesting a SPIN search based on the chosen keyword codes (Limit, 20 keywords).

Office of Research and Technology Transfer Administration

Fax Number (612) 624-4843

<u>Title and/or Area of Responsibility</u>	<u>Name</u>	<u>Number</u>	<u>Internet</u>
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Private/Corporate Fdns, Voluntary Health, MN Med, DHHS	Judy Krzyzek	624-2546	krzyzek@ortta.umn.edu
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DHHS, Cities/Counties, Colleges/Universities	Susan Stensland	625-3515	stensland@ortta.umn.edu

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Administrator	Moira Keane	624-1889	moira@ortta.umn.edu
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Duluth

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Research Review Mailing List Information

Faculty:

- The *Research Review* is automatically mailed to all faculty on the Faculty Mail List holding the rank of Assistant Professor and above.
- To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS).
- Please check with your departmental office or AIS (624-9000) if you need assistance.

Staff / Off Campus:

- ORTTA maintains a supplemental mail list for:
 - a) academic staff not included in the above faculty list;
 - b) staff; and
 - c) off-campus
- Additions/changes/deletions to this supplemental list may be initiated by filling out and sending ORTTA the following:

Change
Add
Delete

Name: _____

Department: _____

Address (Campus: Bldg/Rm #) _____

City/State (if off-campus) _____

**For Changes and Deletions,
PLEASE ENCLOSE YOUR
MAILING LABEL!**

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Office of Research and Technology Transfer

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RESEARCH REVIEW

Research and Technology Transfer Administration

November, 1991

ORTTA Honored for Minnesota Project Outreach

The National Association of Management and Technical Assistance Centers (NAMTAC) honored the University of Minnesota Office of Research and Technology Transfer at its Project of the Year awards October 1. Associate Vice President Tony Potami (right) accepted a plaque from NAMTAC President Pat Shaddix for second place in the technology transfer category, in recognition of his and ORTTA's involvement in developing and implementing Minnesota Project Outreach (MPO).

MPO is an interactive technical information network that is now accessible from 400 small Minnesota technical compa-



Minnesota Project Outreach was cited by NAMTAC for its value to Minnesota and as a model for a national technology access network being explored by the Department of Commerce.

Potami began developing the concept for MPO in 1988. In meetings with companies and organizations such as the Minnesota High Technology Council, he found that the chief frustration related to the University's technology transfer services was the inability of companies, especially small and emerging ones, to find researchers and get information

MPO, Continued On Page 18

nies and at 75 public access sites throughout the state. Through personal computers linked to a central computer database site and assisted by experienced technical data base searchers, users have almost instant access to the technical information, expertise, and business assistance they need to help their companies succeed and grow.

NAMTAC is an organization based in Washington, D.C., and composed largely of college and university representatives who help to transfer academic-based information, knowledge, and technology to communities and businesses in order to further economic development and enhance industrial productivity. Minnesota Project Outreach was cited by NAMTAC for its value to Minnesota and as a model for a national technology access network being explored by the Department of Commerce.

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New On the ORTTA Bulletin Board

Agency Contacts

ORTTA has incorporated agency contacts into the CONTACTS section of the Bulletin Board. We have posted the NSF telephone book which NSF has made available in electronic form. It provides an organizational list of NSF staff, their room and phone numbers, and instructions for determining their electronic mail ID's.

NSF Information

NSF has established an Electronic Document Distribution List, and ORTTA has been designated as the distribution point for the University of Minnesota. All documents which are posted to NSF's Science and Technology Information System (STIS) will be forwarded to an e-mail address at ORTTA. ORTTA will post selected STIS items to its Bulletin Board, such as program announcements, guidelines, and sections of the NSF Bulletin.

Want Ads

When requested, ORTTA will place brief advertisements in the *Research Review* that are directly related to research needs, such as: requests for biological materials or samples, offers to share equipment, or indications of interest in specific research collaborations. All contacts and financial arrangements are the responsibility of the individual parties.

If interested, please send your ad to Mike Moore, Editor, *Research Review*, ORTTA, 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415 (campus mail).

RESEARCH REVIEW

Volume XXI/Number 5

November, 1991

Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/91-6/30/94 rates should be used. **The rate agreement is dated July 1, 1991.** This date should be used where required on proposal applications. Please call Marilyn Surbey at 624-4850 with questions on Indirect Costs.

	07/01/91	06/30/94
Research		
On-Campus		40.0
Off-Campus *		21.0
SAFHL		60.0
Hormel		53.0
Other Sponsored Activity		
On-Campus		20.0
Off-Campus *		10.0
Instruction		
On-Campus		52.0
Off-Campus		16.0

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call Vivian Fickling at 624-2009.

Current actual rates from July 1, 1991 through June 30, 1992 are:

Faculty	28.75
Civil Service	25.25
Graduate Assistants	8.50

For proposals being submitted with start dates **after July 1, 1992**, the estimated fringe benefit rates to be budgeted are:

Faculty	31.25
Civil Service	29.50
Graduate Assistants	10.50

Estimated rates after **July 1, 1993** are:

Faculty	28.00
Civil Service	30.50
Graduate Assistants	31.25

As rates change they will be reflected in this section.

CUFS: Up and Running

ORTTA is currently striving to orient itself to the new accounting system and looking forward to returning to "business as usual" in the near future. We are seeking ways to make the transition as easily and quickly as possible. As always, we appreciate your patience and understanding as we all adjust to new policies and procedures.

We particularly appreciate your cooperation as we make chart-of-account corrections over the next several months. We recognize the burden changing account numbers will cause and we will make account number corrections as soon as possible. You will be notified of the new CUFS number when the change is made.

In the meantime, the following information concerns a number of grant-related CUFS issues.

- The purchasing dollar limit on the POT document is \$2,000 on sponsored accounts (the same limit as on nonsponsored accounts). The \$500 limitation printed on the POT form is incorrect and should be disregarded. ORTTA approval is not required on the POT form; however, ORTTA will be reviewing invoices with dollar amounts greater than \$500.
 - Normally, the POT *does not* encumber funds. However, POTs will be entered into CUFS by Financial Operations (and *will* encumber funds) if the grant ending date is within two months. The POT must contain a statement concerning the grant end date. All POTS without such a statement will be returned by Financial Operations to the originating department.
 - Bookstore purchases greater than \$500 will still require ORTTA approval. Such purchases can be made via the IV, which is similar to the current type 11 journal voucher, or the internal purchase order form, which is similar to the current type 06 requisition. When choosing which method to use, please remember that the IV *does not* encumber funds while the internal purchase order *does* encumber. The Bookstores will not process these documents on sponsored accounts over \$500 without ORTTA approval.
 - All documents on ORTTA accounts should be mailed directly to ORTTA. Any documents requiring ORTTA approvals that are received by Financial Operations will be returned to the originating department, delaying processing by several days.
 - Please be careful when assigning the object codes to your documents. The expense classification affects both the reporting to the sponsoring agency and the charging of indirect costs.
 - CUFS reports will be sent to the area coordinators, not the ORG manager.
- Because of the information required by CUFS for account number establishment, ORTTA will no longer be able to provide account numbers the same day they are requested. We are anticipating some delays in assigning numbers in the next several weeks, but will be working to minimize the time from award receipt to account number assignment. We appreciate your patience as we work out the "bugs" in this process.
 - ORTTA Financial reporting staff may be contacting you for copies of November documents on accounts that must have financial reports submitted (usually terminal or grant-year-end) before CUFS reports are available.
 - Please contact ORTTA *immediately* if you have any old account numbers for which you do not know the new CUFS account number.

If you have any questions concerning this information, please contact Marilyn Surbey at 624-4850.

Graduate Assistant Health Care

Graduate Assistants with at least 50% appointments are currently eligible for health care under the **State Insurance Plan** administered by the Employee Benefits Department. Under the State Insurance Plan, graduate assistants with 50-74% appointments pay for coverage themselves. For graduate assistants at 75% or more, the University contributes the majority of the cost of the coverage.

In the fall of 1990, the University implemented the **Graduate Assistant Health Care Plan** which provides health care for graduate assistants with appointments of at least 25%.

Beginning December 16, 1991, (December 1, 1991 for Duluth), Teaching Assistants (9511), Research Assistants (9521) and Administrative Fellows (9531) will *no longer* be allowed to enroll in the State Insurance Plan and will be eligible *only* for the Graduate Assistant Health Plan. However, graduate assistants on the State Insurance Plan as of December 15, 1991 (November 30, 1991 for Duluth), may remain on the plan until the graduate assistant becomes ineligible (i.e. their appointment ends or drops below 50%), they leave the plan, or eligibility is completely phased out December 15, 1993 (November 30, 1993 for Duluth).

If you have questions concerning the transition from the State Plan to the Graduate Assistant Health Care Plan, please call Employee Benefits at 624-9090; if you have questions about the Graduate Assistant Health Care Plan itself, please call the Graduate Assistant Insurance Office at 625-4346.

An Interview with Ettore Infante

A sign behind Dr. Ettore (Jim) Infante's desk illustrates his approach as a University of Minnesota administrator: over a happy turtle moving confidently forward is the message, "Behold the Turtle! It progresseseth only with its neck out." Sticking his neck out, often quite vociferously, was something Infante did many times during his seven years as dean of the Institute of Technology. Named in July by President Hasselmo to succeed Leonard Kuhi as Senior Vice President for Academic Affairs and Provost, and as a candidate for the permanent position, he will need to do the same to prepare the University for a time of major reallocations and budgetary constraints. Infante agreed to this interview despite his heavy schedule, which gives him little time for what he says is his most important immediate concern: "learning about the rest of the University besides IT."

What are the main issues you see facing University researchers at this time?

I would say there are really three issues that are of considerable concern to our faculty as researchers and as part of the research enterprise. The first one is that it's an extremely competitive situation, partly because the totality of funds have not kept pace with the size and the costs associated with the research community, but also partly because the costs of research have significantly increased. The (Leon) Lederman report, for example, made quite a point of the low morale of certain segments of the research community. On the other side there were so many of the responses to this, for example by Bob White, the president of the National Academy of Engineering, who pointed out that the federal government is spending more money than ever. I think both elements are true. But there is no doubt about it that from

Funds are very tight and the situation is very competitive

the viewpoint of the individual researcher, funds are very tight, and the situation is very competitive, so each researcher finds himself or herself spending a very large amount of time in writing proposals, staying aware of where the research opportunities are, rather than doing the research and teaching.

I have been extremely pleased to see the very high success ratio for our faculty in receiving grants (for FY 91 the number of awards was 76 percent of the number of proposals). This morning at the Board of Regents meeting I was telling them that this is a great indicator of the quality of our faculty, a faculty that last year managed to bring in more than \$250 million to the University of Minnesota. That is the strength of the faculty. I think it is going to be very hard to

maintain this level of success for a couple of reasons. First, the research community is still growing, and second, the total funds available for research are not matching the combination of growth of the research community and inflation. Therefore I would suspect that it is going to be extremely difficult for any institution to maintain its success ratio in the future, and that includes the University of Minnesota.

The second issue is that at all universities, and especially so at this one, many researchers feel that somehow the University



Ettore Infante

has not kept up with the kind of infrastructure that they need to do their research. We have lots of problems that are associated with space; in some cases with lack of space but in most cases with lack of appropriate space for the type of work that they want to do. I sincerely hope that we at the University are going to be changing some of our policies of in-

vestment, because we really must overcome this major difficulty.

The third difficulty, which I think is a more pervasive one but I don't think is facing individual researchers as much as it is facing the entire research enterprise, is that in these days scientific research is being looked at with quizzical, and some cases skeptical eyes by the entire community, and in particular by members of the Congress of the United States and even by political leaders locally. Whether it is questioning the investments of the nation in basic research, or whether it is questioning the integrity of the research enterprise, or whether it is questioning use of indirect costs for inappropriate purposes, this kind of questioning is not designed to make a positive contribution to the morale of the research enterprise that already feels constrained. As a result I don't think the research community has the level of comfort today that it had seven to ten years ago.

Another point of concern and a contributor to low morale in the research community is that the basic sciences, not just the mathematical and physical sciences and engineering but also in the basic medical sciences, are not as attractive to young people as they used to be. As a result we see senior faculty members disappointed that the young women and

men of our society are not beating at their doors to enter and participate as undergraduate and graduate students and to enter the research enterprise.

How do you view the importance of the University's interactions with industry, especially in light of Governor Carlson's vetoes of funding for 19 research centers and his call for the University to look to industry and elsewhere for research funding?

First of all I have a profound disagreement with Governor Carlson's viewpoint. If you look at the funding provided by the State to the University, I call that "core funding." The University is being provided about \$470 million out of a total budget of \$1.7 billion; that's a multiplication factor of close to four. If the State does not provide the University with that core funding, my fear is that the total activities of the University are going to go down not just by the amount of funds lost from the State, but multiplied by a factor of four. It is well known that it is from funds controlled by the State that we provide matching funds for grants and contracts. State funds also provide for some of the costs of the infrastructure that enable us to obtain external resources. Indeed I would say that the right way to look at the relationship between internal funds and external funds, whether they be federal or industrial funds, is as a question of leverage. You can not leverage unless the lever has two sides.

I think industrial funds and federal funds are extremely important, but I think we at the University of Minnesota must with considerable aggressiveness compete with other institutions for those funds. We have been highly successful at doing that. But it seems to me that if anybody thinks in terms of substitution of those funds for internal funds, I am afraid that is a fallacious view, because of the leverage I was referring to. One dollar of state funds provides a totality of four dollars; if that is the case and you take away one dollar, you may be able to replace that dollar from somewhere else but you lose the four. It's a very different type of arithmetic than one of substitution. It is for that reason that the University—and I certainly will be as aggressive as possible participating in this activity—will try to do our best to make very sure that the funds vetoed by the Governor are restored. And I sincerely hope that the Governor will be a participant in bringing about this restoration, which in my mind is not only for the benefit of the University, it is for the benefit of the entire health and economic well being of the State of Minnesota.

There are many ways of defining technology transfer; what do you think of as being parts of the University's technology transfer program?

The University of Minnesota, like any institution of higher education, has always been in the business of technology transfer. After all, one of the most effective ways of technology transfer is through our graduates. Our graduates, both

from the undergraduate and graduate levels, provide a constant input to the rest of society, whether at the industrial level, or through participation in government or business activities. I was very pleased, but not really surprised, by the recent survey report that more than 400 companies have been started by graduates of IT. After seven years with the

Our graduates provide a constant input to the rest of society

Institute, I sort of had a good feel for the large number of companies, I just had never added them up, in particular the number of employees and annual sales; those frankly turned out to be twice as big as I would have guessed. And I have a feeling that as more alumni hear about the survey the numbers will go up another 25 percent. Talk about technology transfer! What better technology transfer than for the graduates of the Institute of Technology, given their education, given the kind of activities they've undertaken at the University, to go out and create companies as in the example of Medtronic and Rosemount. That is proof positive of technology transfer at work.

Secondly, publication, something we pay considerable attention to, is also an essential element of technology transfer. It's the third element (introducing new processes and products) that we have come to call real technology transfer. The University of Minnesota, as a land-grant university, has quite a tradition in this area. We started doing this more than 100 years ago in the agricultural field. Now we are learning and actively making contributions not only in the agricultural and cultural arenas, but also in the industrial arena. Our data on patents and licenses indicate this.

Even more important is the enormous amount of technology transfer that takes place through individual interactions between faculty and staff members of the University and the industrial community. I've heard some very good things about Minnesota Project Outreach (MPO) from the industrial community, about how a small amount of information and advice has been very beneficial for them. From within the University, I've heard from faculty members such as Professor Ephraim Sparrow, in the Department of Mechanical Engineering, who feels that he has really made a very positive contribution. I have great expectations for the continued success of MPO.

MPO brings an extra dimension of increased contact with industry and practical problems to the University. At the same time that I am absolutely convinced this is an excellent thing, it has to be handled with delicacy, because the essential contract between society and a university is teaching and learning. One of the things that I want to make sure continues is that faculty and staff members and students don't

Infante, Continued On Page 20

Grantseekers' Guide to PHS Support

Excerpted from the *Federal Grants and Contract Weekly*, September 16, 1991

There's no simple way to play the federal grants game—it takes effort and persistence. But there are methods, tips and aids that can make the job easier. John Edmiston, a private consultant, is teaching the new grants and contracts workshop being offered by the Public Health Service (PHS) as an overview for beginning applicants and recipients (see article next page).

The bottom line, says Edmiston, is that grantseekers must study the system and learn how to keep up to date. Following are some of what he tells workshop attendees they need to know:

ABC's and RFAs

Funding mechanisms differ vastly in purpose and procedure. Agencies provide funds through *grants* and *cooperative agreements* when the goal is to support or stimulate recipient activities for the general good; and *contracts* when it is to buy specific goods or services for an agency's own use. Cooperative agreements have more strings attached than regular grants—they assume substantial involvement of agency staff in the project—but they are still grants.

At DHHS the main objective (usually) is support, so most funding is by grants. DHHS, along with other agencies, usually uses a *request for applications* (RFA) to generate response to a grant announcement, as opposed to a *request for proposals* (RFP), usually reserved for contracts.

Read the program announcement very carefully. Among other things, it specifies the type of award.

Lay of the Land

Grant-making is a complex system, and Congress, agencies and the Office of Management and Budget all play critical roles. Everything starts with Congress, which authorizes agencies to fund programs and appropriates money to run them. Tracking legislation in areas of interest can give grantseekers an edge. Sometimes one can get involved very early in the game by learning about new programs and the changing fortunes of existing programs.

Marching Orders

Congress tells agencies what to do by passing laws, although OMB generally controls the grants arena by formulating broad government policies. DHHS and other agencies tell applicants and recipients what to do by issuing specific programmatic and administrative regulations—their instructions to applicants.

Applicants and grantees need to build a library of relevant OMB guidance circulars, including cost principles for various types of recipients and rules that cross agency lines in areas such as drug-free workplace. Collections should also include regulations, policy manuals and other specific granting agency guidelines. [Editor's note: Such collections are maintained by ORTTA and access is available upon request].

Who Can Play

In the case of mandatory and formula grants, Congress says not only who gets the money, but how much. Under discretionary grant programs, however, agencies—using various review methods—may choose. Many applicants may compete for a limited number of grants; 100 good applications may result in two awards.

Necessary Tools

Essential tools grantseekers need to dig out information on opportunities include: the *Catalog of Federal Domestic Assistance* (CFDA), the *Federal Register* and the *Commerce Business Daily*. [All available from ORTTA].

In addition to keeping applicants up to date on important rules, the *Federal Register* also lets them in on the rulemaking process. Most regulations appear in the publication at least twice, including in draft form inviting public comment.

Form and Function

There's a correct form for every aspect of the application process. Applicants must make sure they are following the right rules and using the right forms—and their current versions—every time they apply.

Public Health Service

Training Course

The Public Health Service (PHS) has announced a course: "Orientation to U.S. Dept of Health and Human Services Grants and Contracts Activities for Applicants and Recipients of Awards," being presented at locations around the country during FY 1992.

This is a 2-day course designed to provide applicants for and recipients of HHS grants and contracts a better understanding of the procedures and expectations in applying for funding and administering an award from HHS. Day one of the course concentrates on the grants process; day two is devoted to contracting. Students will be provided with a broad overview of conducting business with HHS including: How the Department is organized; when the grant or contract mechanism is used; how the HHS contracts and grants processes are structured; how to identify grant and contract funding opportunities; how to submit effective proposals; and how to properly administer a contract or grant once it has been awarded.

Dates, locations and the application deadline for late spring and summer 1992 are as follows:

1992 Dates	Locations	Appl Deadline
May 18-19	San Francisco, CA	March 10
Jun 15-16	Rockville, MD	March 10
July 13-14	Boston, MA	March 10
August 10-11	Chicago, ILL	March 10

Send a letter of application to: Training Coordinator, Grants Policy Branch, Division of Grants and Contracts, Office of the Assistant Secretary for Health, HHS, Room 17A-45, Parklawn Building, 5600 Fishers Lane, Rockville, MD 20857.

Licensing Consultant to Assist ORTTA with Bioproducts Contacts

In an effort to enhance licensing of biotechnology and biomedical inventions disclosed to the Office of Patents and Licensing, the Office of Research and Technology Transfer has retained the services of Bernard Wolnak and Associates (BWA). Drs. James E. Flinn and Bernard Wolnak will be ORTTA's primary contacts at the 28-year-old multidisciplinary bioproducts consulting firm, which is based in Chicago, Illinois.

BWA has extensive contacts with companies in the United States, Europe, Japan, and other countries that manufacture and sell bioproducts of all kinds. These companies represent the pharmaceutical, health care, food, biotechnology, chemical, and agribusiness industries. Because of its knowledge of these industries' needs, BWA is qualified to evaluate the technical and economic potential of inventions appropriate for these industries. More importantly, the firm has developed an extensive set of international contacts within companies. The ability of BWA to directly contact the proper executives will serve as a starting point for targeting, initiating, and carrying out technology transfer efforts.

The Office of Patents and Licensing has already begun working with BWA to identify potential licensees for inventions with a biomedical, biochemical, or microbiological base, e.g., novel therapeutics and diagnostics, medical devices, drug delivery methods, and fermentation products and processes. The final licensing arrangement resulting from these contacts remains the responsibility of ORTTA, which will continue to closely involve faculty, staff, and student inventors in these discussions.

ADAMHA

Notice of Policy Change

The Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) announces that effective immediately, applications for the Individual National Research Service Award (NRSA) must be accompanied by *at least* three completed, sealed, referenced letters (as described in the instructions for application form PHS 416-1). Applications not containing these letters will be returned to the applicant without review.

The receipt and review schedule for NIH and ADAMHA NRSA Individual Fellowship awards is unchanged: **January 10** (initial review Jun/Jul, approximate start date in August), **May 10** (initial review Oct/Nov, approximate start date in January), and **September 10** (initial review Feb/Mar, approximate start date in May), annually.

Committee on the Use of Human Subjects in Research

Deadlines and Meeting Dates

The deadlines and meeting dates for the Committee on the Use of Human Subjects in Research listed below should be used as a guide in preparing submissions to the Committee. Applications will be accepted at any time, but cannot be scheduled for review at the next meeting if they are not received prior to the deadline for that meeting. The deadlines do not vary; they are 4:30 P.M. on the date indicated. Research applications should be submitted as early as possible to ensure agenda space for an upcoming meeting. Occasionally meeting dates will change due to quorum requirements or other schedule changes.

The deadlines apply to all research reviewed at the full Committee level. Research involving minimal risk and research exempt from Committee review may be submitted to the Committee at any time.

As a cost saving measure, researchers are encouraged to mail applications using **Campus Mail** service:

Human Subjects Committee
1100 Washington Avenue South, Suite 201
Minneapolis Campus Mail

For out-of-town and off campus mailing purposes:

Human Subjects Committee
University of Minnesota
1100 Washington Avenue South, Suite 201
Minneapolis, MN 55415

If you have any questions, please call the Committee office at 624-9829.

	<u>Deadline</u>	<u>Meeting</u>
November, 1991		
HS 01	Oct 25	Nov 06
SS 03	Nov 01	Nov 13
HS 02	Nov 08	Nov 21

December, 1991

HS 01	Nov 22	Dec 04
SS 03	Nov 27	Dec 11
HS 02	Dec 06	Dec 19

January 1992

HS 01	Dec 27	Jan 08
SS 03	Jan 03	Jan 15
HS 02	Jan 10	Jan 23

February 92

HS 01	Jan 31	Feb 12
SS 03	Feb 07	Feb 19
HS 02	Feb 14	Feb 27

March, 1992

HS 01	Feb 28	Mar 11
SS 03	Mar 06	Mar 18
HS 02	Mar 13	Mar 26

April, 1992

HS 01	Mar 27	Apr 08
SS 03	Apr 03	Apr 15
HS 02	Apr 10	Apr 23

May, 1992

HS 01	May 01	May 13
SS 03	May 08	May 20
HS 02	May 15	May 28

June, 1992

HS 01	May 29	Jun 10
SS 03	Jun 05	Jun 17
SS 02	Jun 12	Jun 25

HS = Health and Biological Science Committee(s)
SS = Social and Behavioral Sciences Committee

NOTE: Meeting dates are subject to change; deadlines are strictly enforced.

The Nation's Health Care Spending

The Nation's spending on health care reached \$666.2 billion in 1990, a 10.5% increase over 1989, according to Health and Human Services Secretary Louis Sullivan.

Health spending in 1990 increased more than twice as fast as the 5.1% growth rate of the economy, as measured by the gross national product (GNP), said Sullivan. Further, the na-

tional health expenditure claimed 12.2% of the 1990 GNP, up from 11.6% in 1989.

The total investment in research from all sources was \$12.4 billion in 1990, according to figures compiled by the Health Care Financing Administration, Office of the Actuary, and the Office of National Health Statistics. Other figures show that spending on health care in 1990 reached 15.3% of all federal expenditures, up from 14.7% in 1989.

NSF Receives 11.2% Increase

House and Senate conferees have agreed to an FY 92 budget of about \$2.6 billion for the National Science Foundation (NSF). The figure represents an 11.2% increase over FY 91.

An additional \$105 million for Antarctic logistics and environmental clean-up activities is pending in the Department of Defense (DoD) appropriations bill. If these DoD funds materialize, the total available to support NSF activities will amount to about \$2.7 billion, an increase of 15.8% over FY 91.

Approximately \$1.9 billion has been provided for Research and Related Activities, a 10.9% raise over FY 91. In the area of Education and Human Resources, the conferees provided \$465 million, an increase of \$142.6 million or 44% over FY 91.

Also, the Senate's proposal to provide \$33 million to support a new Academic Research Facilities and Instrumentation Program prevailed in conference. The U.S. Antarctic Program was provided \$88 million, with the balance pending in the DoD appropriations bill.

Summary of NSF's FY 92 Budget Request

(in millions)

<u>Program</u>	<u>FY 91</u>	<u>Request</u>	<u>House</u>	<u>Senate</u>	<u>Conference</u>
Research	\$1,694.2	\$1,963.5	\$1,960.5	\$1,926.0	\$1,879.0
Education	322.4	390.0	435.0	465.0	465.0
Inst/Fac	20.0	50.0	20.0	46.0	33.0
Antarctica	175.0	193.0	193.0	88.0	88.0
Salaries/Ex	101.0	122.0	109.0	117.0	109.0
IG	3.0	3.5	3.3	3.5	3.5
Total	\$2,316.1	\$2,722.0	\$2,720.8	\$2,645.5	\$2,577.5

R&D Rankings From Two Viewpoints

Researchers at the University of Arizona's Center for Higher Education have developed a method of evaluating an institution's research and development activity based on more than just total R&D expenditures. Randall H. Groth, Kenneth G. Brown, and Larry L. Leslie told the journal *Science* that their method, called a Research Activity Index, provides a multidimensional analysis of an institution's research strength. The index results in a single score for each institution based on a compilation of 11 weighted variables, including: Ph.D.s awarded; R&D expenditures from federal, local government, industrial, and institutional sources; equipment expenditures; numbers of graduate and postdoctoral students in science and engineering; and library size.

The table at right is reprinted from the Sept. 27, 1991 issue of *Science*. This table is based on 1987 data, the most recent year for which Research Activity Index (RAI) figures are available. The researchers are reportedly updating their figures, and any new rankings released by the group will be published in a future issue of *Research Review*.

University R&D Activity, 1987 *

Two Alternate Rankings for Top 10 Institutions

<u>NSF</u>	<u>U. of Arizona's RAI</u>
1. U. Wisconsin-Madison	MIT
2. Cornell University	U. Wisconsin-Madison
3. Stanford University	Cornell University
4. U. California-Berkeley	Stanford University
5. Harvard University	U. Michigan
6. MIT	U. Minnesota
7. U. Illinois-Urbana	Texas A&M University
8. U. Minnesota	U. California-Los Angeles
9. U. Michigan	U. Illinois-Urbana
10. U. California-Los Angeles	U. Washington

* This was the latest year for which figures were available when the analysis was performed; the RAI is now being updated.

Animal Care and Use Committee

Filing Animal Usage Forms

Public Health Service (National Institutes of Health) Policy and the Federal Animal Welfare Act require the University Animal Care Committee (UACC) to review and approve all studies involving the use of laboratory animals in research and instructional programs. Before beginning a laboratory animal research study, University scientists must submit a completed Animal Usage Form (AUF) to UACC at Box 351 UMHC, Minneapolis Campus. The AUF form (Business Administration Form 22) is available from the General Storehouse, 628-1878, under order number GS91378.

I. Filing and Updating Animal Usage Forms

A. Procedures for submission and review of AUFs

1. If your proposal is submitted through the Office of Research and Technology Transfer (ORTTA), the AUF is sent with the proposal to ORTTA. ORTTA forwards the form to UACC.
2. If your research proposal is not submitted through ORTTA, send the AUF directly to:
University Animal Care Committee
Box 351, UMHC
420 Delaware Street
Minneapolis, MN 55455 (campus mail)

B. Review process

It is important that all sections of the AUF relevant to your studies be completed. If the responses are incomplete or illegible, the AUF will be returned to the principal investigator. AUFs are reviewed initially by Research Animal Resources (RAR) faculty. If there are questions, the initial reviewer contacts the principal investigator or the AUF is returned for modifications as required. AUFs received by UACC within 3 days of a scheduled Committee meeting are placed on the meeting agenda, provided the initial review by RAR has been completed. UACC usually meets twice monthly.

NOTE: The AUF can be reviewed by UACC only if all personnel listed on pages 1 and 2 of the AUF have Certification Statements on file. See Section II.

C. Notification process

After review and approval of AUFs by UACC, copies of the face page of the AUF, with all appropriate signatures, are sent to the principal investigator, ORTTA and to the agency to which the grant proposal has been submitted. ORTTA notifies only NIH of the Committee approval. All other funding sources are notified by the UACC secretary. Please allow 5 days for processing after approval.

D. Protocol Numbers

After UACC approval, each AUF is assigned a protocol number. The protocol number is located on the face page of the AUF. This number must be given when placing an order for animals through the RAR order desk (624-6169) and is also placed on the animal's cage card. All facilities require a protocol number to obtain animal housing. The species of animals and the number of each species ordered cannot exceed those indicated on an approved AUF.

E. Length of approval

Approved AUF on file with UACC must undergo UACC review and approval every three years per Public Health Service Policy. (*Public Health Service Policy on Humane Care and Use of Laboratory Animals*, revised 9/86, page 8, item 5). Significant changes in animal usage on approved protocols require a written update if UACC approves a protocol for less than three years or has any other contingencies associated with approval (see also F.5.). The principal investigator is notified of UACC's decision in writing.

F. Miscellaneous Information

1. Updating or Minor Modifications to Ongoing Studies

- a. If you require more animals or a different species of animal in a study with an approved UAF, please submit a written request with a brief justification to UACC (Box 351 UMHC). This request must be approved by UACC before additional animals can be ordered.
 - c. Changes in funding sources or research project titles on an already approved AUF can be made by adding all new information to the principal investigator's copy of the face page of the AUF and returning it to the secretary of UACC. The revisions are incorporated into the original AUF and copies are forwarded to ORTTA, the funding source, and the principal investigator.
2. The University's NIH Assurance Number is A3456.
 3. Special documentation that needs to be signed by the Director of Research Animal Resources and the UACC chair should be sent to the UACC secretary. Allow 5 days for processing.
 4. AUFs expire every three years or sooner, as determined by UACC. If the project in question is to be continued, a new AUF must be filed with the Committee. When an approved AUF is about to expire, a reminder is sent to the principal investigator.

II. Certification Statements

All personnel involved with animal use are required to read Section One of the *University Animal Care and Use Manual* and file a Certification Statement with the University Animal Care Committee before the AUF will be reviewed by the Committee. The Certification Statement is located in the Manual, appendix 19. Copies of the Certification Statement should be made by each Department.

III. Occupational Health Program

The University has an Occupational Health Program (OHP) for personnel with laboratory animal contact. The program consists of health monitoring and immunizations, plus occupational health information and urgent care for injuries. The Boynton Health Clinic distributes health history questionnaires to all employees listed on the AUF. The OHP for an individual employee is based upon the information provided in the health history questionnaire and may include recommendations on tuberculosis (TB) testing, chest x-rays, diphtheria-tetanus inoculations, rabies immunizations, toxoplasmosis titres and information allergies. The purpose of the program is to protect the health of people working with research animals. Names of all personnel listed on pages 1 and 2 of the AUF are forwarded to Boynton Health Service for participation in this program. For more information call 625-1430.

Please direct questions or comments concerning filing AUFs to:

Secretary
University Animal Care Committee
Research Animal Resources
Box 351 UMHC
Minneapolis Campus
624-5663

Fringe Benefit Rates

The Fringe Benefit Rates shown below will be charged against salaries during the period
July 1, 1991 through June 30, 1992.

SUMMARY - JULY 1991 THROUGH JUNE 1992

	<u>Academic %</u>	<u>Civil Service %</u>	<u>Grad Assistants %</u>
Retirements			
Faculty	12.76	0.00	0.00
MSRS	0.00	4.57	0.00
FICA	7.17	7.19	0.00
Insurance	5.22	10.19	4.92
Workers' Compensation	0.00	2.47	0.00
Unemployment Compensation	0.02	0.22	0.00
Tuition	<u>3.58</u>	<u>0.61</u>	<u>3.58</u>
<u>Total</u>	28.75	25.25	8.50

For the periods beyond June 30, 1992,
the following Estimated Fringe Benefit Rates should be used for budgeting on sponsored project proposals.

SUMMARY - JULY 1992 THROUGH JUNE 1993

	<u>Academic %</u>	<u>Civil Service %</u>	<u>Grad Assistants %</u>
Retirements			
Faculty	12.81	0.00	0.00
MSRS	0.00	4.58	0.00
FICA	7.63	7.64	0.00
Insurance	6.86	13.79	6.58
Workers' Compensation	0.00	2.54	0.00
Unemployment Compensation	0.03	0.28	0.00
Tuition	<u>3.92</u>	<u>0.67</u>	<u>3.92</u>
<u>Total</u>	31.25	29.50	10.50

SUMMARY - JULY 1993 THROUGH JUNE 1994

	<u>Academic %</u>	<u>Civil Service %</u>	<u>Grad Assistants %</u>
Retirements			
Faculty	12.83	0.00	0.00
MSRS	0.00	4.59	0.00
FICA	7.61	7.63	0.00
Insurance	7.43	14.71	6.42
Workers' Compensation	0.00	2.55	0.00
Unemployment Compensation	0.03	0.31	0.00
Tuition	<u>0.10</u>	<u>0.71</u>	<u>24.83</u>
<u>Total</u>	28.00	30.50	31.25

If you have questions regarding fringe benefit rate development, please call
Vivian Fickling, Accounting Records and Services, 624-2009.

National Institute of Mental Health

Special Issues in Women's Mental Health PA-91-100

Funds are available from the National Institute of Mental Health (NIMH) to expand the full spectrum of research (basic, clinical, and epidemiological studies) on issues pertinent to women's mental health over the life course. Studies are encouraged in basic science issues, premenstrual syndrome and late luteal phase dysphoric disorder, reproductive behavior and mental health, postpartum mental disorders, mood and behavior changes associated with mental health aspects of the menopause, and gender differences in the etiology, treatment, and prevention of mental disorders. Multidisciplinary research projects are encouraged.

NIMH expects to award \$3 million in 1992 for 22 new and continuing grants on mental aspects of reproductive function in women.

This is an on-going program and is available under a variety of support mechanisms, including individual research grants, FIRST Awards and Small Grants (R-awards); Program Project Grants (P-awards); Career (K-awards); training (T-awards); and pre- and post-doctoral (F-awards). R- and K- awards have due dates of February 1, June 1 and October 1; F- and T- awards have due dates of January 10, May 10 and September 10.

For further information contact: Steven J. Hudak, Chief, Grants Management Branch, National Institute of Mental Health, 5600 Fishers Lane, Room 7C-26, Rockville, MD 20857; 301/443-4596. A copy of the announcement is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Fogarty International Center

Collaborative Support to East Europe

The Fogarty International Center of the National Institutes of Health (NIH) is contacting scientists in the Soviet Republics and the Baltic States with information about opportunities for collaborative research support with U.S. scientists.

U.S. scientists with active research grants are encouraged to apply for awards so as to expand their research through collaboration with foreign scientists in central and eastern Europe. Funds will be awarded to U.S. institutions to support U.S. investigators and their foreign collaborators.

For further information, contact: Office of Planning, Evaluation and Public Affairs, National Institutes of Health; 301/496-1491; fax: 301/402-0779.

NEH, NSF, FIPSE

Projects in Science and the Humanities

A joint project between the National Endowment for the Humanities (NEH), the National Science Foundation (NSF), and the Fund for the Improvement of Postsecondary Education (FIPSE) entitled Projects in Science and the Humanities has been announced. The purpose is to support the development of undergraduate courses and curricula based on systematic linkages among the natural sciences, the social sciences, and the humanities. Projects should be based on rigorous study of disciplinary and multidisciplinary texts and topics. The outcomes of successful projects should be curricular models and materials that have the potential for wide utility and replication.

Specific goals are to: 1) Promote coherence in undergraduate general education or enrich majors typically prone to specialization; 2) Promote the practice of scientific literacy and humanistic inquiry among all students; 3) Help students to understand that scientific and humanistic ways of knowing can help them to be more just, responsible, and productive citizens; and 4) Include broad collaboration among faculty from several disciplines.

Completed application should be submitted to one of the participating agencies by **April 1, 1992**, following the guidelines of that agency. Federal funding should be used as seed money and not for operational costs; substantial cost sharing by the institution will be required. Contact: NEH, 202/786-0380; NSF, 202/357-7051; or FIPSE, 202/708-5750.

Procter & Gamble Company

Exploratory Research

The Procter and Gamble Company has announced its annual University Exploratory Research Program. The focus of this program is on exploratory research which might not otherwise be funded because it is too speculative even though it has intriguing potential. Exploratory research intended to be supported falls within the broad areas of the physical and biological sciences.

Three proposals are selected for funding each year for up to \$50,000 per year for three years. Grants are intended to be used to initiate research and are not renewable.

Applications are due **January 10, 1992**. Contact: Brandon H. Wiers, Ph.D., Program Administrator, University Exploratory Research Program, Procter & Gamble Company, Miami Valley Laboratories, PO Box 398707, Cincinnati, Ohio 45239-8707; 513/245-2358; fax: 513/245-1153.

U.S. Information Agency

University Affiliations Program

The bureau of Educational and Cultural Affairs of the United States Information Agency (USIA) announces a program of support for institutional partnerships between U.S. and foreign colleges and universities. The University Affiliations Program seeks to promote institutional relationships through grants for the exchange of faculty and staff for a period of three years.

Participating institutions should be prepared to exchange faculty and staff for teaching, lecturing, and research assignments of one month or longer (preferably three months or one semester); maintain their faculty on full salary and benefits; and receive visiting faculty from the partner institution. USIA grant funds, not to exceed \$125,000, can be used to defray expenses for travel and per diem. A modest amount of the grant total can be allocated for education materials and communications expenses.

Proposals will be accepted either to establish new affiliations or to allow for innovations and strengthening of existing affiliations not previously funded by the University Affiliations Program. Proposals for technical or development assistance projects and feasibility studies to plan affiliations will not be considered. Research proposals must include collaboration by researchers from both institutions and be linked to substantial participation in graduate-level seminars. U.S. institutions are responsible for the submission of proposals and should collaborate with their foreign partners in planning and preparing proposals.

The competition is limited to selected countries and academic disciplines which represent USIA's geographic and academic priorities.

The proposal deadline is **February 14, 1992**. Contact: Aleta Wenger or Camille Barone, University Affiliations Program, Office of Academic Programs, USIA, 301 4th Street SW, Washington, DC 20547; 202/619-5289. A copy of the general announcement (listing eligible geographical areas and eligible academic disciplines) as printed in the October 10, 1991 Federal Register is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

U.S. Arms Control and Disarmament Agency

The U.S. Arms Control and Disarmament Agency (ACDA) is conducting a competition for selection of visiting scholars to participate in ACDA's activities during the 1992-93 academic year called the William C. Foster Fellows Visiting Scholars Program.

The purpose of the program is to give specialists in the physical sciences and other disciplines relevant to ACDA's activities, an opportunity for active participation in the arms control and disarmament activities of ACDA and to gain for ACDA the perspective and expertise such persons can offer.

Positions are available in the Bureau of Strategic Nuclear Affairs, the Bureau of Multilateral Affairs, The Bureau of Verification and Implementation, the Bureau of Nonproliferation Policy, the Office of the Chief Science Advisor, and the Policy Planning Group.

Visiting scholars will be detailed to ACDA by their universities; the universities will be compensated for the scholars' salaries and benefits in accordance with the Intergovernmental Personnel Act and within Agency limitations. In addition to their salary, the visiting scholars will receive reimbursement for travel to and from the Washington, D.C. area for their one-year assignment and either a per diem allowance during the one-year assignment or relocation costs.

Visiting scholars must be citizens of the United States and on the faculty of a recognized institution of higher learning, having served as a permanent career employee of the institution for at least 90 days prior to selection for the program. Prior to appointment, candidates will be subject to a full-field background securing investigation for Top Secret security clearance.

The application deadline is **January 31, 1992**. This announcement appeared in the October 3, 1991 Federal Register; a copy of the full announcement is available and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Department of Energy

University Research Instrumentation

The Department of Energy (DOE) announces the University Research Instrumentation (URI) program. This program provides grants to selected colleges and universities so that they can purchase advanced equipment to enhance their capability to conduct energy research.

Program funds will be concerned primarily with capital equipment costing \$100,000 or more needed for on-campus research in one of five specific energy research areas:

- Biological and Environmental Research
- Chemical Sciences
- High Energy Physics University Infrastructure
- Materials Sciences
- Mechanistic Plant and Microbial Research

The application deadline is **December 9, 1991**. For further information contact: Michael L. Wolfe, Program Manager, Office of University and Science Education, ER-80, Office of Energy Research, U.S. Department of Energy, 1000 Independence Avenue, Washington, DC 20585; 202/586-5462.

Department of Energy

Industrial Waste Reduction

The U.S. Department of Energy (DOE) has issued Solicitation No. DE-SC04-91AL75498 for the Industrial Waste Reduction Program. The U.S. DOE Field Office in Albuquerque solicits proposals for unique and innovative technologies in the areas of industrial processes, process changes, feedstock substitution, and/or product changes that will conserve energy while minimizing or reducing industrial waste material.

The term "innovative technology" is used in a very broad sense and includes, but is not limited to, 1) development of new processes, materials, or products, 2) substitution of materials or products, or 3) significant changes to existing manufacturing processes and operations. Applications with innovative technology applicable to more than one industry with enhanced energy savings potential are encouraged.

Industrial participation or support by the affected industry is essential in all phases proposed. Industrial participation directly related to the project may be in the form of cost sharing.

The application deadline is **December 13, 1991**. Contact: Melanie Thomas, Department of Energy Field Office, Albuquerque, Contracts and Procurement Division, PO Box 5400, Albuquerque, NM 87185-5400; 505/845-6960.

U.S. Department of Agriculture

Graduate Fellowships

The U.S. Department of Agriculture, Cooperative State Research Service, will award competitive grants to colleges and universities for doctoral fellowships to meet national needs for the development of professional and scientific expertise in food and agricultural science. Food and agricultural sciences areas appropriate for fellowship applications are those in which shortages of expertise have been determined and targeted.

Targeted national need areas to be supported in FY 1992 are:

Biotechnology

- Animal
- Human Nutrition and/or Food Science

Marketing or Management

- Food
- Forest Products
- Agribusiness

Water Science

Proposals may request funding in only one (1) national need area; each proposal may request a minimum of two (2) fellowships and a maximum of four (4) fellowships in the area for which funding is requested. While no limitation is placed on the number of proposals an institution may submit, no more than two (2) proposals may be submitted by the same college or equivalent administrative unit within an institution.

Each institution will receive \$54,000 for each doctoral fellowship at \$17,000 per year for three years plus \$1,000 each year for an institution cost-of-education allowance.

The application deadline is **January 15, 1992**. For further information contact: Awards Management Division, Cooperative State Research Service, U.S. Department of Agriculture, Aerospace Center, Room 303, 14th and Independence Avenue SW, Washington, DC 20250-2200; 202/401-5048.

Faculty Research, Training, and Service Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please call Mike Moore at 624-9398.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
September, 1991	417	\$52,248,033
Awards Processed		
September, 1991	249	29,900,616
Proposals Submitted		
July, 1991 - September, 1991	920	131,619,974
Awards Processed		
July, 1991 - September, 1991	638	59,303,869
Proposals Submitted		
July, 1990 - September, 1990	841	113,936,919
Awards Processed		
July, 1990 - September 1990	820	63,017,806

Northeast Technology Resource Center

Kjell R. Knudsen, School of Business and Economics, UMD
 Mark Mueller, School of Business and Economics, UMD
 Minnesota Technology, Inc.
 \$1,500,000-07/91-06/93

Insulin Sensitivity and Clinical Response in CF

Antoinette Moran, Pediatrics
 Cystic Fibrosis Foundation
 \$312,946-07/91-06/94

Base Stable and Composite ZR02 Ceramic Supports for HPLC

Alon V. McCormick, Chemical Engineering and Materials Science
 Peter W. Carr, Chemistry
 Michael C. Flickinger, Bioprocess Technology Institute
 National Science Foundation
 \$278,000-08/91-01/93

Autoimmune Uveoretinitis—Antigen Presenting Cells

Dale S. Gregerson, Ophthalmology
 NIH, NEI
 \$270,027-07/91-06/92

Native American Centers of Excellence

Gerald L. Hill, School of Medicine, UMD
 DHHS
 \$232,977-09/91-08/92

Heparin Sulfate in Cellular Immunity and Graft Rejection

Jeffrey Platt, Pediatrics
 NIH, NHLBI
 \$225,571-09/91-08/92

Diet, Activity and Reproduction as Risks for Colon Cancer

John D. Potter, School of Public Health
 NIH, NCI
 \$199,439-03/91-02/92

G-Proteins and Opioid Receptor Functions

Ping Law, Pharmacology
 ADAMHA, NIDA
 \$181,599-07/91-06/92

Cancer Risk in X-Ray Technologists: Second Survey for Incidence

Jack S. Mandel, School of Public Health
 NIH, NCI
 \$181,002-08/91-08/95

Regulation of Rous Sarcoma Virus RNA Translation

Perry B. Hackett, Jr., Genetics and Cell Biology
 American Cancer Society
 \$180,000-07/91-06/93

Structural Studies of Dioxygenases

Douglas H. Ohlendorf, Biochemistry, Medical School
 NIH, NIGMS
 \$174,386-07/91-06/92

Zebrafish as a Model for Biomedical Research

Perry B. Hackett, Jr., Genetics and Cell Biology
 Anne R. D. Kapuscinski, Fisheries and Wildlife
 NIH, DRR
 \$150,078-08/91-07/92

CML: Purification of Benign Stem Cells Useful for Autologous Transplant and Generation of Autologous A-LAK

Catherine M. Verfaillie, Medicine
 Philip B. McGlave, Medicine
 Jose Carreras International Leukemia Foundation
 \$150,000-04/91-04/94

Minnesota Space Grant College Consortium

Paul W. Weiblen, Geology and Geophysics
 William L. Garrard, Aerospace Engineering and Mechanics
 NASA
 \$150,000-03/91-02/92

A State and Transition Approach to Agroecosystem Landscapes

Pierre Robert, Soil Science
 Jonathon Haskett, Soil Science
 Jean-Alex E. Molina, Soil Science
 USDA
 \$130,000-09/91-08/93

Drug Prevention Programs in Higher Education

Bruce L. Gildseth, Academic Affairs, UMD
 Bruce Meyer, Academic Affairs, UMD
 DE, FIPSE
 \$129,300-09/91-09/93

Rural Education Applied to Community Health

Patricia L. Splett, School of Public Health
 DHHS
 \$124,014-07/91-06/92

Nutritional Copper Status and the Nervous System

Joseph R. Prohaska, School of Medicine, UMD
 Lester R. Drewes, School of Medicine, UMD
 USDA
 \$114,000-08/91-07/93

Superreduced Compounds of the Early Transition Metals

John E. Ellis, Chemistry
 National Science Foundation
 \$109,000-08/91-01/93

Chemical Engineering of Synthesis Solutions for Multicomponent Inorganic Polymers and Ceramics

Alon V. McCormick, Chemical Engineering and Materials Science
 USDOD, Navy
 \$107,513-05/91-12/93

Pelvic Information and Spinohypothalamic Tract Neurons

Glenn J. Giesler, Jr., Cell Biology and Neuroanatomy
 NIH, NINDS
 \$103,404-07/91-06/92

Tillage Induced Microrelief Impact on NO3 and Atrazine Movement in Soils

Gary L. Malzer, Soil Science

USDA
\$102,710-05/91-04/94

Lysosomal Transport and Metabolism of Sialic Acid

Larry W. Hancock, Cell Biology and Neuroanatomy

NIH, NIDDK
\$101,175-07/91-06/92

Structure and Function of Regional Landscape

David Mladenoff, Natural Resources Research Inst, UMD
George E. Host, Natural Resources Research Inst, UMD

USDA
\$100,696-07/91-07/96

Study of Second Generation of Social/Health Maintenance

Michael D. Finch, School of Public Health
Rosalie A. Kane, School of Public Health

HCFA
\$100,000-08/91-02/92

Development of Biocriteria for Regional Watersheds Through Integrated Analysis

Carl Richards, Natural Resources Research Inst, UMD
George E. Host, Natural Resources Research Inst, UMD
Lucinda Johnson, Natural Resources Research Inst, UMD

Environmental Protection Agency
\$100,000-08/91-08/93

Constructing a High-resolution Free-standing Liquid Crystal Film Calorimetric System

C.C. Huang, Physics and Astronomy

National Science Foundation
\$34,400-08/91-08/92

Rockefeller Foundation African Dissertation Internship Awards

Allen F. Isaacman, Institute of International Studies

Rockefeller Foundation
\$26,450-06/91-09/92

Instrumentation and Materials Evaluation for MN/ROAD

John L. Nieber, Agricultural Engineering
David E. Newcomb, Civil and Mineral Engineering
Andrew Drescher, Civil and Mineral Engineering

USDOD, Army
\$125,000-08/91-01/93

Effect of Truck Load Increase on Future Life of Fatigue Details

Theodore V. Galambos, Civil and Mineral Engineering
Roberto Leon, Civil and Mineral Engineering

St of MN, Dept of Transportation
\$35,000-09/91-10/92

Development of a Low-Cost, Near-Optimal Detector for Magnetic Data Storage Systems

Jay Moon, Electrical Engineering

National Science Foundation
\$69,843-07/91-12/93

Automatic Synthesis of Custom and Semi-Custom Analog Integrated Circuits

Ramesh Harjani, Electrical Engineering

National Science Foundation
\$69,756-07/91-12/93

New Methods in Modeling and Control of Dynamical Systems

Tryphon Georgiou, Electrical Engineering

National Science Foundation
\$48,531-07/91-12/92

Theoretical Study of Time Dependent Magnetosphere-Ionosphere Coupling

Robert Lysak, Physics and Astronomy

National Science Foundation
\$75,000-08/91-01/93

1991-92 Minnesota Community Bicycle Safety Project

Cynthia McArthur, Minnesota Extension Service

St of MN, Dept of Public Safety
\$63,500-07/91-06/92

Development of Usable Treatments for Grasshoppers on Conservation Reserve Program Lands

David M. Noetzel, Entomology

USDA
\$33,000-07/91-09/91

Measurement of Starter Culture Proteolysis

Joseph J. Warthesen, Food Science and Nutrition
Philippe Vandeweghe, Food Science and Nutrition

Sanofi Bio Industries
\$96,275-07/91-06/94

Biodiversity Monitoring: Breeding Productivity, Habitat, and Winter Distribution of Nongame Birds

David E. Andersen, Fisheries and Wildlife
Francesca J. Cuthbert, Fisheries and Wildlife

USDI
\$76,000-07/91-09/92

Beta-Andrenoceptor Cycling in Cardiac Hypertrophy

Catherine Limas, Laboratory Medicine and Pathology

American Heart Association, MN Affiliate
\$23,664-07/91-06/92

Mapping and Isolation of the Gene for Spinocerebellar Ataxia

Laura P.W. Ranum, Laboratory Medicine and Pathology
Harry T. Orr, Laboratory Medicine and Pathology

Muscular Dystrophy Association
\$28,000-07/91-06/92

Purification and Characterization of Benign and Malignant Hematopoietic Progenitors in Chronic Myelogenous Leukemia

Catherine M. Verafaille, Medicine
Philip B. McGlave, Medicine

Leukemia Society of America
\$96,120-07/91-06/94

Novel Method for Noninvasive Detection of Rejection in Heart Transplant Recipients

Sara J. Shumway, Medicine

Minnesota Medical Foundation
\$7,500-09/91-08/92

Studies of Soluble Immunoregulators in Murine Lupus

Harumi Jyonouchi, Pediatrics

NIH, NIAID
\$67,680-07/91-12/91

Natural History of Nephropathy in Type I Diabetes

S. Michael Mauer, Pediatrics

Juvenile Diabetes Foundation
\$50,000-09/91-08/92

Parental Leave Policies and Maternal and Infant Health

Patricia McGovern, School of Public Health

AHCPR
\$21,583-08/91-01/93

More Awards On Page 21

of more than 10,000 technical specialists throughout the United States. These faculty were selected based on peer recommendation and a review process developed by Teltech, which looks for people who are both respected specialists and good communicators of technical information. A company with a technical question or problem can locate an appropriate expert by describing the need to a member of the MPO Help Staff at Teltech or by doing a keyword search of the expert database. This results in a listing of University of Minnesota and other experts who have indicated either a primary or secondary interest in the technical area. If no specialists are available in a requested field, Teltech recruits one as quickly as possible.

After deciding on a specialist, the user simply places a call to that person and indicates that he or she is an MPO subscriber. The two parties discuss the question or problem and the caller receives an answer if readily available. Often the specialist must do calculations or other work to answer the question, or he or she may refer the caller to a different specialist for help. After checking with the subscriber to make sure the interaction with the expert was helpful, MPO pays the expert \$75. If a more detailed consulting relationship results from the contact, the faculty member must arrange that directly with the company and within the guidelines set out by the University's outside consulting policy.

The University's most frequently consulted specialist—and easily the most passionate booster of MPO's and Teltech's service—is Ephraim Sparrow, professor of mechanical engineering. A specialist in heat transfer technology, Sparrow says he brings an enthusiastic pencil and an open mind to each telephone consultation. Speaking to a group of Teltech user help staff, he told them that consultants should “listen carefully to what our clients tell us, but don't necessarily be locked into what they think their solution should be. By bringing a clean slate perhaps we can make other suggestions to unstick them from the problem that is causing their anxiety.”

As companies become “unstuck” through MPO consultations, they are finding that they are also saving significant amounts of time and money. Sparrow consulted with MPO subscriber ADA Enterprises, Inc., in Freeborn, Minn., regarding the design of a new oven to cure dip-deposited coating on expanded metal. This process requires a machine to control both air flow and temperature. The designers were unsure of how to obtain accurate measurements of air flow and temperature and knew the solution would require a fair amount of “guess work.” Sparrow minimized that guess work by developing a measurement process and providing suggestions for how the company could build a device to simulate and test the process. The company's representatives commented that “Dr. Sparrow saved us a tremendous amount of research and design time. If we had bought a simulator for this process it would have cost us \$50,000.”

In fielding requests like this, Sparrow says he has “learned the difference between engineering and research. The beauty of engineering is that we have to stretch the available knowledge bases, we can't create them. Research is just the opposite, in that you have the liberty, license, and are paid to build the knowledge base.” He has used that awareness to create new mechanical engineering courses he calls “Engineering With Incomplete Databases,” to underscore the fact that few real-life engineering problems can be solved by a straightforward application of information. He helps students learn to illustrate problems, and if necessary to make laboratory models in order to apply existing knowledge to solve the problem.

Sparrow often uses actual MPO subscriber questions in his classroom teaching. “I learn something when I talk to clients and I enjoy helping them, and I think we should do our best to help people make creative solutions. I think you can teach creativity,” he says. “I think that if you show people—taking real problems—what it is to be creative, you can teach them. I'm now a crusader for a new way of teaching.”

Even companies that are not among the 400 charter subscribers can benefit from MPO's connections to the University. Literature searching and document retrieval by the University of Minnesota Libraries is available, as is the expert database. Minnesota Dehydration Vegetables, Fosston, Minn., went to an MPO Public Access Site for assistance with time-critical questions regarding a new product. The MPO Help Staff suggested the client call Theodore Labuza, a professor in the Department of Food Science and Nutrition. When the Help Staff checked back to see how the consultation had gone, a company representative commented that Dr. Labuza “is a superstar in the field of food processing. He provided valuable information and helped us save hours of research time. We're convinced Minnesota Project Outreach is a great benefit to our company.”

Companies can benefit from MPO in another way, by searching a database of University of Minnesota Technical Research Projects. Winifred Schumi, ORTTA assistant director for information services, is in the process of gathering information from principal investigators to enhance this database. When completed, it will be easily accessible for companies interested in sponsoring research or seeking results and potential commercial applications of research in specific fields.

An expanded version called the Faculty Interest Inventory will soon be available as an intramural tool for the University. It will help the over 5,000 full-time and 1,000 part-time academic employees, as well as 8,500 graduate students, find research collaborators and information about research topics related to or having an impact on their own. “We hope this and other aspects of Minnesota Project Outreach

MPO, Continued On Page 21

out of the University. He realized that before ORTTA could really be of service to industry, the University needed to develop a system companies could turn to at their convenience to find out exactly what the University had to offer.

To develop such a system, Potami turned to a local company, Teltech, Inc., which was already providing technical information to corporations. In October 1988, Teltech helped Potami set up a pilot program in cooperation with the Anoka County Economic Development Partnership. Teltech's services were provided to nine tenant companies of Anoka's Minnesota Medical Enterprise Park. The companies purchased personal computers and modems, through which they were connected to Teltech's computer network. Within the first 90 days the companies logged 57 interactions for patent and literature searches and referral to experts for technical consultations.

As crucial as that information was, Potami found that the companies that needed it most were least able to pay for it, because they were in early or middle growth stages and were struggling just to meet their payroll and cover debts. He therefore launched an effort to publicly fund Minnesota Project Outreach, reasoning that by helping small companies prosper and grow, the project would be expanding employment and state revenues. With the help of pilot users and members of the Minnesota High Technology Council, especially then-chairman Herbert Johnson, Potami presented a proposal to the Minnesota State Legislature in 1989. The proposal envisioned a computerized network to give companies and entrepreneurs access to technical databases and national experts, as well as to experts, research project information, and licensable technologies at the University of Minnesota.

Legislators liked the idea of helping companies get more out of the University of Minnesota and gain access to technical information. They asked that the project be expanded to include the services of the Minnesota Department of Trade and Economic Development (DTED) and the Greater Minnesota Corporation (now known as Minnesota Technology, Inc.). The legislature then established the Minnesota Project Outreach Corporation as a cooperative effort of the University, DTED, and Minnesota Technology, with each contributing \$1.6 million for the first two years of the project.

The MPO Corporation Board of Directors, which is chaired by Herbert Johnson and includes Potami, hired Candace Campbell, a fellow at the Hubert H. Humphrey Institute of Public Affairs, as the corporation's president in 1989. A request for proposals was issued in January 1990, seeking a company capable of handling the project. In September 1990 the Board awarded a contract to Teltech to develop and add new databases—mostly based on University of Minne-

sota research and technology—to its more than 1,000 technical databases. ORTTA then began working with Teltech to develop databases of licensable technologies, faculty expertise, and research projects.

With the vendor contract in place, MPO Corp. began the process of selecting public-access sites for MPO services. The Board of Directors identified 75 locations throughout Minnesota, such as Minnesota Extension Service offices, DTED Small Business Development Centers, and GMC Business Innovation Centers. These sites have personnel trained to assist companies and individuals with business ideas or questions to access the MPO network.

Next came the task of selecting 400 companies with less than \$10 million in annual revenue to be MPO charter subscribers. These companies need only provide a computer and modem to receive free on-site access to MPO for the first year, and for a nominal fee based on revenues the second year (free for companies with \$2 million or less, \$800 for those between \$2-\$5 million, and \$1,600 for those between \$5-\$10 million). As a result of publicity about the project and a targeted mailing, MPO Corp. received hundreds of subscriber applications. These were studied by the Board and companies that were most likely to benefit from the project and in turn benefit Minnesota's economic development, were selected to receive MPO services.

Gateway to the "U"

Through MPO, there now are 400 company-based and 75 community-based gateways to technical information and expertise at the University of Minnesota. "This was the original goal of Minnesota Project Outreach, and I hope that companies and communities realize the value of this powerful business tool and use it to cut through what can otherwise be an intimidating maze of colleges, departments, and research centers," Potami says.

The University of Minnesota Licensable Technologies Database currently includes nearly 100 inventions created by faculty, staff, and students. These technologies are available to companies on either an exclusive or non-exclusive basis, to be used in manufacturing processes or in developing new products. The Office of Patents and Licensing now has more than 175 licensing agreements with 115 companies—50 of them in Minnesota. With more than 150 new disclosures each year, the Office expects to have more than 200 inventions described on the licensable technology database in the near future. "This is an excellent way for us to reach a large number of Minnesota companies and to give them first shot at the inventions coming out of the University," says John Thuente, director of the Office of Patents and Licensing.

MPO users can also select and contact one of the 350 University of Minnesota faculty included on Teltech's database

become overly distracted by these activities, but rather that these activities are in the appropriate proportion. You can always argue what that is, but I think it is fairly clear. I think this can be a win-win-win situation: win on the part of industry, win on the part of the faculty member, and win on the part of students. I think we just have to make sure it is never the case that it is a win-win and then there is a lose. If there were to be an extreme and our students or our scholarly mission turns out to be a loser, then we at the University have to intervene, because we are not a consulting organization. Lastly, we at the University must not compete in the same arena where consulting firms, the private sector, can do the appropriate task. On the one hand, I am highly in favor of MPO and I will support it to the utmost. On the other hand, it is something in which we must proceed with caution, just as we do in our other relationships with industry, including sponsored research and consulting.

Along these lines I am very pleased with the new statement on conflict of interest. I think this is going to be an ex-

Technology transfer is an activity that needs to have an investment of resources to be carried out well.

tremely good guide for us, because it states in very clear terms that it must be an all around win situation and be above board. I am confident that this policy will be an appropriate guide for our relationships in this area.

There is no doubt about it that from the viewpoint of members of the industrial community there is never enough technology transfer. Indeed, my hope and my ambition is that the University will become more efficient and more knowledgeable as we learn how to do technology transfer even more effectively than we have done in the past.

One of the well defined barriers I see is that technology transfer is an activity that needs to have an investment of resources to be carried out well. As an organized activity it is something that is relatively new at all universities. And it is an activity that, just like research and teaching, is very people intensive. In these days of very difficult financial times, it is going to be very difficult to reallocate resources to this endeavor—although we will do it. This brings me back to contradicting the argument of the Governor. It seems to me that investments in technology transfer on the part of the University and therefore on the part of state, have an enormous payoff. It's the multiplier effect again, and for every dollar we are not able to provide for technology transfer, it's going to be five, six, seven, eight dollars of economic activity that is not going to occur. There is going to be a loss to the state and to the nation.

Are there other ways state and federal governments can assist technology transfer?

Beyond providing resources, there are other things that can be done to support technology transfer. For instance, the change in federal policy on patenting by universities was a positive step in supporting this activity. Technology transfer is one of those economic subjects that are very unusual. What is it that you do when you transfer technology? You have certain know-how, certain knowledge, and you enter into a transaction that is different from most economic transactions. If I want a car and I have money I go to a car dealer, and when the transaction is finished we are both happy because that's what we wanted to do. In the area of knowledge and know-how transfer, first of all the person at the corporation is not sure that they want or need the knowledge. Secondly, once the transaction takes place, it is not a simple exchange, because the person or entity that gives the knowledge still retains the knowledge. It is because of the complicated nature of this transaction that the usual rules and regulations of economic transfers do not apply. As a result of that we have developed fairly elaborate schemes, such as patent rights, copyright, protection of intellectual proprietary, etc. Many of these I think have become too complex and complicated. Frankly, I think that in 50 years from now people will look back at this period and say that, "Gee, those were strange rules that those people in the 20th century were operating under in the area of knowledge transfer and technology transfer."

So one of the things that we have to do in this area is not only to be active, but also to be willing to be innovative in the manner in which we exchange this information and the manner in which we reward the transfer. Minnesota Project Outreach is one of these innovations, and I think it deserves a great deal of support. In this area over the past ten years we have been doing a number of national experiments. Some of them have been very rewarding, but some of them have been rather disappointing. Remember, for example, the great experiment for which we had such great hopes, Microelectronics Computer Consortium, a precompetitive research institute in Austin, Texas. This was to be an applied research center with technology transfer to a number of member companies. Perhaps the jury is still out, but I don't think this has worked out as well as we had expected. And that puts an increased burden on universities, as it is becoming clear, in my mind, that universities might be better centers for research and technology transfer than those like MCC.

Increasingly, the private sector, and especially individual companies, are finding it very difficult to justify their investments in basic and in some cases applied research, because they cannot capture the results. Yet these results are certainly captured for and beneficial to the society or the indus-

Continued On Next Page

try or the entire industrial sector. If it is true that an individual investor organization cannot capture the return, if it is true that a consortium of companies in the same industry cannot do it, yet the society is capturing the results, then universities and perhaps national laboratories, but especially universities, are going to prove themselves much better vehicles for this. But then that implies that technology transfer aspects of universities are going to become even more important and require more support.

Are there any plans that you can discuss at this time to enhance the research and technology transfer programs of the University?

It is too early in the process to discuss specifics, other than to say that these are items of very high priority. But also of high priority is being able to discharge in an appropriate fashion our teaching obligations. It is never the case that these things are in opposition to each other. I think it is the genius of the University of Minnesota that we challenge ourselves to continually balance them. I never like to talk about teaching and research. I like to talk about learning, because that's what the student does, that's what the researcher does, and that's what happens when administrators, faculty, staff, and students exchange information with our external constituents—we all learn from each other. I like to talk about teaching, because that's what the student does to other students, that's what the faculty member does to students and to other faculty, here and at other institutions throughout the nation. The two things go hand in hand, and here at the University of Minnesota we have been very fortunate in leveraging teaching, research and service. That's one of the things that really distinguishes us from the other systems of higher education in Minnesota. A teacher at the University of Minnesota is not only a teacher, but also a scholar, a researcher at the forefront of a chosen field. And therefore that affects the teaching and the learning and really alters their nature.

On the other hand we have to realize that these are times of severe financial constraints. The thing that we must do in all of our realms, those associated with service, those with research, and those with teaching, is to examine all of our programs to make really sure they are effective and efficient—for those cases in which you can measure efficiency—and making sure they have the impact that is expected. It's a time of tightening lots of nuts and bolts and making really sure that this wonderful engine at the University of Minnesota is very finely tuned and is putting out its maximum horsepower, and getting fantastic miles to the gallon.

will prove to be very helpful to the University's research community and technology transfer program," Potami says. "MPO has the strong support of President Hasselmo, who sees it as an extension of our outreach and service mission to the industrial community, and of Senior Vice President Infante, who sees the value in exposing faculty and students to the problems facing Minnesota's technical companies.

"It is extremely gratifying to hear the two-way success stories of contacts between MPO users and our faculty, and to see the total uses of the system by MPO subscriber companies and at public access sites go over the 3,000 mark this early after its implementation," Potami says. "Minnesota has established a model in Minnesota Project Outreach for a regional network of technology access centers under consideration by the Department of Commerce. We at the University of Minnesota can be proud of the role we've played in developing and helping to implement this valuable resource."

Awards, Continued From Page 17

The Role of Price in the Demand for Alcohol

Willard Manning, School of Public Health

ADAMHA, NIAAA
\$48,154-09/91-02/92

Pathogenesis, Epidemiology and Control of Encephalomyocarditis Virus Infection in Swine

Han S. Joo, Large Animal Clinical Sciences
Robert Morrison, Large Animal Clinical Sciences
William T. Christianson, Large Animal Clinical Sciences

USDA
\$24,982-06/91-05/92

Ecology of North Temperate Ecosystems with Emphasis on Conservation

Donald C. McNaught, Minnesota Sea Grant Institute
William D. Schmid, Minnesota Sea Grant Institute

USIA
\$65,900-09/91-08/94

Laboratory of Mathematical Modeling and CAI, Phase IV

James W. Rowell, Mathematics and Statistics, UMD
Ronald R. Regal, Mathematics and Statistics, UMD

National Science Foundation
\$70,365-07/91-12/93

Preparation of Taconite Tailings for Ferro-Silicon Production

Rodney L. Bleifuss, Natural Resources Research Inst, UMD
Harlen B. Niles, Natural Resources Research Inst, UMD

Dow Corning Corporation
\$11,500-07/91-08/91

Carbamoyl Phosphate and Energy Metabolism in Elasmobranchs and Other Fish

Paul M. Anderson, School of Medicine, UMD
Wilmar L. Salo, School of Medicine, UMD

National Science Foundation
\$79,590-07/91-12/92

The Sponsored Project Information Network (SPIN) is a computerized locator system of funding opportunities (federal, nonfederal, and corporate) for faculty and institutional research, development, and education program support. It is available to University faculty and staff through ORTTA.

Based on a description of your research areas and/or the type of support sought, ORTTA staff will search the SPIN Keyword Index to identify sources within specific areas of interest. The Keyword Index, a taxonomy developed by SPIN to catalog funding sources, is divided into the following ten major classifications:

- Agriculture/Food/Forestry
- Arts/Culture/Humanities/Communications
- Business/Economics/Management
- Education
- Health/Medical Sciences
- International Affairs/Area Studies
- Miscellaneous/Other
- Science/Technology
- Social/Behavioral Sciences
- Social Welfare/Public Affairs

The result of a search is a set of profiles of applicable funding sources that provides: 1) the sponsor's name; 2) the sponsor's contact address and telephone number; 3) deadline dates; 4) program titles; 5) objectives or interest areas of the sponsor; and 6) restrictions that would affect the submission of a proposal. This set of profiles is sent to the requestor.

SPIN searches are done free of charge to the requestor. A survey of users of SPIN indicates that the information received from a SPIN search was targeted to their request and a reasonable response time was effected.

For further information regarding the SPIN system or to request a search, please contact ORTTA at 624-9004

SPIN searches are also available through the Research and Development Office in the College of Liberal Arts; the Agricultural Experiment Station; the Research Support Office at Duluth; and the Grants Development Office at Morris.

Effective September, 1990 the SPIN indexes became available for on-line review through ORTTA's Electronic Bulletin Board (See the September, 1990 *Research Review* for information on Bulletin Board contents and access instructions.) The Bulletin Board contains a section devoted to SPIN and offers users the opportunity to review the Keyword Index alphabetically or within the topics shown above.

Since the Bulletin Board is accessible anytime, faculty and staff can browse the indexes at their convenience and find *keyword codes* of interest to them. From within the Bulletin Board they can then forward a note to the Bulletin Board Editor requesting a SPIN search based on the chosen keyword codes (Limit, 20 keywords).

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Research Review Mailing List Information

Faculty:

- The *Research Review* is automatically mailed to all faculty on the Faculty Mail List holding the rank of Assistant Professor and above, using the AIS mail list.
- To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS). (AIS labels are characterized by a string of numbers above the name.)
- Please check with your departmental office or AIS (624-9000) if you need assistance.

Staff / Off Campus:

- ORTTA maintains a supplemental mail list for:
 - a) academic staff not included in the above faculty list;
 - b) staff; and
 - c) off-campus
- Additions/changes/deletions to this supplemental list may be initiated by filling out and sending ORTTA the following:

Change

Add

Delete

Name: _____

Department: _____

Address (Campus: Bldg/Rm #) _____

City/State (if off-campus) _____

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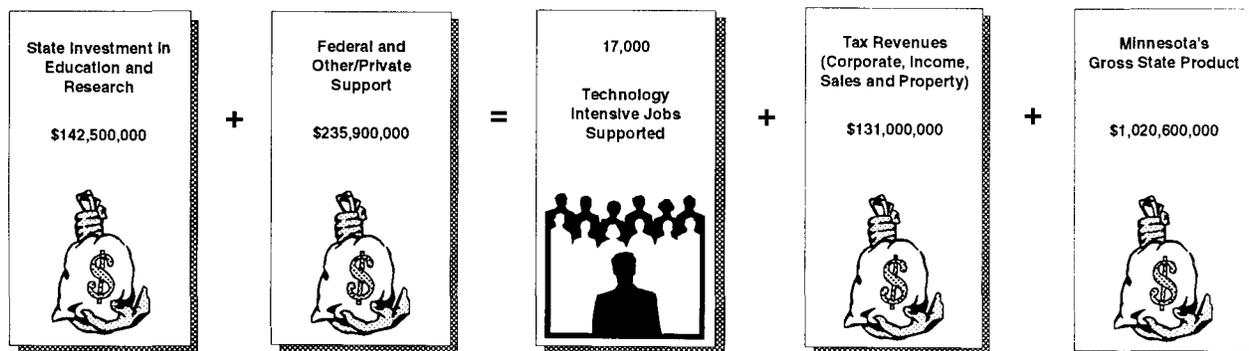
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RESEARCH REVIEW

Research and Technology Transfer Administration

December, 1991

MHTC Reports on Investment Return From the University



Calling the University of Minnesota "An Unheralded Industry," the Minnesota High Technology Council (MHTC) has released the results of a study revealing the extent to which investments in the University have a major impact on the state's economy. The study included nine collegiate units: Institute of Technology, Medical School, UMD School of Medicine, School of Dentistry, School of Nursing, College of Veterinary Medicine, College of Pharmacy, College of Biological Sciences, and the UMD College of Science and Engineering.

Based upon selected financial data from the nine units, the study concluded that:

- 17,000 technology intensive jobs are supported;
- the economic impact of state dollars is multiplied nearly six-fold, resulting in over \$1 billion added to Minnesota's State Gross Product;
- the total state revenue from direct employment by the University in the nine areas exceeds \$131 million;
- as a result of \$143 million in state funding support, \$236 million is received in research and education dollars from the federal government, industry, and private sources.

The study concluded that the total revenue from state, federal, and other sources for the fiscal year ended June 30, 1990, was over \$378 million in the nine technology intensive units. Viewing these colleges as a whole, their combined revenue ranks among top technology corporations in the state, the study said.

MHTC, Continued on Page 17

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Animal Care Rates

Per diem animal care rates will be increased by 5% effective January 1, 1992, according to Patrick J. Manning, Professor and Director, Research Animal Resources.

Please call Dr. Manning's office at 624-9100 if you have questions.

Animal Research Facility Protection Act Passes Senate

The *Animal Research Facility Protection Act* (S544) has passed by a unanimous vote in the Senate. The bill was introduced by Senator Howell Heflin, D-AL.

The legislation would protect research facilities from illegal activities of animal extremists. Specifically, S544 makes it a federal crime to steal, destroy or make unauthorized use of research animals, equipment or data, says the National Association for Biomedical Research (NABR).

A comparable bill to S544 in the House (NR2470), by Representative Charles Stenholm, D-TX, now has more than 240 sponsors. It is expected that the bill will be reported out of the House Agriculture Committee in the near future.



RESEARCH REVIEW

Volume XXI/Number 6

December, 1991

Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/91-6/30/94 rates should be used. **The rate agreement is dated July 1, 1991.** This date should be used where required on proposal applications. Please call Marilyn Surbey at 624-4850 with questions on Indirect Costs.

	07/01/91	06/30/94
Research		
On-Campus	40.0	
Off-Campus *	21.0	
SAFHL	60.0	
Hormel	53.0	
Other Sponsored Activity		
On-Campus	20.0	
Off-Campus *	10.0	
Instruction		
On-Campus	52.0	
Off-Campus	16.0	

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call Vivian Fickling at 624-2009.

Current actual rates from July 1, 1991 through June 30, 1992 are:

Faculty	28.75
Civil Service	25.25
Graduate Assistants	8.50

For proposals being submitted with start dates after July 1, 1992, the estimated fringe benefit rates to be budgeted are:

Faculty	31.25
Civil Service	29.50
Graduate Assistants	10.50

Estimated rates after July 1, 1993 are:

Faculty	28.00
Civil Service	30.50
Graduate Assistants	31.25

As rates change they will be reflected in this section.

Notes on CUFS

Implementation of Negative Amounts

Budgets in CUFS cannot be created in a negative amount. Since budgets will be created from the allotments in the old accounting system (some of which are negative), it was necessary to establish "contra objects" in CUFS for conversion purposes only. Consequently, you will notice in your first CUFS reports that negative allotments have been converted to the following 14 objects specifically designated for negative numbers. We have termed them "contra objects" to separate them from the normal CUFS object. Please do not attempt to make an expenditure against these contra objects; expense documents will process with the normal CUFS object codes. However, contra objects must be included when determining the overall budget of the account and in calculating the unexpended balance.

Object	Object Name
05- 7099	Contra-Salaries
09- 7199	Contra-Fringe Benefits
10- 7399	Contra-Supplies & Other Expenses
02- 7439	Contra-Hospital Inpatient
04- 7449	Contra-Hospital Outpatient
06- 7499	Contra-Participant Expenses
10- 7629	Contra-Trainee Travel
11- 7699	Contra-Travel
01- 7899	Contra-Student Aid
08- 7999	Contra-Subcontracts
07- 8039	Contra-Rent

Chart of Account Errors

ORTTA staff are still working on making corrections to the CUFS chart of accounts. We have been working on error listings generated by the CUFS project team for the past two months in order to assist in the implementation. Nevertheless, we are optimistic that we will soon be able to work on the corrections transmitted to us by departments. Due to the large volume of errors requiring correction, we appreciate your patience and anticipate that error correction will take place over the next several months.

Travel Documents

Departmental staff responsible for preparation of travel papers on sponsored projects should keep in mind that a travel authorization document (TA) is required on sponsored projects for all out-of-state travel. ORTTA staff are receiving a number of travel vouchers (TP/TPA) for reimbursement

which are reflected as TPA documents and *do not reflect the TA Reference Number*. In such cases the vouchers are being returned for addition of the TA Reference Number and/or preparation of the TA (Travel Authorization) document if not previously completed. Accordingly, for expeditious reimbursement, it is important to include the TA Reference Number on the travel voucher. If the TA Reference Number is included, the voucher is forwarded to RAPID, 420 ASC, *without further review and approval from ORTTA since it is assumed such review/approval was provided at time of TA transmittal*. The processing of travel authorizations on out-of-state travel allows ORTTA staff to review documents to assure that all necessary approvals are in place prior to the trip. In cases where trips have already been taken and necessary approvals are lacking, even if we have institutional prior approval authority, the request must be made to the sponsoring agency since it is no longer "prior" but instead "retroactive" approval.

When preparing a travel authorization, we wish to remind departments that if the "Purpose Code" field is used it automatically overrides the description line, which is an essential part of the document if selected for audit sample. When the documents are "keyed" this information will not be included. Accordingly, ORTTA *requires* the use of the "DTEX Document" to provide a statement defining relevance/benefit of travel to the project charged and also to document the total cost applicable to the project, since the travel authorization is only to reflect individual expenses without airfare, unless the individual has paid for the airfare directly. Questions regarding these matters should be addressed to the appropriate grant administrator within ORTTA.

Bookstore Purchases/Sponsored Projects

As you are aware from our Research Review article, November 1991, bookstore purchases over \$500 still require ORTTA review and approval. Such purchases can be made via the "IV" Document (replaces old Type 11 Journal Voucher) OR the "PO" Document, internal purchase order (new). It is the department's decision as to which mechanism to use, however, *remember that the "IV" Document does not encumber funds while the "PO" Document does*. Accordingly, in those cases where the grant year end is near and the items may not be delivered prior to ending, it would be necessary to use the "PO" Document to assure that the funds are encumbered if they must come from that specific grant year. Questions should be referred to the appropriate grant administrator within ORTTA.

Shifts in Standards for Research Consent Forms

The Committee on the Use of Human Subjects in Research continues to work toward consistent, reliable review of consent forms. The new sample consent forms included with all application forms should be used as a guide in preparing documents for Committee review. While not a comprehensive list of all of the problems with consent forms, the following issues, raised by the Chairman of Committee 01, Dale Hammerschmidt, should be considered.

There has in the past decade been a steady evolution in the stringency of the research consent process. At a local level, this has led to a progressive "tightening up" of the IRB review process and criteria, with frequent stipulations to change consent form provisions that had been deemed acceptable at some time in the past. Unfortunately, it has been difficult to arrange that changes, once they are made, endure. It appears to be quite common for an investigator, in preparing a consent form, to work from a model that is old and fails to conform to current standards. The Committee finds it frustrating to make the same stipulations for the same researchers/groups over and over again, just as the investigators find it frustrating to find something that once was acceptable now deemed inadequate.

A wholesale erasure of all consent form templates on all hard and floppy disks throughout the University seems an impossible goal; instead, we have prepared this list of common problems. Each of them has been stipulated numerous times in the past few months. Consent forms with these problems will not be approved; consent forms with several of them may be returned for re-writing and thus delay an application's scheduling for Committee consideration.

A lot of the problems stem from attempts to make the consent form for a study serve also as the consent form for treatment. Sometimes this works, and sometimes it does not; many of the Committee's concerns are that, in giving consent to a complex and risky treatment, a patient may fail to understand that there is research being consented to, as well.

- Consent forms should not be entitled, "Informed Consent." *Informed consent is a process and a state one strives to approximate; it is not a piece of paper. The title tends to obscure the nature of the process, and carries some risk by implying a degree of completeness that the form may not have.*
- Strike out formats ("You/Your spouse/your child?") should not be used where they make the form difficult to read. *Word processors make it pretty easy to prepare more than one version of a form; while this*

may once have been an allowable concession to the problem of typing up several versions, that argument is now a weak one.

- Where children or vulnerable adults are among the subjects, appropriate consent forms should be prepared:
 - a fairly standard consent form for the guardian or parent
 - a fairly standard consent form for the competent adult subject
 - a simplified statement of assent for the 8-18 year old, or for the adult who is not competent to give consent alone.
- Consent forms should not begin with a statement advertising the service or group conducting the study. *This is coercive. A simple, factual statement of who's running the study may be inserted in the text of the document.*
- Consent forms should not indicate that the patient's physician recommends participation; nor should they "offer the opportunity" (as opposed to "invite") to participate. *These are coercive.*
- Fill-in-the-blank formats, in which the features of a given study are "plugged in" to a stock format are discouraged. *Often, studies which fit the format poorly are nonetheless presented in such forms; if the format makes a consent form harder to understand than it would be as a freshly-drawn document, the Committee may use that as a reason to deny approval.*
- In treatment studies, a clear distinction must be drawn between consent for the **study** and consent for the **treatment**.
 - The benefits described should be those of the *study*, and should usually include a clear disclaimer that there may be no benefit of getting treated on study as opposed to off study. The benefits of *being treated* are a different issue; if the consent form is complex enough that the two may be confused, they should be presented in separate consent forms.
 - The risks described should be those of the *study*, and should usually include a statement that there are or are not risks of getting treated on study that are not present if treated off study. Again, the risks of *being treated* are a separate issue; if the consent form is complex enough that the two may be confused, they should be presented in separate consent forms.

...next page

- The alternatives described should be those to being on the *study*, and should usually include a statement whether the study treatment is or is not available outside of the study context. Again, the alternatives to *being treated* or to getting the specific treatment that's in the study are to some extent a separate issue; if the consent form is complex enough that the two may be confused, they should be presented in separate consent forms.
- Where a consent form lists procedures or drugs used in a study, they should make clear the investigational/regulatory status:
 - standard
 - standard, but being used in a non-standard manner (such as unapproved dose, route, or indication for a licensed drug)
 - experimental
- Where the treatment plan is being studied, or on which the study is superimposed, is complex, the consent form description may (and often should) be very brief, and the details may (and often should) be reserved to a separate treatment consent form or attached appendix. *In many treatment studies, patients are unable, even very shortly after "informed" consent, to identify what they were consenting to. The research is lost in the details of the treatment.*
- Similarly, when the list of drugs' and procedures' risks is long, it may often be preferable to list only the major risks in the body of the consent form, and remove the others to a treatment consent form or to an appendix. A format that has in some cases worked well has been to say: *The risk of being on this study is that the treatment may not turn out to be as good as we hope, and may even be less good than our previous standard treatment.* In addition to this risk of being on the study, the drugs used in the treatment have their own risks and side effects. The most important ones are: ...
- The clause "only aggregate data will be presented" should be used only when it is true. Having the wording in the consent form—an unfortunate hold-over from a "model" consent form of yore— would deny consent to describe a patient individually, even if the patient had a unique event. What's really meant here is that identity will not be disclosed (often, but not always, by publishing group data.)
- Statements summarizing foregoing consent information should be used only when they genuinely clarify; they should particularly be avoided when they suggest a warning or limitation of liability or opportunity for redress. Problem Examples:

- *The possible risks associated with this study have been presented.*
- *The method and purpose of administration of this study have been explained to you. (Also objectional for lack of clarity.)*
- *You have been made aware of certain risks and consequences...*
- Assertions that drugs or studies have been approved for human use by the FDA may not be in the consent form if any part of the study is outside the licensed and approved indications of the drugs or devices used. *Patients interpret this to mean "licensed and approved as given," not "has granted permission for experimentation."*
- The patient/subject should not be asked to affirm that the physician will do something. *My doctors will watch for this problem."*
- It is appropriate to point out adverse consequences of study withdrawal. It is not, however, appropriate to point out, in the right-to-withdraw part of the consent form, risks that are not known but might conceivably turn out to be the case if the study works out as the investigators hope. *That's coercive.*

The Committee on the Use of Human Subjects in Research thanks Dr. Hammerschmidt for his contributions toward refining research consent forms.

Questions concerning research with human subjects or preparation of consent forms should be directed to Moira Keane at 624-1889.



From all of us here at ORTTA
 To all of You
 Best Wishes for a
 Joyous Holiday Season
 and a
 Peaceful and Productive
 New Year

Changes in the Peer Review System

The National Institutes of Health (NIH) and the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), as part of their financial management plans, have initiated several major changes in the peer review system. These changes, which are being implemented beginning with the current round of Initial Review Group meetings, will affect all applications submitted to NIH and the research institutes of ADAMHA for funding consideration.

Applications will not longer be "approved" or "disapproved." Instead, each application will receive a score unless the peer review group determines that an application should be deferred for additional information or that it should be "not recommended for further consideration" (NRFC). NRFC means that an application does not have "significant and substantial merit," and differs from the former term "disapproval," which meant "lacking sufficient merit to warrant funding."

Thus, the NRFC recommendations can be expected to include a greater number/percentage of applications than did "disapprovals."

Of equal importance is the new scale of adjectival descriptors for priority ratings, modified to reflect the new concept of "significant and substantial" merit. These descriptors now cover the following range of scores:

- | | |
|-------------|-------------|
| - 1.0 - 1.5 | Outstanding |
| - 1.5 - 2.0 | Excellent |
| - 2.0 - 2.5 | Very Good |
| - 2.5 - 3.5 | Good |
| - 3.5 - 5.0 | Acceptable |

Regardless of the recommendations that are accorded, all applications will be completely and thoroughly reviewed.

Applications that receive the NRFC designation, as well as those whose scores fall within the bottom tier (approximately the last third), usually will not be brought to the National Advisory Councils/Boards for consideration. Councils/Boards will, however, be provided with a complete listing of all applications reviewed, and they may single out any application for individual discussion.

Another new procedure that NIH and ADAMHA will implement at this time is to inform applicant investigators of the outcome of the initial review of their applications as soon as possible following the meeting of the Initial Review Groups. NIH and ADAMHA will provide this information

and the name and telephone number of the staff person responsible for that applications. This communication will also inform the applicant that the Summary Statement, containing evaluative comments, will be mailed to the applicant in approximately six to eight weeks. Applicant investigators are requested to refrain from communicating with staff concerning the specifics of the review or funding possibilities until after the Summary Statement has been received.

U.S. Needs to Turn Discoveries Into Technology

To be competitive industrially, the United States needs to pay more attention to *developing* new technologies discovered by basic researchers, according to panelists addressing the topic of "Competitiveness, Technology Policy and Research Universities." The panel convened at the 104th annual meeting of the National Association of State Universities and Land Grant Colleges, held November 10-12, in Washington, D.C.

The concept that in order to be competitive, business and industry has only to be first to the marketplace with new patented technology or that competitiveness requires shrewd cost cutting, is just not enough, according to Christopher Hill of the National Academy of Engineering. Quality, performance, reliability, and timeliness are real value-added components of the international competitiveness effort, he said.

Hill also criticized the national penchant for investing only in Ph.D.s and Nobel laureates, saying that this base is not going to be broad enough to help industry remain competitive. He encouraged more investment in plants, facilities, and equipment, as well as more support for applied engineering research.

Another panelist, Dorothy Robyn, a member of the Congressional Joint Economic Committee staff, observed that U.S. firms cannot turn technology into products as fast as West German and Japanese firms. She suggested that this problem, while partly the fault of industry, is also the result of the U.S. postwar policy of "pushing out the frontiers of technology," while not developing their full industrial potential. Unlike Japan and West Germany, the United States has not paid enough attention to the downstream need to turn discovery into technology, Robyn said.

(Compiled from a report by Washington FAX news service.)

National Science Foundation

Directorate of Engineering; Mechanical and Structural Systems (MSS)

In order to streamline the processing of unsolicited proposals, the **Division of Mechanical and Structural Systems (MSS)** in the **Directorate of Engineering** has adopted (on a trial basis for two years) a panel review system for the proposals received by the Division.

The panels are convened twice during the year. For proposals received by November 1, MSS expects that awards will be made on or about April 1; for proposals received by the target date of April 1, awards will be made on or about September 1.

Expert panelists are chartered for the review of proposals. In addition to their role as merit reviewers, these distinguished panelists will help the Program Director and the Director, Division of Mechanical and Structural Systems, in identifying and prioritizing major research areas and interfacing with the research community.

It is anticipated that the new review procedures will: 1) make a more efficient use of the review community; 2) more effectively involve the research community in formulating and guiding policy; and 3) allow for better allocation of scarce resources.

Also, PLEASE NOTE: The requirements in the NSF application kit (GRESE - NSF 90-77, Grants for Research and Education on Science and Engineering) pertaining to the 15-page limit for project description (page 3), and the 10 publication limit for senior personnel in the proposed project (page 4) are being strictly enforced. Proposals in violation will be returned without review.

Electronic Information System Available

Electronic access to the NSF Bulletin, publications, announcements, press releases, reports, and descriptions of funded research projects (FY 89-91) is now available through the Science and Technology Information System (STIS). The full text of publications can be searched and copied online. The system is available 24 hours per day.

STIS can be accessed on Internet using the command:

telnet stis.nsf.gov, or
telnet 128.150.195.40

Once you have connected to the system, log into STIS with the word **public**. Appropriate instructions and on line help are then available for use of the system.

New Japanese Research Database

The National Science Foundation (NSF) Scientific and Engineering Database Access Project (NACSIS), is now offering a "Hot Topics" update service. This service focuses on areas of significant Japanese research that are of special interest to the American research community. Each "Hot Topics" package contains the most recent 100 abstract records retrieved from the NACSIS Conference Proceedings databases. Updates will be provided periodically as new records are added to the databases.

The following subject areas are currently offered:

- AI/Expert Systems
- Applied Biotechnology
- Biomedical Electronics
- CAD/CAM-CIM
- Ceramics
- Database Technology
- Electronic Displays
- Integrated Circuits
- Neural Networks
- NLP/Machine Translation
- Optoelectronics
- Parallel Computing
- Polymers
- Robotics
- Sensors and Sensing
- Telecommunications

"No other country besides the United States devotes as much energy to R&D nor uses it as effectively as Japan," says Alexander De Angelis, Manager of NSF's Japan Program. "It is vital, therefore, that we keep abreast of the directions of R&D in Japan. NACSIS is the gateway to an important component of Japan's R&D."

Those interested in having a search of the NACSIS databases done or in obtaining "Hot Topics" packages—both free of charge—may contact the NACSIS Operator at 202/357-7278 between the hours of 1 and 4 EST on weekdays, or may send messages by electronic mail to:

nacsis@nsf.gov (Internet)

nacsis@nsf (BitNet)

Full details on the NACSIS databases, as well as NSF's support for research in Japan, may be found in NSF's Japan Program Announcement, NSF 90-144. Order copies by mail from NSF's Publication Unit, Room 232, NSF, Washington, D.C. 20550; by calling 202/357-3619; or by sending an email request to pubs@nsf.gov (Internet) or pubs@nsf (BitNet).

North Star Research Foundation Initiates U of M Innovation Fund

The Board of Directors of the North Star Research Foundation have approved a three-year grant of \$300,000 to establish a fund to support innovative technology transfer projects at the University of Minnesota. In a letter informing President Nils Hasselmo of the decision, North Star Research Foundation President Donald P. Brown expressed the Board's "hope that these funds will facilitate the transfer of University-developed technology into the private sector."

In reply, Hasselmo wrote that "This decision is an example of the North Star Board of Directors' foresight in recognizing the value of technology developed through faculty research, and a sign of North Star's dedication to contributing to the state's economy."

The North Star grant requires the University to raise \$100,000 in matching funds each year, in new money from either internal or external sources. No distributions can be made from the Innovation Fund until the matching support has been obtained. Funding for subsequent years will be paid following review by North Star's Board of activity and progress during the previous year and a positive vote to continue supporting the effort.

The Innovation Fund will be administered by Tony Potami, associate vice president, research and technology transfer. When matching funds are received, he will announce a program and develop guidelines within which faculty and/or staff can be awarded funding to support the further development and/or patenting of commercially viable inventions. The terms of the North Star grant call for all applications for funding to be reviewed by the Technology Evaluation Council (TEC), a group of business and industry leaders recruited by Potami to help evaluate technology transfer decisions. The North Star Foundation will nominate a representative to serve on the TEC. If inventions aided by Innovation Fund awards generate royalties, one half of the University's share (which is one third of net royalties) will be credited back to the Innovation Fund.

"We are very excited about the Innovation Fund, which together with the Blandin Foundation Early Stage Technology Development Fund will enable the University to support some of the many worthwhile research and development projects that can contribute to the development of Minnesota's economy," Potami said.

National Institutes of Health

Conference

The Christopher Columbus Medical Sciences Committee of the National Institutes of Health, in conjunction with several NIH institutes, the Food and Drug Administration, and the Italian National Research Council, has organized a major international conference that will be held at the Omni Shoreham Hotel in Washington, DC, February 10-12, 1992. The conference, *Aging: Quality of Life*, is part of the commemoration of the Quincentenary of Christopher Columbus' epic voyage to the Americas.

A banquet will be held in the evening of February 11. Presentation of the prestigious Christopher Columbus Discovery Awards to outstanding scientists in biomedical research will be the highlight of the banquet.

Registration for the three-day conference is \$200 if paid in advance, or \$250 on site. Early registration of \$150 is through December 15, 1991. Those interested in program and registration information should contact: Aging: Quality of Life Conference, Suzanne Kuntz, Conference Coordinator, 655 15th Street NW, Suite 300, Washington, DC 20005; 202/639-4524; Fax: 202/347-6109.

National Center for Nursing Research

Anticipated RFA

The National Center for Nursing Research (NCNR) is considering the release of a Request for Applications (RFA) for P20 grant applications in January, 1992. The RFA would be for Exploratory Centers for Biobehavioral Symptom Management. Eligible institutions will be schools of nursing and departments of nursing within clinical settings. The expected deadline date for receipt of applications is **May 7, 1992**.

Although details will not be available until publication in the NIH Guide [ORTTA will note in the bulletin board], the program contact person is: Dr. Laura James, Acute and Chronic Illness Branch, National Center for Nursing Re-



University of Minnesota

Board of Regents Policy

Disclosure of Conflict of Interest

At its meeting in October 1991, the Board of Regents adopted a major change to the University's Conflict of Interest policy. Formerly called Disclosure of Financial Arrangements with Industry, the policy now applies to **all** research proposals, not just those going to an industry sponsor. The policy now provides that, if personnel who will be working on a research project have an interest in a company and the company may be affected by the research, the interest must be reported. (This reporting is usually done in section 19 of the BA23—an amended BA23 will be available in the near future that will reflect this policy change).

If you have questions or comments about this policy, please feel free to call Mark Brenner, Associate Dean, Graduate School, 625-2356 or John Thuente, Director, Patents and Licensing, 624-2816.

NOTE:

This eight-page policy can be removed as a section and saved, if desired.

Guide to Users

This policy is intended to facilitate the widest possible interactions between faculty and industry, while at the same time satisfying the growing national concern over potential conflicts of interest in academia. This policy was a leader when it was first passed in 1988. The current revisions will keep it in the forefront of institutional policy in this area.

The underlying premise upon which this is based is disclosure. Effectively, in all cases in which knowledge of a relationship with an entity would be material, there must be disclosure. This includes, by way of example, disclosure of the relationship in the following cases:

- a) when presenting material by scholarly publication; and/or
- b) when applying for sponsorship from the entity; and/or
- c) when applying for sponsorship from a third party; e.g., NIH or NSF, where the outcome of the research would affect the entity; and/or
- d) when transferring technology to the entity.

Examples of a relationship with an entity that must be disclosed include:

- a) consultantship; and/or
- b) equity position, including stock options; and/or
- c) gifts or loans; and/or
- d) official capacity such as serving on the board of directors or scientific board.

1. PREAMBLE

The University of Minnesota actively encourages and participates in interaction with private companies as an important component of its research, education, and public service missions. Research agreements between the University and private companies provide a valuable source of funds, equipment, and topics for University research. Consulting arrangements and other contacts between faculty and private companies advance the faculty's ability to provide a high quality research and educational experience for students, and enhance employment opportunities for students. Licensing by the University to private companies, consulting services by faculty for private companies, assistance by faculty in new company starts, and other forms of technology transfer are critical to meeting society's needs. The University, therefore, clearly has a responsibility to foster the free flow of ideas and individuals between the University and the private sector.

The commitment of the University to this responsibility is reflected by its policies and guidelines relating to interaction with industry. The Patent and Technology Transfer Policy, Policy on Outside Consulting and Guidelines on Interaction with Industry all recognize the value of various types of relationships with the private sector and provide the means to advance these relationships. These policies and guidelines are supported by the integrity of the faculty, and by the adherence of the faculty to principles of good scholarly and professional practice. In view of the increased interaction between the University and the private sector, there is a need for a vehicle to safeguard the University's independence, credibility, primary missions, and the integrity of those University staff members involved in such interactions. Accordingly, this statement of principles is intended to facilitate and encourage interaction with the private sector by ensuring an environment in which University personnel are permitted the maximum freedom to enter into and continue various types of relationships outside of the University, while at the same time furthering the principal missions of the University and maintaining high standards of professional and ethical conduct.

2. OTHER APPLICABLE POLICIES AND LAWS

This policy complements the provisions of other applicable policies, regulations, and laws, including the Policy on Outside Consulting, the Patent and Technology Transfer Policy, the statement on "Preventing Conflicts of Interest in Government-Sponsored Research at Universities," Guidelines on Interaction with Industry, the Tenure Code, and applicable state and federal law. This policy is intended to help implement and expand upon these other related requirements. It should be noted that this policy does not apply to Medical School consultation practices that are in accord with the Regents' Policy on Private Consultation Practice.

3. GENERAL PRINCIPLES

With the acceptance of appointment or employment, an individual makes a commitment to the University and accords the University his or her primary professional loyalty according to the terms of appointment or employment. Every person is expected to arrange outside obligations, financial interests, and activities so as not to conflict or interfere with this overriding commitment to the University. At the same time, no one benefits from undue interference with the legitimate external activities of individuals who fulfill their primary full-time duties—teaching at the University, conducting scholarly research under its sponsorship, and meeting the other obligations to students and colleagues. Indeed, the involvement of individuals in outside professional activities, both public and private, often serves not only the participants, but also the University as a whole. It has been, and continues to be, assumed that all individuals will be alert to the possible effects of outside activities on the objectivity of their decisions, their obligations to the University, and the University's responsibility to others.

The areas of potential conflict may be divided into two broad categories. The first relates to conventional conflicts of interest—situations in which individuals may have the opportunity to influence the University's decisions in ways that could lead to personal gain or give improper advantage to their associates. The second is concerned with conflicts of commitment—situations in which an individual's external activities, often valuable in themselves, interfere or appear to interfere with their paramount obligations to students, colleagues, and the University. Researchers and scholars are given great freedom in scheduling their activities with the understanding that their external activities will enhance the quality of their direct contributions to the University.

Currently, universities customarily use the term "industry" in the generic sense, to encompass their relations with all facets of the private sector. Throughout this policy, therefore, the term "industry" is not used in any restrictive sense, but rather applies generally to all private enterprise. This policy is intended to apply solely to sponsored research, technology transfer, and other written agreements as provided for in Section 5.f.

4. DEFINITIONS

- a) PERSONNEL shall mean all persons appointed, employed and/or compensated by the University, including faculty, visiting faculty and researchers, professional and administrative staff, civil service employees, research and teaching assistants, residents, fellows, and trainees.
- b) COMPANY shall mean any corporation, partnership, proprietorship, firm, association, or other legal entities world-wide, excluding government entities in the United States.
- c) INTEREST shall mean any of the following interests in the aggregate held in a COMPANY, but not in a mutual fund whose investment policies are beyond the control of the individual, by PERSONNEL and/or PERSONNEL's spouse and/or dependent children:
 - (i) an investment comprising equity or options to purchase equity with a total current value of more than \$1,000.00 or representing more than 5% of the total COMPANY equity; and/or
 - (ii) personal payments (excluding consulting fees), gifts, and other benefits, including personal loans and services, received from a COMPANY to PERSONNEL within the previous twelve months with a total current value of more than \$1,000.00; and/or
 - (iii) a consulting arrangement with a COMPANY or other agreement to provide services to a COMPANY which is or should be disclosed in accordance with the Policy on Outside Consulting; and/or
 - (iv) status as a director, scientific director or member of the scientific board of advisors, officer, partner, trustee, or employee (other than a consultant) of a COMPANY.
- d) SPONSORED RESEARCH shall mean any research sponsored by the University or by any external entity including without limit a COMPANY, agencies of the U.S. federal and state governments, foundations, industry associations, and others.

5. OPERATING PRINCIPLES

- a) **General** PERSONNEL may form relationships with COMPANIES, including acquiring an INTEREST in a COMPANY, provided that such relationships satisfy this policy and any other applicable policies and laws. The University encourages all PERSONNEL to form relationships with COMPANIES which further its education, research and public service missions. For example, effective transfer of University technology may require that the PERSONNEL who originally developed the technology have a consulting agreement with or otherwise assist the COMPANY in acquiring rights in the technology. Under such circumstances, equity in the COMPANY may be an appropriate means to compensate the PERSONNEL. The COMPANY may also desire to fund further University research concerning the technology to be conducted by those PERSONNEL. These combination relationships and other relationships are permissible, and may indeed be very desirable to meeting University objectives, provided that the disclosure requirements in this policy are satisfied. Disclosure will allow the opportunity for review to ensure that the performance of PERSONNEL's duties is not compromised.
- b) **Actual Conflicts** PERSONNEL shall not enter into or allow conflicts of interest or conflicts of commitment to the University, as those terms are announced in the General Principles. Determination whether an actual conflict exists shall be made by the appropriate vice president, or chancellor if a coordinate campus is involved. If PERSONNEL wish to initiate or continue such a conflicting relationship with a COMPANY and remain associated with the University, they shall seek a suitable leave of absence, reduction of appointment, or other arrangements with the University.

- c) **SPONSORED RESEARCH Proposals** PERSONNEL with an INTEREST in a COMPANY and who propose SPONSORED RESEARCH which may affect the COMPANY shall disclose the existence of the INTEREST. To the extent allowed by law, such disclosure shall be considered private until the project is awarded. The disclosure shall be public information after the project is awarded.
- d) **SPONSORED RESEARCH Participation** PERSONNEL with an INTEREST in a COMPANY and who participate in SPONSORED RESEARCH which may affect the COMPANY shall disclose the existence of the INTEREST. Such disclosure shall be considered public information.
- e) **Technology Transfer** PERSONNEL with an INTEREST in a COMPANY shall disclose the existence of that INTEREST in the instance that the University is considering the transfer of rights, by license or otherwise, in technology developed by PERSONNEL to the COMPANY. To the extent allowed by law, disclosure shall be considered private.
- f) **Other Written Agreements** In addition to restrictions in applicable law, PERSONNEL with an INTEREST in a COMPANY shall neither propose, negotiate, nor approve on behalf of the University a contract or other commitment concerning that COMPANY without full disclosure of the INTEREST. The disclosure shall be considered public information. This paragraph applies to all written agreements including, but not limited to, lease agreements, orders and requests for goods and services, or personnel from COMPANIES (including equipment, consulting services, and legal services). This provision does not cover research grants, contracts, and relationships otherwise covered by Section 5.c., 5.d., or 5.e. above.
- g) **Public Statements** PERSONNEL with an INTEREST in a COMPANY are expected to refrain from making public statements (statements for use by the press and/or to individuals with an interest in the stock of the COMPANY) regarding SPONSORED RESEARCH prior to the publication of the results in recognized scientific literature or presentations at recognized scientific meetings. Whenever possible, the University shall include a clause reflecting this principle in each industry-sponsored grant, contract, or agreement.
- h) PERSONNEL with an INTEREST in a COMPANY, or whose research was sponsored by a COMPANY, shall state such INTEREST or sponsorship when reporting research results and when providing expert commentary on a subject that may affect the COMPANY.
- i) PERSONNEL with an INTEREST in a COMPANY who are proposing to perform research involving human subjects where the research may affect the COMPANY, shall disclose that INTEREST in the approved human subjects informed consent form.

6. IMPLEMENTATION

- a) Compliance with this policy requires a three-step determination:
 - (i) Does an INTEREST exist? ¹
 - (ii) When an INTEREST exists, must it be disclosed? ²
 - (iii) When an INTEREST exists, must approval of a vice president, or chancellor if a coordinate campus is involved, be obtained? ³

¹ The existence of an INTEREST is determined by applying Section 4.c. to the situation.

² This is determined by applying Sections 5.c., 5.d., 5.e., and 5.f. to the situation.

³ This is determined by applying Section 6.b. to the situation or, when a BA Form 23 (Application for External Research or Training Support) is not involved, by the appropriate department head or dean after consultation with PERSONNEL involved.

- b) Disclosure under Sections 5.c. and 5.d. shall be made in the manner prescribed by the BA Form 23. These disclosures will be made as part of the proposal process. After acknowledgement by the appropriate department head and dean, the BA Form 23 and accompanying proposal shall be sent to the Office of Research and Technology Transfer Administration (ORTTA). ORTTA will forward the BA Form 23 to the appropriate vice president, or chancellor if a coordinate campus is involved, for approval when required.

It is the responsibility of all PERSONNEL to notify the appropriate department head and dean of any changes in the INTEREST originally reported on the BA Form 23. Such notification shall be made in a timely fashion (normally within a month) and in writing to permit reassessment by the appropriate officials.

It is required by University policy that all SPONSORED RESEARCH be covered by a BA Form 23. However, disclosures made during the term of the project and disclosures not made on a BA Form 23 shall be in the form of a memo to the appropriate department head and dean for their acknowledgment. The memo shall then be sent to ORTTA for consideration and for forwarding to the appropriate vice president, or chancellor if a coordinate campus is involved, when approval is required.

The memo shall define the nature of the contract or other agreement and the COMPANY involved. Where possible, appropriate documentation from the COMPANY shall be attached. This memo shall be submitted in a timely manner so as to permit consideration by appropriate administration officials prior to consummation of the relationship.

- c) Approval of the appropriate academic vice president, or chancellor if a coordinate campus is involved, must be obtained prior to submission of the SPONSORED RESEARCH proposal to the COMPANY or participation in SPONSORED RESEARCH, and approval of the Senior Vice President for Finance and Operations must be obtained prior to the transfer of rights in technology developed by PERSONNEL to the COMPANY, when PERSONNEL have an INTEREST in the COMPANY that is:
- (i) an investment comprising equity or options to purchase equity with a total current value of more than \$25,000.00 or representing more than 5% of the total COMPANY equity; and/or
 - (ii) personal payments (excluding consulting fees), gifts, and other benefits including personal loans and services received from a COMPANY to PERSONNEL within the previous twelve months with a total current value of more than \$2,000.00; and/or
 - (iii) a consulting arrangement with a COMPANY or other agreement to provide services to a COMPANY which is or should be disclosed in accordance with the Policy on Outside Consulting, and with annual compensation of more than \$10,000.00; and/or
 - (iv) status as a director, scientific director or member of the scientific board of advisors, officer, partner, trustee, or employee (other than a consultant) of a COMPANY.

Faculty may wish to seek the above approval in appropriate cases where an INTEREST exists but does not meet the above definitions. Approval shall be granted or denied within two weeks of submission to the vice president, or chancellor if a coordinate campus is involved.

Factors that will be taken into account by the appropriate vice president, or chancellor if a coordinate campus is involved, determining approval include:

- (i) THE PROMINENCE AND SIGNIFICANCE GIVEN THE UNIVERSITY AFFILIATION. Where the name and/or authority of the University (as opposed to that of the researcher) is more clearly being invoked, the University should institutionally examine research affiliations more carefully.
- (ii) THE EFFECT OF THE OUTCOME OF THE PROJECT ON EXPECTED BEHAVIOR OF OTHERS. Where endorsement of a project or policy will result in people in significant numbers using a product or investing money or otherwise changing their lives, the University must bear responsibility to maintain objective evaluations. Where these first two factors combine to suggest the University, or a segment thereof, is acting as an independent evaluative laboratory, University responsibility is at a maximum.

- (iii) DEGREE OF INVOLVEMENT AND DANGER OF OVER-COMMITMENT TO DETRIMENT OF UNIVERSITY MISSIONS. The University has the duty to scrutinize requests in the light of its own missions. High quality research should be encouraged. The extent of involvement of PERSONNEL in a project should not conflict with University activities.
- (d) Disclosure under Section 5.e. shall be made in the form of a memo to the Associate Vice President for ORTTA. This memo shall be submitted in a timely manner so as to permit consideration by appropriate administration officials prior to consummation of the relationship.
- (e) Disclosure under Section 5.f. shall be made by memo to PERSONNEL with no INTEREST in the COMPANY who have final authority over negotiations and approval. The memo shall define the nature of the contract or other agreement and the COMPANY involved. Where possible, appropriate documentation from the COMPANY shall be attached. This memo shall be submitted in a timely manner so as to permit consideration by appropriate administration officials prior to consummation of the relationship.
- f) The Senate Research Committee or, if the Committee so chooses, a subcommittee appointed by the Chair of the Senate Research Committee will deal with issues concerning this policy. It will perform the following functions when necessary:
 - (i) to assist in the implementation of this policy;
 - (ii) to answer questions concerning this policy (the identity of PERSONNEL asking questions and the specific facts of questions shall be kept private to the extent allowed by law);
 - (iii) to review and comment on any disciplinary action to be taken under this policy;
 - (iv) upon the request of affected faculty, to review a decision by an administration official that an INTEREST constitutes an actual conflict of interest. The results of this review shall be forwarded to the appropriate vice president, or chancellor if a coordinate campus is involved, and President of the University for final action; and
 - (v) to periodically review this policy, including the set financial thresholds established herein.

If a subcommittee is appointed, it should include representation from ORTTA, the Research Executive Council, and the Senate Research Committee. Additional appointments can reflect necessary expertise and concerns of the broader University community.

- g) Appropriate disciplinary action may be taken by the University against PERSONNEL who violate this policy.

7. DISCUSSION

By way of example, disclosure is required by this policy in the following situations. These situations are not the only situations requiring disclosure, but may be helpful in assessing the spirit of this policy.

- a) The Principal Investigator must disclose on a BA Form 23 if a scientist working on the project has an INTEREST in the COMPANY funding the research.
- b) The Principal Investigator must disclose on a BA Form 23 if the proposal is going to the National Institutes of Health (NIH) and if the research proposed may affect a COMPANY in which the Principal Investigator has an INTEREST.
- c) The Principal Investigator must disclose in the Human Subjects Consent Form if the Principal Investigator has an INTEREST in a COMPANY that may be affected by the research.
- d) The Principal Investigator must disclose to the editor of a journal, when submitting a paper for publication, the Principal Investigator's INTEREST in a COMPANY which may be affected by the publication.

- e) An inventor must disclose by memo an INTEREST in a COMPANY to which the University is intending to license the inventor's technology.
 - f) If in the course of conducting research for a COMPANY the COMPANY grants an equity option to the Principal Investigator, the Principal Investigator must report that new INTEREST by memo to the Principal Investigator's department head and dean.
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Acknowledgements

The revisions of this policy were drafted by John Thunte, director of the Office of Patents and Licensing, with assistance from a subcommittee of the Research Executive Council: Mark Brenner, associate dean of the Graduate School; Samuel Krislov, professor, Department of Political Science; and John Sullivan, professor, Department of Political Science and former chair of the Senate Research Committee.

The revised policy was discussed by the Research Executive Council and the Senate Research Committee, and was subsequently approved by the University Senate on May 16, 1991. It was presented to the Board of Regents in September and was approved at the October 1991 Board meeting.

U of M Awarded Grant to Purchase Nuclear Magnetic Resonance Spectrometer

The University of Minnesota Biomedical Engineering Center has been awarded a \$500,000 challenge grant by the Kresge Foundation of Troy, Michigan for the purchase of a nuclear magnetic resonance (NMR) spectrometer.

The spectrometer, the most powerful of its kind available, will be used to determine how atoms in proteins, enzymes and nucleic acids are arranged, and how these biological molecules interact. The 1991 Nobel Prize in chemistry was awarded to an NMR pioneer.

"This instrument will put us at the forefront of the field," said Leo T. Furcht, head of the University's laboratory medicine and pathology department and the center's director. "Knowledge about the structure of protein molecules provided by NMR spectroscopy is guiding the design of a new generation of drugs and unique materials for use in artificial joints, organs, vessels and other devices implanted in the body."

The spectrometer to be purchased by the University contains the strongest magnet currently made. It generates a magnetic field 280,000 times more powerful than Earth's. There are about 30 NMR spectrometers of the same power in the United States. They differ distinctly from the type of magnetic resonance instrument unveiled by the University in September, which provides detailed images of human and animal tissues.

The Kresge Foundation award, which will cover half the cost of the instrument, requires the University to raise \$2 million for maintenance and eventual replacement of the spectrometer.

The University's Biomedical Engineering Center was established in 1986 with a \$2 million grant from the Medtronic Foundation to provide greater cooperation between University researchers and the growing biomedical engineering industry in the Twin Cities area.

"The Kresge Foundation award is an endorsement of our efforts to serve as a catalyst for educators, researchers, and business people in the field of biomedical engineering," said Furcht. "We are pleased to be the recipient of such an award."

In commenting on the study in its November 18 edition, the Star Tribune said in an editorial that Governor Arne Carlson is "taking a riskier gamble with the state's economic future by crimping technology research at the University of Minnesota. The governor's gamble seems implicit in a study by the Minnesota High Technology Council, which represents high-tech industry and promotes scientific and engineering education.

"...Technology programs attract federal and industrial research grants requiring matching money that the university gets from state appropriations. For example, \$357,000 in state funds produces \$700,000 in federal funds for Lake Superior research by the university. Because of Carlson's vetoes, the federal government might put its money elsewhere. Universities compete hard for federal funds."

The editorial concluded by quoting from the interview with Senior Vice President for Academic Affairs Jim Infante, which appeared in last month's Research Review (November 1991, page 4). "University Vice President Jim Infante has extended an olive branch. 'I sincerely hope,' Infante has said, 'the governor will be a participant' in restoring the vetoed funds 'for the benefit of the entire health and economic well-being of the state of Minnesota.' Finding more money for technology could be a budget gamble worth taking."

The study was prepared by an MHTC task force chaired by Jan Jachimowicz, Vice President of Business Development for Lec Tec Corporation. "This is one of a series of studies by the Minnesota High Technology Council evaluating the benefits of a strong education system in Minnesota," Jachimowicz says. "We chose the nine colleges because those are the areas that reflect most closely on the quality of graduates that pursue careers in science and technology. We put the data we gathered into profit-loss language, because most legislators are businesspeople. The point of these studies is that we are recognizing that the primary industries in Minnesota are going to change just as they have over its history, and the best way to prepare the workforce for those changes is to have a good education system. That's our best long-term investment."

The task force also included Patricia Hollister of KPMG Peat Marwick, Stephen A. Hoenack, Professor and Director of the University of Minnesota Management Information Division; Herbert C. Johnson, former chairman of Data-Myte Corporation and the Minnesota High Technology Council; and Rex Krueger, Krueger & Associates and chair of the MHTC University of Minnesota Committee.

National Multiple Sclerosis Society

Research Grants and Fellowships

The National Multiple Sclerosis Society strives to stimulate, coordinate, and support research into the cause, prevention, alleviation and cure of multiple sclerosis. It supports research in areas related to multiple sclerosis which may serve in any way to advance its aims, including fundamental as well as applied studies, non-clinical or clinical in nature, and projects in patient management technology. The society offers post-doctoral fellowship grants to help promising new investigators prepare for independent research in multiple sclerosis, junior faculty awards, and senior faculty awards.

Research Grant Support

The following grants are for periods of one to five years; annual deadlines are **February 1** and **August 1**.

- *Biomedical Research Program:* Supports fundamental or applied studies, clinical or nonclinical in nature, relevant to the Society's interests.
- *Patient Management Technology Program:* Supports research on new techniques to improve the quality of life for people with MS.

Grants for the following may not exceed \$20,000; applications are accepted throughout the year.

- *Pilot Research Grant Program:* Provides limited short-term (one year) support for novel, high-risk research.
- *Health Services Research Grants Program:* Provides short-term (one year) support for feasibility studies or small grants in areas related to access to care and legislative and entitlement issues.

Research Training Support

The following awards are for a period of five years. The stipend may not exceed 75% (\$50,000 maximum during the first year) of the applicant's annual salary. Research support of up to \$25,000 per year may also be requested. Annual deadlines are **February 1** and **August 1**.

- *Postdoctoral Fellowships Program:* Applicants must possess or be candidates for the M.D., Ph.D., or equivalent degree and have completed less than one year of prior postdoctoral training at the time of application.
- *Advanced Postdoctoral Fellowship Program:* Applicants must possess or be candidates for the M.D.,

Ph.D., or equivalent degree and have completed more than one year of prior postdoctoral training at the time of application.

- *Senior Faculty Award:* To provide support for established investigators who seek to obtain specialized training in some field which will materially enhance their capacity to conduct more meaningful research in MS.
- *Junior Faculty Award:* Provides support to independent investigators at the beginning of their academic careers.

For further information contact: The National Multiple Sclerosis Society, Research and Medical Programs, 205 East 42nd Street, New York, NY 10017-5076; 212/986-3240.

State of Minnesota

Legislative Commission on Minnesota Resources

Announcement of the next competition for funds from the Legislative Commission on Minnesota Resources (LCMR) is expected on or about December 15, 1991. Final priority strategies and review criteria will be published at that time. In the 1991-93 biennium, the University of Minnesota received over \$10 million in LCMR funds for research and public service programs.

The Research Executive Council recommends that principal investigators submit brief pre-proposals to the Graduate School by January 8, 1992, not for substantive critique, but to identify potential redundancies and recommend collaboration where appropriate.

The LCMR requires U of M proposals to be signed by ORTTA. Given the large number of proposals that University faculty and researchers are expected to generate, ORTTA recommends that final proposal packages reach that office no later than three days before the LCMR deadline to guarantee timely and accurate review and presentation. ORTTA needs a completed BA-23 in addition to the requisite number of proposal copies. Further details will be printed in the January *Research Review* and will be posted to the bulletin board. You may also call 624-9004 for assistance.

The deadline for proposal submission to the LCMR will be in mid-February, 1992. For further information and to obtain copies of the LCMR announcement, contact Michelle Beckmann at 417 Johnston Hall, 626-0309, fax 626-7431.

Department of Energy

Special Research Grants

The Office of Energy Research (ER) of the Department of Energy announces its continuing interest in receiving applications for Special Research Grants supporting work in the following ER program offices:

- Basic Energy Science
- Biological and Environmental Research
- Fusions Energy, Scientific Computing
- Field Operations Management
- Superconducting Super Collider
- University and Science Education Programs
- High energy and Nuclear Physics
- Program Analysis Activities.

It is anticipated that approximately \$475 million will be available for award in FY 1992. Applications may be submitted at any time, but, in all cases, must be received by DOE on or before **October 31, 1992**.

American Cancer Society

The American Cancer Society (ACS), through the University Dean's Committee for the ACS Institutional Research Grant, announces the availability of individual Institutional Research Grants. The stated goal of the American Cancer Society is to "foster meritorious research on cancer that cannot be supported through other available types of support." The purpose of the individual grants is to provide "seed" money to permit the initiation of promising new projects or novel ideas by junior faculty investigators.

ACS Institutional Research Grants to the University of Minnesota have been restructured considerably. The amount of the individual awards has been increased to \$15,000 in direct costs. Eligible applicants must be faculty members at the level of Assistant Professor or Instructor and *must not* have received a prior ACS Institutional Research grant or have a current competitive national research grant.

Grants are available to anyone engaged in cancer-related research at the University of Minnesota who meets the above criteria. Cancer-related research includes analysis of developmental biology, gene regulation, or alteration of intracellular or extracellular processes that may lead to an improved understanding and/or therapy of potential or actual oncogenic events in prokaryotic or eukaryotic cells.

The application deadline is **February 15, 1992**. Instructions and application forms are available from the Pediatric Oncology Office, 421 Masonic Cancer Center; 626-1926.

U.S. Information Agency

University Affiliations Program

The Bureau of Educational and Cultural Affairs of the United States Information Agency (USIA) announces a program of support for institutional partnerships between U.S. and foreign colleges and universities. The University Affiliations Program seeks to promote institutional relationships through grants for the exchange of faculty and staff for a period of three years.

Participating institutions should be prepared to exchange faculty and staff for teaching, lecturing, and research assignments of one month or longer (preferably three months or one semester); maintain their faculty on full salary and benefits; and receive visiting faculty from the partner institution. USIA grant funds, not to exceed \$125,000, can be used to defray expenses for travel and per diem. A modest amount of the grant total can be allocated for education materials and communications expenses.

Proposals will be accepted either to establish new affiliations or to allow for innovations and strengthening of existing affiliations not previously funded by the University Affiliations Program. Proposals for technical or development assistance projects and feasibility studies to plan affiliations will not be considered. Research proposals must include collaboration by researchers from both institutions and be linked to substantial participation in graduate-level seminars. U.S. institutions are responsible for the submission of proposals and should collaborate with their foreign partners in planning and preparing proposals.

The competition is limited to selected countries and academic disciplines which represent USIA's geographic and academic priorities. Geographic areas in which programs may be established include: Africa; American Republics; East Asia/Pacific; Europe; and the Near East/South Asia. Within each of those areas only certain countries are eligible for such exchanges.

The proposal deadline is **February 14, 1992**. Contact: Aleta Wenger or Camille Barone, University Affiliations Program, Office of Academic Programs, USIA, 301 4th Street SW, Washington, DC 20547; 202/619-5289. A copy of the general announcement (listing eligible geographical areas and eligible academic disciplines) as printed in the October 10, 1991 Federal Register is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

National Institute of Allergy and Infectious Diseases

National Cooperative Drug Discovery Groups for the Treatment of HIV

RFA: AI-91-13

The search for improved therapies to treat HIV-1 infection and AIDS is among the highest priorities of the Department of Health and Human Services. The National Institute of Allergy and Infectious Diseases (NIAID) invites applications for the establishment of National Cooperative Drug Discovery Groups for the Treatment of HIV. NIAID plans to continue its support of this program; reissuance of this initiative in future years is anticipated, but not certain.

NIAID has realized that many single institutions may not have either the critical mass of all the talents or the ancillary resources needed to translate leads from basic studies into new entities and strategies for AIDS treatment. A cooperative arrangement that permits the combination of the highest quality research expertise from diverse institutions with the facilitating resources of NIAID was, therefore, established, and are referred to as "National Cooperative Drug Discovery Groups" (NCDDG). They are envisioned as having the capacity to generate new approaches and strategies for the treatment of HIV infection and to rapidly translate their concepts into anticipated effective treatment. Results from the research should be used to identify and develop information for long-term planning of potential therapeutic approaches or to recommend new potential treatments worthy of further consideration in a clinical trial setting.

An NCDDG-HIV may be composed of scientists from any combination of academic, non-profit research, and commercial organizations. Awards will be made as Cooperative Agreements (U01).

NIAID has set aside \$2.2 million for the initial year funding of this RFA; funding of two to three awards is anticipated, subject to a first-year limit of \$1,000,000 in total costs, unless a written approval by NIAID waiving the limit is obtained prior to submission of the application. The application receipt date is **January 16, 1992**; the starting date for the initial annual period will be on or after June 15, 1992. For further information contact: Dr. Nava Sarver, Chief, Targeted Drug Discovery Section, Developmental Therapeutics Branch, Division of AIDS, NIAID, 6003 Executive Boulevard, Room 246P, Bethesda, MD 20892; 301/496-8197. A complete copy of the RFA (AI-91-13) is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the Bulletin Board.

National Institute of Allergy and Infectious Diseases

Enhancing Vaccine Immunogenicity

RFA: AI-92-02

The National Institute of Allergy and Infectious Diseases (NIAID) invites applications for innovative preclinical research on efficient methods to increase the immunogenicity of vaccines for eventual human use.

The focus of this effort is on developing improved vaccines that can be used to ultimately decrease the number of clinic visits that a child requires before s/he is adequately immunized against a variety of infectious diseases. In some cases, this will require that new vaccines be developed, but in other cases, it is possible that existing vaccines could be either reformulated or modified to make them more immunogenic.

The specific purpose of this RFA is to stimulate innovative preclinical research on methods to increase the immunogenicity of existing and candidate vaccines for human use. The major emphasis will be on safe and efficient methods to enhance protective immune responses against a wide variety of infectious diseases of interest to NIAID. These include, but are not limited to, pertussis, bacteria meningitis, bacterial and viral diarrheas, acute respiratory infections, sexually transmitted diseases, and malaria. (HIV and related viruses will *not* be considered under this initiative).

The support mechanism will be the traditional individual research grant (R01). NIAID anticipates making five to seven awards, totaling \$1,000,000. It is expected that the initial year award for successful applications will be in the range of \$125,000 to \$200,000 in total costs. If appropriate, collaboration with other investigators or institutions is encouraged.

A letter of intent is requested (but not required) by December 30, 1991; the final receipt date for applications is **February 24, 1992**. For further information please contact: Dr. Dale R. Spriggs, Enteric Disease Branch, Division of Microbiology and Infectious Diseases, NIAID, Control Data Building, Room 3A-05, 6003 Executive Boulevard, Rockville, MD 20852; 301/496-7051. A complete copy of the RFA (AI-92-02) is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

National Science Foundation

Instrumentation and Instrument Development (IID)

High-technology research often requires high-cost equipment. The National Science Foundation has a program that helps underwrite the cost of research instrumentation. The *Instrumentation and Instrument Development Program (IID)* awards grants to purchase expensive equipment, such as supercomputers, mass spectrometers, lasers, photomicroscopes and image analysis systems.

Grants range from \$35,000 to \$500,000 and require grantees to provide 30% to 50% of the purchase price, with more expensive purchases requiring greater contributions. In FY 1991, the program received 159 proposals and funded 54, for a total of \$5.6 million.

NSF places no limits on the fields of research institutions may pursue with IID-supported equipment; in fact, to be competitive, proposals must show that several scientists from different projects will use the instrument. There is no minimum of users, but five is suggested as a maximum. The program also permits including minor users—investigators who will use the instrument only occasionally—in the proposals.

In addition to guaranteeing widespread use of the equipment, IID applicants also must show that it would help promote the education of graduate and undergraduate students and help develop human resources within the institution. Institutions should outline educational applications of the equipment, such as student training, course preparation and seminars, particularly for undergraduates.

Institutions should also indicate how they will maintain the equipment. Generally, the more specific a proposal is about maintenance plans, the better it will be rated. Many IID awards go to replace instruments that are worn out or obsolete; others go to institutions that are establishing new laboratories or programs or dramatically expanding existing programs.

ID does not set firm deadlines and will accept proposals throughout the year. Program officers recommend that prospective applicants who are new to the program—and even those who are not—contact IID staff for informal consultation prior to submitting a proposal. NSF maintains that a little advance planning and guidance can help avoid most of the pitfalls that generally snare IID applicants, such as not meeting the multi-user and education requirements, or asking for multiple pieces of equipment or equipment arrays instead of one high-ticket piece of equipment.

For further information contact: Instrumentation and Instrument Development Program, Division of Instrumentation and Resources, Directorate for Biological, Behavioral and

World AIDS Foundation

Fogarty International Center

The World AIDS Foundation (WAF), jointly sponsored by the U.S. Department of Health and Human Services and the Institut Pasteur of Paris, France, announces its intent to support research and education relating to AIDS in the developing world. The goal of the WAF is to facilitate information exchange and to assist developing countries in responding to the AIDS pandemic.

WAF is particularly interested in projects that are catalytic and, once in place, could have a multiplicative effect. WAF is specifically interested in supporting:

- Short-term, in-country training for clinicians, allied health professionals, and technicians;
- Fellowships to support training for national experts;
- Development and testing of new concepts and demonstrations for preventing the spread of HIV; and
- Highly focused workshops that enhance the scientific process and transfer knowledge needed in the effort against HIV infections and AIDS.

The limit of any single funding request to WAF is \$200,000.

Concept letters and applications may be prepared in either English or French. Applicants must submit concept letters for initial consideration. Following review of concept letters, applicants may be invited to submit complete applications. **The annual deadline for receipt of concept letters is February 1.** Concept letters, full applications, and inquiries concerning the programs of the WAF may be directed to either:

World AIDS Foundation
Assistant Secretary for Health
c/o Director, Fogarty International Center
National Institutes of Health
Building 31, Room B2C02
Bethesda, MD 20892

or

World AIDS Foundation
c/o Director
Institut Pasteur
28 rue du Docteur Roux
75724 Paris, Cedex 15
France

American Association for the Advancement of Science

Sloan Executive Branch Science and Engineering Fellowships

This program is designed to provide the White House Office of Science and Technology Policy (OSTP) with a resource for scientific and technical policy issues related to industry; to demonstrate the value of industry-government interaction.

Fellows will work for OSTP for one or two years beginning in September 1992, providing expertise in industrial R&D, technology transfer, international competitiveness, and related issues. The program includes an orientation on executive branch and congressional operations and foreign affairs, as well as a year-long seminar program on issues involving science, technology, and public policy.

Prospective Fellows must have significant hands-on industrial experience, demonstrate exceptional competence in some area of science or engineering, possess a graduate or professional degree or equivalent experience, demonstrate sensitivity toward political and social issues, and have a strong interest and some experience in applying technical knowledge toward formulating policies that enhance U.S. technological and industrial effectiveness. Stipends are negotiable depending on qualifications and experience. The deadline for receipt of applications is **January 15, 1992**.

Congressional Science and Engineering Fellowships

These fellowships are designed to provide a unique public policy learning experience, to demonstrate the value of science-government interaction, and to make practical contributions to the more effective use of scientific and technical knowledge in government.

Fellows spend one year working as special legislative assistants on the staffs of members of Congress or congressional committees, beginning in September 1992. The program includes an orientation on congressional and executive branch operations and a year-long seminar program on issues involving science and public policy.

A prospective Fellow must demonstrate exceptional competence in some area of science or engineering, demonstrate sensitivity toward political and social issues, and perhaps most important, have a strong interest and some experience in applying personal knowledge toward the solution of societal problems. Candidates should be postdoctoral to mid-career scientists or engineers. The fellowship stipend is

\$38,000 plus an allowance for relocation and travel expenses. The application deadline is **January 15, 1992**.

Science, Engineering and Diplomacy Fellowships

The fellowships are designed to provide a unique, internationally oriented, public policy learning experience, to demonstrate the value of science and technology in working on important societal problems, and to make practical contributions to the more effective use of scientific and technical knowledge in the foreign affairs and international development programs of the U.S. Government.

Fellows spend one year, beginning in early September 1992, working either in one of several bureaus and offices of the U.S. Agency for International Development (AID) or in the Bureau of Oceans and International Environmental and Scientific Affairs of the U.S. Department of State (STATE).

A prospective Fellow must demonstrate exceptional competence in some area of science or engineering, usually at the doctoral level, i.e., any physical, biological, or social science or any field of engineering. Individuals will serve a one-year appointment, potentially renewable for a second year, at a stipend consistent with education and experience, typically starting at \$38,500. The application deadline is **January 15, 1992**.

Environmental Science and Engineering Fellowships (Summer 1992)

The purpose of this fellowship program is to assist the Office of Research and Development (ORD) of the U.S. Environmental Protection Agency in identifying and assessing the significance of long-range environmental problems and opportunities. There are a considerable number of broad areas of research interest within EPA.

Fellows will spend 10 weeks (June 1 through August 7) working as special research consultants with ORD. Fellows will undertake a detailed, future-oriented research project of mutual interest to the Fellow and EPA and will prepare a report at the completion of the summer's work. The stipend is \$900 per week plus nominal relocation and travel expenses. The application deadline is **February 15, 1992**.

To Apply

For further information on these programs and detailed application materials, contact: [Program Title] American Association for the Advancement of Science, 1333 H Street NW, Washington, DC 20005; 202/326-6600.

Faculty Help Needed to Ensure Adequate Proposal Review

by Mary Lou Weiss

I am writing this to ask the help of faculty and staff regarding month-end proposal deadlines, particularly those on February 1, March 1, June 1, July 1, October 1 and November 1. I have worked in ORTTA for over twenty years, in various capacities, of which the past fifteen have been involved with the review, approval and submission of research proposals. This past October 31 deadline provided a "Halloween Scare" for me and other grants and contracts staff. At 4:30 p.m., October 31, we had an estimated 40 proposals to review, approve and package, with phone messages indicating an additional 18 to 20 were in process and would be coming.

As with all ORTTA staff, the grants and contract staff are committed to providing efficient and helpful service. We take pride in the fact that grant management personnel in agencies such as NIH and NSF have commented that proposals received from the University of Minnesota are complete and thorough with few, if any, errors and/or missing administrative requirements such as lobby certifications, etc. Such comments are a credit to our faculty, their support staff and ORTTA. It is a combined effort that results in such praise. We in ORTTA feel it is important for us to provide the final review of the budgetary/administrative portions of proposals and we believe that faculty/departmental staff also appreciate such review. However, this past deadline, we could not provide the usual review due to the lateness in receiving a large number of proposals.

The total number of proposals processed for the November 1 deadline, to all agencies, was 156. Following are statistics documenting our "Halloween Scare":

Proposals Received 10/31/91	71
Proposals Received 10/30/91	48
Percent Received 10/31/91	45 %
Percent Received 10/30/91 & 10/31/91	76 %
Percent Received AFTER 3:00 P.M. on 10/31/91	21 %
Percent Received AFTER 4:00 P.M. on 10/31/91	15 %

As you can see, of the 45 percent received on October 31, a majority were received after 3:00 p.m. ORTTA uses courier service during major deadlines, but the last pickup by the courier occurs between 6:30 - 7:00 p.m., which means that we must have all our tasks—reviews, corrections, and packaging—completed as near 6:30 p.m. as possible.

Therefore, based on the past deadline, anything faculty and departmental staff can do to "balance out" the receipt time of proposals in ORTTA will be appreciated. We especially appreciate a phone call anytime a proposal will be delivered to ORTTA that must go out that same day, particularly if the

proposal is to be delivered to us after 12:00 noon. Such notification allows us to plan staffing needs, both at the grant administrator and support level to assure proper handling of the proposal.

I want to assure our constituents that regardless of receipt time, proposals will be processed and submitted to meet the stated deadline. Obviously, dependent on receipt time it may not get the "total" review that ORTTA staff would like to provide. We would appreciate receiving any suggestions from faculty and departmental staff regarding this matter. Please feel free to contact the appropriate grant administrator and/or assistant directors: Mary Lou Weiss, 624-5856; Todd Morrison, 624-5066; or Rick Dunn, 626-2265.

Fund for the Improvement of Postsecondary Education

Drug Prevention Programs in Higher Education — Institution-Wide Program

The Fund for the Improvement of Postsecondary Education has announced the FY 1992 Institution-wide Higher Education Drug Program.

The purpose of this program is to provide grants to develop, implement, operate, and improve drug abuse education and prevention programs for students enrolled in institutions of higher education. Grants support comprehensive, institution-wide programs to eliminate student use of illegal drugs and abuse of other drugs and alcohol, including activities whose direct or indirect purpose is to train students, faculty, and staff in drug abuse education and prevention.

Absolute priority will be given to applications proposing the development and implementation of projects a) conducted in conjunction with national college student networks and organizations, and b) addressing one or more specific approaches or problem areas related to drug abuse education and prevention for students enrolled in higher education.

Project period may be as long as 24 months; approximately 100 awards, averaging \$100,000 will be made. Applications must be received no later than **January 21, 1992**. For further information please contact: Lavona M. Grow, FY 1992-B Competition, U.S. Department of Education, 400 Maryland Avenue SW, Room 3100, ROB-3, Washington, DC 20202-5175; 202/708-4850 or 5750.

Faculty Research, Training, and Service Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please call Mike Moore at 624-9398.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
October, 1991	391	\$ 87,954,105
Awards Processed		
October, 1991	438	28,163,990
Proposals Submitted		
July, 1991 - October, 1991	1,311	219,574,079
Awards Processed		
July, 1991 - October, 1991	1,076	87,467,859
Proposals Submitted		
July, 1990 - October, 1990	1,203	164,526,113
Awards Processed		
July, 1990 - October, 1990	1,297	97,998,289

Reducing Youth Access to Alcohol: A Randomized Community Trial

Alexander C. Wagenaar, Epidemiology
 ADAMHA, NIAAA
 \$850,315 - 09/91-08/92

County Geologic Atlas Development

Priscilla Grew, Minnesota Geological Survey
 Legislative Commission on Minnesota Resources
 \$800,000 - 07/91-06/93

Tailored Interfaces with Amphiphilic Polymers

Matthew V. Tirrell, Chemical Engineering and Materials Science
 NSF
 \$475,000 - 09/91-02/93

Lake Superior Initiative

Robert M. Carlson, Office of the Vice Chancellor, UMD
 Robert T. Holt, Graduate School
 Legislative Commission on Minnesota Resources
 \$400,000 - 07/91-06/93

Regional Groundwater Assessment

Priscilla Grew, Minnesota Geological Survey
 St of MN - Natural Resources
 \$370,000 - 08/91-06/93

Control Study on Value of BMT in Storage Diseases

William Krivit, Pediatrics
 NIH, NINDS
 \$356,689 - 07/91-06/92

International Association for the Evaluation of Educational Achievement (IEA) Computers in Education Study

Ronald E. Anderson, Sociology
 NSF
 \$350,000 - 09/91-02/93

Geologic Drilling and Mapping

David L. Southwick, Geology and Geophysics
 Mark A. Jirsa, Minnesota Geological Survey
 St of MN - Natural Resources
 \$325,000 - 08/91-06/93

Minnesota Mathematics Mobilization

Harvey B. Keynes, School of Mathematics
 NSF
 \$284,387 - 09/91-02/95

Drug Education and Prevention: A Training Model for Students

John L. Romano, Educational Psychology
 U.S. Department of Education
 \$282,094 - 09/91-08/92

Mathematics in Education Reform (MER) Network: The Involvement of MER in Education

Harvey B. Keynes, School of Mathematics
 NSF
 \$277,248 - 09/91-02/93

Evaluation of Low Literacy CVD Nutrition Education

Lawrence Kushi, School of Public Health
 NIH, NHLBI
 \$273,960 - 08/91-05/92

Day Treatment for Southeast Asian Refugees

Amos S. Deinard, University Hospital and Clinic
 Bush Foundation
 \$271,225 - 07/91-06/94

Felbamate Concentration Response Trial

Ilo E. Leppik, Neurology
 Robert J. Gumnit, University Hospital and Clinic
 NIH, NINDS
 \$259,670 - 09/91-12/93

Special Care Units in Minnesota Nursing Homes

Leslie A. Grant, School of Public Health
 Rosalie A. Kane, School of Public Health
 Muriel B. Ryden, School of Nursing
 NIH, NIA
 \$242,927 - 09/91-08/92

Social and Psychological Aspects of AIDS Volunteerism

Mark Snyder, Psychology
 ADAMHA, NIMH
 \$239,602 - 09/91-07/92

Career Connections for University Students with Disabilities

Sue Kroeger, Student Development
 U.S. Department of Education
 \$234,481 - 08/91-08/93

Behavioral Architecture and Mental Retardation

Travis Thompson, Institute for Disabilities Studies
 Julia W. Robinson, Architecture
 Lynne K. Edwards, Educational Psychology
 NIH, NICHD
 \$220,819 - 08/91-07/92

Swine Infertility and Respiratory Syndrome (Mystery Swine Disease)

James E. Collins, Veterinary Diagnostic Investigation
 Robert Morrison, Large Animal Clinical Sciences
 Boehringer Ingelheim Ltd
 \$209,000 - 07/91-07/92

Function of Agrobacterium Tumefaciens Virulence Genes

Anath Das, Gray Freshwater Biological Institute
 American Cancer Society
 \$205,000 - 07/91-06/96

Nanoparticle Formation Using a Plasma Expansion Process

Joachim V. Heberlein, Mechanical Engineering
 Steven L. Girshick, Mechanical Engineering
 NSF
 \$199,931 - 10/91-03/93

Minnesota Community Traffic Safety Project

Sharon K. Wright, Minnesota Extension Service
 Richard A.W. Byrne, Minnesota Extension Service
 St of MN - Public Safety
 \$555,000 (3 awards) 10/91-09/92

Vocational Assessment Program

Rene V. Dawis, Psychology
David J. Weiss, Psychology

St of MN - Jobs and Training
\$175,945 - 10/91-09/92

Behavioral Ecology of Sea Otters at Amchitka Island, Alaska

Donald B. Siniff, Ecology, Evolution and Behavior

NSF
\$174,262 - 08/91-01/93

Modulation of Muscarinic Responses by Inositol Lipids

Esam E. El-Fakahany, Psychiatry

NIH, NINDS
\$174,140 - 09/91-05/92

In Vitro and In Vivo Antimicrobial Studies of B. Burgdorferi

Russell C. Johnson, Microbiology

NIH, NIAMS
\$165,557 - 09/91-08/92

Epidemiology of Early Otitis Media

Kathleen Daly, Otolaryngology

NIH, NCNR
\$163,183 - 09/91-08/92

Visual Neuroscience Training Program

Steven McLoon, Cell Biology and Neuroanatomy

NIH, NEI
\$161,400 - 09/91-09/92

Effect of Advanced Age on Human Naive and Memory T Cells

James O'Leary, Laboratory Medicine and Pathology
Helen M. Hallgren, Laboratory Medicine and Pathology

NIH, NIA
\$160,236 - 09/91-08/92

Neurophysiology of Cognitive Processes in Motor Behavior

A. P. Georgopoulos, Physiology

NIH, NINDS
\$151,355 - 09/91-06/92

Understanding Science and Technology

Ronald N. Giere, MN Center for Philosophy of Science
Alan E. Shapiro, History of Science and Technology

NSF
\$128,040 - 09/91-02/93

Opiate Dependence and Tolerance

Richard M. Eisenberg, School of Medicine, UMD

ADAMHA - NIDA
\$125,244 - 09/91-08/92

Cardiotoxic Effects of Granulocyte Peroxidases

John R. Mahoney, Jr., Surgery

American Heart Association
\$123,860 - 07/91-06/94

Prostaglandins and the Zone of Calcified Cartilage in Osteoarthritis

Theodore R. Oegema, Jr., Orthopaedic Surgery

G.D. Searle and Company
\$120,000 - 10/91-09/93

University of Minnesota Ronald McNair Post Baccalaureate Achievement Program

Sharyn Schelske, General College

U.S. Department of Education
\$119,772 - 10/91-09/92

Theoretical Study of Reactions at the Electrode-Electrolyte

J. Woods Halley, Physics and Astronomy

U.S. Department of Energy
\$119,718 - 08/91-01/93

Directing Growth of Molecular Crystals on Functionalized Monolayers

Michael D. Ward, Chemical Engineering and Materials Science
Margaret C. Etter, Chemistry

NSF
\$118,000 - 08/91-01/93

Enzymatic Lignin Degradation in Vitro

Simo Sarkanen, Forest Products
Elmer L. Schmidt, Forest Products

USDA
\$115,000 - 09/91-08/93

Mitochondrial Adaptation in Renal Growth and Injury

Karl A. Nath, Medicine
Thomas Hostetter, Medicine

NIH, NIAMS
\$112,527 - 09/91-07/92

Neuropeptide Y: Effects on Energy Metabolism

Charles J. Billington, Medicine

NIH, NIDDK
\$108,595 - 08/91-10/91

Treating Aggression Through Dementia Care Education

Muriel B. Ryden, School of Nursing

NIH, NCNR
\$107,997 - 09/91-08/92

Smart Test Generation for Complex Devices

Paul E. Johnson, Carlson School of Management

IBM
\$106,185 - 09/91-09/92

Gap Junction Assembly: Mechanisms and Regulation

Ross G. Johnson, Genetics and Cell Biology
Paul D. Lampe, Genetics and Cell Biology

NIH, NIGMS
\$100,000 - 09/91-09/93

Early Detection-Lung Transplant Rejection/Infection

Stanley M. Finkelstein, Laboratory Medicine and Pathology

NIH, NCNR
\$100,000 - 09/91-09/93

The Human Erythropoietin Receptor

John C. Winkelmann, Medicine

NIH, NIDDK
\$100,000 - 09/91-09/93

Studies on Carcinogen Activating Transacetylases

Patrick E. Hanna, Medicinal Chemistry/Pharmacy
David K. Ann, Pharmacology

NIH, NCI
\$100,000 - 09/91-09/93

Farm Soil/Crop Information System

Pierre Robert, Soil Science

Minnesota Technology, Inc.
\$100,000 - 09/91-11/92

Fracture Mechanics of Articular Cartilage

Jack L. Lewis, Orthopaedic Surgery

NSF
\$100,000 - 09/91-02/93

Type IV Collagen Mediated Melanoma Cell Migration

James B. McCarthy, Laboratory Medicine and Pathology
Photini-E.C. Tsilibary, Laboratory Medicine and Pathology

NIH, NCI
\$100,000 - 09/91-09/93

Calorimetric Studies of the Phase Transition of Binary Polymer Mixtures

C.C. Huang, Physics and Astronomy

American Chemical Society/Petroleum Research Fund
\$43,000 - 09/91-08/93

The Sponsored Project Information Network (SPIN) is a computerized locator system of funding opportunities (federal, nonfederal, and corporate) for faculty and institutional research, development, and education program support. It is available free of charge to University faculty and staff through ORTTA.

Based on a description of your research areas and / or the type of support sought, faculty and staff can search the SPIN Keyword Index to identify sources within specific areas of interest. The Keyword Index, a taxonomy developed by SPIN to catalog funding sources, is divided into the following ten major classifications:

- **Agriculture / Food / Forestry**
- **Arts / Culture / Humanities / Communications**
- **Business / Economics / Management**
- **Education**
- **Health / Medical Sciences**
- **International Affairs / Area Studies**
- **Miscellaneous / Other**
- **Science / Technology**
- **Social / Behavioral Sciences**
- **Social Welfare / Public Affairs**

The result of a search is a set of profiles of applicable funding sources that provides: 1) the sponsor's name; 2) the sponsor's contact address and telephone number; 3) deadline dates; 4) program titles; 5) objectives or interest areas of the sponsor; and 6) restrictions that would affect the submission of a proposal. This set of profiles is sent to the requestor.

Effective September, 1990, the SPIN indexes became available for on-line review through ORTTA's Electronic Bulletin Board (See the September, 1990 *Research Review* for information on Bulletin Board contents and access instructions—or call 624-9004 for a copy of the instructions.) The Bulletin Board contains a section devoted to SPIN and offers users the opportunity to review the Keyword Index alphabetically or within the topics shown above.

Since the Bulletin Board is accessible anytime, faculty and staff can browse the indexes at their convenience and find *keyword codes* of interest to them. From within the Bulletin Board they can forward a note to the Bulletin Board Editor requesting a SPIN search based on the chosen keyword codes (limit, 20 keywords).

Additional **Specialty Codes** used by SPIN that may help in choosing key words appropriate to the project for which funding is sought are:

International Travel	Opportunities to travel to countries or to study their cultures.
Opportunities Abroad	Support to travel identified by country, region or continent.
Equipment/Facility Support	Use code that relates to project, not what is being purchased.
Professional Development	Largely Postdoctoral opportunities.
Student Support	For students seeking external funding support.
Foreign Scholar Support	Bringing foreign scholars to this country or seeking programs in the U.S. for which they are eligible.
Conference Support	Funding to hold or conduct a conference, symposium, or workshop.
Publication Support	Support to prepare or complete a work or for actual cost of publishing a completed work.
Sabbatical Support	To undertake or supplement sabbatical leaves.

For further information regarding the SPIN system, please contact ORTTA at 624-9004.

SPIN searches are also available through the Research and Development Office in the College of Liberal Arts, the Agricultural Experiment Station, the Research Support Office at Duluth, and the Grants Development Office at Morris.

Office of Research and Technology Transfer Administration

Fax Number (612) 624-4843

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Duluth

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Morris

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Research Review Mailing List Information

Faculty:

- The *Research Review* is automatically mailed to all faculty on the Faculty Mail List holding the rank of Assistant Professor and above, using the AIS mail list.
- To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS). (AIS labels are characterized by a string of numbers above the name.)
- Please check with your departmental office or AIS (624-9000) if you need assistance.

Staff / Off Campus:

- ORTTA maintains a supplemental mail list for:
 - a) academic staff not included in the above faculty list;
 - b) staff; and
 - c) off-campus
- Additions/changes/deletions to this supplemental list may be initiated by filling out and sending ORTTA the following:

Change
Add
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Name: _____
Department: _____
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City/State (if off-campus) _____

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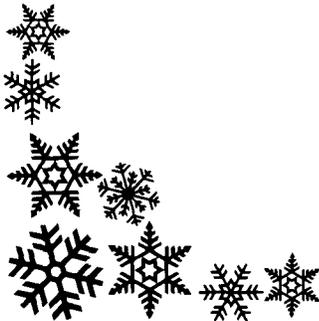
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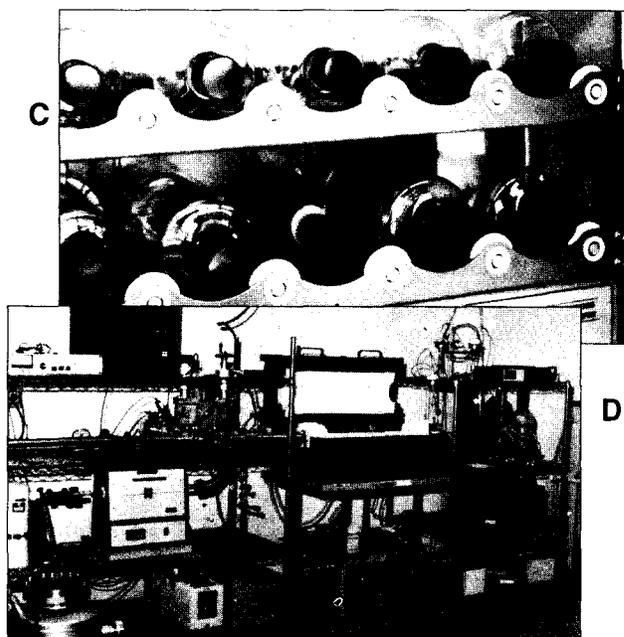
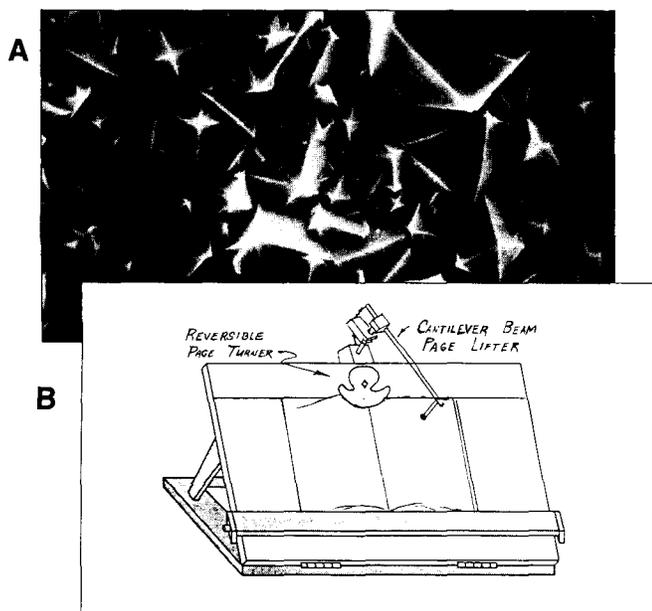
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RESEARCH REVIEW

Research and Technology Transfer Administration

January, 1992

Blandin Foundation Funds Technology Development



A: Diamonds from toxic waste; B: Mechanical page turner; C: Aspen root propagation; D: Aluminum vapor deposition.

Two years after the Blandin Foundation established the Early Stage Technology Development Fund with an award of \$500,000, several of the projects are ready for commercialization and several others have shown sufficient promise to warrant further research and development. "These are projects that probably would not have advanced without the visionary understanding and support of Blandin Foundation President Paul Olson and the Board of Directors," says Tony Potami, associate vice president for research and technology transfer.

"University inventions often face a Catch 22 situation: their commercial potential can't be evaluated without further funding, but it's hard to get funding without further evi-

Blandin, Continued on page 16

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ORTTA Revises Notice of Grant or Contract Award

With the implementation of CUFS, ORTTA has begun revising the *Notice of Grant or Contract Award*. On all awards processed since conversion, the second page of the *Notice*, which showed the fund distribution, has been eliminated in its traditional format and replaced with a screen print of the Expense Budget (EB) Document, which shows the fund distribution by object. All other information formerly found on the old second page, such as future committed funding periods and contributed effort, will now be provided in the Special Provisions Section of the *Notice*. The first page of the *Notice* is currently under revision to make the entire document easier to use for both principal investigators and staff. ORTTA is working to make the *Notice of Grant or Contract Award* a more complete and useful document with additional less cryptic information.

We appreciate your patience during this transition. If you have any questions about your award Notice or have trouble deciphering the EB document, feel free to call the ORTTA grant administrator assigned to the project.

NSF Proposals

In an effort to improve the handling of proposals at the National Science Foundation (NSF), the proposal processing unit has requested that the publication number, announcement number, or solicitation number be included in the mailing address. For example:

Proposal Processing Unit—Room 223
NSF 91-xxx [proposal, solicitation, or announcement number]
National Science Foundation
1800 G Street
Washington, DC 20550

RESEARCH REVIEW

Volume XXI/Number 7

January, 1992

Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, creed, color, sex, marital status, national origin, disability, public assistance status, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The provisional rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/91-6/30/94 rates should be used. **The rate agreement is dated July 1, 1991.** This date should be used where required on proposal applications. Please call Marilyn Surbey at 624-4850 with questions on Indirect Costs.

	07/01/91 <u>06/30/94</u>
Research	
On-Campus	40.0
Off-Campus *	21.0
SAFHL	60.0
Hornel	53.0
Other Sponsored Activity	
On-Campus	20.0
Off-Campus *	10.0
Instruction	
On-Campus	52.0
Off-Campus	16.0

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call Vivian Fickling at 624-2009.

Current actual rates from July 1, 1991 through June 30, 1992 are:

Faculty	28.75
Civil Service	25.25
Graduate Assistants	8.50

For proposals being submitted with start dates after July 1, 1992, the estimated fringe benefit rates to be budgeted are:

Faculty	31.25
Civil Service	29.50
Graduate Assistants	10.50

Estimated rates after July 1, 1993 are:

Faculty	28.00
Civil Service	30.50
Graduate Assistants	31.25

As rates change they will be reflected in this section.

The Primary Role of Universities

The primary role of universities is in education and training, not innovation, said 17 senior industry officials interviewed as part of a project sponsored by the Government-University-Industry Roundtable and the Industrial Research Institute.

The document reports that officials interviewed believe that innovation usually occurs through in-house incremental improvement to existing products or processes rather than through the rare breakthrough event.

The report, *Industrial Perspectives on Innovation and Interactions with Universities*, adds the perspectives of 17 industry officials to the ongoing discussion of how innovation occurs and how alliances with universities contribute to technical change and competitiveness within individual companies.

Those interviewed said that "industry is the primary source for innovation, and universities play only a limited role in this realm." Interviewees note that the role of universities varies depending on the maturity of the field, the type of innovation—incremental or breakthrough—and the culture of the company.

For the purpose of these interviews, innovation was defined as the conception of an idea and its movement toward, and embodiment in, a commercially successful product or process. During the early stages of large breakthrough discoveries, industry often needs to interact closely with universities to gain a more thorough understanding of the science underlying the discovery; and while industry looks to universities to fill this role, it does not want them to become oriented toward product development, said the interviewees.

Academe's primary role—education and provider of talent—is its greatest contribution to the process of innovation, said the senior industrial officials.

Another significant role for universities is providing in-depth, fundamental understanding of scientifically and technologically new or emerging ideas. Product development should not be an academic role, they stressed. Industry needs new knowledge from universities in order to build new technologies and improve old ones. However, interviewees stated that many university officials tend to have an inflated view of the importance of university research efforts in innovation. Most often, ideas from university scientists are too embryonic to be quickly or easily commercialized.

The officials agreed that the best form of university-industry collaboration is on a one-to-one basis. They called a work-

ing relationship between the industry scientist and the university scientist crucial to recognizing a potential product or a goal, assessing the appropriate time frame, identifying the risk and marketability of an idea, and assessing the credibility of the researchers involved.

The challenge for industry is to:

- determine the adequacy of the knowledge base;
- identify emerging technologies and barriers to knowledge transfer; and
- define approaches to collaboration for maximum input of new knowledge.

The interviewees stressed that no company is large enough or smart enough to meet all of its knowledge needs within the firm. A company, they said, must maintain relationships with universities, industry, and federal laboratories on topics relevant to its technological focus.

New University-Wide Contracts for Equipment

Purchasing Services has negotiated eight new contracts which offer the opportunity to purchase scientific equipment from 61 vendors at a substantial savings. The new contracts include: chart recorders, gas chromatographs, incubators, liquid chromatographs, thermal cyclers, spectrophotometers, ultracentrifuges and water purification systems.

These contracts may be used to purchase equipment exceeding \$2,000. The contracts are effective immediately and run through December 31, 1992. The contracts will be published in the Annual Contract Book issued by Purchasing Services. Each piece of equipment will be accompanied by a set-up and/or service manual and has at least a one-year warranty.

Orders for the equipment may be placed by filling out a POT. Forward the POT to ORTTA for approval if the order exceeds \$500 of sponsored funds.

These contracts are not mandatory, but Purchasing encourages departments to take advantage of savings offered by each vendor. Specific questions may be addressed to Kathleen Bergquist in Purchasing Services, 624-5762.

Committee on the Use of Human Subjects in Research

Conflict of Interest Disclosures

The University of Minnesota Board of Regents' Policy on Disclosure of Conflict of Interest, approved by the Regents on October 10, 1991, specifically identifies the requirement to disclose "interest" in research consent forms.

Among several situations requiring disclosure, Section 7.c) reads:

The principal investigator must disclose in the Human Subjects consent form if the principal investigator has an interest in a company that may be affected by the research.

The Committee on the Use of Human Subjects in Research is working with the Industry Relations Committee to ensure that determinations of "interest" are communicated to the Committee so that assurances of compliance with this policy can be enforced in the design of the consent form for research involving human subjects.

The clear statement of policy reflects a national trend in response to the issue of conflict of interest. Every effort must be made to ensure that study subjects are aware of the interest of the researchers to avoid accusations of inappropriate withholding of information from study subjects. Full and complete disclosure is the only approved means for pursuing informed consent from research participants.

Questions regarding human subjects research issues should be addressed to Moira Keane at 624-1889.



After 31 years of service in ORTTA, Merlin Garlid retired from the University of Minnesota effective December 31, 1991. Garlid, center, receives congratulations from Assistant Director Rick Dunn, at a retirement party held November 7, as his wife Kay looks on.

Photo by Brigitte Weller

NIH / ADAMHA

Policy on Supplementation of Stipends on NRSA Training Grants and Fellowships

It is the policy of the National Institutes of Health (NIH) and the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) to ensure that the full amount of any stipend increase is received by all individuals supported on National Research Service Award (NRSA) training grants and fellowships.

NIH and ADAMHA recognize that many NRSA grantee institutions supplement NRSA stipends provided to trainees and fellows; institutions should maintain the level of supplementation currently provided when stipends are increased. When making award decisions, the extent to which an institution maintains the supplementation currently provided will be considered in determining the adequacy of the resources available at the applicant institution, consistent with 42 CFR 66.206(a)(3)(ii).

New R01 Funding Mechanisms

A new R01 funding mechanism, the interactive research program grant (IRPG) has been created by the National Cancer Institute (NCI) as a way to encourage limited collaborations between investigators and coordinated submission of related research project grant applications.

"Typically, the IRPG approach will be suited to many basic research questions, as well as research to develop and apply innovative technology, or to evaluate intervention trials for cancer prevention and control," NCI states. "The IRPG mechanism may also fit well with clinical applications that propose limited testable research questions, or with focused *Phase I* and *Phase II* therapeutic and related correlative laboratory studies."

Under the mechanism, a minimum of three independent investigators will submit "concurrent, collaborative, cross-referenced individual research project grant applications (R01s) that share a common research focus." Unlike program projects (P01s) and cancer center support grants (P30s), the new awards will not require extensive shared physical resources or core functions.

Each application will be reviewed independently of the others and considered an individual research project. Applications may be submitted from a single institution or multiple institutions. The first application receipt date is February 1.

Minnesota Biotechnology Week Announced

Governor Arne Carlson has proclaimed the week of February 22 to be Biotechnology Week in Minnesota. The Proclamation recognized the work of the Minnesota Biotechnology Association, the University of Minnesota Biological Forum, and Minnesota Technology, Inc., for "taking a leadership role in advancing and promoting biotechnology and the biotechnology industry in the state of Minnesota."

A series of symposia, meetings, and a biotechnology trade fair are scheduled for February 22-26, 1992. An overview of the agendas for each event is printed below. Registration forms will be mailed to University faculty, or they may be requested from the Minnesota Biotechnology Association at 612/625-2285.

Minnesota Biotechnology Week February 22-28, 1992 Proposed Agendas

Overview:

Saturday, February 22, 1992 (Northland Inn)

Opening Breakfast Meeting:

Governor's Proclamation

Governor Arne Carlson

Preserving United States Competitiveness in Biotechnology

Vice President Dan Quayle (invited)

Monday, February 24, 1992 (Earle Brown Center)

Biological Forum Symposium III

Genetically Engineered Organisms:

- Introduction into the Environment
- Issues for Public Institutions and Regulatory Agencies

Tour and Reception:

Biological Process Technology Institute

Central Fermentation Research Facility

Tuesday, February 25, 1992 (Northland Inn)

Minnesota Biotechnology Association Annual Meeting

Biotechnology—Are you Ready?

Success Model, Future Trends, Research and Technology

Keynote Address:

The Impact of Biotechnology on Future Health Care

U.S. Senator David Durenberger

Business Workshops

Biotechnology Trade Fair: Day 1

Wednesday, February 26, 1992 (Northland Inn)

Minnesota Technology, Inc.

Programs for Biotechnology Development

- Industry Trends, Financing, Technology Assistance

Biotechnology Trade Fair: Day 2

Vaccine Development a High Priority in NIH Plan

The cost-effectiveness of vaccination and rising health care costs should make the enhanced development of vaccines a high priority, according to an early draft of the National Institutes of Health (NIH) Strategic Plan.

"In the light of the liability concerns facing private vaccine manufacturers in the United States and the multiple barriers to vaccine development and testing in the developing world, it is imperative that NIH continue to provide the leadership to reach the potential offered by the impressive advances in biomedical research," says the draft.

The NIH plan for vaccine development is organized into three areas:

1. Expanding the scientific foundation for vaccine development in microbial pathogenesis, enhancement of the immune response, application of recombinant technologies, and the essential infrastructure for vaccine development.
2. Enhanced vaccine development for common serious diseases such as HIV and other sexually transmitted diseases, and for pediatric diseases targeted by the children's vaccine initiative.
3. Novel applications of vaccines for diseases such as cancer, and for immunologic disorders.

A solid base in microbial pathogenesis is instrumental in the ability to respond rapidly to the threat of emerging microbes. Development of vaccines that elicit an immune response targeted on epitopes that are hidden from the immune system or expressed later in the process and delivered to the site where the immune response is most effective will depend on full understanding of the pathogenesis of the disease, concludes the draft.

The scientific foundation of vaccine development lies in the manipulation of the immune system to produce resistance to infection and disease. Under the Enhancement of the Immune Response to Vaccines Initiative, the plan calls for detailed understanding of the immune response in order to identify the optimal configuration of antigens and conjugates that maximize the immune response.

The section on Enhanced Vaccine Development through the Recombinant Technologies Initiative points out a striking disparity between the few diseases that can be prevented by available vaccines and the many infectious diseases for which no vaccines are available. "This gap defines the scope of the enormous unmet potential of vaccine development," says the NIH draft.

According to the draft report, "It is a gap that can be closed considerably by the application of modern biotechnology to vaccine development. Recombinant DNA technology is one area that has already shown great promise and should be exploited fully to extend the range of disease that can be prevented through immunization."

Development and evaluation of vaccines for a wide range of diseases requires an infrastructure that includes appropriate animal models, animal facilities, biocontainment laboratories, production facilities, and the ability to conduct efficacy trials on humans.

National Institute of Mental Health

NRSA Institutional Training Grants

There have been changes in the receipt dates for most NRSA Institutional Training Grant applications submitted to NIMH. Beginning October 1, 1991:

- Regular NRSA Institutional Research Training applications (T32) and Minority Access to Research Careers (MARC) training applications (T34) will be accepted *only once a year* on **May 10**.
- AIDS related NRSA Institutional Research Training applications (also T32) will also be accepted *only once a year*, but on **May 1**.
- There is no change in receipt dates for Short Term Training applications (T35), which will continue to be accepted on January 10, May 10, and September 10.
- There is no change in receipt dates for NRSA Individual Research Training Fellowships (F31 and F32) which will continue to be accepted January 10, May 10, and September 10.

Regular NRSA institutional programs and MARC programs whose projects end on June 30, 1993, should plan to submit competing renewal applications for the May 10, 1992 receipt date. AIDS related NRSA institutional programs whose project periods end on June 30, 1993 should plan to submit competing renewal applications for the May 1, 1992 receipt date.

If you have questions, please call your appropriate ORTTA grant administrator.

NIH Strategic Plan Sets Out Six Initiatives in Structural Biology

The new hybrid of scientific endeavor known as "structural biology" is vital to biomedical research and to the ability to prevent and treat human disease, says the rough draft of the National Institutes of Health (NIH) Strategic Plan. Structural biology is a blending of physical and biological research. The ability to visualize in precise detail the three-dimensional molecular architecture of proteins and other biologically important molecules can provide critical insights into their function. These insights can speed the rational design of vaccines or inhibitory agents and enable the development of drugs. Structural biology, says NIH, is a "major linchpin in U.S. biotechnology research efforts."

The plan cautions that progress in structural biology depends largely on broad support for development and for routine use by researchers of costly instruments and technologies such as synchrotron radiation-based x-ray crystallography, neutron-based diffraction, and high-field magnet-based spectroscopy, all used in tandem with computer-based methods of data collection and analysis for exact macromolecular structure determination.

In its report, the NIH panel stresses that training of investigators who can bridge the multidisciplinary approaches of structural biology is essential. These researchers should be capable of merging new, powerful techniques of molecular biology with the existing tools of structural biology to enhance the power of rational drug design and the potential of enzyme/protein engineering.

The scientific initiatives proposed in structural biology by the NIH plan are grouped into six main areas.

Structure and Function of Macromolecules

This initiative proposes to further the understanding of the static and dynamic structures of proteins and the factors that govern their stability as a necessary first step toward making progress in elucidating their *in vivo* function.

Macromolecular Assemblies

The potential of determining the structures of macromolecular assemblies to atomic resolution has been recently demonstrated. It is the purpose of this initiative to exploit this new understanding in structural biology to further our understanding of the molecular interactions involved in aggregates of proteins with other biopolymers.

Rational Drug Design

Knowledge of the exact three-dimensional structures of small molecules, proteins/enzymes, and DNA, which function as receptors for therapeutic agents, is fundamental to computer-assisted modeling for the rational design of new

therapeutic agents. This approach to drug design uses high-performance computers to model and analyze the three-dimensional structure of molecules.

This initiative proposes further research on elucidation of *in vivo* structure-function relationships and the application of rational drug design to the development of therapeutics for human disease, including AIDS and its opportunistic infections, cancer and its metastatic phase, pulmonary and cardiac diseases, drug addiction, chronic pain, bacterial infections, peptic ulcers, disorders due to faulty gene expression, disorders caused by environmental toxicity, and rare genetic metabolic diseases.

Studies of Structure and Function *in vivo*

This initiative would encourage research using nuclear magnetic resonance (NMR), positron emission tomography (PET) and other imaging spectroscopic methods to investigate, *in vivo*, flow dynamics of the circulatory system, fundamental anatomy and physiology, measurement of metabolic function in tissues and organs, and applications to the clinical setting.

Technology and Instrumentation

Well established techniques and relevant instruments achieving separation and purification of biological macromolecules need further improvement, especially at the microanalytical level. New instrumental techniques such as multidimensional NMR hold considerable promise of rapidly generating molecular-structural information.

The purpose of this initiative is the further development of these techniques, with greater emphasis placed on synchrotron-related technologies. There also is a need to support research and development in newly conceived methods of microscopy based on previously unexploited chemical and physical principles.

Advanced Computer Based Technologies for Biological Structure Determination and Analysis

Well established methods for determining macromolecular and cellular structure, such as x-ray crystallography, multidimensional NMR, MRI, and PET have an essential dependence upon computers. These techniques produce vast amounts of data that overwhelm many presently used computers.

This initiative would encourage the development of innovative, fast, high performance computer architecture and appropriate algorithms to enable adequate handling of data analysis, storage, and management.

Program Information

Internal and External Sponsors

US Department of Agriculture

Competitive Research Grants Program 1992

Applications are invited by the U.S. Department of Agriculture for competitive grant awards in agricultural, forestry and related environmental sciences under the National Competitive Research Initiative Grants Program, administered by the Office of Grants and Program Systems.

Research is needed which will form a broad base of knowledge for addressing cost-effective prevention and solution of problems associated with agricultural production, particularly for generating production systems that are sustainable both environmentally and economically; for developing means to protect natural resources and wildlife; for optimizing national and international economic factors; for optimizing livestock and crop quality and productivity; for protecting human health and food safety; for finding new uses of agricultural products, including use as fuel; and for adding value to all stages of agricultural products.

Subject to the availability of funds, proposals are solicited in support of high priority research of importance in the following research divisions: Natural Resources and Environment (\$17.039 M); Nutrition, Food Quality, and Health (\$6.153 M); Animal Systems (\$23.666 M); Plant Systems (\$37.866 M); Markets, Trade, and Policy (\$3.787 M); Processing Antecedent to Adding Value or Developing New Products (\$3.787 M).

To be considered for funding during FY 1992, proposals must be postmarked by the following dates (contact telephone numbers are included; all are area code 202):

21.0	Water Quality	
	401-6030	January 13
23.0	Forest/Rangeland/Crop Ecosystems	
	401-5114	January 13
51.1	Pathology	
	401-4310	January 13
51.4	Weed Science	
	401-4310	January 13
31.0	Human Nutrient Requirements for Optimal Health	
	205-0250	January 21
54.1	Photosynthesis and Respiration	
	401-6030	January 21
55.0	Alcohol Fuels Research	
	401-4310	January 21
52.1	Plant Genome	
	401-4871	January 27

52.2	Plant Genetic Mechanisms and Molecular Biology	
	401-5042	January 27
22.1	Plant Responses to the Environment	
	401-4871	February 3
51.2	Entomology	
	401-5114	February 3
51.3	Nematology	
	401-5114	February 3
43.0	Animal Molecular Genetics	
	401-4399	February 10
24.0	Improved Utilization of Wood and Wood Fiber	
	401-4002	February 18
41.0	Reproductive Biology of Animals	
	401-6234	February 18
42.0	Cellular Growth and Developmental Biology of Animals	
	205-0250	February 24
53.0	Plant Growth & Development	
	401-5042	March 9
54.2	Nitrogen Fixation/Metabolism	
	401-6030	March 9
44.0	Mechanisms of Animal Disease	
	401-4399	March 16
71.0	Processing for Value-Added Products	
	401-4002	March 16
61.0	Market Assessments, Competitiveness, and Technology Assessments	
	401-4425	March 30
62.0	Rural Development	
	401-4425	March 30
80.1	Research Career Enhancement	
	401-5114	April 6
80.2	Equipment Grants	
	401-5114	April 6
80.3	Seed Grants	
	401-5114	April 6
32.0	Food Safety	
	401-4399	April 13

A copy of the complete announcement/guidelines, as published in the December 2, 1991 Federal Register, and application kits are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Department of Energy

Energy Biosciences

The Office of Basic Energy Sciences, Office of Energy Research, U.S. Department of Energy (DOE) announces its interest in receiving preapplications from potential applicants for research funding in the Energy Biosciences program area.

The Energy Biosciences program has the mission of generating fundamental biological information about plants and non-medical related microorganisms that can provide support for future energy related biotechnologies. The objective is to pursue basic biochemical, genetic and physiological investigations that may contribute towards providing alternate fuels, petroleum replacement products, energy conservation measures as well as other technologies related to DOE programs.

Areas of interest include: bioenergetic systems, including photosynthesis; control of plant growth and development, including metabolic, genetic, and hormonal and environmental regulation, metabolic diversity, stress physiology and adaptation; genetic transmission and expression; plant-microbial interactions, plant cell wall structure and function; lignocellulose degradative mechanisms; mechanisms of fermentations, genetics of neglected microorganisms, energetics and membrane phenomena; thermophily (molecular basis of high temperature tolerance); microbial interactions; and one-carbon metabolism, which is the basis of biotransformations such as methanogenesis.

Preapplications should be received by February 26, 1992. Preapplications should consist of two to three pages of narrative describing research objectives, scientific goals and their significance, an outline of the approaches planned, and any other information that relates to the planned research. No budget information or biographical data need be included, nor is an institutional endorsement necessary.

Formal applications should be received by **June 10, 1992.** For further information contact Ms. Pat Snyder, Division of Energy Biosciences, Office of Basic Energy Sciences, ER-17, Washington, DC 20585; 301/903-2873. A copy of the announcement, as printed in the November 29, 1991 Federal Register is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

National Institutes of Health

Small Instrumentation Grants Program

The National Institutes of Health (NIH) has announced the FY 1992 Small Instrumentation Grants Program. Approximately \$5 million will be available from NIH for these grants.

Each institution that received \$21,608 or less in support under the Biomedical Research Support Grant (BRSG) Program in FY 1991 and that currently has active NIH research grant support is eligible to apply. Only one application may be submitted from each eligible institution or organizational component [department].

The small instrumentation award will be restricted to the purchase of equipment costing between \$5,000 and \$60,000. Awards will be made on or before September 30, 1992. The amount of the award will be based upon a percentage of the institution's research grants base for FY 1991 or \$5,000, whichever is greater.

Letters of instruction to eligible institutions were mailed on or about November 28, 1991. Completed applications must be received by **February 12, 1992.** Investigators interested in applying should contact their appropriate Grant Administrator at ORTTA for further information.

National Science Foundation

Instrumentation and Instrument Development (IID)

High-technology research often requires high-cost equipment. The National Science Foundation has a program that helps underwrite the cost of research instrumentation. The *Instrumentation and Instrument Development Program (IID)* awards grants to purchase expensive equipment, such as supercomputers, mass spectrometers, lasers, photomicroscopes and image analysis systems.

Grants range from \$35,000 to \$500,000 and require grantees to provide 30% to 50% of the purchase price, with more expensive purchases requiring greater contributions. In FY 1991, the program received 159 proposals and funded 54, for a total of \$5.6 million.

For further information contact: Instrumentation and Instrument Development Program, Division of Instrumentation and Resources, Directorate for Biological, Behavioral and Social Sciences, National Science Foundation, 1800 G Street NW, Washington, DC 20225; 202/357-7652.

National Science Foundation

Undergraduate Programs at NSF

The educational system of the nation extends from kindergarten through graduate school, and its vitality and intellectual product are the chief concerns of the National Science Foundation. Undergraduate education has a central place in this array. The teaching and learning of science in college are crucial. NSF is organized to support efforts in these areas through the Directorate for Education and Human Resources (EHR). The programs of this Directorate address every educational level, and every category of citizen needing enhanced access to education in science, mathematics and engineering.

Undergraduate education is supported in many parts of NSF. NSF has created within EHR the Division of Undergraduate Science, Engineering, and Mathematics Education (USEME) to serve as its focal point for undergraduate education. USEME programs—many of which cooperate with the various research directorates of NSF—are evolving and growing rapidly. The following is intended to alert faculty to opportunities for grant support to improve undergraduate curriculum, instrumentation, and research activities.

Programs of General Interest

Instrumentation and Laboratory Improvement

(Brochure 91-84)

Provides grants of \$5,000 to \$100,000 for acquisition of laboratory equipment (match required) to improve instruction; proposal closing date annually in early November.

Undergraduate Course and Curriculum Development

(Brochure 91-50)

This program applies to all NSF disciplines and has broad curricular scope. In 1992 it emphasizes introductory-level courses, curricula, and laboratories, and encompasses all activities affecting the learning environment, content, and experience of instruction at this level. Projects envisioning major changes are sought by this program. Closing Date: June 15, 1992.

Curriculum Development in Mathematics: Calculus and the Bridge to Calculus

(Brochure 91-125)

This program fosters improvement in the quality of calculus instruction on a national scale. In addition to curriculum development and dissemination, awards are made to support adaptation and large scale implementation of previously developed approaches to instruction. Closing Date: February 18, 1992.

Undergraduate Faculty Enhancement Program

(Brochure 90-112)

Offers grants that enable groups of faculty to learn about new techniques and developments in their fields. Awards are made to conduct seminars, short courses, workshops, or similar activities for faculty from outside the grantee institution. A special component emphasizing coalitions between two-year and four-year colleges was added in 1991. Contact USEME.

Research in Undergraduate Institutions

(Brochure 89-60)

Provides research grants or research equipment grants for faculty of predominantly undergraduate institutions (that offer no doctorate in the submitting department). Proposals are handled by research directorates. Contact the Senior Staff Associate for Cross-Directorate Activities, EHR, Room 516, 202/357-9522.

Research Opportunity Awards

(Brochure 89-60)

Supports faculty to join an NSF-supported research group for a summer or academic year; may be combined with a sabbatical leave. The request is prepared by the research mentor at the initiation of the faculty member. Contact the Senior Staff Associate for Cross-Directorate Activities, EHR, Room 516, 202/357-9522.

Research Experiences for Undergraduates

(Brochure 91-78)

Provides grants at doctoral or non-doctoral school sites for eight to ten undergraduates to pursue hands-on research projects with faculty mentors in the summer; half the participants must be from outside the host institution. NSF Research grantees may apply for a supplement to support participation by one or two undergraduates in ongoing research projects. Contact the Senior Staff Associate for Cross-Directorate Activities, EHR, Room 516, 202/357-9522.

CISE Educational Infrastructure Program

(Brochure 90-155)

Stimulates innovative educational activities in computer science and engineering such as curriculum development, laboratory infrastructure, faculty enhancement, and instructional delivery systems. Contact CISE-EI, Office of Cross Disciplinary Activities, Room 304, 202/357-7349.

Continued on Next Page...

NSFNET

(Brochure 90-7)

This high-speed data network gives access to supercomputers, software, and data bases. Proposals for instructional use may be submitted to ILI for equipment, and to NSFNET for other costs of access. Contact Division of Networking and Communications Research and Infrastructure, Room 416, 202/357-9717.

Programs of Interest for Minorities

Alliances for Minority Participation

(Brochure 90-44)

Seeks multidisciplinary or disciplinary approaches at the undergraduate level to increase the quantity and quality of underrepresented minority students attaining degrees and careers in science and engineering. Coalition approaches are favored. Contact the AMP Director, Division of Human Resources Development, Room 1225, 202/357-7350.

Research Improvement in Minority Institutions

(Brochure 91-117)

Provides grants of up to \$500,000 per year to institutions with graduate programs and large minority populations for improvement of research and instructional activities at baccalaureate and graduate levels. Contact RIMI Program Director, Room 1225, Division of Human Resources Development, 202/357-7350. The Computer and Information Science Directorate has a specific program in computer research improvement for minority institutions; contact 202/357-7349.

Research Careers for Minority Scholars

(Brochure 88-126)

Provides grants for research and enrichment programs for underrepresented minority students in undergraduate or graduate school. This program aims to increase the number of these students who enter careers in science and engineering. Contact Division of Human Resource Development, Room 1225, 202/357-7350.

National Science Foundation

Engineering Faculty Internships Initiative

The Engineering Directorate of the National Science Foundation (NSF) would like to encourage interested faculty to conduct research *within* an industrial setting. The principal objective of the Engineering Faculty Internships Initiative is to serve as a catalyst for faculty to either establish or redirect their research efforts with greater awareness of national competitive issues and needs. While the main emphasis is on internships within manufacturing organizations, proposals for research activities within service organizations or corporate research laboratories are also encouraged.

The following conditions are imposed:

- Interested faculty may submit a proposal for a grant to support up to 50% of their total budget for the internship period. The internship period may include either one summer and/or one semester. Awards will be made up to \$25,000 of support and may include up to 10% of the requested amount to be used in lieu of indirect costs.
- The proposal must include a written matching commitment of non-federal funds from the industrial partner to support the other 50% of the budget for the duration of the internship. Equipment purchases or discounts on the same *will not* be accepted as matching funds.
- The proposal must include an industrial co-investigator.
- Preference will be given to proposals that also include student involvement. Industrial matching funds for student stipends will be looked upon favorably. Since the potential for long-term research relationships with industry often depends on interpersonal skills, evidence of teaching excellence or related abilities will also be weighed in the evaluation process.

The target date for submission of proposals is **February 15, 1992**. A copy of the announcement is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

American Cancer Society

The American Cancer Society (ACS), through the University Dean's Committee for the ACS Institutional Research Grant, announces the availability of individual Institutional Research Grants. The stated goal of the American Cancer Society is to "foster meritorious research on cancer that cannot be supported through other available types of support." The purpose of the individual grants is to provide "seed" money to permit the initiation of promising new projects or novel ideas by junior faculty investigators.

ACS Institutional Research Grants to the University of Minnesota have been restructured considerably. The amount of the individual awards has been increased to \$15,000 in direct costs. Eligible applicants must be faculty members at the level of Assistant Professor or Instructor and *must not* have received a prior ACS Institutional Research grant or have a current competitive national research grant.

Grants are available to anyone engaged in cancer-related research at the University of Minnesota who meets the above criteria. Cancer-related research includes analysis of developmental biology, gene regulation, or alteration of intracellular or extracellular processes that may lead to an improved understanding and/or therapy of potential or actual oncogenic events in prokaryotic or eukaryotic cells.

The application deadline is **February 17, 1992**. Instructions and application forms are available from the Pediatric Oncology Office, 421 Masonic Cancer Center; 626-1926.

GTE Corporation

Lectureship Program in Technology and Ethics

During each academic year, GTE Corporation sponsors a competition open to all accredited colleges and universities in the United States, offering grants of up to \$5,000 for lecture programs to be presented on campus. In an effort to promote social responsibility, the GTE program focuses on topics that integrate technology and ethics. The program has three purposes:

- To encourage public consideration and discussion of current issues integrating science and technology with social and ethical values;
- To promote interdisciplinary ties on campuses of educational institutions and facilitate exposure to outside experts on these issues;
- To support efforts by colleges and universities to enrich the lives of their surrounding communities.

Continued...

Any accredited community college, college, or university in the U.S. is eligible to apply. Multiple applications will be accepted, but only one grant will be awarded to any one institution. All lectures should take place during the 1992-93 academic year. A report on the attendance, finances, and effect of funded lectures will be required.

The proposal deadline is **February 14, 1992**. For further information contact: The GTE Lectureship Program, Rosedale & Carter Roads (N-156), P.O. Box 6317, Princeton, New Jersey 08541-6317.

Baxter Healthcare Corporation

Study of Kidney Disease

The Extramural Grant Program of Baxter Healthcare Corporation announces continued support of the study of kidney disease, its pathophysiology and treatment options.

Cardiovascular accidents (i.e. myocardial infarction and stroke) lead the causes of morbidity and mortality for patients maintained on chronic dialysis, both hemodialysis and peritoneal dialysis. Hypertension appears to be an important risk factor predisposing patients to these morbid and mortal events. Hypertension in the ESRD population has been associated with sodium volume overload, an abnormal renin-angiotensin system and increased peripheral vascular tone. Other pathophysiologic circumstances, which are as yet unidentified, may also play a role in the cause of this hypertension.

The specific subjects of research under this RFP are Hypertension and Dialysis. Areas of research include but are not limited to:

- The underlying causes of hypertension in the maintenance dialysis patient;
- How to prevent cardiovascular deterioration in the dialysis patient;
- Whether one or another treatment modality improves or corrects the blood pressure abnormality.

The application deadline is **November 6, 1992**. To receive instructions and application materials, potential applicants must submit a brief questionnaire. Copies of the complete announcement and the questionnaire may be requested from ORTTA by calling 624-9004 or by sending a note through the bulletin board. The agency may be contacted directly by calling 708/270-5201; fax: 708/270-5227.

Alcohol, Drug Abuse, and Mental Health Administration

Research Scientist Development Award

The ADAMHA Research Scientist Development Award (RSDA) is intended to enhance the development of outstanding scientists and enable them to expand their potential for making important contributions to the fields of alcohol, drug abuse, or mental health research. This Award provides five years of salary support (renewable once) and guarantees that the awardee will be able to devote at least 80% of his/her time to research for the duration of the award.

Candidates must be nominated, and must have an earned doctorate degree. Scientists who hold a position with firm salary support for full-time research are not eligible for support under this program.

Individuals who receive salaries for RSDA grants are to devote full time (at least 80%) to research and research-related activities, including science education activities. The salary proposed must be consistent with the established salary structure for full-time, 12-month staff appointments at the grantee institution. ADAMHA's contribution to salary support is geared to the institution's base as follows:

- up to \$45,000 — 100 % of institutional base;
- \$45,001 to \$60,000 — \$45,000;
- \$60,001 and over, — 75% of institutional base up to \$75,000.

Research Scientist Award

The purpose of the ADAMHA Research Scientist Award (RSA) is to enable exceptionally talented investigators who are well-established in fields relevant to alcohol, drug abuse, or mental health research to engage in research on an essentially full-time, long-term basis. This renewable award provides five years of salary support for the investigator's research and research-related activities and guarantees that the awardee will be able to devote at least 80 percent of his/her time to research for the duration of the award.

RCAs are geared to support persons with an earned doctorate degree who have established a distinguished record of original contributions to research in the ADM research areas. Awards will be made to those individuals who can best demonstrate the benefits provided by allowing them release time to pursue research full-time. Scientists who hold a position with firm salary support for full-time research or whose primary responsibility is administrative are not eligible for support under this program. Salary support is the same as for the Research Scientist Development Award, indicated above.

Continued...

Annual deadlines for both types of award are **February 1, June 1** and **October 1**. For a complete copy of the guidelines, please call ORTTA at 624-9004 or send a note through the bulletin board. Review criteria outlined in guidelines will be effective for all applications received as of February 1, 1992, and will be applied beginning with the June peer review by the Initial Review Groups.

National Institute on Alcohol Abuse and Alcoholism

Research on Pharmacologic Treatments for Alcoholism

Development of new medications for the treatment of brain and behavior disorders is a priority of the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA). As part of this initiative, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) is seeking applications for grants in the area of clinical pharmacological treatments for alcoholism.

Over the past decade, research activity on the pharmacological treatment of alcohol dependency has burgeoned. As a result, many types of pharmacological agents have been employed in the various situations encountered in clinical practice. The pharmacological agents for managing the clinical events can be divided into the following categories (Liskow and Goodwin, 1987):

- Anticraving agents
- Aversive agents
- Agents to treat acute alcohol withdrawal
- Agents to treat the protracted withdrawal syndrome
- Agents to diminish drinking by treating associated psychiatric pathology
- Agents to decrease drinking by treating associated drug abuse
- Agents to induce sobriety in intoxicated individuals (amethystic agents)

Research is needed to resolve questions within each of these classes of pharmacological agents. Research is also needed to address general questions that transcend specific pharmacological classes.

The application receipt date for this RFA (AA-92-01) is **April 3, 1992**. Mechanisms of support include the individual research grant (R01); small grant (R03); FIRST award (R29); and exploratory/developmental grants (R21). A copy of the RFA is available from ORTTA and may be requested by calling 624-0061, or by sending a note through the bulletin board.

Faculty Research, Training, and Service Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please call Mike Moore at 624-9398.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
November, 1991	278	\$ 29,185,882
Awards Processed		
November, 1991	419	44,273,105
Proposals Submitted		
July, 1991 - November, 1991	1,589	248,759,961
Awards Processed		
July, 1991 - November, 1991	1,495	131,740,964
Proposals Submitted		
July, 1990 - November, 1990	1,484	195,922,812
Awards Processed		
July, 1990 - November 1990	1,486	116,588,757

Accelerated Soil Survey

James L. Anderson, Soil Science
David F. Grigal, Soil Science
St of MN - Legislative Commission on Minnesota Resources
\$1,270,000 - 07/91-06/93

Biological Control of Pests: Administration and Development

Mark E. Ascerno, Entomology
St of MN - Department of Agriculture
\$550,000 - 07/91-06/93

North Star Research Foundation Innovation Fund

Anton R. Potami, ORTTA
North Star Research Foundation
\$300,000 - 09/91-08/94

Early Childhood Research Institute on Substance Abuse

Mary McEvoy, Educational Psychology
Scott McConnell, Educational Psychology
University of Kansas Center for Research
\$274,266 - 11/91-10/92

Child Health Initiative

Stephen C. Joseph, School of Public Health
Robert Wood Johnson Foundation
\$233,476 - 11/91-10/92

Neuroscience Training in Drug Abuse Research

Robert P. Elde, Cell Biology & Neuroanatomy
Virginia S. Seybold, Cell Biology & Neuroanatomy
ADAMHA, NIDA
\$220,458 - 09/91-08/92

Organic Contaminants in Sediments and Waters of Lake Michigan

Steven J. Eisenreich, Gray Freshwater Biological Institute
Deborah L. Swackhamer, School of Public Health
EPA
\$219,613 - 08/91-08/93

Factors Affecting Health Care Costs in Minnesota

John Kralewski, School of Public Health
Bush Foundation
\$216,580 - 11/91-10/94

Molecular Mechanisms of Lung Damage in Pasteurella Pneumonia

Samuel K. Maheswaran, Veterinary PathoBiology
Mathur S. Kannan, Veterinary PathoBiology
Douglas Weiss, Veterinary PathoBiology
USDA
\$200,000 - 08/91-08/94

Reclamation of Recreational Systems and Environmental Resources

William Morrish, Architecture
St of MN - Legislative Commission on Minnesota Resources
\$200,000 - 07/91-06/93

Hybrid Aspen/Larch Research and Paper Science Engineering

Alan R. Ek, Forest Resources
James L. Bowyer, Forest Products
St of MN - Department of Natural Resources
\$196,000 - 07/91-06/93

Reduction of Truncation Artifacts and Noise in NMR Chemical Shift

Xiaoping Hu, Radiology
Whitaker Foundation
\$179,395 - 12/91-11/94

Interdisciplinary Training in the Biology of the Cytoskeleton

Richard W. Linck, Cell Biology & Neuroanatomy
NSF
\$175,000 - 10/91-03/93

National Transition Study of Individuals with Severe Disabilities

Robert H. Bruininks, Educational Psychology
David R. Johnson, Educational Psychology
U.S. Department of Education
\$175,000 - 10/91-09/92

Mechanism of Human Leukocyte Chemotaxis

Robert D. Nelson, Surgery
NIH, NIAID
\$162,618 - 07/91-05/92

Enforcement of the Legal Minimum Drinking Age

Alexander C. Wagenaar, Epidemiology
U.S. Department of Transportation
\$152,252 - 09/91-09/92

Igneous Stratigraphy of the South Kawishiwi Intrusion

Steven A. Hauck, Natural Resources Research Inst, UMD
Mark Severson, Natural Resources Research Inst, UMD
St of MN - Department of Natural Resources
\$150,000 - 10/91-06/93

Molecular Genetics of Porcine Stress Syndrome

Charles F. Louis, Veterinary PathoBiology
James R. Mickelson, Veterinary PathoBiology
Harry T. Orr, Laboratory Medicine & Pathology
USDA
\$150,000 - 08/91-07/94

Model Land Use Controls for Broad Environmental Quality Goals

Robert D. Sykes, Landscape Architecture
Patrick M. Condon, Landscape Architecture
St of MN - Legislative Commission on Minnesota Resources
\$150,000 - 07/91-06/93

Development and Application of Aeration Technologies

Heinz Stefan, St. Anthony Falls Hydraulic Lab
Charles C.S. Song, St. Anthony Falls Hydraulic Lab
John S. Gulliver, St. Anthony Falls Hydraulic Lab
St of MN - Legislative Commission on Minnesota Resources
\$148,000 - 07/91-06/93

Advanced Nursing Education

Mariah Snyder, Nursing
HRSA
\$142,058 - 09/91-08/92

Test of the CO₂/PH Hypothesis for Blue-Green Dominance

Joseph Shapiro, Geology and Geophysics
NSF
\$140,000 - 10/91-03/93

Developing and Evaluating a Model of Inservice and Technical Training

Joe Reichle, Communication Disorders
Mary McEvoy, Educational Psychology
U.S. Department of Education
\$130,000 - 11/91-10/92

Database for the Plants of Minnesota

John F. Doebley, Plant Biology
St of MN - Legislative Commission on Minnesota Resources
\$130,000 - 07/91-06/93

Spectroscopic Probes of ATP-Binding Sites in Muscle

David D. Thomas, Biochemistry (MS)
Muscular Dystrophy Association
\$126,100 - 07/91-06/94

Sentencing Workshop

Robert Levy, Law School
Michael Tonry, Law School
Edna McConnell Clark Foundation
\$112,000 - 10/91-09/92

Post-Fire Ecology of Red Oak and Competing Hardwood Regeneration

Peter B. Reich, Forest Resources
USDA
\$112,000 - 11/91-10/94

Use of Peat in Turkey and Pig Manure Management

Thomas Levar, Natural Resources Research Inst, UMD
Thomas Malterer, Natural Resources Research Inst, UMD
Minnesota Technology, Inc.
\$106,695 - 07/91-06/93

Structure-energy Correlates in Aspartate Transcarbamylase

Norma Allewell, Biochemistry (CBS)
NIH, NIDDK
\$106,578 - 09/91-12/91

Physical Modelling of Sedimentary Basins, Magma Mechanics

David A. Yuen, Geology and Geophysics
U.S. Department of Energy
\$101,863 - 09/91-09/93

Technical and Consulting Services for MTI

Michael Lalich, Business and Economics, UMD
Minnesota Technology, Inc.
\$101,000 - 07/91-06/93

Organic and Inorganic Contaminants in the Sediments and Waters of Lakes Michigan and Ontario

Steven J. Eisenreich, Gray Freshwater Biological Institute
Deborah L. Swackhamer, School of Public Health
EPA
\$100,351 - 08/91-08/93

Black Bear Research in East Central Minnesota

Elmer C. Birney, Bell Museum of Natural History
David E. Andersen, Fisheries and Wildlife
St of MN - Legislative Commission on Minnesota Resources
\$100,000 - 07/91-06/93

Landuse Designs and Strategies to Enhance Environmental Quality

Harrison Fraker, Architecture
St of MN - Legislative Commission on Minnesota Resources
\$100,000 - 07/91-06/93

Commercial Aquaculture: Implications for Water Quality in Minnesota

Richard Axler, Natural Resources Research Inst, UMD
Michael E. McDonald, Chemical Engineering, UMD
Minnesota Technology, Inc.
\$75,000 - 07/91-06/93

Commuter Linkages Among Minnesota Counties

John S. Adams, Geography
St of MN - Department of Transportation
\$17,500 - 10/91-11/92

Pollution Prevention in Chemical Laboratory Instruction

Kent Mann, Chemistry
MN Waste Management Board
\$30,000 - 08/91-01/93

Minnesota Road Subgrade Characterization and Pavement Instrumentation

David E. Newcomb, Civil & Mineral Engineering
Roberto Leon, Civil & Mineral Engineering
St of MN - Department of Transportation
\$80,000 - 11/91-10/92

Identification of High-Hazard Locations for Older Drivers

Gary A. Davis, Civil & Mineral Engineering
St of MN - Department of Transportation
\$35,000 - 10/91-12/92

A Traffic Data Management System for Navigation, Collision Avoidance

Shashi Shekhar, Computer Science
Peter A. Hancock, Kinesiology and Leisure Studies
St of MN - Department of Transportation
\$44,830 - 10/91-10/92

Matching Filtration to Health Requirements - Phase 2

Thomas Kuehn, Mechanical Engineering
David Y. Pui, Mechanical Engineering
Donald Vesley, Environmental and Occupational Health
American Society of Heating Refrigerating & Air Conditioning
\$97,655 - 09/91-06/92

Use of Alternate Protein Substances for Growing Turkeys

Paul E. Waibel, Animal Science
Sally L. Noll, Animal Science
MN Turkey Research & Promotion Council
\$35,975 - 07/91-06/92

Microbial and Genetics Strategies for Mosquito Control

Ann Fallon, Entomology
Timothy J. Kurti, Entomology
St of MN - Legislative Commission on Minnesota Resources
\$75,000 - 07/91-06/93

Tree and Shrub Planting for Energy Conservation

Patrick H. Huelman, Forest Products
St of MN - Department of Natural Resources
\$69,400 - 10/91-06/93

Regional Indoor Air Quality Training Course

William J. Angell, Design, Housing & Apparel
EPA
\$99,246 - 10/91-09/92

Predictors of Functional Ability

Charles E. Boulton, Family Practice and Community Health
NIH, NIA
\$76,397 - 09/91-08/92

Prevention and Therapy of Autoimmune Diabetes in Non-Obese Diabetic Mice with Anti-T Cell Immunotoxins

Bruce Blazar, Pediatrics
Daniel A. Vallera, Therapeutic Radiology
American Diabetes Association - MN Affiliate
\$10,000 - 11/91-10/92

Health Survey of Native American Youth

Robert W. Blum, Pediatrics
Robert Wood Johnson Foundation
\$40,000 - 11/91-10/92

Mutational Variance for Quantitative Traits in Arabidopsis Thaliana

Franklin D. Enfield, Genetics and Cell Biology
Robert E. Pruitt, Genetics and Cell Biology
Robert Stucker, Agronomy and Plant Genetics
Pioneer Hi-Bred International
\$60,000 - 10/91-10/93

Behavioral and Hormonal Responses to Stress in Human Infants

Megan Gunnar, Institute of Child Development
ADAMHA, NIMH
\$75,798 - 09/91-08/92

dence of their commercial potential. The Blandin Foundation, and more recently the North Star Research Foundation, are helping us to address this situation in order to realize more of the economic potential arising out of our faculty's research."

The Office of Research and Technology Transfer is collaborating with the Blandin Foundation to transfer technologies that are ready for commercialization, preferably in rural areas of Minnesota. These technologies include a method for making handcrafted paper products from natural plant fibers, a mechanical page turner for the disabled, an automated drill bit sharpener, hybrid sweet corn stocks with increased resistance to the European corn borer, and a method for commercial aspen propagation. These and other Early Stage Technology Development projects are described below.

Handcrafted Paper from Minnesota Plant Fibers

Harold H. Alexander, Associate Professor of Design, Housing, and Apparel

Professor Alexander and his wife, Marjorie, an artist and teacher of papermaking techniques, collaborated on a feasibility study to determine if paper could be made from Minnesota plant fibers such as cattail, stinging nettle and basswood blast, and bracken fern.

Working closely with St. Louis County economic development officials in Babbitt, they developed environmentally sensitive harvesting techniques and taught a small group of individuals the process of pulping plant fibers and making paper.

Based on similar experience in Jamaica, the Alexanders developed a model for a regional hand papermaking educational center. There individuals could learn basic and advanced plant fiber selection and preparation, pulping, paper formation processes, paper product design and presentation, and marketing and distribution. Individuals and families could then produce paper products such as stationery, envelopes, fine art papers, and decorative baskets in their homes. The educational center also could serve as a collection and distribution center. The Office of Patents and Licensing is now working with the Alexanders to gauge in-



William and Cari McKibbin with paper they made from cattails.

terest in establishing regional training centers under non-exclusive licenses with the University and the Blandin Foundation.

Mechanical Page Turner

David A. Wyrick, Assistant Professor of Industrial Engineering, UMD

Directed by Dr. Wyrick, junior and senior level students designed improved versions of a patented page turner invented in 1984 by University undergraduates John Berger and David Emmons. The students' efforts led to a design using a cantilever beam page lifter and reversible page turning disk. Tests showed that the design worked well on hardcover books or magazines. Wyrick's class estimated the device could be priced about \$300, roughly half the price of devices now on the market. A Duluth businessman who is disabled has licensed the device and plans to start a company to manufacture and sell it.

Twist Drill Grinding Machine

Mark A. Fugelso, Associate Professor of Industrial Engineering, UMD

Dr. Fugelso has designed a personal computer controlled system for sharpening twist drill bits. The system consists almost entirely of readily available hardware and runs on software he wrote to direct the multi-axis grinding operation. Current sharpening methods depend on manual skill and are labor intensive. This system could be manufactured by a small company and be sold as a cost-saving and efficiency-increasing system for small production shops that either discard bits or send them out for sharpening.

Insect-Resistant Sweet Corn

David W. Davis, Professor of Horticultural Science

Dr. Davis and David A. Andow, associate professor of entomology, evaluated sweet corn stocks that had been bred to be resistant to the European Corn Borer, which causes annual losses equal to 10-15 percent of the value of Minnesota's sweet corn crop. Of the nine test crosses evaluated in this study, all had less damage than Jubilee, the widely grown commercial hybrid. Two parentage stocks seemed to offer the most resistance. Seed from all the resistant stocks was distributed to interested seed firms, which will provide germplasm to local sweet corn growers.

Commercial Aspen Propagation

Wesley Hackett, Professor of Horticultural Science

Dr. Hackett and colleagues identified factors that would allow roots to be used to produce aspen shoots in a laboratory process. This process could be used for cloning selected varieties of aspen and hybrid aspen, and for propagating shoots for commercial plantings of aspen. Projections indicate that current state resources of aspen, which is used primarily in the particleboard industry, will be depleted within one to

two decades. With funding from the Legislative Commission on Minnesota Resources, Dr. Hackett's method is being further developed and tested by a commercial laboratory to evaluate its cost efficiency for reforestation of Minnesota's aspen stands.

Improved Diagnosis of Lyme Disease

Jesse L. Goodman, Assistant Professor of Medicine

Tick-borne Lyme disease can cause debilitating long-term symptoms if not diagnosed early and treated aggressively and effectively. Current diagnosis requires analysis of a blood sample for signs of an antibody response to the disease antigen, sometimes producing ambiguous results. Dr. Goodman and colleague Microbiology Professor Russell Johnson have developed a molecular probe for the chromosomal DNA of the Lyme disease spirochete. In tests they were able to detect minute traces of spirochetes in urine. This would offer a more convenient diagnostic test that could be performed in a physician's office, and it would produce clearer confirmation that disease-causing spirochetes were present initially and whether they had been eradicated by antibiotic therapy. Dr. Goodman recently received a grant from the National Institutes of Health to make the test suitable for office-based testing and to evaluate it in patients with various stages of Lyme disease.

Low-Temperature Aluminum Films

Wayne L. Gladfelter, Professor of Chemistry

In this project Dr. Gladfelter has developed a chemical vapor deposition reactor, applying his discovery that trimethylamine alane forms aluminum films under unprecedentedly mild conditions. He tested the ability of the device to deposit homogenous films at low temperatures, while detecting any particles formed during the gas phase of the process, using a particle detector loaned by TSI, Inc. These tests confirmed that homogenous thin films of aluminum could be deposited on irregularly shaped surfaces. The reactor and linked particle detection device could be useful in coating very small silicon microcircuits, in which any particle settlement can cause the failure of the device. It could also be used in less sensitive processes, such as applying aluminum films to plastic products, food storage bags, and other irregularly shaped, temperature-sensitive products.

Toxic Waste Destruction/Diamond Film Deposition

Emil Pfender, Professor of Mechanical Engineering

With funding from the Blandin Foundation, Professor Pfender and colleagues have invented and patented plasma torch devices that operate on a smaller and less costly scale than other plasma reactors. They have used the devices to pyrolyze liquid carbon substances and deposit thin films of microscopic diamonds on substrates. In a project supported by the Early Stage Technology Development fund they showed that toxic wastes, including laboratory simulants of PCBs, could be used as the source material and that dia-

mond films could be produced at a uniform, fairly rapid rate. They also showed that the toxic waste destruction and removal efficiency exceeded the 99.99 percent level required by federal regulations.

Dr. Pfender's group has applied for continued early stage funding to upgrade the laboratory's ventilation system so they can test destruction of actual PCBs. They will also seek the highest possible efficiency rate for waste destruction and evaluate the economic desirability of joint toxic waste destruction/diamond deposition. If shown to be commercially feasible, the plasma torch units could be manufactured in rural Minnesota and sold to large and small generators of liquid toxic wastes. Paint, photographic processing, and laundry industries, for example, could have devices for on-site destruction of toxic wastes, removing the costly need for transportation to large storage or disposal facilities.

Genetically Enhanced Aquaculture

Anthony J. Faras, Director, Institute of Human Genetics and Professor of Microbiology

Beginning in 1987 Dr. Faras began investigations of genetic methods for improving growth efficiency in species of fish important for aquaculture, in collaboration with other members of the Minnesota Transgenic Fish Group (Perry B. Hackett, Jr., genetics and cell biology; Anne R. Kapuscinski, fisheries and wildlife; Richard D. Goodrich, animal science, who replaced Kevin Guise after his death earlier this year; and John F. Schneider, Institute of Human Genetics). They have developed an expression vector that acts as a genetic switch to promote the expression of growth hormone genes in fish cells. With early stage technology funding they injected the expression vector into a total of 200,000 fish eggs, which were hatched and are being reared in isolated holding tanks. Microbiological analysis of DNA from northern pike and salmon revealed that approximately 20 percent contained the vector and that one third of these fish were expressing the gene and growing the fastest.

The Minnesota Transgenic Fish Group has received support from the Legislation Commission on Minnesota Resources to build a large, state-of-the-art fish facility on the University's St. Paul campus. They have requested an additional two years of early stage technology funding to support continued studies of the genetically enhanced fish as they grow to sexual maturity. The results will indicate whether the technology is suitable for transfer to commercial aquaculture operations in Minnesota and elsewhere.

Lightweight, Insulating Particleboards

Roland O. Gertjeansen, Professor of Forest Products

Lightweight sandwich panels made with paper honeycomb cores are used commonly in the furniture and construction industries, served by Minnesota's waferboard and oriented

Continued...

strandboard plants. Dr. Gertjeansen has developed a one-step process for manufacturing sandwich panels that are lightweight and have a high R-value. The one-step process could reduce manufacturing costs, and the lighter weight would reduce shipping and handling costs for products made or built with these panels. Dr. Gertjeansen has submitted a proposal for continued early stage technology support in order to test the applicability of his laboratory process to methods currently used by particleboard plants.

Improved Nutritional Value of Livestock Soybean Meal

Craig Coon, Professor of Animal Science

Dr. Coon and colleagues investigated methods and effects of removing oligosaccharide carbohydrates from soybean meal to improve its nutrient utilization by poultry and other livestock. Removal of these carbohydrates improves true metabolizable energy by 300 to 1,000 kcal/kg of meal, but the process for doing so is time-consuming. This project determined the exact amounts of individual oligosaccharides that have to be removed, the most efficient methods for increasing true metabolizable energy of soybean meal, and that the protein efficiency ratio of soybean meal could be significantly enhanced by the extraction process. Dr. Coon has applied for continued early stage technology funding to test these methods and results when conducted on a large scale with a Crown IV extractor at Crown Iron Works Company in Minneapolis.

Fax Network for Computer Graphics

James E. Holte, Associate Professor of Electrical Engineering

Computerized graphic imaging is becoming an increasingly integral part of research and development, and it is central to many industrial design processes. It is often desirable to transfer the large amounts of data representing graphic images between computers or facilities in order to complete the design or research project. This project, which is still in progress, involves the design and testing of five circuitboards to allow the interfacing of facsimile communications with the IBM AS/400 computer. If a graphic imaging network is successfully implemented on this computer, Dr. Holte and colleagues will apply the knowledge gained to develop interfaces with a variety of other computers.

Vacuum Arc Application of Multicolored Coatings

Subbiah Ramalingam, Professor of Mechanical Engineering

Dr. Ramalingam has invented a vacuum chamber arc coating processing that has been used commercially to apply metallic oxide coatings to reduce wear of machine parts, cutting tools, and molds. In this project, which is in progress, he has adapted the cathode carrier in the chamber so that it can be used to apply thin films of multicolored, decorative coatings on various shaped objects.

CUFS

This is a clarification of information printed in the December Research Review.

Bookstore Purchases/Sponsored Projects

As you are aware from our Research Review article last month, bookstore purchases over \$500 still require ORTTA review and approval. Such purchases can be made via the "IV" Document (replaces old Type 11 Journal Voucher) OR the "PO" Document, internal purchase order (new). It is the department's decision as to which mechanism to use, however, remember that the "IV" Document does not encumber funds while the "PO" Document does.

Accordingly, in those cases where the grant year end is within 60 days and the items may not be delivered prior to ending, it would be necessary to use the "PO" Document to assure that the funds are encumbered if they must come from that specific grant year. We understand that departments have experienced problems in obtaining the PO documents from the storehouse. A meeting was held with bookstore/financial operations staff and the documents should now be available to all departments. It is necessary to complete only one document, IV or PO. If a PO document is used, the bookstore will generate the IV document to liquidate the obligation. Questions should be referred to the appropriate grant administrator within ORTTA.

Directory of Faculty Expertise

Over the past 10-15 years, there have been many discussions regarding the need to establish a system that would enhance faculty collaboration and networking, to assist faculty in identification of peers for interdisciplinary research, and to help locate scientific expertise and/or equipment at the University. With the support of collegiate deans, a project is currently underway in ORTTA to build such a system. It is called the **Directory of Faculty Expertise**. A questionnaire has been developed to obtain information such as key words or phrases that describe faculty areas of expertise, brief descriptions of research interests, special research techniques, methodologies or processes in which have faculty experience, and current research or other scholarly activity.

During January, questionnaires will be distributed by deans and department heads to all faculty. The information collected will be entered into a database that will be accessible to all faculty through the University computer network. Significant information about research resources will then be available for viewing in a comprehensive format in order to establish linkages with scholars throughout the University.

Your cooperation in completing the questionnaire is requested. A favorable response to this project will enhance the University's priority areas of research and outreach. Questions regarding this project may be addressed to Winifred A. Schumi at 624-5750.

Office of Research and Technology Transfer Administration

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Morris

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- The *Research Review* is automatically mailed to all faculty on the Faculty Mail List holding the rank of Assistant Professor and above, using the AIS mail list.
- To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS). (AIS labels are characterized by a string of numbers above the name.)
- Please check with your departmental office or AIS (624-9000) if you need assistance.

Staff / Off Campus:

- ORTTA maintains a supplemental mail list for:
 - a) academic staff not included in the above faculty list;
 - b) staff; and
 - c) off-campus
- Additions/changes/deletions to this supplemental list may be initiated by filling out and sending ORTTA the following:

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Department: _____

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RESEARCH REVIEW

Research and Technology Transfer Administration

February, 1992

Multimedia Presentation Software Enhances Lectures

During this academic year more than 3,000 University of Minnesota students are benefitting from a particularly powerful result of President Hasselmo's undergraduate initiative. Each time they take their seats in Moos Tower or Willey Hall auditoriums, they are treated to the very latest in computer-directed, large-screen, multimedia presentation technology.

On a 12- by 15-foot screen the General Biology students see presentations compiled from original graphics, textbook art, slides, videotape, and laser disks, all projected in photographic quality.

Rather than sitting through the traditional, televised series of lectures, students participate in a faculty-led presentation enhanced by such visuals as an animated sequence that shows a virus approach a cell receptor, inject its genetic material, and take over the cell's reproductive capabilities for its own propagation. They see the power of MacPresents™, a software program developed with funding provided through the undergraduate initiative, administered by Anne Hopkins, vice provost for arts, sciences, and engineering.

In April 1990 the Office of the Vice President for Academic Affairs funded a College of Biological Sciences project to enhance the quality of the large lecture sections presented by the General Biology Program. General Biology had already begun improving the quality of its courses in 1986 by installing first-generation videodisc projection systems in Willey Hall 125 and 175 and in Moos Tower 2-650. The new project is built upon the experience of education specialist Richard Peifer, M.A., and Steve Fifield, a graduate student in plant biology and science education who produces the animation sequences in General Biology's graphic databases. Together they work with a small group of graduate teaching assistants to make state-of-the-art computer and audiovisual technology available to instructors.

Multimedia, Continued On Page 10



Rick Peifer (center) demonstrates the MacPresents™ software developed by the General Biology Program.

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Correction of CUFS Conversion Errors



The University's deadline for cleaning up conversion errors is **April 30, 1992**.

ORTTA staff will be correcting conversion errors on all sponsored accounts. Many of you have already notified us of AREA number conversion errors that you have discovered. Thank you, that is very helpful. If you know of any other errors that ORTTA may not be aware of, please let us know *in writing* by **March 1, 1992** so we can make the corrections before the deadline.

Corrections should be sent to Marilyn Surbey at ORTTA.

New Fed Ex Contract Includes Import/Export Services

Effective immediately, the University of Minnesota contract with Federal Express will include transport and customs work for imported and exported goods. Using the same vendor for both shipping and customs work promises to be a much simpler process for departments. The affiliation with Norman Jensen Company has been discontinued as of December 1, 1991.

A copy of the new import/export procedures can be obtained from Kathleen Stoner, Purchasing Services, 624-1696. A copy of the procedures will also be mailed to current Federal Express account holders. Anyone who wishes to set up a new Fed Ex account may contact Carol Stroud at 612/832-8925.

RESEARCH REVIEW

Volume XXI/Number 8

February, 1992

Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, creed, color, sex, marital status, national origin, disability, public assistance status, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/91-6/30/94 rates should be used. **The rate agreement is dated July 1, 1991.** This date should be used where required on proposal applications. Please call Marilyn Surbey at 624-4850 with questions on Indirect Costs.

	07/01/91
	<u>06/30/94</u>
Research	
On-Campus	40.0
Off-Campus *	21.0
SAFHL	60.0
Hormel	53.0
Other Sponsored Activity	
On-Campus	20.0
Off-Campus *	10.0
Instruction	
On-Campus	52.0
Off-Campus	16.0

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call Vivian Fickling at 624-2009.

Current actual rates from July 1, 1991 through June 30, 1992 are:

Faculty	28.75
Civil Service	25.25
Graduate Assistants	8.50

For proposals being submitted with start dates **after July 1, 1992**, the estimated fringe benefit rates to be budgeted are:

Faculty	31.25
Civil Service	29.50
Graduate Assistants	10.50

Estimated rates after July 1, 1993 are:

Faculty	28.00
Civil Service	30.50
Graduate Assistants	31.25

As rates change they will be reflected in this section.

New Application Kits Required

Public Health Service

The Public Health Service (PHS) has revised its standard **Form 398** application kit. The new kit has a tentative release date by PHS of February 1, 1992, and *should* be available from ORTTA by the middle of the month. Use of the new form will be required in applying for May and June deadlines. PHS will release a new **Form 2590** at the same time, although it is expected to contain fewer changes.

Among major changes to the Form 398 are:

- An increase in the maximum length of the research plan, from 20 pages to 25 pages, to allow more room to explain the project;
- A simplified budget that eliminates some math previously required to figure levels of effort;
- A requirement to list all, not just key, individuals who will participate in the research;
- A requirement to identify all other research support or project-specific funds from any source available to investigators, including gifts and prizes;
- Acceptance of manuscripts—as well as published articles and manuscripts accepted for publication—as supporting material;
- A requirement that literature citations be complete, including the names of all article titles and authors, so reviewers can consult articles if they wish; and
- A requirement that tables and graphs be included in the research plan section, not banished to appendices to gain space.

The form also reflects recent federal policy changes requiring a drug-free workplace and other grantee assurances and, for the first time, asks applicants to report anticipated program income and states PHS's policy on including appropriate gender and minority research subjects.

Officials and advisers have tried to produce a more readable and "user friendly" document. To that end, NIH has added a section explaining peer review, inviting applicants to contact institute staff for help and providing phone numbers.

Department of Energy

The Department of Energy (DOE) has also revised its application kit. Copies are available from ORTTA and may be requested at any time. DOE has stated categorically that *it will not accept applications prepared on old forms*. Proposals prepared on out-dated forms will be returned without review.

BA23 Form Undergoes Revision

Office of Research and Technology Transfer

The BA23 Form, "*Application for External Research, Training or Public Service Support*," has been revised as of January 1992.

The most significant change became necessary with the revision in the *Disclosure of Conflict of Interest* policy that was approved by the Board of Regents in October, 1991 (see *Research Review*, December 1991, page 9). BA23 Question 19, relating to conflict of interest, must now be completed for all applications regardless of funding source. In addition, when Question 19a is marked yes, the signatures of the Department Head and Dean will certify that the disclosure of interest has been reviewed and will not comprise a conflict as indicated by the policy.

Other BA23 changes include:

- listing first the primary principal investigator and area to administer the grant if awarded (Question 6),
- providing both direct and indirect amounts requested (Question 10),
- including the Code Number assigned to a protocol by the Human Subjects Committee to facilitate the approval process (Question 15a), and,
- indicating whether matching funds are a requirement of the particular request for proposal (Question 17).

In addition, the approvals and certifications section has been modified to incorporate an acknowledgement of the Patent and Technology Transfer Policy for the principal investigator's signature.

The new forms will be available February 1 from the General Storehouse. Departments are asked to **destroy all old forms** and begin using the new forms immediately. If an old BA23 form (Revision date prior to January, 1992) is used, the applicant is required to provide a statement regarding conflict of interest as an addendum to the BA23; ORTTA will request appropriate documentation from the principal investigator(s).

Questions regarding these changes should be directed to the appropriate grant administrator in ORTTA.

MTI Releases Minnesota Science and Technology Policy

Editor's Note: The following policy was submitted in January to Governor Arne H. Carlson and the Minnesota Legislature by Minnesota Technology, Inc. The policy is based on input provided by over 100 policy stakeholders in a series of three sessions sponsored by the State and Local Policy Program of the Hubert H. Humphrey Institute. The sessions, titled, "A Science and Technology Policy for Minnesota," addressed the following: "What are the Questions?" (April 20, 1991); "What Approach Should Minnesota Take and Who are the Stakeholders?" (June 14, 1991); and, "An Agenda for Action," (September 5, 1991).

In releasing the policy, John Yngve, Chair, Minnesota Technology, Inc., stated: "I will say to the Governor, adopt the policy, do it now. I will say to the Governor and the legislators, lead, be leaders, there must be leaders supporting technology. Finally, I will say to the Governor and the legislators, help to develop a constituency for job growth through technology."

MINNESOTA TECHNOLOGY, INC. TECHNOLOGY POLICY

To: Governor Arne H. Carlson and the Minnesota Legislature

The following technology policy recommendations are submitted in the form of policy principles intended to help guide future investments made by the state in the area of science and technology. This policy is a flexible document and should be subject to both legislative and public input.

The policy does not attempt to prioritize potential areas of investment nor does it estimate the cost of such an investment. Rather this initial effort is designed to develop a consensus on critical elements which will contribute to Minnesota's future economic growth.

Several underlying premises shape this document. These need to be understood for the policy to be accepted by the general public. The premises include:

- 1. The technology community plays a critical role in the economy of Minnesota. It directly accounts for more than 20 percent of all non-farm employment in Minnesota. The industry produces value-added products which lead to high-skilled, high paying jobs, future opportunities for our children, and ultimately lead to a higher standard of living.**
- 2. Following on the example of Japan and Western Europe, government can play a role in working with industry to gain the competitive edge.**
- 3. Technology should not be defined as "high-tech" only. It is not limited to the development of new technologies, but also incorporates the effective use of "off the shelf" technology by existing companies.**
- 4. Given scarce resources, we must recognize that we cannot excel at everything. Strengths must be defined and investments made on the basis of quality and excellence.**

TECHNOLOGY POLICY RECOMMENDATIONS

The technology policy recommendations outlined below list five goals which will contribute to Minnesota's long-term economic growth. Investment in these areas is critical if we are to create an environment which is conducive to the growth and expansion of technology-based companies, as well as improving the competitive ability of existing industries.

Encourage and Support Innovation & Development of New Technologies

Minnesota has a long tradition of innovation and entrepreneurship. However, with the dramatic changes taking place in the global economy, the pace of technological change and shortened product life cycles, young companies are finding it increasingly difficult to compete effectively without appropriate resources.

These entrepreneurs and the emerging technology-based companies represent the future of Minnesota's economy. In order to give these individuals and young companies a greater chance at success, the state should support excellence in innovation and nurture the creative spirit of this sector by providing incentives to spur growth.

Support for Industrial Modernization & Technology Transfer

The vast majority of Minnesota companies, both in rural and metropolitan areas, are small firms employing fewer than 50 employees. These firms generally lack the resources to identify and implement available technologies that can help them develop their products in a more efficient manner. This is particularly pronounced in the manufacturing area.

The state should play a critical role in improving the competitive ability of these firms by making available information, technical expertise and other services required to access existing, off-the-shelf technologies.

Strengthen Research & Development Partnerships Between Industry & Academia

While continued research and development is a prerequisite to the commercialization of new products and the growth of technology-based companies, this area is primarily the responsibility of private industry.

State government should play a significant role in supporting applied R&D initiatives through Minnesota's university community. To maximize the impact, these investments in R&D should be closely tied to the research needs of the state's industrial/technology community.

Development of a Literate & Technology Skilled Workforce

To compete in the future, communities will have to increasingly rely on knowledge-based economies. Not only will the workforce of the future need to be more technically skilled than at present, but the basic level of literacy will also have to continually increase.

State government must continue to invest extensively in Minnesota's human capital. Not only will we need more scientists and engineers in the future, but this investment is required throughout the educational system from K - 12, to vocational education, and through the Ph.D level.

Take Advantage of Opportunities in Technology Development

In addition to the above four critical elements, the state should also be prepared to act on individual opportunities which may occur from time to time and which would enhance Minnesota's technology infrastructure.

This could take the form of investing in a statewide telecommunications network, matching federal funds for science and technology initiatives, or matching industry support for the development of research facilities.

Editor's Note: "An Agenda for Action on Science and Technology" is available from the State and Local Policy Program of the University's Hubert H. Humphrey Institute of Public Affairs. Among the University of Minnesota participants in the group meetings contributing to the development of the document were A.R. Potami, Associate Vice President for Research and Technology Transfer, and Michael P. Moore, ORTTA Communications Coordinator. The Office of Research and Technology Transfer will continue to develop and participate in state and national projects that define and enact the general principles cited in the state science and technology policy.

Salary Limitation on PHS Grants and Contracts

National Institutes of Health / Alcohol, Drug Abuse, and Mental Health Administration

The purpose of this notice is to inform grant and cooperative agreement applicants and contract offerors of the Congressionally-mandated provision for the limitation of salary for the second consecutive year of funding.

Section 212 of the appropriations Act of the Department of Health and Human Services for FY 1992 (October 1, 1991 - September 20, 1992) (Public Law 102-170) limits the amount of the direct salary of an individual under a grant or contract award issued by the National Institutes of Health (NIH) and the Alcohol, Drug Abuse and Mental Health Administration (ADAMHA) to no more than \$125,000 per year (for 100% effort). This requirement is an increase from the limitation of \$120,000 in FY 1991.

NIH and ADAMHA will apply the restriction to all grant, cooperative agreement, and contract awards and to all funding amendments to existing grants and contracts made during FY 1992 and with FY 1992 funds. The salary limitation applies to amounts *permitted* in grant and contract awards as well as *charged* to those awards. However, an individual's institutional salary, *per se*, is *not* constrained by this legislative provision. An institution may supplement an individual's salary with non-HHS funds.

NIH and ADAMHA grant and contract awards that indicate direct salaries of individuals in excess of a rate of \$125,000 per year will include an appropriate notification, such as:

According to the HHS Appropriations Act, "None of the funds appropriated in this title from the National Institute of Health and the Alcohol, Drug Abuse and Mental Health Administration shall be used to pay the salary of an individual, through a grant or other extramural mechanism, at a rate in excess of \$125,000 per year." The application/proposal for this project proposed a salary at a rate greater than \$125,000 per year. This award has been reduced accordingly.

Grant applications and contract proposals submitted to NIH and ADAMHA should continue request funding at the regular rates of pay of all individuals for whom reimbursement is requested. NIH, and ADAMHA will make downward adjustments of direct salary amounts in excess of ceiling rate and fringe benefits based upon the budget approved as part of the original award. Corresponding indirect costs will also be adjusted.

Following is an example of this process:

Individual's institutional base salary per year	\$150,000
Research effort requested on grant application or contract proposal	50%
Direct salary requested	\$ 75,000
Fringe benefits requested (25% of salary)	\$ 18,750
Applicant organization's indirect cost rate	47%
Amount requested: salary plus fringe benefits plus associated indirect costs	\$137,813

If a grant/contract is to be awarded, the amount included in the award for the above individual will be calculated as follows:

Direct salary: Restricted to rate of \$125,000 times effort (50%) to be devoted to project	\$ 62,500
Fringe benefits (25% of allowable salary)	\$ 15,625
Subtotal	\$ 78,125
Associated indirect costs at 47% of subtotal	\$ 36,719
Total amount included due to salary limitation	\$114,844
Amount of reduction due to salary limitation (\$137,813 requested, minus \$114,844 awarded)	\$ 22,969

Grantee and contractor organizations are reminded of these important points:

- The salary limitation provision *does not* apply to payments made to consultants under an NIH or ADAMHA grant or contract (however, as with all costs, such payments must continue to meet the test of reasonableness).
- The salary limitation provision *does* apply to those subawards/subcontracts for substantive work under an NIH or ADAMHA grant or contract.
- Unobligated funds from a prior grant/contract period "carried over" into a FY 1992 award period *are* subject to the salary limitation provision.
- In a noncompeting continuation application (type 5) setting, a grantee organization is *not* permitted to either 1) redistribute an amount of "excess" salary among other budget categories, nor 2) increase the principal investigator's effort on the project, in an attempt to apply for the full level of funding as previously recommended by the peer review process.

For further information, contact any of the grants management offices of the funding components of NIH and ADAMHA, or the DHHS grant administrators at ORTTA—Mary Lou Weiss, 5-5856; Todd Morrison, 6-5066; Kevin McKoskey, 4-1521; Susan Stensland, 5-3515.

NABR Reports Status of Animal Research Legislation

Three bills proposing that crimes against animal research facilities be made a federal offense have attracted unprecedented support in Congress, and there is an excellent chance of their passing, says the National Association for Biomedical Research (NABR) in its annual report.

In addition, the report says that 11 states have increased penalties for acts of criminal protest that disrupt research involving animals. In all, 23 states have now taken steps to better protect research, says Craig Burrell, chair of the NABR board.

Nationally, NABR reports that through its efforts new United States Department of Agriculture (USDA) animal welfare regulations are in effect after five years of consideration. And while the cost of the new regulations is estimated to be \$552 million, that figure represents a savings of \$1.5 billion over early proposals based on rigid engineering standards.

Also, says the report, USDA had started to regulate the use of farm animals and horses in biomedical and nonagricultural research. NABR is working for passage of HR2407, the "Farm Animal and Research Facilities Protection Act." The bill, sponsored by Rep. Charles Stenholm, D-TX, offers protection for agriculture as well as for research facilities from illegal animal rights activities.

NABR reports it opposed 10 pieces of legislation in the 101st Congress that it found to have adverse effects on research. So far, says NABR, only one such piece of legislation has surfaced in the 102nd Congress. For the seventh time in the last seven years, Rep. Robert Torricelli, D-NJ, has introduced HR1389, the "Information Dissemination and Research Accountability Act," which, according to NABR, would establish a panel to review for duplication all federal research proposals using animals.

NABR reports that during the 1991 legislative session nine state legislatures considered 19 bills that would limit or abolish animal testing to determine the safety of a substance. At the time the NABR annual report went to press, no state-level measure had been enacted. However, California's Berkeley City Council has passed a local ordinance prohibiting ocular and dermal irritancy tests using animals.

There has been a decrease in state legislation that would limit the availability of pound animals for research, says NABR. In 1991, only four states considered this type of legislation. New York has two bills in process that would amend current law prohibiting in-state pound animal use to include animals from out-of-state pounds. Legislation in Wyoming, Missouri and Virginia failed.

Finally, the report notes that legislative measures to prohibit the use of animals in K-12th grade classes increased in 1991. Massachusetts, New York, New Jersey and Pennsylvania all considered measures either to ban animal use in classrooms or to give students the right to refuse participation in such projects without penalty.

NIH Seeks Public Input on Its Draft Strategic Plan

Two additional public hearing sites for receiving testimony on the draft of its Strategic Plan have been announced by the National Institutes of Health (NIH). The document, when completed, will include the Strategic Plan for both the scientific and the policy and legislation direction of NIH.

"We are now entering what we hope will be a stage of comprehensive public input on the NIH Strategic Plan. We have been in the development stage for the last nine months on the first draft document," explained Jay Moskowitz, NIH deputy director for science policy and legislation. Moskowitz said it is not the intent of those in NIH who were involved in preparing the draft development to have it completed or implemented in a vacuum. "It is now time for it to be circulated and to get the reaction of the scientific community and the public," he stated. "When we get this input we can begin to plan how to revise or modify the draft document and then how to go about implementing the Strategic Plan," Moskowitz said.

The draft document will be unveiled at an invitation-only symposium cosponsored by the Southwest Foundation for Biomedical Research and the Department of Health and Human Services in San Antonio, Texas on February 2-4. President Bush or Secretary of Health Louis Sullivan will address the gathering.

The two new hearing sites are the Emory University School of Medicine in Atlanta, Georgia on March 3 and the Washington University School of Medicine in St. Louis, Missouri on March 5. The public meetings previously announced are at Occidental College in Los Angeles, California on February 12 and the University of Connecticut at Farmington on February 25.

Space at the public hearings is limited. To request an invitation to offer testimony, send or fax the name, title, institution name, phone number and address of the individual attending to: NIH Strategic Plan Regional Meetings, c/o Jay Moskowitz, NIH Building 1, Room 103, 9000 Rockville Pike, Bethesda, MD 20892, FAX: 301/402-1759

— from the Washington FAX

Committee on the Use of Human Subjects in Research

Continuing Review of Research

The Committee on the Use of Human Subjects in Research is charged with the continuing review of approved research projects. In addition to the annual review process, the Committee must be made aware of any new findings which might affect the risks and benefits of participating in a study.

Suspension of Placebo Controlled Trials

In some placebo controlled trials, particularly multi-center trials with numerous sites reporting data to a central statistical center, preliminary findings may be so compelling that it becomes unethical to continue placebo-controlled trials.

In cases such as these, the investigator should write to the Committee on the Use of Human Subjects in Research and describe the findings and the need to suspend the placebo portion of the study. After consultation with the Committee, the researcher should then begin the process of identifying all subjects who received a placebo and invite those subjects to continue in a "open label" study where all subjects receive the study medication.

Adverse Event Reporting

Researchers are reminded that any unanticipated adverse event or any complication requiring medical treatment, including death of a subject/patient, *must be reported to the Committee immediately*. A written report outlining the facts of the case and the steps taken to ameliorate the condition should be included. A statement of the etiology of the event, whether the event could be considered related to study procedures, medications, etc., or to the underlying disease or condition, should also be included. Reports are reviewed by expedited review procedures, or, in some cases, by the full Committee. At times, a study must be suspended to ensure that appropriate safety measures are in place.

For all events, including those which occur at other institutions participating in a multicenter trial, the local principal investigator should provide a memo to the Committee describing the nature of the event, the severity, and the likelihood of the event occurring at this institution. Implications for future subjects should also be described by the local principal investigator.

The Committee reviews all reports and may, in some cases, require a revised consent form to ensure that subjects have an opportunity to hear about new findings or additional risks which may affect their decision to continue in a clinical trial.

Questions regarding this and other human subjects research issues should be addressed to Moira Keane at 624-1889.

Peter Magrath is New President of NASULGC

On January 1, C. Peter Magrath became president of the National Association of State Universities and Land-Grant Colleges (NASULGC). He replaces Robert Clodius, who was president of the association for 13 years.

Magrath was president of the University of Minnesota from 1974 to 1984 and president of the University of Missouri System for six years after that.

Magrath, who stresses that "people and attitudes are more important than organization," is taking over as the association is undertaking a major internal reorganization in order to better serve its members. He describes the reorganization as "an effort to refocus ourselves to better promote the public research agenda and improve technology transfer. In effect, we are going to try to be more of a voice and a player in representing populace public institutions," he said.

State Universities and land-grant colleges are "very complex," because they have to be so many different things to so many different constituencies. "We have to break down some of the barriers to good education, innovation and technology transfer," said Magrath.

"We [universities and colleges] have made mistakes and lost credibility. There must be an effort to restore our credibility, and we must begin by being candid. There are some very sincere critics of the education and science enterprise, and we must respond to them sincerely. Where they are right, we must acknowledge and take steps to correct. We must also defend those areas that are sometimes wrongly targeted for sharp criticism from those outside the system," he stressed.

NASULGC will become better coordinated and even more visible and more active in coalitions and in working with federal agencies and the Congress, vowed Magrath. He believes that an effort must be made to better coordinate state and federal appropriations as they become more closely tied. He intends, through NASULGC, to use the presidents of member institutions to work with state governments and state legislatures in order to effect better coordination between federal and state actions affecting the education and science enterprises.

NASULGC is a 105-year-old, voluntary association of 148 public research universities located in the 50 states and in U.S. territories. Its member universities are involved in teaching, research and public service. They enroll over 2.7 million students and award about one-third of all U.S. bachelor's and master's degrees and 60 percent of U.S. doctorates.

— from the Washington FAX

Quality Assurance Strategies for Purchasing

To help departments ensure delivery of quality goods and services, and to strengthen the legal position of departments and the University if quality problems occur, Purchasing Services has compiled the following strategies with the help of U of M Attorney Greg Brown.

Before the Purchase

- Ask for a demo of identical equipment. Such a demo is an express warranty that the equipment purchased will work identically to the demo equipment.
- Describe to the vendor the project that the equipment/goods will be used for. Make sure it's included on the Purchase Order. Knowing ahead of time the intended use of the goods gives the vendor more legal responsibility for the losses the project may suffer if equipment fails or goods do not meet specifications.
- Equipment or goods may be rejected upon inspection, or upon performance. Negotiate an acceptance period during which the equipment's performance may be monitored.

At Purchase Order Time

- Do not accept the term "As Is" on the vendor's warranty or contract. Strike any verbiage that names and disclaims the "Implied Warranty of Merchantability." This disclaims implied warranties that would otherwise apply to the goods being purchased.
- Make the salesperson's promises part of the PO verbiage. If the salesperson says, "This process is much faster than your old one," ask him to quantify "faster". If he says 1500/second, make sure this speed is written into the PO. Include on the PO all claims made in vendor's sales brochures.
- Formal acceptance and payment should not occur until completely satisfied that the equipment is performing as expected. Specify an acceptance period, or which functions must be successfully performed before formal acceptance, and that payment (or a portion of it) will be withheld until formal acceptance.
- Build into the PO that the warranty period begins only upon official acceptance of the equipment/goods/services.
- *Do not sign vendor acknowledgements.* Terms referenced in vendor acknowledgements may be in conflict with University of Minnesota Purchase Order terms. Call the vendor's attention to condition #2 on the back of the U of M Purchase Order:

"This award notice is expressly conditional on your agreement to its terms... The University hereby expressly rejects any additional or conflicting terms and conditions on this or any other document..."

When you Receive the Equipment/Goods

- Inspect the material upon receipt, not 3 weeks later when it is taken out of the box. If it does not pass inspection, reject it immediately.
- If there is any difficulty in using the material, reject it promptly and request a replacement. The longer that attempts are made to make it work, the weaker the legal position becomes, as the appearance of acceptance has been created. Also remember that modifying the equipment for any reason (to make it work) may invalidate the warranty.
- After acceptance, document any problems experienced. Notify the vendor and document your notification. Document how long it takes the vendor to react to the complaints and what action is taken.

Notice of Policy Change

FIRST Awards

The Alcohol, Drug Abuse and Mental Health Administration (ADAMHA) announces that effective February 1, 1992, applications for the First Independent Research Support and Transition (FIRST) Award must be accompanied by at least three letters of reference. FIRST applicants are to request the letters of reference well in advance of the application submission, advising the referees to return the reference letters to the applicant in sealed envelopes as soon as possible. The sealed envelopes must be attached to the front of the original application. Applications not containing these letters will be returned to the applicant.

Additionally, effective February 1, 1992, applicants for the FIRST award must request five years of support. Applications requesting fewer than five years of research support will be designated as R01s and so reviewed unless the applicant withdraws the application.

PHS Statement of Appointment Form (PHS 2271)

National Institute of Health/Alcohol, Drug Abuse and Mental Health Administration

Beginning in Fiscal Year 1992, a *Statement of Appointment* form (PHS 2271, revised 9/91) must be completed and sent to the PHS Awarding Component whenever an individual is appointed to one of the following programs:

- Any NIH Career Development Program Award (K12 or K16)
- Any Research Supplement for Underrepresented Minorities

The form *must* be completed and submitted to PHS at the time an individual *starts* an appointment, a reappointment, or when the name or permanent mailing address of the appointed individual changes. A reappointment includes the extension of an appointment into a new budget period. The form must be signed by both the appointed individual and the principal investigator of the Career Development Program Award or the supplemented research grant.

The Statement of Appointment form will continue to be required for all appointments to National Research Service Award Institutional Research Training Grants (T32, T34). This requirement *does not* apply to individual NIH career awards (K04, K07, K08, K11, K14, K15, K16; ADAMHA-K20, K21).

The Statement of Appointment form has been substantially revised, and the new form dated Rev. 9/91 **must replace all previous versions**. Only the revised form will be accepted after May 10, 1992.

The form dated Rev. 9/91 is available from the Office of Administrative Service, Division of Research Grants, National Institutes of Health, Westwood Building, Room 436, Bethesda, MD 20892; 301/496-9797. Please call NIH if you need a large number of these forms; otherwise, ORTTA keeps some on hand.

Inquiries may be directed to:

Dr. Walter T. Schaffer, Director
Research Training and Special Programs Office
Office of Extramural Programs
National Institutes of Health
Building 31, Room 5B44
Bethesda, MD 20892
Telephone: 301/496-9743

Thanks to the Academic Affairs funding and additional funds provided by the General Biology Program, Peifer's group got into the project at a time when AV and computer hardware capabilities were taking off and prices were plummeting. "What one thought might be possible in five years is often realized within five months. Microcomputers that produce high-resolution computer graphics, have rapid processing capabilities, and contain large memories are now available for under \$5,000," Peifer says.

The only thing missing from that perfect scenario was an effective and efficient medium for channeling all that computing power into faculty lecture presentations. After assembling a laboratory of several Macintosh IIcx™ computers, videodisc library and player, videotape player, flatbed and slide scanners, and hard-drives with tape backup, Peifer set out to fill that need. He contracted for the programming services of Timothy Sundell of Advantage Microcomputing to translate his vision of user-friendly multimedia presenting into software reality. The result was MacPresents, a software program that speeds and simplifies the presentation of multimedia lectures and the development of a database for the management of graphics and animated sequences.

Commercialization plans for this valuable new educational tool are being handled by Paul McDowall, assistant director in the Office of Patents and Licensing. McDowall also helped arrange for Peifer and Fifield to attend and present at a national multimedia technology conference in California. From conversations with representatives of Apple Computer, Inc., they had suspected that MacPresents was on the leading edge of presentation software, and the experience at the California show confirmed it. Since presenting there and at a national biology teachers' conference, Peifer has had calls from all over the country asking about the project and requesting access to the software. He is now working with McDowall to locate a suitable licensee to produce and distribute it.

Peifer stresses that the computer laboratory and software he has put together are suited to presenting any subject—not just biology lectures. He has worked with faculty in psychology and philosophy to prepare lectures that can be presented in the specially equipped auditoriums. He estimates the current cost for a workstation to assemble multimedia presentations at less than \$10,000. High quality auditorium projection equipment can add another \$10,000 to \$20,000, but those costs often can be split among the auditorium's user-departments and amortized over years of use. And now that high-quality, portable video projectors are becoming

available, multimedia presentations can be given in small classrooms as well. Peifer has given several demonstrations to faculty and administrators from various colleges, all of whom are interested in improving the quality of undergraduate lectures.

A key factor in the success of General Biology's lecture enhancement program has been to assign to each faculty lecturer, a graduate student who has learned the presentation system. "After sitting down together and discussing the material the faculty member wants to cover in each lecture, the teaching assistant can pull visuals from all of our libraries, and even create some, and then go through it with the professor. This minimizes the time faculty need to spend on presentations, yet it makes them aware of the full range of what is available," Peifer says. "It also provides teaching assistants with valuable experience in preparing lectures."

After finalizing a lecture, it is stored on a removable hard drive and ready to present. Although the lecture graphics are organized in the desired order, the instructor can choose from any image or video sequence at any time.

Despite being caught up in the dizzying onslaught of new presentation technologies, Peifer is quick to point out that he is not intent on replacing the human element of instruction, only on enhancing it. The true measure of that, of course, is the response of students.

In a paper that Peifer and Fifield will present at the National Science Teachers Association National Convention in Boston on March 27, they report the results of an ongoing evaluation of lectures enhanced by MacPresents. Written evaluations include such comments as:

"With DNA, the visual aids helped me to understand structures and I could visualize this when taking my test."

"AV materials were helpful in showing detail and function that can't easily be conveyed by speech. Especially helpful were the visuals that conveyed motion."

"It made me more interested in the material. I told people about it. My friend is taking the class because of it."

Peifer will soon be adding to his survey of General Biology students, which now includes questionnaires from more than 1500 students from nine lecture sections taught by ten instructors during 1990 and 1991. So far, 34 percent have answered "very good" and 18 percent "excellent" in response to the question: "How would you rate the effectiveness of the visual materials in aiding your understanding of biological processes and concepts?" In response to the question: "How would you rate the effectiveness of the visual materials in making the lectures more interesting?" 38 percent marked "very good" and 25 percent "excellent."

The response that Peifer found most rewarding came from an extension student who for his own interest was retaking the General Biology classes he originally had taken as an undergraduate 10 years ago. "He came up to me after one of the lectures and said that the difference was like night and day. He said he was able to understand and remember vividly some of the concepts that had been just complicated diagrams before."

For further information, contact Rick Peifer, P-180 Kolthoff Hall, 625-9048.

ORTTA Annual Gift Drive



In December, members of the Golden Gopher Men's Basketball Team (above) pitched in to help distribute gifts to children at the Variety Club Children's Hospital. The gifts were donated by companies that have licensed University of Minnesota Trademarks for use on their products.

The annual gift drive is organized by ORTTA's trademark licensing division, represented below by Paul Vander Tuig (left of cart), Bob Hicks (right of cart), and Kris Nelson (next to Hicks).



Patents Assigned to the University of Minnesota for the Year 1991

- 1. Title:** **Amplitude and Frequency/Phase Modulated Pulses to Achieve Plane Rotations of Nuclear Spin Magnetization Vectors with Inhomogeneous B_1 Fields**
Patent #: **4,988,947** Date: January 29, 1991 Status: Available
Purpose: Improved method of imaging for use in magnetic resonance imaging devices.
Inventors: Kamil Ugurbil, Biochemistry, Medical School; Michael Garwood, Radiology
- 2. Title:** **Process of and Apparatus for Extruding a Reactive Polymer Mixture**
Patent #: **4,990,293** Date: February 5, 1991 Status: Available
Purpose: Improved manufacturing of thin sheets and films coated with polymers.
Inventors: Christopher Macosko, Thierry Charbonneaux, Chemical Engineering
- 3. Title:** **Quantitative Analysis of the Active Tablet Ingredient by Power X-Ray Diffractometry**
Patent #: **4,991,191** Date: February 5, 1991 Status: Available
Purpose: Evaluation of mass-produced medicinal pills for quality control.
Inventors: Raj G. Suryanarayanan, Pharmaceutics
- 4. Title:** **Optically Nonlinear Aromatic Carboxylic Acid Complexes**
Patent #: **4,992,214** Date: February 12, 1991 Status: Available
Purpose: New compounds that could be used in laser or light-focusing devices.
Inventors: Margaret C. Etter, Chemistry; Gayle M. Frankenbach, formerly from Chemistry
- 5. Title:** **Bacterial Degradation of 4-chlorobiphenyl**
Patent #: **4,999,300** Date: March 12, 1991 Status: Available
Purpose: Natural decomposition of a hazardous waste related to PCBs.
Inventors: Marlene Barton, formerly from the Gray Freshwater Institute
- 6. Title:** **Prosthetic Devices Coated with Polypeptides with Type IV Collagen Activity**
Patent #: **5,007,925** Date: April 16, 1991 Status: Available
Purpose: A heparin-binding composition that promotes cellular adhesion and might be used to enhance biocompatibility of prosthetic implants, percutaneous devices, and bandages.
Inventors: Photini-Effie C. Tsilibary, Leo T. Furcht, Laboratory Medicine and Pathology
- 7. Title:** **Phospholipase A2-Resistant Liposomes**
Patent #: **5,009,956** Date: April 23, 1991 Status: Available
Purpose: Drug delivery method that extends the time liposomes can carry medication in the body without being broken down.
Inventors: Kumar V. Vedantam, Wolfgang J. Baumann, Hormel Institute
- 8. Title:** **Split-Gate Field Effect Transistor**
Patent #: **5,012,315** Date: April 30, 1991 Status: Available
Purpose: To accelerate electrons and thereby decrease electron transit time, increasing speed and operation frequency of field-effect transistors in semiconductor devices.
Inventors: Michael Shur, formerly Electrical Engineering
- 9. Title:** **High Stability Porous Zirconium Oxide Spherules**
Patent #: **5,015,373** Date: May 14, 1991 Status: Licensed
Purpose: For use in inorganic oxide-based chromatography; reverse-phase, high-pressure liquid chromatography; and ion-exchange, high-pressure liquid chromatography.
Inventors: Peter Carr, Eric F. Funkenbusch, Douglas A. Hanggi, Chemistry; Martin P. Rigney, Patrick L. Coleman, Wes A. Schafer, 3M
- 10. Title:** **Fluid Regulator Valve**
Patent #: **5,017,099** Date: May 21, 1991 Status: Available
Purpose: An energy-saving vacuum/pressure regulator for use in pumps, such as those in milking machines.
Inventors: Jinglu Tan, Agricultural Engineering

11. **Title:** **Crystalline Saponin-Containing Complex**
 Patent #: **5,017,562** Date: May 21, 1991 Status: Licensed
 Purpose: A relatively pure plant extract for use as an intermediary in producing sapogenin animal growth stimulants.
 Inventors: Thomas J. Holmes, Barbara Nygaard, Medicinal Chemistry
12. **Title:** **Polypeptides with Fibronectin Activity**
 Patent #: **5,019,646** Date: May 28, 1991 Status: Available
 Purpose: A composition that binds heparin and promotes cellular adhesion and neurite outgrowth and might be useful in cell cultures and medical devices such as implants and catheters.
 Inventors: James B. McCarthy, Leo T. Furcht, Laboratory Medicine and Pathology
13. **Title:** **Time Symmetric Pulse to Uniformly Rotate Magnetization Vectors by an Arbitrary Angle in the Presence of Large B1 Inhomogeneities and Resonance Offsets**
 Patent #: **5,019,784** Date: May 28, 1991 Status: Available
 Purpose: A method to improve editing capability of images generated by magnetic resonance imaging and spectroscopy.
 Inventors: Kamil Ugurbil, Biochemistry (MS); Michael Garwood, Radiology
14. **Title:** **Surface Instability Detection Apparatus**
 Patent #: **5,024,103** Date: June 18, 1991 Status: Available
 Purpose: A compression test apparatus for materials such as rock and concrete, to measure stress displacement characteristics of the failure zone.
 Inventors: Ioannis G. Vardoulakis, Joseph Labuz, Euripides Papamichos, Civil and Mineral Engineering
15. **Title:** **Method and Apparatus for Scanning and Recording of Coordinates Describing Three-Dimensional Objects of Complex and Unique Geometry**
 Patent #: **5,027,281** Date: June 25, 1991 Status: Licensed
 Purpose: A method and apparatus for scanning and recording of coordinates describing three-dimensional objects of complex and unique geometry, such as in creating crowns for teeth.
 Inventors: E. Dianne Rekow, formerly School of Dentistry; Arthur Erdman, Donald Riley, Yang Zhu, Jeong-Ho Ahn, and Barney Klamecki, Mechanical Engineering
16. **Title:** **Treatment for Cocaine Use**
 Patent #: **5,028,611** Date: July 2, 1991 Status: Available
 Purpose: Application of an existing neurological medication to reduce craving for cocaine.
 Inventors: James Halikas, Psychiatry
17. **Title:** **Anisodamine to Prevent and Treat Eye Disease**
 Patent #: **5,030,637** Date: July 9, 1991 Status: Licensed
 Purpose: A substance taken from a Chinese herb and used to vasodilate small blood vessels, including those in the retina.
 Inventors: Stanley Einzig, Shu-Lun Zhang, formerly of Pediatrics
18. **Title:** **Deposition of Superconducting Thick Films by Spray Inductively Coupled Plasma Method**
 Patent #: **5,032,568** Date: July 16, 1991 Status: Available
 Purpose: A method to apply a mixed metal oxide or ceramic oxide to prepare a superconducting thick film.
 Inventors: Emil Pfender, Yuk-Chiu Lau, Mechanical Engineering
19. **Title:** **Gravity Lumbar Traction Device and Treatment Method**
 Patent #: **5,033,460** Date: July 23, 1991 Status: Licensed
 Purpose: A support that uses the patient's own lower body weight to apply gentle traction for low-back therapy.
 Inventors: Gary Goldish, formerly of Physical Medicine and Rehabilitation
20. **Title:** **Preparation of Superconductive Ceramic Oxides Using Ozone**
 Patent #: **5,039,657** Date: August 13, 1991 Status: Available
 Purpose: A low-temperature method of fabricating superconducting thin films on flexible, plastic surfaces and semiconductors.
 Inventors: Allen Goldman, Dale Berkley, Burgess Johnson, Physics and Astronomy

21. **Title:** **High volume PM 10 Sampling Inlet**
 Patent #: **5,040,424** Date: August 20, 1991 Status: Licensed
 Purpose: A device for evaluating air pollution.
 Inventors: Virgil Marple, Benjamin Y.H.Liu, Mechanical Engineering
22. **Title:** **Radial Drive for Implantable Centrifugal Cardiac Assist Pump**
 Patent #: **5,044,897** Date: September 3, 1991 Status: Licensed
 Purpose: An improved drive system for a device to temporarily take over or supplement the pumping function of the heart.
 Inventors: Frank Dorman, Mechanical Engineering
23. **Title:** **Closed-Loop Control System**
 Patent #: **5,050,089** Date: September 17, 1991 Status: Licensed
 Purpose: A computerized system for controlling a pipe-bending process to achieve precisely angled bends, such as those in aircraft hydraulic lines.
 Inventors: Kim Stelson, Mechanical Engineering
24. **Title:** **Method for Diagnosing, Monitoring and Treating Hypertension**
 Patent #: **5,054,493** Date: October 8, 1991 Status: Licensed
 Purpose: A novel method of monitoring the blood pressure pulse wave to diagnose and treat hypertension.
 Inventors: Jay Cohn, Medicine; Stanley Finkelstein, Laboratory Medicine and Pathology
25. **Title:** **Biodegradation of Halogenated Hydrocarbons Utilizing Ammonia-Oxidizing Bacterium**
 Patent #: **5,055,193** Date: October 8, 1991 Status: Licensed
 Purpose: For cleanup of toxic wastes.
 Inventors: Alan Hooper, Genetics and Cell Biology
26. **Title:** **Chest Compression Apparatus**
 Patent #: **5,056,505** Date: October 15, 1991 Status: Licensed
 Purpose: Improvements on pneumatic rapid chest compression system for people with disorders affecting the lungs.
 Inventors: Warren Warwick, Leland Hansen, Pediatrics
27. **Title:** **Bandage Comprising a Fibrous Surface Coated with Polypeptides with Type IV Collagen Activity**
 Patent #: **5,059,425** Date: October 22, 1991 Status: Available
 Purpose: To improve healing of wounds.
 Inventors: Effie C. Photini-Tsilibary, Leo Furcht, Laboratory Medicine and Pathology
28. **Title:** **Integrated Metallurgical Reactor**
 Patent #: **5,060,913** Date: October 29, 1991 Status: Available
 Purpose: An improved two-chamber furnace for smelting and reduction of metal oxides, such as iron oxide, used in making steel.
 Inventors: Kenneth Reid, Mineral Resources Research Center
29. **Title:** **Plane-Strain Apparatus**
 Patent #: **5,063,785** Date: November 12, 1991 Status: Available
 Purpose: For testing soft rock and concrete specimens for failure under compression.
 Inventors: Joseph Labuz, Ioannis Vardoulakis, Andrew Drescher, Civil and Mineral Engineering
30. **Title:** **Direct Smelting Process and Apparatus**
 Patent #: **5,069,715** Date: December 3, 1991 Status: Available
 Purpose: Improved method of smelting iron.
 Inventors: Kenneth Reid, Mineral Resources Research Center
31. **Title:** **Zero Net External Displacement Implantable Pump and Driver**
 Patent #: **5,073,094** Date: December 17, 1991 Status: Sublicense available
 Purpose: A manually compressible, implantable pump for transferring an unwanted accumulation of body fluids in a body cavity to a site where the fluids can be processed by the body.
 Inventors: Frank Dorman, Mechanical Engineering; Bruce Wigness, Surgery

Foundations Funding Faculty Development

Many foundations fund higher education, but several support those who deliver it, believing that quality education is not possible without quality faculty.

Ford Foundation

Under its education and culture program, the Ford Foundation supports faculty development in several areas. The foundation has funded fellowships, research, conferences, workshops and other activities to strengthen faculty in social sciences, international and areas studies, foreign languages and African and women's studies. Ford also supports a doctoral and postdoctoral fellowship program for minority faculty through the National Research Council of the National Academy of Sciences. Ford's 1991 education and culture budget was \$79.4 million. Proposals may be submitted at any time. Contact: Ford Foundation, 320 East 43rd Street, New York, NY 10017; 212/573-5000.

Camille and Henry Dreyfus Foundation

The Camille and Henry Dreyfus Foundation's New Faculty Award Program gives \$25,000 grants to first-year chemical sciences faculty members for research and curriculum-related projects. Individuals must be nominated by their institutions; institutions may nominate only one candidate a year. The foundation makes about 10 awards a year. The deadline is May 15. Contact: Camille and Henry Dreyfus Foundation, 445 Park Avenue, New York, NY 10022; 212/753-1760.

KPMG Peat Marwick Foundation

The KPMG Peat Marwick Foundation supports development of accounting faculty through research fellowships and professorships. The foundation awards \$25,000 research fellowships to full-time untenured faculty in U.S. institutions and may award additional \$25,000 faculty fellowships to outstanding research fellows. The foundation also selects a few outstanding faculty members a year for professorships, which are not open to application. The foundation also provides support for accounting faculty who want to attend Peat Marwick professional development programs. Peat Marwick's 1991 grants totaled \$6.4 million. Applications for research fellowships are due March 15. Contact: KPMG Peat Marwick Foundation, 3 Chestnut Ridge Road, Montvale, New Jersey 07645; 201/307-7151.

Robert Wood Johnson Foundation

The Robert Wood Johnson Foundation's Minority Medical Faculty Development Program awards four-year postdoc-

toral research fellowships to help minority physicians who are committed to teaching careers. Each awardee studies and conducts research with a senior faculty member at a U.S. scientific institution that trains young faculty. The program's advisory board helps match candidates with mentors. Grants are up to \$50,000 a year for salary support plus \$25,000 a year for research activities. The foundation awards up to 12 grants a year. Application materials must be requested by April 1; full applications are due April 30. Contact: Harold Amos, Program Director, Minority Medical Faculty Development Program, Robert Wood Johnson Foundation, P.O. Box 446, Brookline Massachusetts 02147; 617/732-1947.

Department of Agriculture

Aquaculture Research

Applications are invited for competitive grant awards under the Special Research Grants Program, Aquaculture Research for FY 1992.

Under this program, and subject to the availability of funds, grants may be awarded for periods not to exceed five years, for support of research in order to enhance the knowledge and technology base necessary for the continued growth of the domestic aquaculture industry as a form of sustainable agriculture. Emphasis is placed on research leading to improved production efficiency and increased competitiveness of private sector aquaculture in the U.S. Because of limited funds for this program, only proposals focused on commercially important finfish species in the specific subareas of Disease and Parasite Control (1.1), and Integrated Aquatic Animal Health Management (1.2) will be considered.

A total of approximately \$299,320 will be available for this program area for FY 1992; up to \$80,000 will be awarded for the support of any one project under this program area.

The Cooperative State Research Service (CSRS) contact for Aquaculture Research programmatic questions is Dr. Meryl Broussard, 202/401-4061.

The application (postmark) deadline is **March 2, 1992**. Copies of this solicitation, the Grant Application Kit and the Administrative Provisions governing this program may be obtained by writing or calling: Proposal Services Branch, Awards Management Division, Office of Grants and Program Systems, Cooperative State Research Service, U.S. Department of Agriculture, Aerospace Center Room 303, Washington, DC 20250-2200; 202/401-5048.

National Science Foundation

Academic Research Infrastructure Program

The Academic Research Infrastructure Program is designed to improve the condition of research equipment and facilities in our Nation's academic institutions. This initiative, which broadens the Foundation's recent Academic Research Facilities Modernization Program to include major research instrumentation, will be implemented through competitive grants for:

- Acquisition or development of major research instrumentation, and/or
- Repair, renovation, or in exceptional cases, replacement of obsolete science and engineering research facilities.

This initiative responds to needs identified by the academic science and engineering community for research instrumentation that is not routinely available through other NSF programs. For research instrumentation, eligible project costs may include installation, operation, maintenance, calibration, and other appropriate technical support. For facilities modernization, costs may include architecture and engineering services, survey, testing, inspections, relocation, demolition, removal, construction, fixed equipment, and related construction management costs.

The goals are:

- Support the acquisition, through purchase or development, of major state-of-the-art research instrumentation;
- Improve accessibility to and greater utilization of modern research instrumentation by scientists, engineers, and graduate and undergraduate students;
- Promote the modernization of science and engineering research laboratories and related facilities at institutions of higher education (including graduate and undergraduate institutions), independent non-profit research institutions, research museums, and consortia thereof; and
- Assist graduate and undergraduate academic institutions, including those that historically have received limited Federal research and development funds, to improve their academic science and engineering infrastructure.

Awards for instrumentation will range from \$100,000 to \$2 million—50% of the total cost of instrumentation. Cost-sharing at the level of at least 50% of total eligible project costs is required. The matching or cost sharing may be from any

private or non-Federal public source and may be in cash or in kind. Eligible cost sharing may include cost of acquisition or renovation of space to house the instrumentation, cost of instrumentation installation, and cost of personnel and supplies directly associated with operation and maintenance of the instrumentation (up to 10% of the total instrument cost per year for the duration of the award, but not exceeding five years). Manufacturers' discounts do not constitute eligible cost sharing.

Awards are not expected to exceed three years in duration, except awards for the development of major research instrumentation, which may be made for up to five years.

An institution may only submit two proposals to this program. Please contact the Graduate School Research Office, which will be conducting the review of proposals, at 626-0309 or send an electronic message to *brenner@mailbox.mail.umn.edu*.

The proposal deadline at NSF is **March 3, 1992**. A full copy of the announcement is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

National Science Foundation

Arctic Land-Atmosphere-Ice Interactions

NSF invites scientists from U.S. institutions to submit proposals to perform research on environmental processes and interactions of the arctic terrestrial environment. This research will contribute to NSF's Arctic System Science Program (ARCSS), a component of the U.S. Global Change Research Program.

ARCSS program goals are:

- To understand the physical, chemical, biological and social processes of the arctic system that interact with the total earth system and thus contribute to or are influenced by global change, in order
- To advance the scientific basis for predicting environmental change on a decade to centuries time scale and for formulating policy options in response to the anticipated impacts on human and societal support systems.

The application deadline is **March 15, 1992**. A complete copy of the solicitation is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Department of Transportation

Discretionary Grants to Support Highway Safety Research

The Federal Highway Administration (FHWA) announces a discretionary grant program to support highway safety and solicits applications from U.S. colleges and universities interested in participating in this program. The grant program has two objectives: 1) Broaden existing highway safety research at U.S. colleges and universities; and 2) encourage U.S. citizens to seek advanced degrees in highway safety related areas.

The FHWA Office of Research and Development is responsible for developing strategies to save lives and reduce injuries and property damage through the prevention and reduction of motor vehicle accidents. The Office of Safety and Traffic Operations Research and Development is currently conducting highway safety research in six high-priority areas:

- Advanced Traffic Control Devices
- Developing Specifications for Retroreflective Devices
- Information Resources
- Special Highway Users
- Highway Safety Design Practices and Criteria
- Improved Highway Travel for an Aging Population

Grants will be for a one-year period. Additional options to extend grants for up to two additional years, pending availability of funds, will be considered. Up to four grants will be made to selected universities in amounts of up to \$50,000 to enhance graduate student research in all highway related areas of traffic safety. These areas include geometric and roadside design, traffic control devices; traffic barriers; pedestrian and bicyclist safety; and human factors.

Disciplines necessary to conduct this research include: civil engineering, transportation engineering, highway engineering, statistics, physics, structural mechanics, mechanical engineering, materials engineering, computer sciences, human factors, and hazardous materials.

The application deadline is **March 10, 1992**. General administrative questions may be directed to Lise Lyles, Office of Contracts and Procurement, 202/366-4229; programmatic questions relating to this discretionary grant program should be directed to Jerry A. Reagan, Design Concepts Research Division (HSR-20), 703/285-2057.

National Institute on Deafness and Other Communication Disorders

Small Grant Program

The National Institute on Deafness and Other Communication Disorders (NIDCD) has announced new guidelines for its Small Grants Program, superseding all previously issued announcements.

The NIDCD Small Grant program is designed solely to support basic and clinical scientists with limited research experience who are at the beginning stages of their research careers, to undertake pilot research that is likely to lead to a subsequent Individual Research Project Grant (R01) or a First Independent Research Support and Transition Grant (FIRST-R29) application. The research must be focused on areas within the mission of NIDCD, that is, hearing, balance/vestibular, smell, taste, voice, speech, and language.

Current and previous recipients of NIH research grants such as Small Grant awards, R01 or R29 grants are ineligible for this program; individuals who have received research support from other Federal funding agencies are also ineligible. Small Grant funds may not be used to support thesis or dissertation research.

Applicants may request up to \$25,000 (direct costs) per year. The grant may not exceed two years and is not renewable. Investigators are expected to seek continuing support for research through a research project grant (R01) or FIRST award (R29). Only one application may be submitted by an investigative team per receipt date. Applicants may not submit R01 or R29 applications on the same topic concurrently with the submission of a Small Grant application.

Annual receipt dates are: January 7, May 6, and September 16. For additional information, investigators are encouraged to call 301/496-5061, or write to NIDCD staff responsible for grants in the investigator's particular area of scientific interest:

- Dr. Beth Ansell (voice, speech)
- Dr. Judith Cooper (language)
- Dr. Amy Donahue (hearing)
- Dr. Jack Pearl (chemical senses)
- Dr. Daniel Sklare (balance/vestibular)

Address: NIDCD, NIH, Executive Plaza South, Room 400-B, 6120 Executive Plaza Boulevard, Rockville, MD 20892.

Environmental Protection Agency

Environmental Education Grants

The purpose of these grants is to stimulate environmental education by supporting projects to design, demonstrate, or disseminate practices, methods or techniques related to environmental education or training. The program is separate from the Environmental Education and Training Program of EPA.

There are four program objectives: 1) to enhance environmental teaching skills and curricula; 2) to create partnerships and promote teamwork to improve environmental education; 3) to help the general public make informed decisions about the environment; and 4) to motivate the general public to be more environmentally conscious.

Eligible activities may include, but not be limited to:

- Design, demonstration, or dissemination of environmental curricula, including development of educational tools and materials;
- Design and demonstration of field methods, practices, and techniques, including assessment of environmental and ecological conditions and analysis of environmental pollution problems;
- Projects to understand and assess a specific environmental issue or a specific environmental problem;
- Design and demonstration of projects to foster international cooperation in addressing environmental issues and problems involving the U.S. and Canada or Mexico.

Priority will be given to projects which develop:

- A new or significantly improved environmental education practice, method, or technique;
- An environmental education practice, method, or technique which may have wide application; and
- An environmental education practice, method, or technique which addresses an environmental issue which, in the judgment of EPA, is of high priority.

About \$2.5 million is available for grants; federal funds may not exceed 75% of the total project costs, so matching funds are required. The statutory ceiling for any one grant is \$250,000 but most will be for \$25,000 or less. Funding may be requested for 12-24 months.

The application deadline is **March 9, 1992**. Contact: EPA, Environmental Education Grants-Applications, AScl, 1365 Beverly Road, McLean, VA 22101; 703/847-3036.

Department of Energy

Generator and Large Motor Application of Superconductivity

The Office of Program Analysis, Office of Energy Research, Department of Energy, has announced its interest in receiving applications for a Special Research Grant that seeks support for conducting a research needs assessment in the area of superconductivity as it relates to electric power generators and large motor applications. The purpose of this activity is to identify and disseminate priority research needs for achieving high efficiency utilization of state-of-the-art development in superconductivity with superior economic, environmental and performance potential. This project should *not* focus on topics such as those requiring liquid helium for operation.

Applicants must include a description of the planned methodology that will be used in assessing long term (up to 20 years) research directions, opportunities, priorities, and degrees of difficulty in accomplishing identified research opportunities.

Applicants must enlist the aid of experts from academia and industry to identify, describe, and assess on a worldwide basis, the most promising new (i.e. beyond state-of-the-art) developments, applications and opportunities in science and technology to facilitate the future utilization of superconductivity for power generators and large motor applications.

Subject to the availability of appropriated FY 1992 funds, one grant award for approximately \$300,000 is planned. The grant award will be for a 1-year period.

Formal applications should be received by **March 1, 1992**. Application guidelines are available from Paul Maupin, Office of Program Analysis, Office of Energy Research, U.S. Department of Energy, ER-33, Washington, DC 20585. Telephone requests may be made by calling 301/903-4355.

The complete announcement is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

The Sponsored Project Information Network (SPIN) is a computerized locator system of funding opportunities (federal, nonfederal, and corporate) for faculty and institutional research, development, and education program support. It is available free of charge to University faculty and staff through ORTTA.

Based on a description of your research areas and / or the type of support sought, faculty and staff can search the SPIN Keyword Index to identify sources within specific areas of interest. The Keyword Index, a taxonomy developed by SPIN to catalog funding sources, is divided into the following ten major classifications:

- Agriculture / Food / Forestry**
- Arts / Culture / Humanities / Communications**
- Business / Economics / Management**
- Education**
- Health / Medical Sciences**
- International Affairs / Area Studies**
- Miscellaneous / Other**
- Science / Technology**
- Social / Behavioral Sciences**
- Social Welfare / Public Affairs**

The result of a search is a set of profiles of applicable funding sources that provides: 1) the sponsor's name; 2) the sponsor's contact address and telephone number; 3) deadline dates; 4) program titles; 5) objectives or interest areas of the sponsor; and 6) restrictions that would affect the submission of a proposal. This set of profiles is sent to the requestor.

Effective September, 1990, the SPIN indexes became available for on-line review through ORTTA's Electronic Bulletin Board (See the September, 1990 *Research Review* for information on Bulletin Board contents and access instructions—or call 624-9004 for a copy of the instructions.) The Bulletin Board contains a section devoted to SPIN and offers users the opportunity to review the Keyword Index alphabetically or within the topics shown above.

Since the Bulletin Board is accessible anytime, faculty and staff can browse the indexes at their convenience and find *keyword codes* of interest to them. From within the Bulletin Board they can forward a note to the Bulletin Board Editor requesting a SPIN search based on the chosen keyword codes (limit, 20 keywords).

Additional **Specialty Codes** used by SPIN that may help in choosing key words appropriate to the project for which funding is sought are:

International Travel	Opportunities to travel to countries or to study their cultures.
Opportunities Abroad	Support to travel identified by country, region or continent.
Equipment/Facility Support	Use code that relates to project, not what is being purchased.
Professional Development	Largely Postdoctoral opportunities.
Student Support	For students seeking external funding support.
Foreign Scholar Support	Bringing foreign scholars to this country or seeking programs in the U.S. for which they are eligible.
Conference Support	Funding to hold or conduct a conference, symposium, or workshop.
Publication Support	Support to prepare or complete a work or for actual cost of publishing a completed work.
Sabbatical Support	To undertake or supplement sabbatical leaves.

For further information regarding the SPIN system, please contact ORTTA at 624-9004.

SPIN searches are also available through the Research and Development Office in the College of Liberal Arts, the Agricultural Experiment Station, the Research Support Office at Duluth, and the Grants Development Office at Morris.

Faculty Research, Training, and Service Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please send the pertinent data, as listed below, to Michael Moore at ORTTA.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
December, 1991	285	\$ 37,593,210
Awards Processed		
December, 1991	181	16,294,706
Proposals Submitted		
July, 1991 - December, 1991	1,874	286,353,171
Awards Processed		
July, 1991 - December 1991	1,676	148,035,670
Proposals Submitted		
July, 1990 - December, 1990	1,728	228,496,021
Awards Processed		
July, 1990 - December, 1990	1,593	128,416,424

Aquaculture Facility Purchase and Development

Ira R. Adelman, Fisheries and Wildlife
 Anne R.D. Kapuscinski, Fisheries and Wildlife
 Legislative Commission on Minnesota Resources
 \$960,000 - 07/91-06/93

Technology for Removal of Toxic Pollutants From Bottom Sediment

Rodney L. Bleifuss, Natural Resources Research Inst, UMD
 John R. Ludwig, Natural Resources Research Inst, UMD
 Keith B. Lodge, Natural Resources Research Inst, UMD
 EPA
 \$300,000 - 07/91-06/94

Impacts of Intensified Forest Management Nutrient Cycling

Alan R. Ek, Forest Resources
 David F. Grigal, Soil Science
 John Pastor, Natural Resources Research Inst, UMD
 Legislative Commission on Minnesota Resources
 \$220,000 - 07/91-06/93

Modulation of Reproductive Efficiency by Prolactin in the Domestic Turkey

Mohamed E. El Halawani, Animal Science
 USDA
 \$215,000 - 09/91-08/94

Coordinated Preservation Microfilming Project

Donald G. Kelsey, University Libraries
 Committee on Institutional Cooperation
 \$155,610 - 10/91-06/94

Continued Analysis of Transgenic Fish

Perry B. Hackett, Jr., Genetics and Cell Biology
 Legislative Commission on Minnesota Resources
 \$149,500 - 07/91-06/93

Rates and Mechanisms of Chemical Recovery from Lake Acidification in Little Rock Lake, Wisconsin

Patrick L. Brezonik, Civil and Mineral Engineering
 USDI, Geological Survey
 \$133,601 - 08/91-07/94

Subsurface Greenstone Belts, SW Minnesota

David L. Southwick, Geological Survey
 Legislative Commission on Minnesota Resources
 \$120,000 - 07/91-06/93

Land and Water Resource Management Strategies for Lower St. Croix National Scenic Riverway Project

James A. Perry, Forest Resources
 Minnesota Wisconsin Boundary Area Commission
 \$102,000 - 07/91-06/93

Effects of Caffeine and Caffeine Withdrawal in Children

Gail A. Bernstein, Psychiatry
 Minnesota Medical Foundation
 \$100,000 - 07/91-06/92

Psychoactive Drug Use by Nursing Home Elderly

Judith Garrard, School of Public Health
 NIH, NIA
 \$187,947 - 12/91-11/93

OBRA Drug Regulations

Judith Garrard, School of Public Health
 Health Care Financing Administration
 \$56,000 - 12/91-06/92

An Epidemiologic Mortality Study of Workers at a Lithium Plant

Jack S. Mandel, School of Public Health
 FMC Corporation
 \$85,367 - 12/91-03/93

Modeling of Multilayer Nanostructure Magnetic Thin Films

Jian-Gang Zhu, Electrical Engineering
 NSF
 \$69,756 - 08/91-01/94

Study of Recording at Track Edges in Thin Film Media

Jian-Gang Zhu, Electrical Engineering
 IBM
 \$59,000 - 10/91-09/92

Reduction of Radiator Sludge to Commercial Lead Bullion

Vance Leak, Applied Research & Technology Dev Cntr, UMD
 Automotive Cooling Products, Inc.
 \$30,000 - 09/91-12/92

Statistical Support for Aquatic Mesocosm Test

Ronald R. Regal, Mathematics and Statistics, UMD
 George E. Host, Center for Water and Environment, UMD
 EPA
 \$24,000 - 10/91-09/92

Modeling Copper-Nitrogen Oxide Interactions

William B. Tolman, Chemistry
 Exxon Education Foundation
 \$10,000 - 11/91-10/92

Minnesota Road Subgrade Characterization and Pavement Instrumentation

David E. Newcomb, Civil and Mineral Engineering
 Roberto Leon, Civil and Mineral Engineering
 St of MN - Dept of Transportation
 \$80,000 - 11/91-10/92

Brittleness Effects on the Structural Response of Strain-Softening Materials

Joseph F. Labuz, Civil and Mineral Engineering
 NSF
 \$69,813 - 07/91-12/93

Collaborative Research on Networking

David H. Du, Computer Science
 IBM
 \$50,000 - 10/91-10/92

IMA Summer Program in Mathematical Modeling

Avner Friedman, Inst for Math and Its Applications
 Alfred P. Sloan Foundation
 \$30,000 - 12/91-11/92

Transgenic Mosquito Technology: Site-Specific Control

Ann Fallon, Entomology

World Health Organization
\$18,940 - 11/91-10/92

Biological Control of Pests: Trichogramma Control of European Corn Borer

David Andow, Entomology

St of MN - Dept of Agriculture
\$50,000 - 07/91-06/93

Biological Control of Pests: Leafy Spurge

Donald L. Wyse, Agronomy and Plant Genetics
David W. Ragsdale, Entomology

St of MN - Dept of Agriculture
\$40,000 - 07/91-06/93

Biological Control of Pests: Alfalfa Weevil Parasitoids/Phenology

Edward B. Radcliffe, Entomology
Kathy Flanders, Entomology

St of MN - Dept of Agriculture
\$64,000 - 07/91-06/93

Biological Control of Pests: Streptomyces Suppression of Potato Scab

Neil A. Anderson, Plant Pathology
Janet L. Schottel, Biochemistry, CBS

St of MN - Dept of Agriculture
\$36,000 - 07/91-06/93

Biological Control of Pests: Corn Borers and Grasshoppers

Timothy J. Kurtti, Entomology
Ulrike G. Munderloh, Entomology

St of MN - Dept of Agriculture
\$50,000 - 07/91-06/93

Biological Control of Pests: Vegetable Biocontrol

William D. Hutchison, Entomology

St of MN - Dept of Agriculture
\$14,000 - 07/91-06/93

Identification of Cholesterol-Raising Saturated Fatty Acids

Craig A. Hassel, Food Science and Nutrition

Minnesota Beef Council
\$27,550 - 11/91-12/92

Isolation/Characterization/Application of Antioxidant in Wild Rice

Paul B. Addis, Food Science and Nutrition

Minnesota Wild Rice Council
\$50,000 - 08/90-09/91

Factors Limiting the Abundance and Distribution of Sloth Bear of Nepal

James L. David Smith, Fisheries and Wildlife
Anup Joshi, Fisheries and Wildlife
David L. Garshelis, Fisheries and Wildlife

Earthwatch
\$20,000 - 12/91-12/92

Analysis of the Isakson Bridge Retrofit System

Robert Seavey, Forest Products
Roberto Leon, Civil and Mineral Engineering

St of MN - Dept of Transportation
\$17,275 - 10/91-10/92

Aspen Hybrids/New Tissue Culture Technology

Carl A. Mohn, Forest Resources

Legislative Commission on Minnesota Resources
\$70,000 - 07/91-06/93

Artificial Regeneration of Red Oak in Southeast Minnesota

Melvin J. Baughman, Forest Resources
Alvin A. Alm, Forest Resources

Legislative Commission on Minnesota Resources
\$60,815 - 07/91-06/93

Housing, Ethnicity, Household Well-Being, and the National Economy

Earl W. Morris, Design, Housing and Apparel

Georgia State University
\$15,831 - 10/91-09/94

Aquaculture Facility Purchase and Development

Anthony J. Faras, Institute of Human Genetics

Legislative Commission on Minnesota Resources
\$90,500 - 07/91-06/93

Role of Matrix Nonenzymatic Glycosylation in Diabetic Retinopathy

Aristidis S. Charonis, Laboratory Medicine and Pathology

American Diabetes Association - MN Affiliate
\$10,000 - 11/91-10/92

Human Coronary Artery Endothelial Function in Diabetes

David Laxson, Medicine

American Diabetes Association - MN Affiliate
\$10,000 - 11/91-10/92

Insulin Secretory Reserve in Human Pancreas Allograft Recipients

R. Paul Robertson, Medicine

American Diabetes Association - MN Affiliate
\$10,000 - 11/91-10/92

Skin Biopsy to Quantitate Recovery of Diabetic Neuropathy

William R. Kennedy, Neurology

American Diabetes Association - MN Affiliate
\$10,000 - 11/91-10/92

Use of Stents in Aortic Coarctation

Kimberly A. Krabill, Pediatrics
Albert P. Rocchini, Pediatrics

American Heart Association - MN Affiliate
\$24,000 - 07/91-06/92

Structure of a Kidney Proteoglycan and its Role in Diabetes

Ralph Butkowsky, Pediatrics
Youngki Kim, Pediatrics

American Diabetes Association - MN Affiliate
\$10,000 - 11/91-10/92

Insulin Gene Regulation by Chronic Exposure of HIT Cells to High Glucose

Timothy F. Walseth, Pharmacology

American Diabetes Association - MN Affiliate
\$10,000 - 11/91-10/92

Role of CGNFH II in Avian Reproduction

Patricia L. Faris, Psychiatry

University of California, Davis
\$46,255 - 09/91-08/92

Evaluation of the Biochemical and Time-Related Effects of PLGA as Compared to Indomethacin and Vehicle

Kenneth M. Hargreaves, Restorative Sciences

Alza Corporation
\$66,000 - 11/91-03/93

Continued on Next Page...

Pretransplant FK506 Pharmacokinetics

Daniel M. Canafax, Pharmacy Practice

Fujisawa Pharmaceuticals
\$20,000 - 11/91-11/92

Compliance Factors Related to Universal Precautions

Donald Vesley, Environmental and Occupational Health
Johns Hopkins University
\$29,962 - 10/91-09/92

Evaluation of the EACH Program

Jon Christianson, Health Services Research and Policy
Ira S. Moscovice, Health Services Research and Policy
Health Care Financing Administration
\$10,000 - 09/91-09/94

Variations in the Management and Outcome of Diabetes

Willard Manning, Health Services Research and Policy
New England Medical Center
\$86,132 - 09/91-09/92

Women's Health Trial: Feasibility Study in Minority People

I. Marilyn Buzzard, Human Development and Nutrition
Fred Hutchinson Cancer Research Center
\$9,290 - 10/91-01/92

Origins of Montane Park in the Central Rocky Mountains

Margaret Davis, Ecology, Evolution and Behavior
Elizabeth Lynch, Ecology, Evolution and Behavior
NSF
\$10,000 - 10/91-03/94

Screening and Selection of Salt Tolerance in Minnesota Grass

David D. Biesboer, Plant Biology
St of MN - Dept of Transportation
\$15,000 - 11/91-10/93

The Effect of Weaning Age on New Pigs

Barry Wiseman, Large Animal Clinical Sciences
National Pork Producers Council
\$13,488 - 07/91-06/92

Northern Raptor Rehabilitation and Education Facility

Patrick T. Redig, Small Animal Clinical Sciences
Legislative Commission on Minnesota Resources
\$75,000 - 07/91-06/93

Immunogenicity of a 110-KDA Recombinant Borrelia burgdorferi

Russell F. Bey, Veterinary Pathobiology
Upjohn Company
\$48,300 - 09/91-09/92

Faculty Training in Learning Through Modeling and Cooperation

Roger T. Johnson, Jr., Curriculum and Instruction
Karl A. Smith, Civil and Mineral Engineering
Anthony M. Starfield, Ecology, Evolution and Behavior
NSF
\$47,594 - 01/92-06/92

Keepers of the Waters

H. Yvonne Cheek, HHH Institute of Public Affairs
Jerome Foundation
\$10,000 - 09/91-08/92

Effects of Storage on Populus Deltoids X NIGRA for Biomass to Ethanol and Thermochemical Fuels

Wendell Johnson, Arts and Sciences, Crookston
Solar Energy Research Institute
\$24,288 - 11/91-10/92

Minnesota Biotechnology Week

Governor Arne Carlson has proclaimed the week of February 22 to be Biotechnology Week in Minnesota. The Proclamation recognizes the work of the Minnesota Biotechnology Association, the University of Minnesota Biological Forum, and Minnesota Technology, Inc., for "taking a leadership role in advancing and promoting biotechnology and the biotechnology industry in the State of Minnesota."

A series of symposia, meetings, and a biotechnology trade fair are scheduled for February 22-26, 1992. An overview of the agendas for each event is printed below.

Minnesota Biotechnology Week February 22-28, 1992

Registration forms may be requested from the Minnesota Biotechnology Association at 612/625-2285.

Proposed Agendas

Overview:

Monday, February 24, 1992 (Earle Brown Center)

Biological Forum Symposium III

Genetically Engineered Organisms:

- Introduction into the Environment
- Issues for Public Institutions and Regulatory Agencies

Tour and Reception:

Biological Process Technology Institute
Central Fermentation Research Facility

Tuesday, February 25, 1992 (Northland Inn)

MBA Breakfast Meeting

Proclamation of Biotechnology Week

Governor Arne Carlson

Future Health Care in the United States

U.S. Senator David Durenburger

Minnesota Biotechnology Association Annual Meeting

Biotechnology—Are you Ready?

Success Model, Future Trends, Research/Technology

Keynote Address:

U.S. Biotechnology Programs and Policies

*Oscar Zaborsky, Director, Board on Biology,
National Academy of Science*

Business Workshops

Biotechnology Trade Fair: Day 1

Wednesday, February 26, 1992 (Northland Inn)

Minnesota Technology, Inc.

Programs for Biotechnology Development

- Industry Trends, Financing, Technology Assistance

Biotechnology Trade Fair: Day 2

Office of Research and Technology Transfer Administration

Fax Number (612) 624-4843

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Executive Assistant	Ellen Stewart	624-9829	ellen@ortta.umn.edu

Duluth

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Morris

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Research Review Mailing List Information

- Faculty:**
- The *Research Review* is automatically mailed to all faculty on the Faculty Mail List holding the rank of Assistant Professor and above, using the AIS mail list.
 - To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS). (AIS labels are characterized by a string of numbers above the name.)
 - Please check with your departmental office or AIS (624-9000) if you need assistance.

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RESEARCH REVIEW

Research and Technology Transfer Administration

March, 1992

U of M Patenting and Licensing: A Growing Public Service

John Thuente, Director, Office of Patents and Licensing

In a recent issue of *The Scientist* newspaper (November 25, 1991), university technology transfer officers were asked why their universities support the patenting and licensing of inventions from faculty, staff, and students. Overwhelmingly, the first and most compelling reason cited was public benefit: an obligation to contribute new technologies for public well-being and economic development.

This obligation recognizes that most university research is funded by the public through federal grants, and to a lesser extent by state grants. So the public really "owns" the research results, which are shared through scientific and lay publications. Often the research produces discoveries and developments that can create valuable products if these results are protected and transferred to private industry. The federal government recognizes that the most effective way to make those transfers is to allow universities to seek patents on useful developments and to negotiate contractual arrangements—licenses—that give companies the rights to develop and commercialize products under those patents.

Another compelling reason for universities to patent and license is to try to generate royalty income to support more research and technology transfer efforts. The fact is, however, as pointed out in *The Scientist*, that only a handful of universities are breaking even, much less making money through their technology transfer offices. The article stated that although U.S. universities received a total of almost 1,200 patents in fiscal year 1990, total royalty income was only \$60 million. Most of that income goes to a handful of universities that have been patenting and licensing aggressively for decades and have each had one or two highly successful products. The remainder of the universities are presently spending more on patents than they are receiving

in royalties. (The University of Minnesota is about breaking even using its share of royalty income on outside patenting expenses).

A recent study by the University of California concluded that it takes an average of eight years for a university invention to generate royalties; during those eight years the patent

Over \$13 million in recent industry-sponsored research can be directly linked to patenting.

costs can rise into the hundreds of thousands of dollars for

inventions protected by several patents in the United States and internationally.

Patenting, Continued On Page 13

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Human Subjects Committee

Delays in Processing Applications to the Committee

The Committee on the Use of Human Subjects in Research revised its application forms in the summer of 1991. All new applications for Committee approval should be made on the revised forms since new regulations have required attention to specific issues not covered in the old form.

The Committee is concerned that researchers are completing the forms without regard for the specific information requested. Former templates for response to questions do not fit the new format or the new federal guidelines for research.

- Several recent applications have not included the appropriate attachments describing the medication used in clinical research (question 18-B on the application form). The Committee cannot assess the risks and benefits of participation in a clinical trial without that specific information.
- The Committee also asks for a complete protocol for all medical research (FDA guidelines require a file copy of the protocol).
- For research involving questionnaires or interviews, the Committee must preview a copy of the survey instrument to assess risks and benefits. It is acceptable to cite commonly used standardized instruments (MMPI, etc). Instruments designed by the investigator and/or rarely used forms should be submitted for review.

Deficient applications will be returned to researchers without Committee review. If you have questions, please call Moira Keane at 624-1889.

RESEARCH REVIEW

Volume XXI/Number 9

March, 1992

Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, creed, color, sex, marital status, national origin, disability, public assistance status, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/91-6/30/94 rates should be used. **The rate agreement is dated July 1, 1991.** This date should be used where required on proposal applications. Please call **Marilyn Surbey at 624-4850 with questions on Indirect Costs.**

	07/01/91 <u>06/30/94</u>
Research	
On-Campus	40.0
Off-Campus *	21.0
SAFHL	60.0
Hormel	53.0
Other Sponsored Activity	
On-Campus	20.0
Off-Campus *	10.0
Instruction	
On-Campus	52.0
Off-Campus	16.0

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call **Vivian Fickling at 624-2009.**

Current actual rates from July 1, 1991 through June 30, 1992 are:

Faculty	28.75
Civil Service	25.25
Graduate Assistants	8.50

For proposals being submitted with start dates **after July 1, 1992**, the estimated fringe benefit rates to be budgeted are:

Faculty	31.25
Civil Service	29.50
Graduate Assistants	10.50

Estimated rates after **July 1, 1993** are:

Faculty	28.00
Civil Service	30.50
Graduate Assistants	31.25

As rates change they will be reflected in this section.

Patent and Technology Transfer Policy

An Abbreviated, Informal Translation

The University of Minnesota Patent and Technology Transfer Policy was enacted by the Board of Regents in October, 1986, as revised by the Patent and Technology Transfer Council and recommended by the University Senate. Copies of the policy are available from the Office of Patents and Licensing, 624-0550.

Introduction

The policy is intended to advance the University's education, research and public service missions by providing a means to transfer University technologies directly to external parties for beneficial use. It also contains mechanisms for obtaining and distributing income from such transfer, so as to encourage and reward inventors and to pay for the costs of patenting, licensing, and protecting the technologies. By encouraging and assisting patenting and licensing, the policy helps obtain recognition for the University's role in advancing technology that is beneficial to society.

Definitions

The following terms are used to describe who and what is covered by the policy:

Personnel are all persons employed or otherwise compensated by the University, including visiting faculty and researchers, but excluding consultants to the University.

University Funds are funds provided by the University for the specific purpose of supporting research, and funds received by the University through federal and state appropriations to various University units.

University Administered Funding is provided to the University by external entities—public or private—to support research.

Developments are the results of research by University personnel, not including matter that is primarily educational, literary, or artistic in nature. Developments are categorized in three ways:

- Category (1) includes developments involving University Funds or University Administered Funding, where disclosure and disposition of developments are required by the terms of the funding arrangement;
- Category (2) includes developments involving University Funds or University Administered Funding where disclosure and disposition of developments are not required;
- Category (3) includes developments that didn't involve the use of University Funds or University Administered Funding.

Developers are all Personnel who produce a Development, such as an invention on which a patent is filed.

Transferee is any legally constituted organization or individual who acquires rights in a Development under a license negotiated by the University's Office of Patents and Licensing.

Net Income means the gross monetary payments received by the University as a result of transferring rights in a Development, minus the University's out-of-pocket costs for protecting, developing, and transferring the Development.

Application

The policy is a condition of employment and applies to all Personnel.

Rights and Obligations

The policy does not infringe on the right to publish. It usually requires a limited waiting period before publication to allow the Office of Patents and Licensing to review the Development and to file for protection if warranted.

Personnel are required to disclose Category 1 developments to the Office of Patents and Licensing, usually by sending a draft of a research paper or abstract. Disclosure of Category 2 Developments is not required unless Developers decide to protect and/or commercially exploit a Development, in which case they must fully and confidentially disclose the Development to the University, which has the first right to acquire title. Disclosure of Category 3 Developments is voluntary but is encouraged because it complements the University's mission and provides Developers with free legal services and protection for the Development.

The Office of Patents and Licensing is required to evaluate each disclosed Development and, within two weeks, to contact the Developers to discuss the nature and extent of protection, if any, to be sought. If the University decides not to proceed with the Development, it will waive rights of ownership to the Developers, if permitted by the terms of the funding arrangement. If the University decides to protect or commercialize a development, Developers must assign title to the University and provide whatever assistance is needed to obtain suitable protection. Developers shall also help the Office of Patents and Licensing identify potential Transferees and provide them with information about the Development. The Office of Patents and Licensing will, at University expense, use its best efforts to

Continued on Next Page

suitably protect and transfer the Development, and will keep Developers fully informed of such efforts.

Distribution of Income

Gross income from a patented Development will first be used to reimburse the University for patent costs. Then net income will be distributed as follows:

33 1/3% to the Developer(s)

25 1/3% to the Developer(s)' research (or department, if a Developer leaves the University)

8% to the Developer(s)' college

33 1/3% to the Office of Patents and Licensing, to be used to cover costs for technology protection, development, and transfer activities concerning other Developments.

Net income from non-patented developments, such as software, texts and audiovisual materials, is distributed 75% to the developer(s) and 25% to the Office of Patents and Licensing.

Additional Considerations

The Office of Patents and Licensing, may, as circumstances warrant, negotiate other forms of compensation, such as shares of stock in a company. In such cases, suitable arrangements must be made to compensate all persons and units that have a right to a share of net income, with the express agreement of all parties. The Office of Patents and Licensing may also, at its discretion, pay Developers for extraordinary efforts in identifying potential Transferees and interesting them in the Development.

Developers should be aware that the obligations and procedures in this policy are subject to terms and conditions of any funding arrangement related to a Development. Generally, industry sponsors will acquire some rights in Developments made under research projects they fund.

In seeking to apply this policy to transfer Developments and maximize their public utility while obtaining a fair return for Developers and the University, the Office of Patents and Licensing shall apply the following principles:

- Rights to a Development will not be granted without fair compensation in the form of royalties, stock, or research funding.
- Exclusive rights to a Development may be granted to a Transferee, but terms will be negotiated to obligate the Transferee to adequately attempt to exploit the Development to meet a public market. The University shall retain the right to terminate the agreement and reacquire

all rights if the Transferee does not adequately exploit the Development.

- The University may enter into agreements with an organization that will itself attempt to transfer a Development for commercialization. This type of sub-licensing agreement has been made with some faculty who have formed their own companies to license their Developments.

Starting the Technology Transfer Process

Disclosing the Invention

Editor's note: This article is written as an introduction for those unfamiliar with the process of technology transfer at the University of Minnesota, and to encourage faculty, staff, and students to take advantage of the services offered by the Office of Patents & Licensing.

Technology transfer at the University of Minnesota is a process by which inventions and other original creations are protected by patent, copyright, or trademark rights, and then those rights are transferred to industry or other entities through license agreements that return royalties and other benefits to the inventors and the University. The process of transferring University inventions to industry begins with a communication called a "disclosure."

A disclosure is simply a written statement informing the Office of Patents & Licensing that a development with potential commercial value has taken place. The statement can be in the form of a memo, a draft of an abstract or journal article, a copy of a poster or other scientific presentation, or a copy of a proposal for research funding.

A licensing professional in the Office of Patents & Licensing will review the disclosure and do some preliminary background research to help in making a decision to protect the University's proprietary interest in the development thus disclosed. Depending on the type of development, proprietary interests can be protected by applying for a patent (devices, methods, novel plants and organisms), or by registering for copyright (textual, visual and audio materials), or trademark (logos and names) protection. The person making the disclosure will be involved in the process of deciding whether and how to protect the development, and in the filing of an application for patent, copyright, or trademark.

If a development is potentially patentable, it is important that the Office of Patents & Licensing receives the disclosure in time to file a patent application before the

development is published or presented to others. This is necessary to protect the international patentability of the invention, which is becoming increasingly important to companies when they decide whether or not to license a technology with commercial potential.

However, if the invention has already been publicly disclosed, the U.S. market may still be covered. The U.S. Patent and Trademark Office will consider a patent application filed within one year of the public disclosure.

Submitting a disclosure according to the following guidelines will speed the process of evaluating the invention and will minimize time spent by the inventor in helping to prepare a patent application. If time is an issue, however, the Office of Patents & Licensing is willing to review any written disclosure and will follow up with the inventor as quickly as possible to protect patent rights with minimum impact on publishing obligations.

Guidelines for Preparing an Invention Disclosure

The following guidelines illustrate the preferred layout and content for invention disclosures. Completeness is very important in preparing the disclosure so that it may serve as a basis for a worthwhile patent search and for preparing the patent application. To be complete, the disclosure should mention the various alternative solutions to the problem addressed by the invention. Having the alternative embodiments on hand permits the preparation of a patent application that is broad in scope. The inventor should, however, specify which embodiment is preferred.

The Disclosure

The disclosure should contain the following elements:

A. A Title and Funding Source

The ideal title is brief, technically accurate, and descriptive. The source of the funding under which the invention was made is very important. It should include the granting agency, the grant/contract number, and the principal investigator's name.

B. An Abstract of the Invention to be Disclosed

A paragraph is usually enough.

C. Statement of the Background of the Invention

The disclosure should state the technical field to which the invention pertains. An accurate description will permit the invention to be properly classified and assigned among the staff members of the Office of Patents and Licensing.

D. Description of the 'Prior Art'

A statement of the prior and recent publications and inventions similar to the disclosed technology should be set forth by the inventor. This will include a description

of the various existing devices or processes and their shortcomings that are remedied by the present invention. If published material such as scientific papers, patents, or commercial literature relating to or describing the prior art is known to exist, it should be supplied or cited.

E. Summary of the Invention.

1. In this section describe:

- a. How the invention is designed. If appropriate, attach and refer to descriptive drawings, flow sheets, circuit diagrams, etc.
- b. Where conditions such as time, temperature, pressure, etc. are relevant to the invention, describe ranges of operating conditions.
- c. How the invention operates.
- d. What new concept has been invented.
- e. Advantages such as efficiencies, cost benefits, etc., produced by these new results.

2. Indicate the expected primary use of the invention, as well as any other potential uses.

3. List (and append, if possible) all publications in which the invention has been described or occasions on which it was described orally to others; for example, at symposiums.

F. Signatures, Witnesses, and Dating

Each inventor should sign the disclosure before a witness who understands the invention. The witness will also sign. Each set of signatures (inventors and witness) should be dated. It is helpful if each inventor includes his/her Social Security Number. This is needed in order to process royalty payments.

G. Send the Disclosure

Address the disclosure to John Thuente, Director, Office of Patents and Licensing, 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415 (U.S. or campus mail). A licensing professional will be assigned to your invention and will call for more information or to arrange a meeting.

Research Animal Resources

Per Diem Rates

Effective January 1, 1992, animal care per diem rates for Research Animal Resources increased by 5%. Principal investigators are requested to consider this increase in their grant applications. The new rates are as follows:

Species	Rate
Mice	.0717
SPF Mice (Autoclaved Supplies)	.3197
Conventional Rats	.2205
SPF Rats	.2536
Guinea Pigs	.3969
Conventional Hamsters	.2205
SPF Hamsters	.2315
Gerbils	.1544
Degus	.1544
Chinchillas	.4520
Ground Squirrels	.3969
Chicks (up to 60 days)	.1433
Chickens	.5513
Ducks	.5513
Turkeys	.8269
Non-Human Primates (Monkeys)	2.1499
Non-Human Primates (Baboons)	2.9925
Dogs	3.0870
Dogs (Puppy Chow)	3.1421
Cats	1.9845
Dogs and Cats with Litter	3.3075
Rabbits	.8930
Rabbits with Litter	1.1576
Calves	6.6150
Pigs	3.6383
Sheep and Goats through 10 weeks	2.0948
Sheep and Goats over 10 weeks	3.9690
Voles	.1103
Lizards	.1654
Pigeons	.4410
Ferrets	1.1025
Turtles	.5513
Geese	.8269
Post-Operative Care	\$12.60/day + per diem
Dog Whole Blood Units (500 ml)	
a) ACD	\$ 19.50
b) Heparin	\$ 18.50

Current Laboratory Dog and Cat Prices Effective January 1, 1992

Species	Current Purchase Price
Acute or Chronic Cat	\$ 45.00
Acute Dog	\$ 66.00
Conditioned Dog (less than 24 kg.)	\$143.00
Conditioned Dog (24 kg. and up)	\$163.00

Animal Care and Use Committee

As required by Federal law, the University of Minnesota established specific programs in 1991 for the environmental enrichment of primates involved in research and for the exercise of dogs. The programs are described below:

Primate Enrichment Programs

All nonhuman primates housed without specific task-oriented feeding or other behavioral measurement involving intensive training and frequent noninvasive human contact (e.g., regularly "working" for food or other reward) will be included in the Research Animal Resources (RAR) primate psychological enrichment program. When clinical state or experimental procedures contraindicate extra contact, animals will be exempted from the program *as approved by the RAR veterinarian*. If an animal needs to be exempted from the program for scientific reasons, the request for exemption must be a part of the protocol as reviewed and approved by the University Animal Care Committee (UACC). The program will consist of the following elements:

Whenever possible, all nonhuman primates will be housed in such a way that they can see, hear and smell members of their own species. Animals that must be housed away from conspecifics for over 48 hours (e.g., radiolabeled animals, animals in quarantine) will require extra attention from care staff. Rooms with animals housed on only one side will be modified with wall-mounted mirror tiles to allow visual contact between animals.

In addition to the normal biscuit ration, primates will receive special foods on a rotating basis three or more times per week. These foods will include fruits, vegetables, nuts, bread, and other "treats". These foods will be distributed at times other than routine feeding times and will be cautiously fed to individual animals by hand, in order to provide positive human interaction and extend contact time.

Postsurgical animals, animals less than five years of age, and animals with behavioral problems will receive special attention. This may include special feeding of treats, use of the puzzle feeder on a rotating basis, and placement of varied, sanitizable objects in their cages (e.g., hanging chain, nylaball, etc.).

Where feasible mechanically and economically, squeeze cages will gradually be fitted with perch bars of stainless steel or PVC pipe, in a manner not interfering with the squeeze mechanisms, as in Schmidt EM et al, *Laboratory Animal Science* 33:166-67; 1989.

The feeding of treats and the use of other enrichment devices will be noted for each room on animal inventory sheets, in order to provide the documentation of the program as required by the amendment to the Animal Welfare Act.

Dog Exercise Program

All healthy, individually housed conditioned dogs over twelve weeks of age will be provided the opportunity for exercise if they are housed in enclosures less than twice the minimum floor space for their size.

Dogs in the postoperative facility will not be included in the exercise program. Clinically ill dogs, and dogs on which procedures have been performed that contraindicate exercise (e.g., cardiovascular, orthopedic) will not be included in the program *as approved by an RAR veterinarian*. Dogs exempted from the program for clinical reasons, along with the specific reasons for exemption, will be listed monthly by an RAR veterinarian for RAR records. If exercise will be contraindicated for all dogs in a project, that fact must be specified in the protocol reviewed by UACC; the dogs' cage cards will then carry special notation to that effect. Aggressive dogs will not be released for exercise; such an exemption will be noted on the cage cards.

Dogs housed in pairs are exempt from the exercise program, provided that the total floor space in the pen exceeds the combined minimum floor space for each dog. Compatible dogs may be housed in same-sex pairs if each dog is assured adequate access to feed and water.

Since RAR dog runs have over twice the minimum floor space for most dogs, a special exercise program is not required for animals in Unit F, KE Mezzanine, and BC basement. An occasional dog will be large enough to require exercise even in those facilities; the size limit for exemption will be posted in each of the above facilities, and dogs larger than the limit will be exercised as specified below.

Dogs will be exercised daily, Monday through Friday, if personnel and time permit. If absenteeism makes it impossible to exercise dogs some days, dogs will still be exercised a minimum of three days per week. Daily exercise will be for a minimum of 15 minutes each time; three times-weekly exercise will be for a minimum of 20 minutes each time.

The following requirements apply to all dogs exercised at all RAR facilities:

1. When possible, dogs will be exercised in compatible groups to provide social interaction. Such groups will include only one sex at a time. A member of RAR staff will be present during group exercise to verify animal compatibility and provide additional interaction.
2. All dogs will wear identification collars during all exercise periods.

3. Principal investigators will be notified of approximate dog exercise schedules for each facility. When procedures are planned in conflict with the exercise schedule, it will be the responsibility of the principal investigator to notify RAR so that the dog is available and/or rested. Requests for exemption from exercise will be handled through the RAR veterinarian in a similar manner.
4. Exercise areas will be cleaned and sanitized between groups of dogs.
5. Exercise is to be documented for all dogs not housed in pairs or runs. A notation of exercise dates will be made on the census sheet for each room.

All dogs housed in non-RAR facilities (Veterinary Science, Veterinary Medicine) will be exercised with the same procedures and requirements as above. Exemptions will be as specified above.

Preparation and Maintenance of Higher Mammals

During Neuroscience Experiments

Preparation and Maintenance of Higher Mammals During Neuroscience Experiments (NIH Publication Number 91-3207; 45 pp, no charge), second printing of a report that has drawn wide interest in and beyond the neurosciences, according to co-editor Michael D. Oberdorfer, of the National Eye Institute, which joined with the National Institute of Mental Health in sponsoring the 1989 workshop on which the report is based. The aim, according to the introduction, is to assist researchers in interpreting the basic principles in the *National Institute of Health Guide for the Care and Use of Laboratory Animals*, which the present report describes as specific about what's forbidden, but "only rather general about what is allowed."

Order from: Michael Oberdorfer, National Eye Institute, Building 31 Room 6A47, Bethesda, MD 20892; 301/496-5301.

Change in Document Review Procedure Effective April 1, 1992

In January ORTTA hosted a meeting with a randomly selected group of ORTTA clients from various departments and collegiate units. The meeting was held to discuss concerns about document review procedures and to solicit ideas for improving this process. As a result of this meeting, the following was decided:

Effective April 1, 1992, ORTTA staff will begin reviewing all "POT" documents, \$500 and over on sponsored accounts. Departments are responsible for routing the documents to ORTTA for review and approval.

If a department wishes ORTTA staff to process the document to the vendor when approved, a stamped, addressed envelope must be included. Furthermore, if the document is to be encumbered (only on accounts near grant expiration date, as specified in University policy) instructions must be provided. *If no instructions and/or envelope is provided, the document will be returned to the department when approved.*

Background

As you are aware, there have been numerous changes in the University accounting system and related policies over the past year. For example, approval was given some time ago to allow departments to issue departmental purchase orders up to \$500; the limit was subsequently raised to \$2,000. Effective July 1991, AR&S eliminated its review of documents for available funds, which necessitated changes in ORTTA document review procedures. After that date, departmental and collegiate staff were instructed to send *all* sponsored account documents (with the exception of personnel/payroll appointments) to ORTTA for processing. It was also agreed that ORTTA would provide an after-the-fact review for cost incurrences related to department purchase orders ("POT" documents). The after-the-fact review would be based on review of vendor invoices. There has been recent discussion to raise the departmental purchase order level to \$10,000, and it was this possibility that initiated the January meeting.

The after-the-fact review has been difficult for ORTTA staff. Large numbers of invoices are processed each day and ORTTA staff have no way of readily recognizing whether an invoice relates to a central requisition or to a "POT" document. Furthermore, vendors frequently use acronyms or catalog numbers in lieu of an actual description of the purchase. ORTTA staff were in many cases forced to return invoices for additional information. Considering the problems ORTTA was experiencing at \$2,000 and how those problems would increase if the limit were raised to \$10,000, it was decided to seek department/collegiate input as to the

value of ORTTA review. Decentralization was an option offered to ORTTA clients.

The meeting was well attended and much discussion took place. The consensus of attendees was that departments would much appreciate the continued involvement of ORTTA staff in document review. It was agreed that a change in procedure was appropriate in that such review could be better done in advance rather than after-the-fact.

The New Process

All documents on sponsored accounts, with the exception of personnel/payroll documents, should be mailed to ORTTA for processing. ORTTA staff will sort and review documents as noted below. Those not reviewed will be stamped to indicate receipt by ORTTA and sent directly to Financial Operations for processing.

Review will be made for all of the following documents:

- Travel Authorizations (required on sponsored accounts, out-of-state); all documents regardless of dollar amount.
- In-state travel; documents at \$500 and above.
- ET Documents (Expense Budget Transfer); all documents regardless of dollar amount.
- IX (Expense Transfer), IV (Intra-Institutional Voucher) JV (Journal Voucher); documents at \$500 and above.
- RX (Central Requisition), POT (Department Purchase Order); documents at \$500 and above.
- PVA (Payment Authorization); documents at \$500 and above.

Note that the above listing specifically excludes the EB (Expense Budget) document. **EB documents on sponsored accounts can be prepared only by ORTTA staff. Department staff should not use the EB document on sponsored accounts.**

Questions regarding the above information should be referred to one of the following ORTTA Assistant Directors and/or the grant administrator responsible for the specific account addressed by the document: Rick Dunn, 626-2265; Todd Morrison, 624-5066; Mary Lou Weiss, 624-5856.

President's New \$4 Billion Biotechnology Initiative

The National Institutes of Health (NIH) is the anchor agency in the president's new \$4 billion biotechnology initiative outlined in the FY93 budget. The funds in the president's request will provide a \$271 million increase governmentwide for biotechnology, about a 7% increase over biotechnology spending in FY92. That amounts to a total increase since FY91 of \$650 million, or 19%.

The initiative, which looks to coordinate research programs across 12 federal agencies, was developed by an interagency task force formed by the Federal Coordinating Council for Science, Engineering and Technology (FCCSET), which is part of the Office of Science and Technology Policy (OSTP) headed by D. Allan Bromley, the president's science advisor. The task force, in effect, inventoried the biotechnology programs at the 12 agencies to give a crosscut look at where biotechnology research is being done.

The Department of Health and Human Services (DHHS) has the lion's share of the initiative's investment, with an FY93 request of \$3.1 billion. That is because the bulk of the research (\$2.9 billion) on life sciences, the knowledge base of biotechnology, will be carried out at NIH, which is part of DHHS.

The remaining billion dollars is spread throughout the other 11 agencies: Department of Agriculture, \$167.7 million; Department of Commerce, \$13 million; Department of Defense, \$86.6 million; Department of Energy, \$242.7 million; Department of Interior, \$5 million; Department of Justice, \$2.3 million; Department of Veterans Affairs, \$88.4 million; Agency for International Development, \$30.7 million; Environmental Protection Agency, \$18.3 million; NASA, \$44.7 million, and NSF, \$206 million.

The FCCSET "crosscut inventory" revealed the following current federal investment in biotechnology research:

General Foundation Research: general scientific and technical foundation research that is broadly applicable to agriculture, energy, manufacturing, environment and health; it accounts for 37% of the current FY92 federal investment.

Health Research: biotechnology research directed toward improving, restoring and preserving human health; it accounts for 42% of the current effort.

Infrastructure: facilities, training and career development, instrumentation, repositories (DNS clone libraries, germplasm centers, etc.) and data bases/reference standards; it accounts for 8% of the present federal investment in biotechnology research.

Agriculture: biotechnology research applicable to food, feed, fiber, ornamentals and forestry products; it accounts for 5%.

Manufacturing/Bioprocessing: biotechnology research applicable to chemical industry materials, manufacturing and processes; development of pharmaceutical production/manufacturing processes; and mineral processing and scale-up; it accounts for 3% of the FY92 investment.

Environment: biotechnology research applicable to restoration, maintenance and remediation of the environment and ecosystem analysis; it accounts for 2%.

Energy: biotechnology research applicable to the production of energy and fuels; it accounts for 2%.

Social Impact: research on the social, ethical, economic and legal issues associated with technology research, development, adoption or use; it accounts for 1% of the federal investment in biotechnology research.

The initiative also cites three areas that officials believe merit special attention because they relate to nearly all areas of biotechnology research. They are marine biotechnology, structural biology and genome research.

Currently, sales of the U.S. biotechnology industry amount to \$4 billion. The presidential initiative is aimed at stimulating the growth of biotechnology sales to their predicted \$50 billion potential by the year 2000.

from the Washington Fax

President's FY93 R&D Budget

Individual investigators will get \$8 billion in support if Congress adopts the president's \$76.6 billion FY93 Research and Development (R&D) budget. The \$8 billion for individual investigators represents a 9% increase over FY92. The funds will be awarded by the departments of Health and Human Services, and Energy, and by the National Science Foundation.

The \$76.6 billion R&D budget is nearly \$2 billion (or 3%) over FY92. Included is \$14.3 billion for basic research, which is \$1 billion (or 8%) more than was available in FY92. Applied research will increase by \$1.5 billion (or 3%) over FY92. The FY93 budget increases civilian R&D by 7%. Defense-related R&D in the departments of Defense and Energy increases by 1%.

Among several presidential initiatives in the budget is a new \$4 billion 12-agency biotechnology initiative that would fund more biotechnology research than was expended in all agencies in FY92—an increase of \$271 million or 7%. The program would emphasize potential new applications of biotechnology in health, manufacturing, bioprocessing and the environment. (See article page 9).

The president's proposed FY93 budget for the National Institutes of Health is about \$9.4 billion, a \$443 million increase over FY92. The total number of research project grants is

projected to be an all time high of 22,132, an increase of 461 grants over FY92. The total dollar amount for grants in FY93 is \$5.3 billion, \$350 million more than in FY92. (See chart, below). Also at NIH a proposed 80% increase for the Women's Health Initiative would push support from \$25 million in FY92 to \$44 million in FY93.

In his FY93 budget, the president continues toward his goal of doubling the National Science Foundation's (NSF) budget by FY94. The FY93 NSF budget contains \$3 billion, an 18% overall increase and a raise of \$455 million over FY92.

The Alcohol, Drug Abuse and Mental Health Administration is slated to receive \$3.3 billion in FY93, a 6% increase of \$184 million over FY92. (See chart, page 12).

A \$52 million increase, amounting to 53% over FY92, would take the National Agriculture Research Initiative in the U.S. Department of Agriculture to \$150 million.

The Human Genome Project is listed in the president's budget for a 7% increase to a total of \$177 million, \$11 million over FY92. This amount will give NIH about \$110 million for its genome center and the Department of Energy \$65 million for its project.

from the Washington Fax

National Institutes of Health Budget Request by Mechanism

(Dollars in Millions)

	1991	1992	1993	Change
Research Project				
Grants	\$4,520	\$4,927	\$5,277	+ \$ 350
(Number)	(20,973)	(21,671)	(22,132)	+ (461)
Centers	699	787	788	+ 1
Research Training	305	309	309	0
R&D Contracts	594	644	644	0
Intramural Research	923	992	1,042	+ 50
Research Support	366	411	432	+ 21
Extramural Construction	7	12	12	0
Women's Health Study	0	25	44	+ 19
Minority Health Study	0	0	45	+ 45
Other Research	708	742	730	- 12
NIH Facilities Repair	169	104	73	- 31
SUBTOTAL:	\$8,291	\$8,953	\$9,396	+ \$ 443
Less National Library of Medicine Receipts:	- 14	- 18	- 19	- 1
TOTAL:	\$8,277	\$8,935	\$9,377	+ \$ 442

President's NSF Budget Request

An increase of \$230 million for investigator initiated research support by the National Science Foundation (NSF) is proposed in the president's FY93 budget. The \$230 million represents a 17% increase over FY92 and boosts FY93 funding for individual and small group investigators to \$1.5 billion.

The \$3.03 billion administration-proposed budget for FY93 continues the effort to double the agency's budget that started in FY88 when the total NSF budget was about \$1.6 billion. The requested increase for FY93 is \$453.5 million, 17.6% above NSF's FY92 appropriation.

Overall, NSF research will increase by \$337 million to \$2.2 billion if the president's FY93 budget is approved by Congress. More than 70% of NSF's budget supports basic research, primarily at universities and colleges.

Major research activities at NSF include:

- The U.S. Global Change Research Program, which is \$108 million in FY92 and would increase to \$162 million in FY93;
- High Performance Computing and Communications, which is proposed in the FY93 budget for an increase to \$262 million—up from \$201 in FY92;
- Biotechnology, which, as proposed for FY93, would climb from \$174 million to \$206 million;
- Advanced Materials and Processing, which would increase to \$318 million from the FY92 figure of \$261 million; and
- Advanced Manufacturing, which is slated for a 31% FY93 increase from \$80 million to \$104.5 million.

Funding for NSF's education initiatives, which has experienced several years of rapid growth, is projected essentially to remain flat, increasing by \$14 million from \$465 million in FY92 to \$479 million in the FY93 budget.

The budget proposes \$33 million for NSF's instrumentation initiative, which will continue to provide instrumentation that costs from \$200,000 to \$4 million to university researchers through a merit-based competitive process. The federal funding must be matched 50-50 with non-federal funds.

For the second fiscal year in a row, the Academic Research Facilities program, funded in FY91 at about \$39 million, has no request in the president's budget.

from the Washington Fax

National Science Foundation Budget Summary

(Dollars in Millions)

	1992 Appropriation	1993 Request	Dollar Increase
Research	\$ 1,875	\$ 2,212	+ \$ 337
Biological Sciences		321	+ 46
Computer & Information Sci & Eng		272	+ 61
Engineering		313	+ 54
Geosciences		472	+ 68
Mathematical & Physical Sciences		726	+ 103
Social, Behavioral & Economic Sciences		108	+ 22
Education	465	479	+ 14
Instrumentation	33	33	
Antarctic	88 *	163 **	+ 75
Critical Technologies Institute		1	+ 1
Salaries & Expenses	109	135	+ 26
Inspector General	3.5	4	+ .5
TOTAL:	\$ 2,573.5	\$ 3,027.0	\$ 453.5

* An additional \$105 million to be provided by the Department of Defense (DOD) in FY92.

** An additional \$14 million proposed as part of the FY93 DOD budget request.

Alcohol, Drug Abuse and Mental Health Administration Budget Request by Mechanism

(Dollars in Millions)

	1991	1992	1993	Change
Research	\$ 982	\$ 1,059	\$ 1,121	+ \$ 62
Demonstrations	158	160	164	+ 4
Substance Abuse				
Prevention	271	285	306	+ 21
Expansion	0	9	86	+ 77
ADMS Block Grant	1,269	1,360	1,360	0
Other Improvement	171	137	188	+ 51
SUBTOTAL: Office of Treatment Improvement	\$ 1,440	\$ 1,506	\$ 1,634	+ 128
State Grants for the Homeless	33	30	30	0
Protection and Advocacy	16	20	0	- 20
Clinical Training	14	11	0	- 11
Other	21	21	21	0
St. Elizabeth's	12	0	0	0
TOTAL ADAMHA BUDGET:	\$ 2,947	\$ 3,092	\$ 3,276	+ \$ 184

Other Support in PHS Grant and Contract Applications

NIH - ADAMHA

Grant Applications

The PHS 398 grant application forms include a section on OTHER SUPPORT, where applicants are expected to list all, including both Federal and non-Federal, active support and pending and planned requests for support of research and research-related activities by all key personnel listed for each application. This information is important to PHS review-award processes to help evaluate the compatibility of application requests with investigators' capabilities and responsibilities, and to eliminate unwarranted duplication of support for investigators' efforts. Application instructions emphasize the requirement for complete, accurate, and reliable information. In signing the face page of the application, the principal investigator/program director and the applicant institution officially certify that the application information is accurate and complete.

Applicants are reminded of the necessity to provide the full and reliable information requested. As noted in the instructions, "Incomplete, inaccurate, or ambiguous information about OTHER SUPPORT could lead to delays in review of the application." Further, applicants should be cognizant that serious consequences could result if failure to provide complete and accurate information be construed as an at-

tempt to mislead PHS agency advisory groups and staff in their review and award responsibilities.

R&D Contract Proposals

Documentation required in National Institutes of Health and Alcohol, Drug Abuse, and Mental Health Administration uniform Request for Proposals include Standard Form 1411, *Contract Pricing Proposal Cover Sheet*, which instructs offerors to identify any contracts or subcontracts they have been awarded "for the same or similar items" within the past three years. Additionally, offerors are required to provide a *Summary of Related Activities*, identifying all active federal contracts, cooperative agreements, grants, and commercial agreements, and submitted proposals, including actual and proposed levels of effort for all key individuals in the proposal.

As with PHS grant applications mentioned above, offerors should be aware that serious consequences could result if their failure to provide complete and accurate information is construed as an attempt to mislead agency advisory groups and staff in their review and award responsibilities.

As we have found out, though, there are significant short-term benefits to a patents and licensing program other than royalties. Contacts with companies about important new technologies can generate substantial amounts of non-royalty income, in the form of industry-sponsored research. We recently reviewed our files and found that over the past five years more than \$13 million in industry-sponsored research can be directly linked to filed patent applications. By filing a patent, we've indicated our support for a new technology. A company may not be interested in licensing that technology right away, but it might agree to support further development of the technology in return for the right of first refusal to negotiate licensing terms at a future date.

Thus, patents are an important part of encouraging trends in industry sponsored research. Expenditures for projects supported by industry have increased from about \$3 million in fiscal year 1975 to over \$18 million in fiscal year 1991. This indicates two things: 1) companies are recognizing the breadth and value of the expertise offered by our faculty, and 2) industry is becoming increasingly interested in the research and developments produced by our faculty, staff, and students.

The Crucial First Step: Disclosures

The benefits of technology transfer cannot be realized without the crucial first step: disclosure of a potentially commercializable development to my office (see page 4 for an explanation of how to make a disclosure). This step requires the cooperation and assistance of our faculty, staff, and students. Some may not be aware that the Office of Patents and Licensing exists. Some may not think of themselves as "inventors," or may think that technology transfer is not an appropriate endeavor for them. However, University inventors can benefit society, their college, their laboratory, and themselves by seeking protection and transfer for their developments.

Patenting and licensing an invention can be done without jeopardizing publication in scholarly journals or any other research and education objectives of the inventors. However, the technology transfer process does require the active involvement of the inventors in making the disclosure, assisting in the evaluation process and with the patent application, and in identifying potential licensees and meeting with companies to explain the technology and assist in the transfer.

After my office receives the disclosure we determine whether or not to file a patent application. With very few exceptions, the University must apply for patent protection in order for transfer of the technology to be successful. Without such proprietary protection, an invention is virtually worthless to a company. By filing an application early, both

U.S. and foreign rights are preserved. At that point, publication of the results of research that led to the invention will have no effect on patent rights.

Before deciding whether to file a patent application, the licensing professional on my staff must first learn enough about the invention, its scientific field, and the potential market to determine if it is a patentable discovery with significant commercial value. To be patentable it must be new, useful, and not obvious. A computerized patent search and the inventor's own knowledge of the field usually answer the patentability question. Evaluation of commercial potential usually poses more difficulties, because of the basic nature of most university developments. But commercial potential is a critical component of the evaluation process since funding for patenting is derived from the University's share of income from successful licenses.

To help my staff do a better commercial evaluation, the Office of Research and Technology Transfer has assembled an advisory group called the Technology Evaluation Council (TEC). This group of business and technology leaders has become a great asset by sharing both their technical expertise and their business acumen. Many times they have been able to tell us not only the right companies to talk to, but also the right people at those companies. This is a tremendous benefit in speeding up our licensing efforts. When we contact companies, care is taken to not disclose confidential information about the technology. If such disclosure is necessary, we obtain a written agreement from the company to protect the proprietary nature of the information.

When a decision to file a patent application is made, an outside patent counsel is authorized to proceed with drafting a patent application. This task, and later interactions with the U.S. Patent and Trademark Office (USPTO), involve my office and the inventors. A good patent application claims as many potential uses and variations of those uses as possible. Each claim must be proved to the patent examiner's satisfaction as a valid use for the invention and as one that is not an obvious extension of existing technology. Some inventions may need to be protected by several different patents, with new ones filed as the nature of the discovery is better understood and applied.

As the number and complexity of University patents increase, so do the costs involved. These costs include a wide range of services, some external and some internal: the professional fees charged by legal firms that draft our patent applications; the salaries and expenses of university personnel who evaluate new invention disclosures, work with the university inventors and outside counsel to file patent applications, and seek licensees for the university's inventions; and the filing and patent maintenance fees charged by the USPTO and by the patent offices of foreign countries. These fees periodically increase. The USPTO recently raised the fee structure for small inventors, including universities, by

69 percent and is seriously considering an additional 90 percent increase.

Licensing efforts usually commence soon after the patent application is filed; in many cases potential licensing contacts are made in the evaluation phase. The Office of Research and Technology Transfer has developed several strategies for speeding up the licensing and, we hope, the royalty returns to the University and the economic returns to the public. First, we have increased our contacts with companies, especially Minnesota companies, through Minnesota Project Outreach (MPO), through our external newsletter *R&D Outreach*, and through personal visits with company representatives. MPO has been especially helpful in providing convenient and quick information about the University's researchers and technologies to 400 small companies and 75 public access sites throughout the state. As awareness of the University's technology transfer services increases, so will our licensing, industry funding, and faculty consulting.

We are also creating programs to assist in bridging the gap between research phase development and a licensable technology. One such program is the Blandin Foundation Early Stage Technology Development Fund (see January 1991 Research Review, page 1). We recently received a similar grant to establish a Northstar Foundation Innovation Fund to support new ideas with potential economic impact. The Blandin and Northstar foundations recognize the enormous potential for economic development that can only be realized by increased support for the University's technology transfer program. Their grants have helped encourage faculty to send us disclosures of new technologies and made it possible for us to support many worthwhile projects.

We are seeking similar partnerships with other organizations to help keep our patenting and licensing efforts strong. For the near future, in light of cuts in the University's budget, we must continue to use our limited funds to file patent applications only on those inventions that generate industry interest and support early in the process. We also will seldom be able to seek international patent protection unless we have an industry partner. Fortunately, our increased contacts with companies have resulted in a steady increase in license agreements that include company support for the patenting of the technology involved.

The technology transfer process, from the first disclosure to eventual licensing income, can be a long and at times frustrating experience. A patentability evaluation may reveal that the development is not patentable or needs more work. If a patent application is filed, it may have to be revised several times over two to three years before it is awarded. It may take some time to find a suitable licensee; indeed, many apparently valuable inventions are never licensed. Even after an invention is licensed, there may be problems with the company's approach to commercialization. Although the process is not easy, we have found that in most

cases the outcome has been favorable for all concerned. The University of Minnesota now has 163 license agreements with 130 companies; 48 are in Minnesota, 82 are in other states, and 9 are in other countries.

Copyrights and Trademarks

In addition to licensing patented technologies, some of the University's license agreements are for copyrighted computer software. My office can provide information on software protection as well as on copyrighting and trademarking of other creative works and products. Copyrights and trademarks are increasingly being used to enhance the marketability of software and other products, such as our new patented apple, HoneycrispTM.

My office also handles the protection and licensing of the University of Minnesota's trademarked identifiers, including Goldy Gopher, the Regents' seal, and the University of Minnesota wordmark. Bob Hicks and Paul Vander Tuig have developed a very active program licensing the University's trademarks for decorative use (not as endorsements) on products. Their program has grown to involve 277 licenses, 49 of which are Minnesota companies that generated over a million dollars of sales last year.

It is fair to ask, I think, whether it is worth all this effort and expense to protect university inventions and to transfer them to industry. I have no doubt that it is, and that technology

University/Industry Technology Transfer is becoming an even more vital process in stimulating economic development.

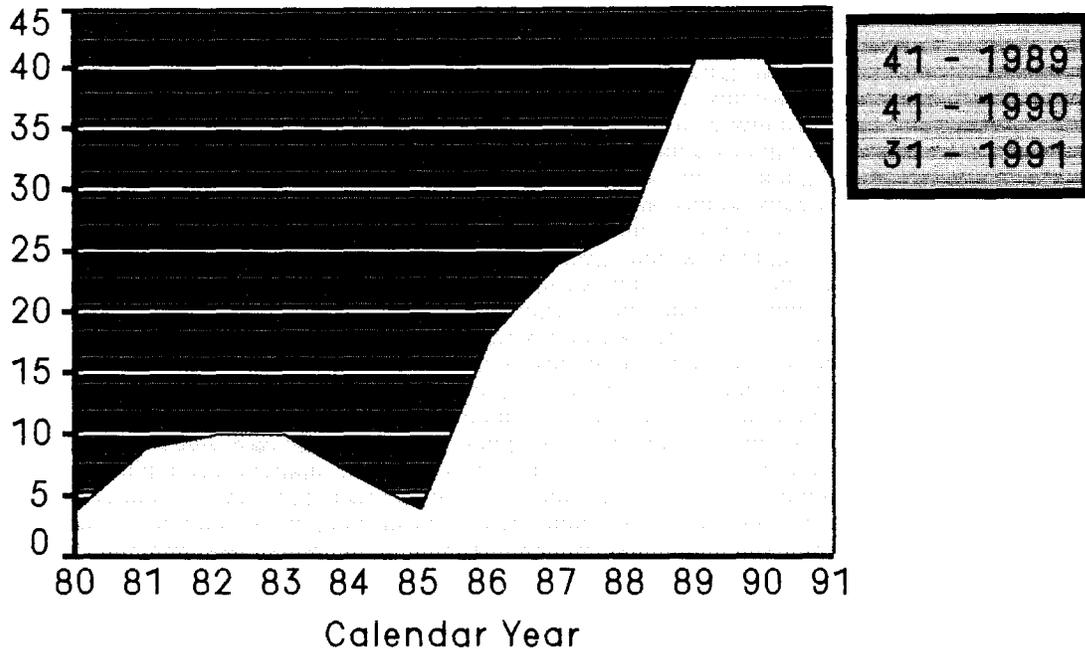
transfer is becoming an even more vital process in stimulating state economic development

and sustaining national technological competitiveness. History has shown clearly that the basic technological breakthroughs—electronic, medical, agricultural, mechanical—emerge from and are sustained by university research until industry is ready to produce and market products based on them. As technology's pace quickens, the need for university discoveries and industry awareness of them is growing exponentially.

If we are to nurture this process of technology transfer, we must understand the challenges and the costs involved. For far from being a quick and easy road to monetary success, it is a significant investment that universities must make on behalf of the public, without any assurance of seeing a financial return. With help from the state and federal governments and visionary organizations like the Blandin and Northstar foundations, and in partnership with companies open to new ideas, I believe the University of Minnesota can increase its already major contributions to economic development in the state and nation.

University of Minnesota Patents Issued

Number of Patents



Disclosures rose from 30 in 1983 to 175 in FY 1991.

Current Licenses

(As of February 21, 1992)

Total Agreements	163
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Total Companies	137
In Minnesota	47
Other States	81
Foreign	9

Foundations for the Environment

Foundations and corporations fund environmental causes in amounts exceeding \$100 million a year, preferring to spend the bulk of their money on projects that protect against future destruction.

Environmental funders awarded almost \$129 million in 1989, the latest year for which figures are available. The funders supported issues ranging from encouraging agricultural methods that preserve the soil to preventing global warming.

Foundations are interested especially in aiding grass-roots movements, but they also fund education efforts that influence public policy. Many foundations take a global approach in their grant-making, supporting preservation projects around the world.

Some foundation sources for environmental projects are:

W. Alton Jones Foundation

The W. Alton Jones Foundation works toward its goal of creating a safe and healthy society by supporting grassroots environmental organizations and international projects to protect global natural resources. The foundation is interested especially in projects that prevent further environmental destruction and work to avoid irreversible damage to the planet.

The Jones Foundation supports a wide range of issues, from preserving ancient forests and reducing toxic substances in the atmosphere, to developing new energy policies. Specific areas of interest are preventing global warming and maintaining a diverse ecosystem.

The foundation funds environmental advocacy groups in the U.S. and abroad and supports research projects, publications and conservation programs. It also awards research fellowships to scientists and other scholars in disciplines that address the foundation's priorities.

Amounts granted range from \$5,000 to \$550,000. There is no application deadline. Initial proposals should be in the form of a two-page letter. Contact: J.P. Myers, Director, W. Alton Jones Foundation, 232 East High Street, Charlottesville, Virginia 22901; 804/295-2134.

C.S. Fund

The C.S. Fund emphasizes preserving the planet's existing biological and environmental diversity and eliminating toxic substances before they contaminate the Earth.

The foundation is interested in projects that influence national and international policies. Grants support efforts to conserve genetic diversity in plants and animals; to prevent the alteration of genetic diversity; to reduce or eliminate toxic substances through alternative policies and products; and to assess the harm that toxic substances cause the Earth and its residents.

Environmental grants range from \$2,500 to \$50,000. Annual application deadlines are **May 15** and **September 15**. Contact: C.S. Fund, 469 Bohemian Highway, Freestone, California 95472; 707/874-2942.

Weyerhaeuser Company Foundation

The Weyerhaeuser Company Foundation supports efforts to promote proper land management in the Pacific Northwest, and is interested especially in educating young people on the need for efficient land use. The main objective of the foundation's environmental program is to demonstrate the forest industry's economic and environmental impact. The program also seeks to expand knowledge of how to better use forest-based products, such as paper and timber. Weyerhaeuser also seeks to create partnerships between nonprofits and industry to promote proper land management techniques.

Grants range from \$10,000 to \$60,000; There are no application deadlines. The foundation encourages nonprofits to submit a proposal that briefly explains the project's purpose and how it will meet the foundation's goals. Contact: Mary Hall, President, Weyerhaeuser Company Foundation. Mail Stop CH1F31, Tacoma, Washington 98477; 206/924-3159.

Other Sources

Ben & Jerry's Foundation supports small, grassroots organizations' environmental projects. Contact the foundation at: P.O. Box 67, 79 Weaver Street, Winooski, Vermont 05404; 802/655-6215. The Ruth Mott Fund supports projects to prevent global deforestation and promote sustainable agriculture. Contact the foundation at: 1726 Genesee Towers, Flint, Michigan 48502; 313/232-3180.

Centers for Disease Control

Conference Support Grant Program

The Centers for Disease Control (CDC) announces the availability of funds in FY92 for the Public Health Conference Support Grant Program. The purpose of the grant support is to provide partial support for specific non-Federal conferences in the areas of health promotion and disease prevention information/education programs.

Applications are specifically being solicited for conferences on: 1) chronic disease prevention; 2) infectious disease prevention; 3) control of injury or disease associated with environmental, home, and workplace hazards; 4) environmental health; 5) occupational safety and health; 6) control of risk factors such as poor nutrition, smoking, lack of exercise, high blood pressure, stress and drug misuse; 7) health education and promotion; and 8) laboratory practices.

Because conference support by CDC creates the appearance of CDC co-sponsorship, there will be active participation by CDC in the development and approval of those portions of the agenda supported by CDC funds. In addition, CDC will reserve the right to approve or reject the content of the full agenda, speaker selection, and site selection.

Grant funds may be used for direct cost expenditures: salaries; speaker fees; rental of necessary equipment; registration fees; and transportation costs (not to exceed economy class fare) for non-Federal employees.

The two application deadlines for FY92 are **March 15** and **July 1, 1992**. To receive additional written information call 404/332-4561. Leave your name, address and phone number; refer to Announcement Number 208.

National Institutes of Health

Research Facilities Construction Projects

The National Institutes of Health (NIH) announces the availability of an RFA (RFA Number: OD-92-02) for the construction of facilities of urgent national importance for biomedical research and/or services to support such research.

The main objective of this construction program is to facilitate the conduct of biomedical research by providing funds for construction of new facilities and for the purchase of associated fixed research equipment essential for the operation of these facilities. Support may be requested for the construction of new facilities and additions or renovations to existing facilities to meet the biomedical research and/or biomedical research support needs of an institution or of a research group at that institution or elsewhere that utilizes

the resources of that institution. The purpose of the proposed facility must be within the scope of one of the statutes authorizing awards. Those statutes authorize construction grants that would benefit the fields of cancer, vision, heart, lung, blood, and AIDS research.

This one-time solicitation provides \$7,500,000 for this initiative. It is anticipated that four to five awards will be made. Up to 50% of the allowable costs of a project may be awarded, not to exceed \$2,000,000. Prior to grant award, the applicant must provide an assurance of required matching funds and that additional funds will be secured to meet any projected costs in excess of the award amount. Requests of less than \$500,000 will not be accepted; no indirect costs or continuation costs will be awarded.

An optional letter of intent is requested by March 10, 1992, listing the RFA number, the name of the Principal Investigator, and a brief title of the type(s) of research/research support to be conducted in the new facility.

The application deadline is **April 27, 1992**. A copy of the RFA may be requested from ORTTA by calling 624-9004 or by sending a note through the bulletin board. Agency contact: Kenneth Brow, Chief, Research Facilities Branch, Division of Cancer Biology, Diagnosis, and Centers, National Cancer Institute, Executive Plaza North, Room 300, Bethesda, MD 20892; 301/496-8534.

Annenberg/Corporation for Public Broadcasting

Math and Science Project

The Annenberg/Corporation for Public Broadcasting (CPB) Project has released guidelines under which it will award about \$10 million this year for projects that use information technology to reform mathematics and science education in the elementary and secondary schools.

The project is looking for ways to help parents, teachers, and education policy makers understand why reform is important and how to get effective programs into the schools. The project also is seeking a cadre of minority-group teachers skilled in using technology to improve the curriculum.

For a copy of the guidelines, contact the Annenberg/CPB Math and Science Project, 901 E Street, NW, Washington 20004-2006; 202/879-9658. Requests may also be sent via facsimile: 202/783-1036.

State of Minnesota

Higher Education Coordinating Board

Federal funds under the Dwight D. Eisenhower Mathematics and Science Education Act have been appropriated for 1992. This legislation continues the federal program of state grants to improve the knowledge and skills of teachers and the quality of instruction in mathematics and science in the nation's public and private elementary and secondary schools. Proposals must be submitted by a higher education institution and must reflect the cooperative involvement of two or more of the following groups and organizations: 1) institutions of higher education; 2) local school districts; 3) Minnesota Department of Education; 4) private industry; and 5) public and private nonprofit agencies including, but not limited to museums, zoos, libraries, educational television stations, professional mathematics, science and engineering societies and associations.

The request for proposals solicits projects for:

- provision of inservice training for elementary and secondary teachers of mathematics and science, and
- development and dissemination of projects to improve understanding and performance in science and mathematics of students traditionally underserved and underrepresented in these fields.

The maximum amount that may be requested for teacher inservice training is \$45,000. The maximum amount that may be requested for cooperative programs is \$35,000.

Preliminary proposals may be submitted to the MHECB Eisenhower Grants Coordinator if the proposal writer wants assistance or clarification in directing proposed activities toward program requirements. However, applicants need not submit a preliminary proposal in order to submit a final proposal, although new applicants are encouraged to obtain the technical assistance provided by a preliminary review. Preliminary proposals are due by **April 6, 1992**.

The deadline for submission of final proposals is **June 1, 1992**. A copy of the announcement, guidelines and application materials is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board. The Agency contact is: Nancy B. Walters, Eisenhower Grants Coordinator, Capitol Square Building, Suite 400, 550 Cedar Street, St. Paul, MN 55101; 612/296-9777.

U.S. Department of Education

Research and Improvement Fellows

The Office of Education Research and Improvement (OERI) has announced its Fellows Program for FY92. The purpose of the program is to provide federal financial assistance enabling individuals to make contributions to the improvement of education by engaging in education research at the Office of Education Research and Improvement in Washington, DC.

Any individual who has training and experience that indicates that he or she has the potential to conduct education research is eligible to apply; an individual must be a U.S. citizen.

The amount of a fellowship includes a stipend based on the fellow's current annual salary prorated for the length of the fellowship. Award amounts will range from \$25,000 to \$45,000. An estimated 2 to 3 awards will be made. Project periods will be for no fewer than four nor more than twelve months of full-time activity.

Some examples of educational topics are:

1. Helping parents support the learning of their young children;
2. Improving the education of children and youth whose circumstances put them at a disadvantage;
3. Identifying factors that will lead to greater student learning at any stage from birth through postsecondary and graduate education; and
4. Identifying how school or college organization and environment affect student achievement.

The application deadline is **April 17, 1992**. Copies of the announcement are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board. Agency contact: Dr. Jeffrey Gilmore, U.S. Department of Education, Office of Educational Research and Improvement, Office of Research, Room 615, 555 New Jersey Avenue, NW, Washington, DC 20208-5647; 202/219-2243.

David and Lucile Packard Foundation

The David and Lucile Packard Foundation's Center for the Future of Children is seeking applications for research, demonstration, evaluation and policy analysis projects in the areas of child development, pregnancy and birth outcomes, and medical outcomes.

Under child development, the foundation funds projects on quality child care and early education. Under pregnancy and birth outcomes, the foundation is interested in projects studying factors and interventions in adverse pregnancy and birth outcomes and improving access to and participation in prenatal care. Under medical outcomes, the foundation seeks projects on establishing databases and linking existing databases on interventions for childhood disorders and disabilities, and evaluating the effectiveness of medical interventions in the early stages of life.

Grants are usually for one year and average \$50,000. The center awards a few multiyear grants that usually total \$250,000 to \$300,000.

Application deadlines are **March 15, June 15, September 15, and December 15**. Contact: Richard Behrman, Managing Director, Center for the Future of Children, David and Lucile Packard Foundation, 300 Second Street, Suite 102, Los Altos, California 94022; 415/948-3696.

Russell Sage Foundation

Grants in the Social Sciences

The Russell Sage Foundation is dedicated to the support of social science research as a means of improving social policies, methodology, and data, and of strengthening the theoretical core of the social sciences. Grants are restricted to support for basic social science research within the Foundation's announced programs, which currently are poverty, immigration, behavioral economics, and research synthesis.

A brief letter of inquiry is advisable to determine whether the Foundation's present interests and funds permit consideration. Letters should summarize the project's objectives, the work plan, and an estimated budget. Awards are *not* made for support of undergraduate or graduate degree work. Grants currently average about \$50,000.

Letters of inquiry may be submitted at any time. Full proposals must arrive at least eight weeks before Foundation Board meetings held at the end of February, June, and October. Contact: Russell Sage Foundation, 112 East 64th Street, New York, New York, 10021; 212/750-6000.

National Science Foundation

Cooperative Program with EPRI

The National Science Foundation announces a new cooperative program with the Electric Power Research Institute (EPRI). The purpose of this program is to increase cooperation and cross fertilization of ideas between different disciplines of engineering and computer science, with the goal of addressing challenging research issues in the control of complex dynamic systems.

The program supports analytical and experimental research on Intelligent Control Systems. Participating NSF Directorates and EPRI encourage multidisciplinary proposals dealing with engineering applications, control theory, real-time computations, and laboratory experiments to explore concepts in intelligent control. Control-oriented mathematical modeling of systems, new algorithms and architectures, and concepts from expert systems, neural networks, fuzzy logic, and other areas shall be used to reduce uncertainties and control the system in a safe and reliable manner. The emphasis should be on new ways to formulate problems to design intelligent controllers rather than piecing together traditional approaches such as a proportional, integral and derivative controller at a lower level loosely connected to a rule-based controller operating at a supervisory level.

The purpose of this program is to encourage the development of fundamental control engineering methods not for technology demonstrations. The applications may be selected from electrical, mechanical, manufacturing, chemical, or biological systems to develop simulations and/or laboratory experiments for validation, verification, and performance evaluation of real-time intelligent control systems.

A letter of intent including two pages of proposal summary and the names of the investigators is required by March 23, 1992. The deadline date for receipt of the formal proposal is **April 27, 1992**.

A copy of the complete announcement for this program is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Faculty Research, Training, and Service Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please send the pertinent data, as listed below, to Michael Moore at ORTTA.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
January, 1992	490	\$ 91,336,350
Awards Processed		
January, 1992	165	9,651,897
Proposals Submitted		
July, 1991 - January, 1992	2,364	377,689,521
Awards Processed		
July, 1991 - January 1991	1,841	157,687,567
Proposals Submitted		
July, 1990 - January, 1991	2,136	302,044,836
Awards Processed		
July, 1990 - January, 1991	1,841	145,582,654

Magnetic Resonance Imaging and Spectroscopy at 4 T

Kamil Ugurbil, Radiology
Keck Foundation
\$875,000 - 01/92-12/93

Diamond Film Deposition in a Radio-Frequency Thermal Plasma

Steven L. Girshick, Mechanical Engineering
National Science Foundation
\$247,071 - 12/91-05/95

Adaptation from Childhood to the Beginnings of Adulthood

Ann S. Masten, Child Development
Auke Tellegen, Psychology
William T. Grant Foundation
\$214,258 - 01/92-12/93

Biochemical Studies of TYL Encoded Multifunctional Enzymes

David H. Sherman, Biological Process Technology Institute
Eli Lilly and Company
\$180,000 - 12/91-11/94

Long-Term Health Impact of Voluntary Weight Loss

Aaron Folsom, School of Public Health
Association of Schools of Public Health
\$128,812 - 10/91-09/92

Crystalline-Amorphous Interfaces and Amorphous Films in Grain Boundaries

C. Barry Carter, Chemical Engineering & Materials Science
U.S. Department of Energy
\$121,221 - 11/91-12/92

Role of Nitric Oxide in Memory and Synaptic Modification

Paul F. Chapman, Psychology
Whitehall Foundation
\$111,152 - 02/92-01/95

Landspreading of Yard Waste

Thomas R. Halbach, Soil Science
Jean-Alex E. Molina, Soil Science
Russell S. Adams, Soil Science
Metropolitan Council of the Twin Cities
\$100,000 - 07/91-06/93

Estrogens in Older Women: Bone Density and Lipid Effect

Mary E. O'Connell, Pharmacy
NIH, NIA
\$100,000 - 09/91-09/93

Como Yard Debris Recovery and Reuse Project

Dana Donatucci, Facility Support
MN Office of Waste Management
\$36,972 - 08/91-08/93

The Meaning of Alcohol in an Urban Indian Community

Timothy Dunnigan, Anthropology
Paul Spicer, Anthropology
National Science Foundation
\$1,648 - 01/92-06/93

University Orchestra Residence Program

Vern Sutton, Music
U.S. West Foundation/Blandin Foundation
\$4,000/\$10,000 - 01/92-03/93

Analysis of the Positions of Substitution of Methyl and Hydroxypropyl in Hydroxypropylmethyl Cellulose

Gary R. Gray, Chemistry
Dow Chemical Company
\$33,939 - 01/92-12/93

Base Metal and Gold Mobility in Subseafloor Hydrothermal Systems

William E. Seyfried, Geology & Geophysics
Michael E. Berndt, Geology & Geophysics
National Science Foundation
\$93,153 - 10/91-03/93

Ecological Evaluation of Year-Round Lake Aeration: Sediments

Daniel R. Engstrom, Geology and Geophysics
Legislative Commission on Minnesota Resources
\$36,000 - 07/91-06/93

Non-Classical Symmetries of Differential Equations

Peter Olver, Mathematics
National Science Foundation
\$7,776 - 01/92-06/94

Computation of Radiation Heat Transfer

Suhas V. Patankar, Mechanical Engineering
NASA
\$99,800 - 11/91-11/92

Mayor's Institute on City Design: Midwest 3

William Morrish, Design Center for American Urban Landscape
Catherine R. Brown, Design Center for American Urban Landscape
National Endowment for the Arts
\$50,000 - 10/91-06/92

Soybeans in Pig Starter Diets: Improving Utilization

Lee Johnston, West Central Experiment Station
James E. Pettigrew, Jr., Animal Science
Gerald Shurson, Animal Science
MN Soybean Research & Promotion Council
\$34,209 - 09/91-08/92

Cholesterol Lowering and Fecal Bulking by Hyper Fiber Process

Daniel D. Gallaher, Food Science and Nutrition
Humanetics Corporation
\$48,967 - 01/92-12/92

Molecular Mapping of Soybean Cyst Nematode Resistance Genes

Nevin Dale Young, Plant Pathology
James H. Orf, Agronomy & Plant Genetics
MN Soybean Research & Promotion Council
\$47,500 - 09/91-08/92

Global Climate Changes on Soils as Sink or Source of CO₂

H.H. Cheng, Soil Science
James C. Bell, Soil Science
Clive Reece, Soil Science

NASA
\$67,500 - 12/91-05/93

Gasoline Consumption by Snowmobiles in Minnesota

Dorothy H. Anderson, Forest Resources

St of MN - Natural Resources
\$10,000 - 12/91-01/92

Evaluation of State Programs for Conserving Biological Diversity

Paul V. Ellefson, Forest Resources

USDA
\$5,000 - 11/91-10/92

Marketing Minnesota Soybeans: A Survey on Consumer Preference

Elaine H. Asp, Food Science and Nutrition

MN Soybean Research & Promotion Council
\$27,680 - 09/91-08/92

Prevention of Water Loss, Shrinkage, & Toughening of Intact Beef Muscle During Microwave Heating

Eugenia Davis, Food Science and Nutrition
Joan Gordon, Food Science and Nutrition

Minnesota Beef Council
\$22,127 - 10/91-09/92

Molecular Analysis of an End-Specific Mitotic Map

Ryoko Kuriyama, Cell Biology and Neuroanatomy

Council for Tobacco Research
\$65,401 - 01/92-12/92

Cholesterol Lowering Effect of Hydrolyzed Guar Gum

Harold C. Seim, Family Practice & Community Health

Sandoz, Incorporated
\$37,713 - 11/91-01/93

Genetic Studies of Tumor Suppressor Genes in a Haploid Cell

Walter Sauerbier, Institute of Human Genetics

Council for Tobacco Research
\$78,850 - 01/92-12/92

Effects of Various Bile Acids in Liver Regeneration in Rats

Clifford J. Steer, Medicine

Ciba-Geigy Corporation
\$30,000 - 12/91-11/92

Allergen and Antibody Responses in Atopic Conditions

Malcolm Blumenthal, Medicine

Sanofi Diagnostics, Inc.
\$435,000 - 12/91-11/92

Immune Clearance Dysfunction and Murine Autoimmune Disease

Nancy L. Meryhew, Medicine

Arthritis Foundation - MN Chapter
\$16,000 - 01/92-12/92

Strain-Related Susceptibility to Murine Polymyositis

Patricia E. Tam, Medicine

Arthritis Foundation - MN Chapter
\$16,000 - 01/92-12/92

Growth Regulation of Breast Cancer by Growth Factors

Benjamin S. Leung, Obstetrics & Gynecology

Minnesota Medical Foundation
\$4,000 - 01/92-12/92

Development of Monoclonal Antibody Against Rheumatic Heart Disease

Edward L. Kaplan, Pediatrics
Ernest D. Gray, Pediatrics

NIH, NIAID
\$21,566 - 11/91-04/92

Studies of Soluble Immunoregulators in Murine Lupus

Harumi Jyonouchi, Pediatrics

Minnesota Medical Foundation
\$9,200 - 01/92-12/92

Needs Assessment of Parents

Robert W. Blum, Pediatrics

Hennepin County
\$54,900 - 11/91-01/92

Service Utilization Patterns of Public Inebriates

Mark L. Willenbring, Psychiatry
Frank C. Miller, Anthropology

St of MN - Human Services
\$21,452 - 12/91-09/92

Implications of Chiral Purity in Solid State Pharmaceutics

David J.W. Grant, Pharmaceutics

Pharmaceutical Manufacturers Association Fdn
\$5,000 - 01/92-12/92

Intestinal Brush Border Membrane Affecting Oral Availability

Pei-Fan Bai, Pharmaceutics

Pharmaceutical Manufacturers Association Fdn
\$10,000 - 01/92-12/92

Interventions to Decrease Agitated Behaviors in Dementia

Mariah Snyder, Nursing
Ellen Egan, Nursing

Ken Burns, Nursing
Alzheimer's Disease and Related Disorders Association
\$24,894 - 12/91-11/92

Software for Curricula in Ecology and Evolution

Donald N. Alstad, Ecology, Evolution & Behavior
James W. Curtsinger, Ecology, Evolution & Behavior
Peter A. Abrams, Ecology, Evolution & Behavior

National Science Foundation
\$43,851 - 01/92-06/94

The Effect of Weaning Age on Pigs

Barry Wiseman, Clinical and Population Sciences

Robert Morrison, Clinical and Population Sciences
Thomas W. Molitor, Clinical and Population Sciences

Minnesota Pork Producers Association
\$20,000 - 07/91-06/92

Advancing the Networked Organization with Group Decision Support Systems

Gerardine DeSanctis, School of Management
Marshall S. Poole, Speech Communication
Gary W. Dickson, School of Management

National Science Foundation
\$54,990 - 09/91-09/92

Globe-Net

Eugene D. Gennaro, Curriculum and Instruction

North Carolina State University
\$66,764 - 12/91-02/93

Introductory Educational Technology Methods: A Proposal to DoD for Nine Inservice Workshops

Gregory C. Sales, Curriculum and Instruction

U.S. Department of Defense
\$65,100 - 12/91-12/92

The Sponsored Project Information Network (SPIN) is a computerized locator system of funding opportunities (federal, nonfederal, and corporate) for faculty and institutional research, development, and education program support. It is available free of charge to University faculty and staff through ORTTA.

Based on a description of your research areas and / or the type of support sought, faculty and staff can search the SPIN Keyword Index to identify sources within specific areas of interest. The Keyword Index, a taxonomy developed by SPIN to catalog funding sources, is divided into the following ten major classifications:

- Agriculture / Food / Forestry**
- Arts / Culture / Humanities / Communications**
- Business / Economics / Management**
- Education**
- Health / Medical Sciences**
- International Affairs / Area Studies**
- Miscellaneous / Other**
- Science / Technology**
- Social / Behavioral Sciences**
- Social Welfare / Public Affairs**

The result of a search is a set of profiles of applicable funding sources that provides: 1) the sponsor's name; 2) the sponsor's contact address and telephone number; 3) deadline dates; 4) program titles; 5) objectives or interest areas of the sponsor; and 6) restrictions that would affect the submission of a proposal. This set of profiles is sent to the requestor.

Effective September, 1990, the SPIN indexes became available for on-line review through ORTTA's Electronic Bulletin Board (See the September, 1990 *Research Review* for information on Bulletin Board contents and access instructions—or call 624-9004 for a copy of the instructions.) The Bulletin Board contains a section devoted to SPIN and offers users the opportunity to review the Keyword Index alphabetically or within the topics shown above.

Since the Bulletin Board is accessible anytime, faculty and staff can browse the indexes at their convenience and find *keyword codes* of interest to them. From within the Bulletin Board they can forward a note to the Bulletin Board Editor requesting a SPIN search based on the chosen keyword codes (limit, 20 keywords).

Additional **Specialty Codes** used by SPIN that may help in choosing key words appropriate to the project for which funding is sought are:

International Travel	Opportunities to travel to countries or to study their cultures.
Opportunities Abroad	Support to travel identified by country, region or continent.
Equipment/Facility Support	Use code that relates to project, not what is being purchased.
Professional Development	Largely Postdoctoral opportunities.
Student Support	For students seeking external funding support.
Foreign Scholar Support	Bringing foreign scholars to this country or seeking programs in the U.S. for which they are eligible.
Conference Support	Funding to hold or conduct a conference, symposium, or workshop.
Publication Support	Support to prepare or complete a work or for actual cost of publishing a completed work.
Sabbatical Support	To undertake or supplement sabbatical leaves.

For further information regarding the SPIN system, please contact ORTTA at 624-9004.

SPIN searches are also available through the Research and Development Office in the College of Liberal Arts, the Agricultural Experiment Station, the Research Support Office at Duluth, and the Grants Development Office at Morris.

Research Review Mailing List Information

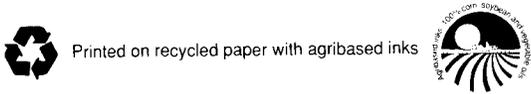
- Faculty:**
- The *Research Review* is automatically mailed to all faculty on the Faculty Mail List holding the rank of Assistant Professor and above, using the AIS mail list.
 - To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS). (AIS labels are characterized by a string of numbers above the name.)
 - Please check with your departmental office or AIS (624-9000) if you need assistance.

- Staff / Off Campus:**
- ORTTA maintains a supplemental mail list for:
 - a) academic staff not included in the above faculty list;
 - b) staff; and
 - c) off-campus
 - Additions/changes/deletions to this supplemental list may be initiated by filling out and sending ORTTA the following:

Change	<input type="checkbox"/>	Name: _____
Add	<input type="checkbox"/>	Department: _____
Delete	<input type="checkbox"/>	Address (Campus: Bldg/Rm #) _____
		City/State (if off-campus) _____

**For Changes and Deletions,
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Return To:
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Office of Research and Technology Transfer
1100 Washington Avenue South, Suite 201
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(For U.S. or Campus Mail)



University of Minnesota

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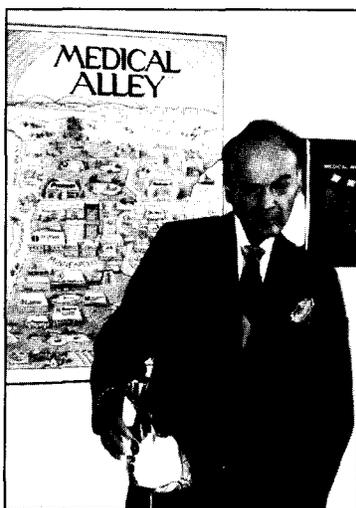
RESEARCH REVIEW

Research and Technology Transfer Administration

April, 1992

Medical Alley Association Honors C. Walton Lillehei

Minnesota's Medical Alley Association presented its Lifetime Achievement award to C. Walton Lillehei, Ph.D., M.D., at its seventh annual awards banquet March 26th. The Lifetime Achievement award is presented to individuals who have demonstrated an outstanding commitment and contribution to the state's healthcare industry.



Dr. Lillehei participated in the world's first successful open-heart surgeries at the University of Minnesota starting in 1952. Spurred on by Chief of Surgery Owen H. Wangensteen, who inspired his surgeons to explore novel methods of solving surgical problems, Lillehei worked with colleagues and local companies to develop numerous medical products, including the first heart pacemaker, the first successful blood oxygenator for heart-lung bypass, and the first artificial heart valves. Lillehei is currently Director of Medical Affairs at St. Jude Medical, Inc., and a clinical professor of surgery at the University.

The following article summarizes a longer feature article, "The Genesis of Minnesota's Medical Alley," published in the Winter 1992 issue of the University of Minnesota Medical Bulletin. Call Michael Moore at 612/624-9398 if you would like a copy.

The Birth of Minnesota's Biomedical Industry

In 1956 a young electrical engineering graduate of the University of Minnesota Institute of Technology was walking down the hall in the University Hospital. He was headed to the operating room to repair the ECG machine, as part of his garage-based business repairing electronic medical equipment. As he passed the office of Dr. C. Walton Lillehei, he heard these words: "Hey Earl, I've got a problem for you."

As fate would have it, Lillehei was in critical need of someone to build a wearable, battery-powered pacemaker he had conceived. Ten percent of his open-heart surgery patients were dying of heart block, and his experiments with dogs had shown that a wire sutured to the surface of the heart could keep the heart beating using a small electrical current. Lillehei turned to Earl Bakken, who had gained a reputation

Lillehei, Continued On Page 12

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Record Retention for POT Documents

This is a follow-up to the March, 1992 article announcing that ORTTA will begin reviewing POT documents over \$500 on April 1, 1992.

The white and blue copies should be sent to ORTTA for approval. If a department wants to mail the white copy to the vendor, both copies will be returned to the department upon approval. If a department wants ORTTA to mail the white copy to the vendor, a stamped, addressed envelope must be provided and only the blue copy will be returned to the department. Since no copy is retained centrally, it will be necessary for the blue copy (with the ORTTA approval) to be retained in the departmental file for audit purposes.

Phone-in orders over \$500 should not be placed until the POT has been returned with ORTTA approval. If the vendor does not require a copy of the POT document, a copy of the POT (with ORTTA approval) must be noted as a phone-in order and retained in the departmental file.

Questions regarding this procedure should be addressed to the appropriate ORTTA grant administrator.

RESEARCH REVIEW

Volume XXI/Number 10

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Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, creed, color, sex, marital status, national origin, disability, public assistance status, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/91-6/30/94 rates should be used. **The rate agreement is dated July 1, 1991.** This date should be used where required on proposal applications. Please call Marilyn Surbey at 624-4850 with questions on Indirect Costs.

	07/01/91 06/30/94
Research	
On-Campus	40.0
Off-Campus *	21.0
SAFHL	60.0
Hormel	53.0
Other Sponsored Activity	
On-Campus	20.0
Off-Campus *	10.0
Instruction	
On-Campus	52.0
Off-Campus	16.0

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call Vivian Fickling at 624-2009.

Current actual rates from July 1, 1991 through June 30, 1992 are:

Faculty	28.75
Civil Service	25.25
Graduate Assistants	8.50

For proposals being submitted with start dates after July 1, 1992, the estimated fringe benefit rates to be budgeted are:

Faculty	31.25
Civil Service	29.50
Graduate Assistants	10.50

Estimated rates after July 1, 1993 are:

Faculty	28.00
Civil Service	30.50
Graduate Assistants	31.25

As rates change they will be reflected in this section.

Director and Licensing Associate Leave Office of Patents and Licensing

Editor's Note: The following is the text of a letter sent March 24 to Deans, Directors, and Department Heads by Associate Vice President Tony Potami.

I am writing to inform you of recent changes in the staff of the Office of Patents & Licensing, and to ask for your help in finding replacements and continuing the University's active program of technology transfer.

John Thuente, director of the University of Minnesota Office of Patents and Licensing since 1984, has resigned effective March 24 to join the Minneapolis patent law firm of Patterson & Keogh. I am assuming the director's responsibilities and launching a nationwide search to find the best possible person to continue our national leadership in this area. I would appreciate any help you can give us in referring potential members for this search committee, as well as qualified candidates for the position.

At the same time that we will be searching for a new director, we will also be searching for a replacement for Paul McDowall, who resigned effective March 13 to take a position on the patent staff of Rosemount Inc. Paul handled software licensing, copyright questions, plant patents, and several other technologies during his three years with us. Before joining the Office full-time, he served as a law clerk until his graduation from the Law School in 1989.

As you know, John Thuente was instrumental in building the University's patents and licensing program into a national leader. He came to the University from Rosemount Inc., at a time when technology transfer activity was very low. During his tenure, the annual number of development disclosures rose from about 30 to 170, and the number of patents assigned to the University grew from 11 in 1985 to 41 each in 1989 and 1990, and 31 in 1991. The key factor fueling those numbers was John's leadership in meeting with you and your faculty to explain the process of patenting and licensing, and to discuss concerns anyone might have had. His ability to bridge the worlds of academia and industry to reach agreements everybody is comfortable with has resulted in the number of technology licensing agreements growing from about 20 in 1985 to more than 160 currently, involving more than 130 companies.

It is my firm resolve to continue to build on the University's technology transfer program, which has been recognized as an innovative leader in linking industry—small companies as well as large—with the tremendous assets of expertise and technology we have to offer. Despite these personnel changes and financial constraints that have forced us to reduce our patent filings somewhat, I would like to stress that

the Office of Patents and Licensing maintains the capability to meet with University inventors and to file patent applications when warranted.

The staff currently consists of Tony Strauss, an attorney who is primarily responsible for mechanical and electronic inventions but also handles several biological technologies; Jim Severson, a former researcher and industry licensing professional who handles medical and biological inventions; and Grace Malilay, who will join the Office full-time when she graduates from the Law School this summer, and who will be responsible for some biological inventions. The Office also handles licensing of University trademarks for use on clothing and other products, under the direction of Bob Hicks, who will provide assistance on software and copyright questions until Paul McDowall's replacement is hired.

With assistance from faculty and outside experts such as the members of our Technology Evaluation Council who help us evaluate new technologies, we are confident that we can maintain the momentum John has helped build. Technology transfer is a major part of the University's public service mission, and we intend to do the best we can with the available resources to contribute to the economic development and technological competitiveness of the state and nation.

With your understanding and assistance, the University can move forward in this increasingly crucial area.

DOE Has \$40 Million Increase for Small Science

A \$40 million dollar increase for university-based "small science" research, undertaken by individual investigators or a small group of investigators, is part of the Department of Energy (DOE) FY93 budget. If appropriated, the increase would make a total of \$494 million (excluding the Superconducting Super Collider Grants) available to university-based researchers through DOE's Office of Energy Research (ER).

ER programs include: Basic Energy Science, Fusion Energy, Biological and Environmental Research, Energy Research Analyses, University and Science Education, ER Lab Technology Transfer, Multiprogram Energy Lab-Facilities Support, the Superconducting Super Collider, High Energy Physics and Nuclear Physics.

From the Washington FAX

Indirect Costs at the University of Minnesota

by A.R. Potami

Editor's Note: This article appeared in the February 14 issue of the journal, SCIENCE, as part of a Policy Forum, with a similar article from the Massachusetts Institute of Technology.

The University of Minnesota, a large, public, land-grant institution, has a total five-campus enrollment of 44,500 undergraduate and 8,500 graduate students. It payrolls 5,100 full-time and 1,054 part-time academic employees, 11,500 full-time and 2,500 part-time civil service employees, and 1,500 full-time and 5,500 part-time student employees. The research enterprise in FY90 reported expenditures of more than \$218 million for externally sponsored research, training, and public service grants and contracts. Of this total, \$155.5 million came from the federal government (\$122.6 million for direct costs and \$32.9 million for indirect costs).

The University of Minnesota's indirect cost rate, 44%, includes the following components: plant operation and maintenance, 17.92; building use, 2.26; libraries, 0.68; equipment use, 1.26; departmental administration, 13.99; general administration, 5.90; and research administration, 1.99. Recently completed negotiations with the Department of Health and Human Services decreased the rate to 40% (component breakdowns are not yet available), primarily due to growth in research expenditures and cost reductions related to the overhead components.

Discussion

Plant Operations and Maintenance: The indirect cost amount identified for plant operations and maintenance, which includes heat, electricity, janitorial services, hazardous waste removal, and building repairs, stand at about \$82 million. On the basis of a study of each campus building, 20% of the space at the University of Minnesota is allocable to research. Applying the 20% research space figure to the \$82 million yields \$16.4 million in indirect costs.

Building Use: The total purchase price of all buildings on the five University of Minnesota campuses is \$1.065 billion. The federal government allows universities to claim 2% of the original purchase cost as an indirect cost. Accordingly, \$21.3 million is included in the indirect cost pool. On the basis of an account of the original cost of the space in each building attributable to research, \$1.96 million is recovered from federal sources.

Libraries: The expenditures for the University of Minnesota Libraries in FY90 were \$36 million. In lieu of conducting a costly study of library use, the University uses the Office of

Management and Budget's (OMB) A-21 "default" method, which adds an estimate of public use to the known numbers of faculty, staff and graduate and undergraduate students. Then, the number of full-time equivalents for faculty, graduate students and staff engaged in research is calculated and correlated with the portion of library costs allocated to each group from the initial use estimate. This calculation allows \$1.16 million to be recouped from federal sponsors for indirect research costs.

Equipment: The University of Minnesota's equipment use rate of 1.99 is derived from the identification of the total equipment value, which is \$255 million. OMB A-21 allows about 6.7% of this amount to be charged over a 15-year period. This method identifies \$17 million as total indirect costs related to equipment use. On the basis of the 20% calculation of space devoted to research, \$3.12 million is recovered from federal sponsors.

Administration: The components of departmental, research, and general administration (totaling 21.88) are all calculated from the sum of the portions of administrative costs from the university's financial statements that are allocable to research. Included in the component for department administration (13.99) are a portion of the costs for collegiate deans, department heads and faculty involved in research administration (capped at 3.6), plus clerical and secretarial salaries and related expenses allocable to research support. The research administration component (1.99) includes allowable costs incurred by the sponsored programs office. The general administration component (5.90) includes portions of costs such as accounting, purchasing, and appropriate vice presidents' offices that are allocated to research. Totaling these categories allows the recovery of \$16.4 million from federal research sponsors.

Direct Charging

The University of Minnesota charges as direct costs of research some costs that other institutions may recover through the indirect cost rate. These include such items as printing, technical shops, and telephones. Also charged directly but subsidized heavily by the University of Minnesota are computer services (\$8.5 million total cost, including a \$4.5 million institutional subsidy) and costs related to caring for and using animals in research (\$2.6 million total cost, including a \$372,000 subsidy). The subsidies mean affordable services for researchers and a lower charge to all users, including the federal government. Because costs must be assigned either completely as direct costs or indirect costs, the university cannot recoup any of its subsidized costs through indirect cost recovery. These subsidies will be reviewed in light of current financial difficulties, which may result in increased costs directly charged to grants and other

users. Normally, salaries of secretarial and clerical employees who support research activities are charged as indirect costs under the departmental administration component of the indirect cost rate. However, for large, complex, multi-departmental grants or contracts that require unusual tasks, support personnel may be charged directly to those grants and contracts.

Cost Sharing

The University of Minnesota effort reporting system has historically captured both voluntary and mandatory cost sharing. The Department of Health and Human Services' strict interpretation of OMB Circular A-21 (its cost accounting guidelines), requires the inclusion of cost sharing in the research base. Excluding voluntary cost sharing from the University's research base would increase the research indirect cost rate by nearly 2 points.

Use of indirect cost recovery funds: Although funds reimbursed as indirect costs are not required to be expended for indirect or research purposes, all of the University of Minnesota's indirect cost recovery funds are used to support research-related activities. For example, of the \$32.9 million received in indirect cost payments in fiscal year 1990, 25% was used to support research-related administration, scientific computing, and other research-related activities such as animal facilities and removal of hazardous wastes. About 12% was allocated for library acquisitions and automation and for financing of building and equipment capital expenditures (in addition to general funds devoted to building and equipment acquisition and maintenance, which amounts to far more than the total recovered through the indirect cost rate). The remaining funds, more than half the total, were distributed to colleges to provide research setup funding for new faculty, to acquire equipment, and to support initiatives in research that will enable faculty to pursue projects with the federal government and others.

It is becoming increasingly important for the University of Minnesota to obtain state-of-the-art research equipment and to maintain leading-edge laboratories to compete successfully for all sources of research funds. With the condition of Minnesota's budget and the reduction in state funding for the university, any further reduction or limitation of indirect costs will seriously threaten the vitality of the institution's research enterprise.

Cautions and Suggestions

Capping indirect cost rates or their specific components is receiving much attention as a method of reducing these rates, while supposedly freeing up money for direct funding of research. This is a potentially dangerous quick fix. Even though the University of Minnesota would not now be affected by the proposed caps, these caps pose questions about the fundamental philosophy of supporting actual indi-

rect costs of research. A cap is at best an economic threshold and at worst an arbitrary decision based on idealism—not on determination to support high-quality research.

Rather than place arbitrary caps on indirect costs, there is a need to clarify guidelines for charging certain institutional costs as indirect costs of research. To little avail, universities and federal auditors spend a great deal of time interpreting the A-21 guidelines. Institutional or individual failure or inability to carefully scrutinize the suitability of costs leads to damaging public revelations that hurt the overall research effort. Clarifying the guidelines and setting uniform standards of federal scrutiny for all universities would reduce these failures and the time spent haggling over rule interpretations.

The recent scrutiny of various administrative costs has failed to identify some of the costs universities bear for what many say are extraordinary and unnecessary federal requirements. For example, the effort reporting requirements of A-21 cost the University of Minnesota and the federal government more than \$4 million annually to complete. This is a requirement that is carefully followed by this institution, but it offers no value in management of research. Individual federal agencies have rarely asked for these reports, and auditors ask to see records on specific grants only once or twice a year. Some changes in this area are needed. The cost of maintaining an effective system of effort reporting far exceeds the amounts receiving national scrutiny as inappropriate indirect research costs.

The age of an institution's physical plant is another issue that looms large when calculating the indirect cost rate. The University of Minnesota is an older institution, founded in 1869. Many of the buildings used today for teaching and research were completed before 1950, and approximately 80% of all buildings were built before 1970. Thus, the original cost of the buildings to which the 2% use allowance is applied is small by today's costs and translates into a low recovery in the building component. The needed modernization of buildings and equipment to maintain the nation's research capacity is important, and attention is needed to increase the recovery rate for this purpose. Some would propose that all or some portion of indirect cost recovery funds be devoted entirely to buildings and equipment, but this ignores the fact that the University of Minnesota and most other research universities expend considerably more general funds for this purpose than they recover from sponsors of research and that institutions need flexibility to provide matching support and respond to research opportunities.

Differences in institutional library services, especially whether they are public or private, is another area that causes disparities among universities' indirect cost rates.

IDC, Continued On Page 10

Grants to Women

Female investigators have increased their grant competitiveness under National Institute of Health research programs in the past decade, but they still have a long way to go to catch up to men.

Women seeking NIH funding are doing as well as men in key areas of grant competition, says a new NIH report that tracks their progress from FY81 to FY90. For example, success rates for competing research project grants are now virtually the same for males and females, and women win grants in proportion to the number of applications they submit.

However, women make up only 19% of the winners of NIH research project grants, and their awards are usually smaller than men's. In 1990, grants to women accounted for only 16% of research project grant funds.

Unpublished data from the National Science Foundation also paint a picture of generally competitive success rates and roughly proportional funding. Women submitted almost 16% of competing proposals in FY91 and captured 15% of awards.

Both agencies cite an increased demand by women for research funding, including a 63% growth in proposals to NSF in recent years and more than a 50% increase in applications for competing research project grants at NIH in the past 10 years.

While women are winning more research than ever before, the report shows that men still far outpace them (see boxes). The data show that despite gains by female investigators, continued progress will depend on increasing their numbers. That means keeping women on track once they've begun research training and luring them back after they've been away, says NIH training director Walter Schaffer.

With women making up 41.2% of NIH trainees but only 20% of the research applicants, the question is, what's hap-

pening to them? One approach to recruiting female researchers could be to award grant supplements similar to those for minorities and the disabled, but that would be costly, Schaffer says.

Female Applicants at NIH

The following reflects female applicants' competitive chances at the National Institutes of Health

Applications

- The number of women's NIH research project grant applications has grown more than 50% in the past 10 years.

Success Rates

- Women's research project grant success rate in 1990 was 23.2%, compared to 23.6% for men. In 1981, it was 30% compared to 32.9% for men.

Amount Awarded

- Total funding for women's research project grants quadrupled, from \$134 million in 1981 to \$609 million in 1990, while men's only doubled, but rose from \$2.1 billion to \$4.5 billion.

Individual Grant Size

- Women's research project grant awards continue to average \$30,000 less than men's, with women's grants averaging \$176,000 in 1990, compared to \$206,325 for men. In 1981, women averaged \$86,358 and men \$111,860.

Women's situation is similar at NSF, where they comprise less than 20% of the applicant total. In the biological and behavioral sciences, the area most comparable to NIH activity, women's 1991 success rate was 24% compared to men's 27%. Women garnered 22.7 percent of the awards, an increase from 19% in 1987. In other NSF areas, women's rates rivaled or exceeded men's in 1991, perhaps partly influenced by an NSF initiative to help programs increase women's participation in fields in which they are underrepresented.

Copies of the report, *Women in NIH Extramural Grant Programs* are available free of charge from: National Institutes of Health, Division of Research Grants, Information Systems Branch, Room 1A18, Westwood Building, 5333 Westbard Avenue, Bethesda, MD 20892; 301/496-7864.

- Federal Grants and Contracts Weekly

Women's Progress at NSF

The following statistics reflect female applicants' competitive progress at the National Science Foundation.

Applications

- The number of NSF proposals from women increased from 2,783 in 1987 to 4,514 in 1991, about 63%. Proposals from women increased 17% from 1990 to 1991 alone.

Awards

- The number of awards to women increased from 862 in 1987 to 1,394 in 1991, about 62%.

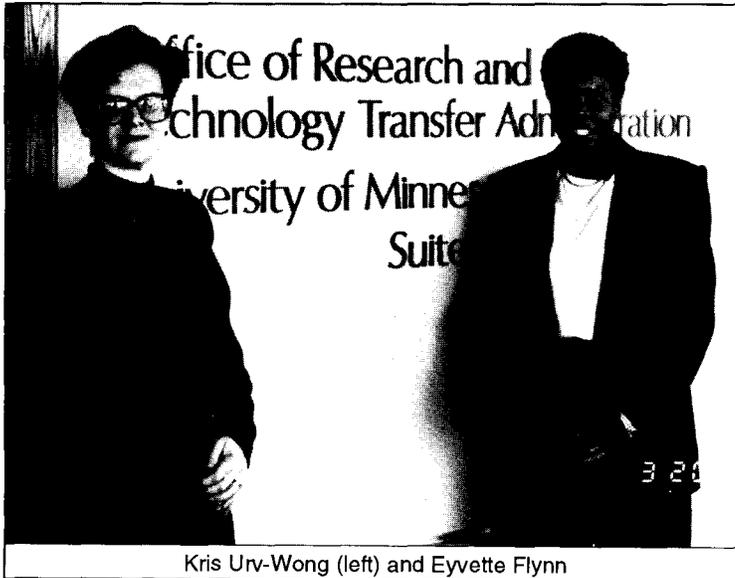
Success Rates

- Women's overall success rate was 31% in 1991, about the same as in 1987 and less than the 34% success rate for men. Women outpaced men in NSF's education and human resources and engineering programs.

New Grant Administrators Join ORTTA Staff

ORTTA announces the addition of two Grant Administrators to the Grants and Contracts staff:

Eyvette Flynn has a B.S. in Economics from Santa Clara University, Santa Clara, California, and has previously worked for the Office of Management and Budget and the Federal Communications Commission in Washington, D.C. as a telecommunications and information policy analyst.



Kris Urv-Wong (left) and Eyvette Flynn

Her areas of responsibility as an ORTTA Grant Administrator will be with federal agencies such as Agriculture, Defense, State, the U.S. Information Agency, the Agency for International Development, and non-corporate international agencies.

Kris Urv-Wong has a B.A. in Political Science from the University of Washington and earned an MHA from the University of Minnesota in Hospital Health Care Administration. She comes to ORTTA from the School of Public Health.

She will be responsible for selected DHHS accounts and for grants from Voluntary Health Agencies.

Revised PHS-398 Grant Applications

Newly revised Public Health Service grant applications — PHS 398 (dated 9/91) — are now available from ORTTA.

Applicants are to use the new form starting with the May 1 receipt date for AIDS applications, the May 10 receipt date for NRSA Institutional Training Grant applications and the June 1 receipt date for research grant and Research Career Development Award applications.

The revised form contains several significant changes and additions, including:

- a modest increase in page limitations for the research plan (from 20 to 25 pages) and for the introduction to revised applications (3 pages);
- an introductory section on the peer review process, including contact telephone numbers of the awarding components of the Public Health Service;
- the requirement to list all personnel (not just key personnel) on the abstract page;
- a detailed discussion of the various assurances and certification requirements; and
- an explanation of the necessary documentation regarding gender and minority status in study populations.

To obtain revised forms, call 624-9004 or send a request through the bulletin board.

Committee on the Use of Human Subjects in Research

Research in Foreign Countries

The Committee reviews many applications submitted for research projects in foreign countries. Both medical science and social science projects must comply with special requirements and University policy requires review of the project if faculty, staff, or students are involved in conducting the research.

The new federal regulations guiding research with human subjects leave the impression that University research conducted in foreign countries may not require Committee Review. The Committee cannot waive the requirement for review of research conducted in foreign countries. However, the Office for Protection from Research Risks (OPRR) can, by federal regulation 45 CFR 46 101 (h), determine whether procedures described by a foreign institution afford protections that are at least equivalent to U.S. regulations. If found to be equivalent, the agency is permitted to substitute those foreign procedures. This provision would require OPRR to conduct an investigation into the foreign country's ethical guidelines and framework for protecting human subjects.

Prior to approving a project for University researchers, the committee on the Use of Human Subjects in Research must ensure that research conducted in foreign countries meets the requirements for research conducted in this country. While the Committee cannot impose our standards for written documentation on other cultures, we *cannot* relax our standards and claim that we hold foreign research projects to a lower standard of quality than those conducted in our own country.

Documentation of approval from the local equivalent of an Institutional Review Board is required prior to initiation of research projects. In some countries, there is no "equivalent" board or group to review research and the Committee must rely on other local experts to provide documentation of approval for the proposed research project.

The requirements for documenting informed consent may vary among cultures. The Committee is not able to waive informed consent for research conducted in foreign countries, but may, under special circumstances, waive the requirement for *written documentation of informed consent*. In some settings, the process of signing the form is more intimidating and therefore perceived as "riskier" than the research project itself.

The researcher planning to travel to another country should prepare an argument for the proposed means of documenting informed consent. The investigator should be prepared to describe the local customs and to document the rationale for the proposed departure in the regulations. Evidence of culturally appropriate systems should accompany applications to the Committee.

In most cases, the Committee will require written documentation of informed consent. The consent form should be prepared in simple language, with provisions for translation into the local language or dialect. Technical language or jargon should be eliminated. (An English language version should be submitted for Committee review.) Researchers are reminded to include local (foreign site) contact information should participants have questions. Participants should not be required to place international telephone calls to have their questions answered.

Failure to adequately demonstrate that the researcher has prepared a culturally sensitive research proposal and an appropriate consent form or consent process will result in delays and perhaps refusal to approve research projects.

Researchers should consider the local customs concerning written documents, the local cultural and religious norms which might affect a given project or recruitment process, and prepare an appropriate application for approval to the Committee. Researchers must allow adequate time to review proposals prior to foreign travel. Changes in the proposal or requests for additional information may take months to reach the investigator if s/he has already travelled to a remote site.

Culturally Sensitive Research in This Country

Application for Committee approval for the use of human subjects in a minority culture group in this country should be prepared in a culturally sensitive manner. Researchers should include evidence that they have made appropriate contact with the community groups under study and that they have prepared culturally sensitive protocol for the research procedure and for obtaining informed consent.

Sovereign Nation Status and Research Involving American Indians

By federal law, American Indian Reservations have sovereign nation status. Research proposals involving the American Indian populations should conform to the guidelines for culturally sensitive research. Local leaders or the tribal council must give approval for the conduct of any research projects with the Indian Community. Researchers should prepare this documentation to accompany their applications to the Committee. Research proposals which do not demonstrate culturally sensitive mechanisms for protecting human subjects will not be approved by the Committee on the Use of Human Subjects in Research.

Questions regarding this and other human subjects research issues should be addressed to Moira Keane at 624-1889.

USDA National Research Initiative

The FY93 budget for U.S. Department of Agriculture's National Research Initiative (NRI) is \$150 million out of the \$82.6 billion total budgeted for USDA. In 1991 the program was funded at \$73 million, which allowed 22% of all proposals received to be funded, and the current FY92 level is estimated to be \$97.5 million.

USDA officials say that NRI has proven successful in attracting high quality research proposals from a broad spectrum of scientists. According to the president's budget narrative, the administration is committed to increasing the funding level annually in increments of \$50 million—provided that funds are appropriated on a non-earmarked basis.

The six areas of the NRI initiative are:

Natural Resources and the Environment: The FY93 proposal is for \$28 million, up from \$18 million in FY92. The research supports enhanced understanding of agriculture and natural resources management systems and protection of the environment. Included among the topics are water quality research and global change research.

Nutrition, Food Quality and Health: The FY93 proposal is for \$17 million, up from \$6.5 million in FY92. The research focuses on the relationship of human health to diet and food safety and quality. Opportunities are available to design food for optimal nutrition and safety. Advanced research methods can help understand microbiological contamination and human nutrition at the molecular and cellular levels.

Plant Systems: The FY93 proposal is for \$52 million, up from \$40 million in FY92. Research focuses on developing a better understanding of basic plant functions and offers the promise of addressing pest and disease problems through built-in defense mechanisms, providing improved biomass for energy production, increasing forest productivity and developing more nutritious crop plants to improve human health.

Animal Systems: The FY93 proposal is \$32 million, up from \$25 million in FY92. Research applies advanced tools, including genome mapping and genetic engineering, to understanding the mechanisms that control fat deposition, animal disease and reproduction.

Processes and New products: The FY93 proposal is \$16 million, up from the FY92 budget of \$4 million. The research focuses on developing new high-value markets for agriculture commodities and providing products that are less damaging to the environment. Proposed research in this area will provide the basis for industrial development of value-added or new products including biofuels.

Markets, Trade and Policy: The FY93 proposal is \$5 million, up from \$4 million in FY92. The research goal is to develop a better understanding of international markets in order to help policy makers improve the competitiveness of U.S. agriculture. In addition to international market studies, research investigates dietary patterns, rural community and economic development issues, and reviews the impact of technology on the environment, people and communities.

From the Washington FAX

FY94 NIH Budget

The president's FY94 budget proposal for the National Institutes of Health (NIH) is likely to be based upon the strategic planning process now underway.

More than 1,000 extramural scientists and administrators have aired their observations—likes and dislikes about the plan—at five regional meetings held by NIH to gather comments on its draft document, "*Framework for Discussion*." Bernadine Healy, NIH director, said that a key point NIH is attempting to get across is that a strategic plan is not meant to micromanage scientists.

NIH management does not agree with some of the comments offered in response to the plan, said Healy. In response to the opinion that NIH should not be doing clinical research and clinical trials, Healy observed that they are a real part of the NIH mission. To the suggestion that NIH should not be placing emphasis on managing resources, she responded that if NIH doesn't manage its financial and other resources carefully, it cannot carry out its responsibility to a program of scientific excellence.

Healy said that a strategic planning document will be available this summer to be used in planning the FY94 budget. The plan will reflect a careful look at the institutes' research portfolios and training needs, among other areas.

Scientists from the extramural community will be brought onto the NIH campus to help prepare the final document from the material gathered at the regional meetings in five areas: Critical Technologies, Research Capacity, Intellectual Capital, Stewardship of Public Resources, and Public Trust.

NIH Says Arbitrary Cuts No Longer Routine

According to the National Institutes of Health (NIH), "uniform, flat-rate," downward negotiations (cuts) in research project grants are *no longer part of the regular NIH award practice*.

The new NIH financial management plan provides measures to educate Initial Review Group (IRG) members to cost issues. These efforts include strengthening the review guidelines provided to initial reviewers and emphasizing the need to examine the proposed budgets more closely. The plan also notes that where financial objectives are not met by accepting IRG recommended budgets, councils and boards, working with NIH staff, have developed cost control practices necessary to manage research portfolios.

The policy to eliminate downward negotiations has not meant the elimination of all budgetary adjustments, NIH says. NIH has eliminated the uniform, flat-rate, budgetary reductions of prior years, but still has to make some adjustments to the budgets recommended by the IRGs in order to fund a specified total number of grants.

NIH now achieves budgetary reductions through a combination of IRG and Clinical/Board recommendations, program and grants management staff review for cost accuracy, allowability and reasonableness and, where necessary, programmatic adjustments, reads a pertinent NIH document.

Percentage figures in the following table are reliably reported to be NIH estimates of budgetary adjustment in competing research project grants for fiscal years 1991 through 1993.

	FY91	FY92	FY93
NCI	- 20.2	- 17.9	- 21.2
NHLBI	- 10.9	- 12.8	- 16.0
NIDR	- 12.5	- 2.8	- 4.7
NIDDK	- 18.3	- 21.9	- 22.1
NINDS	- 10.3	- 10.0	- 10.0
NIAID	- 14.0	- 13.5	- 13.5
NIGMS	- 14.9	- 12.5	- 15.6
NICHD	- 25.0	- 21.0	- 21.0
NEI	- 9.2	- 9.1	- 7.5
NIEHS	- 15.4	- 16.5	- 18.7
NIA	- 17.8	- 16.3	- 14.3
NIAMS	- 8.2	- 10.0	- 10.0
NIDCD	- 9.6	- 10.0	- 13.5
NCRR	- 4.2	- 6.0	- 6.0
NCNR	- 16.0	- 25.0	- 23.4
NCHGR	- 17.2	- 26.2	- 12.7

From the Washington FAX

Number of Young Investigators Declining

The number of young investigators (those under 35) applying for grant support from the National Institutes of Health (NIH) has dropped from 25.4% of applicants in 1980 to 15.5% in 1990.

The downturn includes a steep decline in the small group of applicants who are aged 26 to 30. That group dropped from 4.1% of applicants in 1980 to 1.2% in 1990.

A study from the Division of Research Grants (DRG), however, shows that applicants in the group aged 26 to 35 *receive the best scores and are most successful* in obtaining NIH funding. These better priority scores translate into substantially higher success rates for younger principal investigators' new applications. FY90 rates range from a high of 19.1% in the 31-to-35-year-old group to only 8.3% for applicants in the 61-to-65-year-old group. However, success rates for all age groups have shown a decline over the last decade.

Figures show that there has been a corresponding increase in the proportion of applicants in the 36-to-45-year-old range. The proportion of applicants over 45 has grown from 30.9 in 1980 to 37.2% in 1990. The average age of applicants for support has increased from 42.0 to 43.8 years of age since 1980.

From the Washington FAX

IDC, Continued From Page 5

During the past decades of supporting university research, the federal government has bought into a culture in which university libraries are expected to provide something for all their users. Most of the journal acquisition driven by this expectation supports the needs of faculty and student research, yet the costs involved are unfairly spread to undergraduates, professional staff, and the general public. The director of the University of Minnesota Libraries estimates that two-thirds of its journal and book acquisition and maintenance costs are incurred to support the needs of researchers, yet the reimbursement is calculated based on total numbers of users versus research users, yielding an indirect cost recovery far below the actual costs related to research.

In conclusion, universities differ in many ways that can affect their indirect costs: private versus public, old versus new, large versus small, type of research (mostly medical versus mostly social sciences, for example), or use of direct versus indirect charging of research expenses. Extreme caution must be used to avoid hurting individual universities or the nation's overall research capacity, which already is threatened by deteriorating and outdated laboratories, state financial crises, and federal budget limitations.

DOE Clarifies Requirements for Proposal Content

Many principal investigators who have support from the Department of Energy (DOE) are familiar with delays in processing DOE awards—usually because additional paperwork must be submitted to DOE-Chicago before a grant award or amendment can be issued by that office. ORTTA requested and has received clarification from DOE concerning what DOE needs at the time of proposal submission in order to eliminate these delays later in the award process.

DOE proposal requirements are summarized below by type of proposal. Please note that all forms are available from ORTTA and may be obtained from Rick Dunn (626-2265).

New Proposals

DOE requires an original plus 6 copies of a new research proposal, with 1 *additional* copy for ORTTA. ORTTA will transmit all proposal copies to the appropriate DOE office as indicated by the PI on the BA23 form.

In addition, the following forms are required:

- Federal Assistance Cover Page
(DOE F 4650.2 or SF 424) —2 copies
- Grant Application Budget Period Summary
(ER F 4620.1) —3 copies
- Budget Explanation
(AA-86-3) —3 copies
- Grant Application Project Period Summary
(ER F 4620.1A) —2 copies
- Financial Assistance Pre-Award Information Sheet
(AA-47) —3 copies
- Assurance of Compliance
(DOE F 1600.5) —**Completed by ORTTA**
- Drug, Debarment and Lobbying Certifications
—**Completed by ORTTA**

Continuation and Renewal Proposals

Continuation or renewal proposals are due six months before the end of the current grant period. Principal investigators are reminded that the continuation or renewal proposal and the progress report must be physically separated from one another. Considerable delay may result if the proposal and the annual technical report are combined in the same document.

Principal investigators should submit an original and 8 copies of both the proposal and the annual progress report to ORTTA. ORTTA will send 7 copies of each to the appropriate DOE technical monitor and the original, along with the

forms listed below, to the DOE Chicago Grants and Contracts office. The following forms are required:

Continuation Proposals

- Federal Assistance Cover Page
(DOE F 4650.2 or SF 424) —2 copies
- Grant Application Budget Period Summary
(ER F 4620.1) —3 copies
- Recommendations for Distribution of Documents
(DOE F 1332.16) —3 copies
- Assurance of Compliance
(DOE F 1600.5) —**Completed by ORTTA**
- Drug, Debarment and Lobbying Certifications
—**Completed by ORTTA**

Renewal Proposals

- Federal Assistance Cover Page
(DOE F 4650.2 or SF 424) —2 copies
- Financial Statement Concerning Carry-over Funds
(AA-86-1) —3 copies
- Grant Application Budget Period Summary
(ER F 4620.1) —3 copies
- Budget Explanation
(AA-83-3) —3 copies
- Grant Application Project Period Summary
(ER F 4620.1A) —2 copies
- Financial Assistance Pre-Award Information Sheet
(AA-47) —3 copies
- Recommendations for Distribution of Documents
(DOE F 1332.16) —3 copies
- Notice of Energy RD&D Project
(DOE F 538) —5 copies
- Assurance of Compliance
(DOE F 1600.5) —**Completed by ORTTA**
- Drug, Debarment and Lobbying Certifications
—**Completed by ORTTA**

Please contact Rick Dunn, ORTTA, at 626-2265 if you have any questions concerning this clarification of DOE proposal requirements.

for his ability and ingenuity with the new-fangled electronic gadgets that were becoming part of hospital care.

Six weeks later Bakken returned with a box 4 inches square by 2 inches high. Lillehei's research team of surgical residents found that it worked wonderfully on dogs, and the famous surgeon was soon saving nearly 90 percent of his patients who would have died of heart block. In reporting his success in treating heart block, Lillehei referred surgeons to Earl Bakken for the external device, giving him the income with which to start Medtronic and develop the implantable pacemaker.

Lillehei credits the pioneering efforts at the University of Minnesota in the 1950s with setting the stage for the explosive growth of Minnesota's medical industry. "The Chief," Owen Wangenstein, insisted that his surgeons and their trainees learn basic subjects such as physiology and biochemistry, and apply that knowledge in research to find solutions to surgical problems. He himself developed the Wangenstein Suction Pump, a simple device that used siphon principles to drain abdominal wounds, reducing mortality by 80 percent.

Another basic principle, that of bubbles rising to the surface of blood, was applied by Lillehei, Richard DeWall, and Vincent Gott, in inventing the disposable bubble oxygenator, which they used to replace the function of the heart and lungs during surgery. This first "heart-lung machine" was built of plastic tubing Lillehei obtained from a local company, Mayon Plastics, which was one of the first plastic suppliers of products such as mayonnaise processing and dairy industry tubing. The company became a supplier of plastic medical tubing as a result of requests from the hundreds of heart surgeons referred to them by Lillehei, who quickly spread the word about the open-heart surgery success at Minnesota.

At Medtronic, Bakken created an environment of support for innovative ideas and creative people—sometimes to the company's eventual disadvantage. Thirty-five medical companies have been started by former Medtronic employees, and many of them have looked to the University for help with research, development, and testing of their products. These companies and others have grown to form the core of the Minnesota Medical Alley Association, a trade organization of more than 500 biomedical companies and health care institutions. Medtronic is the largest, with 1991 revenues in excess of \$1 billion and employing 8,200 people.

Lillehei has been closely involved with one of Medtronic's lineage, St. Jude Medical, the leading supplier of ar-

tificial heart valves. The company was started by Manny Villafana, a former Medtronic employee who left to start a competing heart pacemaker company, Cardiac Pacemakers, Inc., which he sold to Eli Lilly & Company. With the proceeds of that sale, Villafana looked to the artificial heart valve industry just beginning based on research at the University of Minnesota. He settled on one of four heart valves developed by Lillehei and colleagues, and the St. Jude Valve has since risen to be the leader in its field, with a 70 percent share of the market and annual sales of over \$125 million.

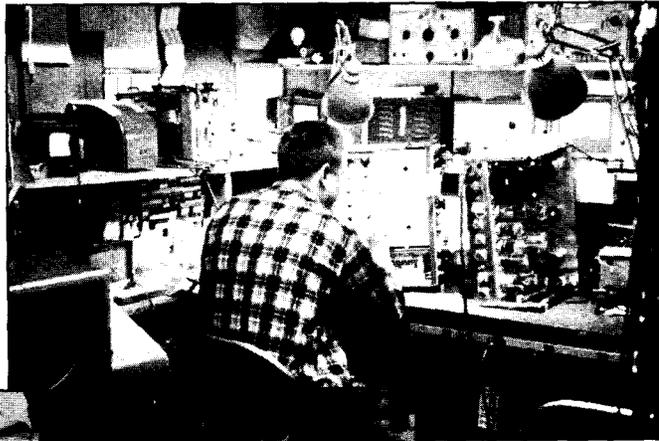
Lillehei now travels a great deal, especially to Japan, as director of Medical Affairs at St. Jude Medical and as a consultant and speaker on developing medical technology. As clinical professor of surgery at the University, his most frequent contacts are with Professor R. Morton Bolman III, director of cardiothoracic surgery and first holder of the C. Walton and Richard C. Lillehei Endowed Chair in Thoracic and Cardiovascular Surgery. The chair was established through the Minnesota Medical Foundation with contributions from the two surgeons' students and friends, who also founded the Lillehei Surgical Society. C. Walton Lillehei trained 139 surgeons from 40 countries at the University of Minnesota from 1951 to 1967, and an additional 28 at Cornell University Medical Center in New York City from 1968 to 1974.

Lillehei sees many parallels between the academia-industry partnerships of the fifties and sixties and the current movement to transfer technology from universities to industry. "We developed so many relationships with local companies that were either introducing new products or supplying the needs of our program; it was good for us and good for them."



C. Walton Lillehei performing open-heart surgery in the mid-1950s with the patient supported by cross-circulation from a parent.

The historic partnership between C. Walton Lillehei and Earl Bakken continues to reap benefits for the University and for Minnesota's biomedical industry. Current and future partnerships between Medical School and Institute of Technology researchers and biomedical companies are being supported and kindled through the Biomedical Engineering Center, established with a \$2 million challenge grant from the Medtronic Foundation. The Foundation also donated \$1 million to establish the Earl Bakken Chair in Biomedical Engineering, recently filled by Dr. Frederick H. Silver, former director of the joint biomedical engineering program at Rutgers University and Robert Wood Johnson College of Medicine in New Jersey. Earl Bakken privately donated \$500,000 to support four M.D.-Ph.D. students each year, saying "Our industry needs the biomedical engineers that will come out of the Center, because we're going to be facing a critical shortage in the near future."



Above: Earl Bakken at work in his Medtronic repair shop where he invented the external pacemaker conceived by Dr. Lillehei.

Left: A photo from the March 4, 1961 Saturday Evening Post, showing Dr. Lillehei examining David Williams, who was wearing the external pacemaker while recovering from heart surgery.



Top Ten Institutions in Total Research and Development Spending

	Fiscal 1990			
	U.S. Funds for Research & Development		Total Funds for Research & Development	
	Amount	Rank	Amount	Rank
Johns Hopkins University	\$599,851,000	1	\$668,915,000	1
Massachusetts Institute of Technology	233,813,000	3	311,767,000	2
University of Michigan	180,456,000	6	310,578,000	3
University of Wisconsin, Madison	178,862,000	7	309,841,000	4
Stanford University	251,446,000	2	305,700,000	5
Cornell University	171,249,000	9	300,144,000	6
University of Minnesota	143,810,000	14	292,046,000	7
Texas A&M University	93,001,000	27	272,800,000	8
Pennsylvania State University	136,656,000	15	256,926,000	9
University of California, Los Angeles	164,442,000	10	246,795,000	10

NOTE: Figures cover only research and development expenditures in science and engineering, and exclude spending in such disciplines as the arts, education, the humanities, law, and physical education.

Source: National Science Foundation

Honeywell/W.R. Sweatt Lectures in Technological Leadership

Mildred Dresselhaus, Institute Professor at the Massachusetts Institute of Technology, delivered the first of the 1992 series of Honeywell/W.R. Sweatt Lectures in Technological Leadership on March 12. Speaking on "Mutually Beneficial Partnerships Between Universities, National Laboratories, and Industry," she



addressed recent changes in research partnerships from her perspective as a physicist, educator, and advisor to federal agencies and corporations. The lecture series is sponsored by the Center for the Development of Technological Leadership in the Institute of Technology.

Dresselhaus called the 1980s a watershed in terms of increased global competition in high technology industries, as other countries emulated the United States and became competitive and even surpassed U.S. industry in certain technologies. "U.S. universities then began to meet new challenges; up until this time it was good enough to be pre-eminent in teaching our graduate courses, where we put our main emphasis, and in turning out classic research. That was not enough, and there were those who thought that universities should help industry become more competitive. As a result the life of a university professor has become somewhat schizophrenic," with many facing the need to balance teaching, research, and working with industry, she said.

At the same time, national laboratories were completing the missions that were the reason for their existence, and they faced the need for new strategies and goals. That again led to a demand for a more applied research orientation, and for more transfer of technology to industry.

"So all three sectors were looking for change. What can we do to maintain our competitive position? I think the kind of business we'll have to do will involve forming new partnerships, and I'm quite optimistic that we'll be able to accomplish a great deal by looking at what the problem is and trying to solve it."

Dresselhaus outlined several changes she sees contributing to this effort:

Dresselhaus outlined several changes she sees contributing to this effort:

- "If the fruits of basic research are going to reach industry, it's going to have to be through some kind of partnership," which will involve universities as well as some kind of role for the national laboratories.
- "As for applied research, which is what I do in solid-state physics, industry cares about we do and there's much more of a partnership already established." Universities should also be playing a role by trying to

translate what they've found in basic and applied research that might be useful to companies. "This is a very important interface."

- "I think that to be successful as an industrial leader, it is important for the manager to have both intimate and detailed knowledge of the technical issues as well as the management issues. What we do in universities by and large is we train one or the other, we don't train people with both of these skills. Probably the correct order for doing this is to train the technical one first, [have the person] spend a few years getting to be pretty good at it, and then if the person has the talent, interest and opportunity," to provide management training.
- "In the university sector, we have to change faculty attitudes. I think faculty have to get more sensitive about the importance of teaching. It isn't really enough to do world-class research. If we're not training our own people then we're not doing our duty to youth and to our country. Teaching is important and we have to accept that, and learn to enjoy it.
- "Faculty need to have more interest in the world around them. [Most faculty] have to learn more about what goes on in industry, and acquire some experience with it. The reason this is important is because we're teaching young people," and if we know what it's like in industry and what the problems and challenges are, then we can impart that to our students.

Dresselhaus concluded her lecture with a discussion of her experience with Japanese academic research exchanges in the development of new biomaterials.

The next two Honeywell/Sweatt lectures will be: **April 16**, Professor Donald Frey, Department of Industrial Engineering and Management Science, Northwestern University, "*The Founding Fathers are Dead—Long Live Schumpeter*"; and **May 14**, Professor Rias J. Van Wyk, Graduate School of Business, University of Cape Town, South Africa. Both lectures are at 4 p.m. in Room 3-210, Electrical Engineering/Computer Science Building, on the Minneapolis Campus.

W. K. Kellogg Foundation

An Agency Profile

The W.K. Kellogg Foundation was begun to "help people help themselves." It has established the following guidelines for its grantmaking activities.

The Foundation's current areas of activity are limited to the fields of agriculture, education, health, leadership and youth. Within those broad fields, nine grantmaking areas have been identified:

- Youth
- Leadership
- Philanthropy and Volunteerism
- Community-Based Health Services
- Higher Education
- Food Systems
- Rural Development
- Groundwater Resources
- Economic Development in Michigan

In addition, the following areas of interest are seen as sufficiently promising to warrant exploration and limited grantmaking in the immediate future. It will be decided whether these themes will become major parts of Foundation funding.

- Emergent Programming
 - Families and Neighborhoods
 - Human Resources for the Management of Information Systems

The Foundation concentrates its grantmaking in the United States, Latin America, the Caribbean, and southern Africa.

The Foundation assists education and service projects of potential national or international importance that emphasize the application of new knowledge in addressing significant human problems. There is a firm commitment to supporting projects which involve the physically handicapped, the elderly, women, children and youth, and minorities.

The Foundation funds research only as a part of a broader program of action to which assistance is provided, including investigation of the effects of the project's results. Funds may be provided for planning or studies but only when directly related to the development aspects of project implementation.

There are no application deadlines or application forms. Potential applicants are asked to submit a one- or two-page

preproposal letter that describes the basic problem and a plan for its solution. The letter should briefly explain project objectives, operational procedures, time schedule, and personnel and financial resources available and needed. If a proposal is within the Foundation's guidelines and interests, conferences and staff investigation may follow.

Preproposal letters should be addressed to: Executive Assistant—Programming, W.K. Kellogg Foundation, One Michigan Avenue East, Battle Creek, Michigan 49017-4058.

Council for International Exchange of Scholars

Fulbright Scholar Program

The Council for The International Exchange of Scholars has announced the 1993-94 competition for awards under the Fulbright Scholar Program for postdoctoral lecturing and research abroad. Each year over 1,000 Fulbright grants are awarded to U.S. faculty and professionals from literally every area of the humanities, social sciences, and the physical sciences, as well as from applied fields such as business and law.

- Faculty in all academic ranks, including emeritus, are eligible to apply;
- Duration of awards is from two months to an academic year; many assignments are flexible to the needs of the grantee;
- One-third of Fulbright grants are targeted for research, and many lecturing awards include research opportunities;
- Language skills are needed for certain countries, but most lecturing assignments are in English;
- Many offerings allow scholars to propose their own lecturing or research projects.

The application deadline for Australasia and South Asia is **June 15, 1992**. The deadline for Africa, Asia, Europe, Latin America and the Caribbean, Middle East, and Canada is **August 1, 1992**. Write or call: Council for International Exchange of Scholars, 3007 Tilden Street NW, Suite 5M, Box GPOS, Washington, DC 20008-3009; 202/686-7877; fax, 202/362-3442.

W.E. Upjohn Institute

The W. E. Upjohn Institute supports policy-relevant research on employment and unemployment at the national, state and local levels. Grants made under this program are expected to result in research of a rigorous nature and publication of a monograph by the Institute. Although the Institute encourages applicants to submit proposals that consider any policy-relevant issues related to employment or unemployment, the following are the topics of particular interest.

- **Earnings Replacement:** Studies to examine the impacts and effectiveness of earnings replacement programs, including unemployment insurance, workers' compensation, social security and other pension programs.
- **Structural Change and the Distribution of Earnings:** Studies to examine changes in the quality and quantity of jobs, the sources of those changes, the effects of those changes on different groups of workers, and public policy measures to reduce the costs of change and spur the growth of high quality jobs.
- **Family Employment Issues:** Studies that address the employment implications of the rise in female labor supply and single-parent households, i.e. studies that analyze both public and private sector initiatives in areas such as child care, parental leave, work time adjustment and fringe benefits.
- **Labor Relations and Organization of Work:** Studies that analyze recent changes in the organization of work, including flexible work schedules, part-time work, job sharing, remote worksites, and others, which challenge our traditional labor market institutions and policies.
- **Workforce Quality:** Studies of how firms and institutions improve the skills of the workforce, including productivity enhancement and improved competitiveness.
- **Economic Development and the Labor Market:** Studies of state and local economic development in the U.S.
- **International Comparative Research in Labor Markets:** Studies that draw on the experiences of a foreign country or countries to shed light on important labor policies in the U.S.

The maximum grant amount for 1992 will be \$45,000 although grants are often for less. An additional amount up to \$25,000 may be awarded to conduct surveys or assemble unpublished administrative data.

The next application deadline is **September 21, 1992**. Prospective applicants are encouraged to send brief descriptions of ideas prior to preparing a full proposal. Contact: Institute Grant Committee, W.E. Upjohn Institute, 300 South Westnedge Avenue, Kalamazoo, Michigan 49007-4686.

National Science Foundation

Graduate Research Traineeship Program

The National Science Foundation (NSF) announces a new program of Graduate Research Traineeships (GRT) beginning in 1992. The principal objective of this program is to increase the numbers of talented American undergraduates enrolling in doctoral programs in critical and emerging areas of science and engineering. The program is also intended to contribute to strengthening the human resource base in all geographical sectors among all underrepresented groups; the program will promote diversity with respect to both student and institutional participation.

Graduate Research Traineeship awards are packages of student support. The colleges and universities that receive the awards are responsible for the selection of trainees, retention of trainees, and administration of traineeships. The principal investigator designated in a GRT proposal will have overall responsibility for the administration of the awards and for discussions with NSF. This individual should be the department head, other senior officer, or faculty member who can represent the focus area and lead the effort toward achievement of the goals and objectives stated in the proposal.

Approximately 180 traineeship positions will be made in this competition on a fully-funded basis (i.e., up to a maximum of 5 years support per traineeship). Within each award, traineeships will provide initially a \$14,000/year stipend and a \$7,500/year cost-of-education allowance in lieu of tuition and fees normally charged to students of similar academic standing. A one-time \$3,500 per trainee project enhancement allowance to be directly matched by the institution will be provided in the initial year of an award.

Any university or other academic institution in the United States and its territories that awards a Ph.D. in a field of science or engineering normally supported by NSF is eligible to submit proposals. Only one proposal may be submitted by a department or comparable organizational unit within the institution. There is no limit, however, on the number of departmental units within an eligible institution submitting GRT proposals. Proposals must request a minimum of five traineeships. There is no limit on the maximum number of traineeships that may be requested in any individual proposal, or by all proposals submitted by an institution.

The application deadline is **May 15, 1992**. A complete copy of the announcement pertaining to this program is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Minnesota Humanities Commission

The Minnesota Humanities Commission (MHC) supports and conducts public programs in the humanities throughout the state. All MHC funded programs are based in one or more of the disciplines that constitute the humanities: history, literature, philosophy, archaeology, modern and classical languages, ethics, jurisprudence, comparative religion, linguistics, cultural anthropology, history and criticism of the arts, and those aspects of social and natural sciences that are historical or philosophical in approach.

The MHC competitive grant program provides support for public programs including lecture/discussion programs, panel discussion, conferences, symposia, discussion groups, seminars, interpretive exhibits, and film, video, radio, and print projects. In some cases, MHC awards grants for residencies by scholars in schools and for professional development for persons involved in humanities education.

If a project meets MHC requirements, application for a grant may be made in any of the following four categories:

Mini-Grants

Mini-grants provide up to \$300 in support of humanities projects. They are ideal for:

- First time applicants who wish to gain some experience with MHC procedures for applying for MHC funds in other categories;
- Projects that do not afford the six week lead time required in the other grant categories.

Mini-Grant applications may be submitted at any time.

Small Grants

Small grants provide from \$300 to \$1,000 in support of humanities projects. They are ideal for:

- Special occasion lectures, small panel discussions, and other single-site programs;
- Pilot programs illustrating the form, content, and feasibility of larger projects for which applicants plan to apply for funding in the general grant category.

Small grant applications may be submitted at any time during the year but must be received at the MHC office at least six weeks prior to the beginning of the proposed project.

General Grants

General Grants provide in excess of \$1,000 in support of humanities projects. While there is no fixed limit on the amount that may be requested, MHC does limit the number

of grants it makes over \$7,000 for single-site projects. General grants are ideal for:

- Multi-site projects, touring exhibitions, lecture/discussion series, public conferences, and other large-scale humanities projects.

General grant applications will be considered two more times this year at regularly scheduled board meetings. Applicants must allow six weeks from the date of the MHC meeting to the date of the first public program. Dates are:

Application Drafts:	April 3, 1992 August 7, 1992
Final Applications:	April 24, 1992 August 28, 1992
Commission Decisions:	June 5, 1992 October 2, 1992

Media Grants

Media grants are available for humanities projects which plan to use film or video formats. Applicants must submit a sample of previous work with the draft application. Draft applications are due **July 31, 1992**.

MHC staff members are eager to discuss possible projects at any stage of development. Contact: Minnesota Humanities Commission, 26 East Exchange Street, Lower Level South, St. Paul, Minnesota 55101; 612/224-5739.

Center for Indoor Air Research

The Center for Indoor Air Research awards Research Grants for scientific and technical research on sources, transformation, and fate of constituents affecting indoor air quality; on factors governing human exposure to and retention of those constituents; on the effects of those constituents on health, including exposure response relationships; and on methods of preventing or abating indoor air contaminant concentrations.

Current research priorities include: environmental tobacco smoke, including respirable particulate and vapor-phase components; chemical contaminants from all sources, organic and inorganic; and biological agents, including aero-allergens and aeropathogens.

Grants usually range from \$50,000 to \$200,000 per year. Letters of intent are due July 1; full proposals are due **July 31**. Contact: Lynn F. Kosak-Channing, Ph.D., Center for Indoor Air Research, 1099 Winterson Road, Suite 280, Linthicum, Maryland 21090; 301/684-3777.

American Heart Association

The National Office of the American Heart Association (AHA) has announced guidelines and deadlines for 1993-94. *Application forms may be obtained only from the agency by writing or calling:* Division of Research Administration, American Heart Association, 7272 Greenville Avenue, Dallas, Texas 75231-4596; 214/706-1453; Fax: 214/706-1341. Grant programs offered by AHA are:

Grant-In-Aid

The Grant-In-Aid award supports research activities broadly related to cardiovascular function and disease, stroke, or to related basic science, clinical and public health problems. Support is available for all basic disciplines as well as for epidemiological and clinical investigations that bear on cardiovascular problems.

The award offers \$40,000 yearly plus 10% overhead for a 3-year project; there is no salary for Principal or Collaborating Investigators. Applicants must have a doctoral degree. Proposals will be accepted from junior independent investigators and established investigators pursuing new areas of research.

The application deadline is **July 1, 1992**.

Clinician Scientist Award

The purpose of this award is to encourage promising clinically trained physicians to undertake careers in investigative science.

A \$40,000-\$44,000 stipend, plus fringe benefits, is offered for a minimum of 80% of time devoted to research for a five-year award period. Applicants, at time of application, must have not less than 2 years of clinical training and be less than 4 years beyond qualifying for subspecialty board certification.

The application deadline is **June 1, 1992**.

Established Investigator

The purpose of this award is to support promising scientists who have recently acquired independent status to ensure their continued success as investigators.

A maximum stipend of \$45,000, plus fringe benefits, including project support of \$6,000-\$10,000 per year for five years, will be offered, for a minimum of 75% time devoted to research. Eligible applicants must have 5 - 9 years postdoctoral research experience at time of application.

The application deadline is **June 1, 1992**.

International Research Fellowship

This award is to provide postdoctoral research training in U.S. and foreign research centers for individuals who are building cardiovascular research careers but who are not yet independent.

This is a 1-year award with an option to extend for an additional year. The stipend is \$25,000, plus fringe benefits and travel allowance. Arrangements with a sponsoring institution must be completed at time of application; a doctoral degree is required at time of activation.

The application deadline is **June 1, 1992**.

Medical Student Research Fellowship

This is an institutional award to attract promising medical students to careers in cardiovascular research. Students engage in full-time research for a period of one year prior to graduation.

This award is made to the institution; there may be only 1 application per medical school. The institution may award a maximum of 6 fellowships per year at a stipend of \$12,000 per fellow plus \$1,800 annually for trainee related expenses. This is not a scholarship for medical school academic credit.

The application deadline is **June 1, 1992**.

Minority Scientist Development Award

This award is intended to assist promising scientists who are members of ethnic groups underrepresented in the field of cardiovascular research to develop independent research programs. Junior faculty and clinical faculty seeking basic research training may apply.

This is a 5-year award comprising research training in preceptor's lab for 2 years and independent research for 3 years. The stipend is \$40,000-\$44,000 plus fringe benefits. At activation of award, applicants must have between 2-5 years relevant postdoctoral research experience.

The application deadline is **June 1, 1992**.

National Institute of Mental Health

The National Institute of Mental Health (NIMH) has announced three Requests for Applications (RFAs) with a general heading of Mental Health Clinical Training Grants.

Mental Health Clinical Training Grants:

Individual Faculty Scholar Award (RFA MN-92-06)

The purpose of this award is to develop a cadre of academically based faculty scholars who will guide the training of professionals in the core mental health disciplines (psychiatry, social work, psychology, psychiatric nursing, and marriage and family therapy) and who will play major leadership roles in the continued development of their professions. The mechanism of support is the NIH Graduate Training Programs Grant (T01).

On behalf of a qualified nominee, an application may be submitted by an academic department or professional school in a U.S. college, university or nonprofit mental health training institution.

Up to four awards will be made, each not to exceed \$117,000 total costs per year. The application receipt date is **April 24, 1992**

Professional Training Addressing Severe Mental Disorders (RFA MH-92-07)

This program is designed to recruit and prepare mental health professionals in the core mental health disciplines (as listed above). The purpose of the program is to enhance the quality and effectiveness of services to persons with major mental disorders, specifically: 1) severely and persistently mentally ill adults with illnesses such as schizophrenic disorders or mood disorders, including homeless persons with these disorders; 2) seriously emotionally disturbed children and adolescents; 3) elderly persons with mental disorders; 4) individuals with mental disorders in rural areas; 5) racial/ethnic minorities with mental disorders.

The mechanism of support is the NIH Graduate Training Programs Grant (T01). Applications may be for predoctoral and/or postdoctoral training. It is expected that up to 10-16 awards will be made, each not to exceed \$80,000 total costs per year. The application deadline is **April 24, 1992**

Professional Training for Racial/Ethnic Minority and Disadvantaged Students (RFA MH-92-08)

This program is designed to support recruitment and education of racial/ethnic minority and disadvantaged students to become professionals in the core mental health disciplines

(as listed above). Currently minorities represent less than 10% of mental health professionals. The needs to increase the numbers of racial and ethnic minority mental health professionals is clear so that they may not only serve their own communities but also contribute to improving the overall quality of the mental health system.

The mechanism of support is the NIH Graduate Training Programs Grant (T01). It is expected that up to 10-16 awards will be made, each award not to exceed \$80,000 total costs per year. The application deadline is **April 24, 1992**.

Prospective applications are strongly encouraged to consult NIMH staff regarding eligibility and assistance in developing all applications. Complete copies of the RFAs are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

National Science Foundation

Research Program in Hydrologic Sciences

The President's Budget Request for FY93 includes a request for \$2.5 million to begin a new basic research program in hydrologic sciences at the National Science Foundation (NSF).

The new program, to be located within NSF's Division of Earth Sciences, will provide funding for basic research dealing with the Earth's hydrologic cycle and the role of water on and near the continental surfaces of the Earth.

Research proposals relating to water in the form of precipitation, lakes, streams, and groundwater, and their interactions with landforms, climate, weather, the biosphere, and the Earth's crust will be eligible for submission to the new program. Where appropriate, research proposals will be considered for joint review and possible joint funding with other NSF programs including those in Engineering, Biotic Systems and Resources, Atmospheric Science, and Polar Programs.

Subject to appropriation of funds by Congress, it is expected that the new program will establish proposal deadlines of **June 1 and December 1, 1992**.

For further information about the program, about procedures for proposal submission, and about opportunities to serve as program officer or proposal reviewer, contact: James Hays, Division Director, Division of Earth Sciences, National Science Foundation, Washington, DC 20550; 202/357-7958; fax: 202/357-0364; E-mail: jhays@nsf.gov.

Faculty Research, Training, and Service Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please send the pertinent data, as listed below, to Michael Moore at ORTTA.

Proposal and Award Summary		
	Number	Amount
Proposals Submitted		
February, 1992	520	\$ 93,258,446
Awards Processed		
February, 1992	212	14,648,076
Proposals Submitted		
July, 1991 - February, 1992	2,884	470,947,967
Awards Processed		
July, 1991 - February, 1992	2,053	172,335,643
Proposals Submitted		
July, 1990 - February, 1991	2,466	345,238,603
Awards Processed		
July, 1990 - February, 1991	1,977	156,391,502

Evaluation of the Improving the Quality of Hospital Care Program

Ira S. Moscovice, Health Services Research & Policy
Nicole Lurie, Public Health

Robert Wood Johnson Foundation
\$681,280 - 02/92-01/97

Editorial Office-Biophysical Journal

Victor A. Bloomfield, Biochemistry (CBS)

Biophysical Society
\$450,000 - 01/92-12/94

Pharmaceutical Services to Minnesota Correctional Facilities

Richard L. Kingston, Pharmacy Practice

St of MN - Department of Corrections
\$294,700 - 10/91-06/94

Effects of Forest Changes in Biodiversity of Forest Birds

Gerald Niemi, Academic Administration, UMD
David Mladenoff, Natural Resources Research Institute, UMD

St of MN - Department of Natural Resources
\$278,754 - 07/91-06/93

Mercury Reduction in Sport Fisheries Using Micronutrients

George R. Rapp, Jr., Science and Engineering, UMD

Legislative Commission on Minnesota Resources
\$175,000 - 07/91-06/93

Development of a Bioartificial Liver for Human Application

Frank B. Cerra, Surgery
Wei-Shou Hu, Chemical Engineering and Materials Sciences
Rory P. Rimmel, Medicinal Chemistry

Endotronics, Inc.
\$150,000 - 01/92-12/92

Behavior-Based Control for Autonomous Tending of Manufacturing

Max Donath, Mechanical Engineering
Subbiah Ramalingam, Mechanical Engineering

NSF
\$150,000 - 02/92-07/93

Effect of Dose Prolonged Release Somatotropin on Lactation

Brian Crooker, Animal Science
Donald E. Otterby, Animal Science

Upjohn Company
\$142,651 - 12/91-06/93

Phase Transformations in Crystalline Ceramic Oxides

C. Barry Carter, Chemical Engineering and Materials Science

NSF
\$140,000 - 01/92-12/92

Use of Polymerized Crumb Rubber in Hot-Mix Asphalt

David E. Newcomb, Civil & Mineral Engineering
Andrew Drescher, Civil & Mineral Engineering

St of MN - Department of Transportation
\$130,000 - 01/92-01/94

Molecular Genetics of Polyketide and Fatty Acid Syntheses

David H. Sherman, Biological Process Technology Institute

NIH, NIGMS
\$129,031 - 01/92-12/92

Prepubertal Gonadectomy in the Cat: Effect on Health and Obesity

Shirley D. Johnston, Small Animal Clinical Science
Patricia N. Olson, Small Animal Clinical Science

Ralston Purina Company
\$127,660 - 11/91-09/93

Effects of Somatotropin and Dietary Fat on Energy Balance

Brian Crooker, Animal Science
Donald E. Otterby, Animal Science

Dennis G. Johnson, West Central Experiment Station, Morris
Upjohn Company
\$124,716 - 11/91-11/93

Assessment of the Federal Role in Growth Management

Charles R. Blinn, Forest Resources
Beth Walter Honadle, Management Operations
Elizabeth E. Templin, Agricultural and Applied Economics

U.S. Department of Commerce
\$117,149 - 10/91-06/92

Supercritical Phase Separation in Ridge Crest Hydrothermal System

Michael E. Berndt, Geology & Geophysics
William E. Seyfried, Geology & Geophysics

NSF
\$108,023 - 10/91-09/93

Improving Environmental Science Education Among K-6 Teachers

Judith Kuechle Olson, Elementary & Secondary Education, Morris
St of MN - Higher Education Coordinating Board

\$26,489 - 10/91-12/92

Study of Nonprofit Governance in Minneapolis - St. Paul

Joseph J. Galaskiewicz, Sociology

Yale University
\$18,250 - 01/92-10/92

Fundamental Studies in Polyurethane Recycling

Chris Macosko, Chemical Engineering & Materials Science

Dow Chemical Company
\$50,000 - 07/91-12/92

Structure Determination and Synthesis of Macrolactin A

Scott Rychnovsky, Chemistry

NIH, NCI
\$72,055 - 02/92-01/93

Faculty Awards for Women Scientists and Engineers

Catherine E. French, Civil & Mineral Engineering

NSF
\$50,000 - 11/91-04/93

Simulation of Dynamically Loaded Pavement

Henryk K. Stolarski, Civil & Mineral Engineering
David E. Newcomb, Civil & Mineral Engineering
St of MN - Department of Transportation
\$40,000 - 01/92-06/93

Intelligent Query Processing in FADB's

Jaideep Srivastava, Computer Science
Honeywell, Inc.
\$38,251 - 09/91-09/92

Multiscale and Multigrid Information Representation Extraction

Ahmed H. Tewfik, Electrical Engineering
USDOD - Air Force
\$28,388 - 02/92-01/93

Effect of Counter Flow on the Stability and Mixing of Variables

Paul J. Strykowski, Mechanical Engineering
American Chemical Society-Petroleum Research Fund
\$18,000 - 03/92-08/94

Application of the Methane Gas Tracer Technique to Measure Reaeration at Low Head Corps of Engineers Structures

John S. Gulliver, St. Anthony Falls Hydraulic Lab
USDOD - Army
\$29,784 - 01/92-01/93

Correlated Electron Transport on One-Dimensional Channels

Leonid Glazman, Theoretical Physics Institute
Boris Shklovskii, Physics and Astronomy
NSF
\$61,000 - 02/92-07/93

Commercial Vegetable Production

Gary C. McVey, Northwest Experiment Station, Crookston
Northwest Minnesota Initiative Fund
\$8,000 - 01/92-06/92

Lower Nitrogen Applications: Implications for Farm Profits

Richard A. Levins, Agricultural and Applied Economics
Environmental Law Institute
\$10,000 - 01/92-03/92

Canola Meal in Turkey Diets

Paul E. Waibel, Animal Science
Sally L. Noll, Animal Science
Canola Council of Canada
\$24,100 - 01/92-12/92

Wild Rice Hull Antioxidants

Paul B. Addis, Food Science and Nutrition
Richard J. Epley, Animal Science, Food Science & Nutrition
Agricultural Utilization Research Institute
\$80,000 - 03/92-02/93

Functional Studies of Lectin-Like Receptors on NK Cells

Jeffrey Houchins, Laboratory Medicine & Pathology
American Cancer Society
\$73,599 - 02/92-01/93

Quantitative Histochemistry of Purkinje Cell Metabolism

Keith Lurie, Medicine
NIH, NHLBI
\$34,802 - 01/92-03/92

Transgene Expression of Embryonic Acetylcholine Receptor

Christopher Gomez, Neurology
NIH, NIGMS
\$81,001 - 01/92-12/92

Alcohol, Cell Membranes, and Signal Transduction in Brain

Wellington G. Wood, Pharmacology
ADAMHA, NIAAA
\$17,500 - 01/92-12/92

Pilot Study of DSG in Combined Kidney/Islet Transplantation

Paul Gores, Surgery
David E. Sutherland, Surgery
John S. Najarian, Surgery
Bristol Myers Company
\$30,000 - 01/92-01/94

Young Investigator Award

Timothy S. Wiedmann, Pharmaceuticals
American Assoc of Pharmaceutical Scientists
\$10,000 - 09/91-08/92

Enhancing Carbohydrate Transport in Microorganisms

Robert Brooker, Biological Process Technology Institute
Minnesota Technology, Inc.
\$21,477 - 01/92-06/92

Effects of Chronic Ethanol Feeding on Neutrophils

Martha A. Mellencamp, Large Animal Clinical Sciences
ADAMHA, NIAAA
\$54,626 - 02/92-03/92

Development of an Elisa Test to Predict the Carrier Status of Salmonella Choleraesuis Infected Swine

Robert A. Robinson, Clinical and Population Science
Kakambi, V. Nagaraja, Veterinary Pathobiology
Sagar M. Goyal, Veterinary Diagnostic Medicine
Minnesota Pork Producers Association
\$24,000 - 11/91-06/93

Mentoring Model to Enhance K-8 Mathematics Teachers

Peggy A. House, Curriculum & Instruction
St of MN - Higher Education Coordinating Board
\$33,336 - 10/91-12/92

Automating Instructional Design, Development and Delivery

Robert Tennyson, Educational Psychology
NATO
\$25,150 - 03/92-02/93

Discourse Training, Consultation and Support Project

Stanley L. Deno, Educational Psychology
Steven L. Robinson, Educational Psychology
Interactive Communication Systems, Inc.
\$35,750 - 07/91-06/92

Summer Education Experience, 1992

William Stewart, Minority Student Program; Morris
Joseph J. Latterell, Science & Mathematics, Morris
St of MN - Higher Education Coordinating Board
\$13,011 - 10/91-12/92

Wastepaper Sludge and Fly Ash Pelletizing Studies

Harold E. Goetzman, Natural Resources Research Institute, UMD
Rodney L. Bleifuss, Natural Resources Research Institute, UMD
Greengrove Corp
\$33,500 - 11/91-06/92

PCBs, Pesticides and Dioxins in Environmental Samples

Donald P. Poe, Chemistry, UMD
St of MN - Pollution Control Agency
\$25,000 - 12/91-10/92

Microbial Regulation of Sediment Toxicity: Interactions Between Sediment Contaminants and Bacterial Processes

J.P. Schubauer-Berigan, Center for Water & Environment, UMD
U.S. Environmental Protection Agency
\$30,000 - 02/92-01/94

The Sponsored Project Information Network (SPIN) is a computerized locator system of funding opportunities (federal, nonfederal, and corporate) for faculty and institutional research, development, and education program support. It is available free of charge to University faculty and staff through ORTTA.

Based on a description of your research areas and / or the type of support sought, faculty and staff can search the SPIN Keyword Index to identify sources within specific areas of interest. The Keyword Index, a taxonomy developed by SPIN to catalog funding sources, is divided into the following ten major classifications:

- Agriculture / Food / Forestry
- Arts / Culture / Humanities / Communications
- Business / Economics / Management
- Education
- Health / Medical Sciences
- International Affairs / Area Studies
- Miscellaneous / Other
- Science / Technology
- Social / Behavioral Sciences
- Social Welfare / Public Affairs

The result of a search is a set of profiles of applicable funding sources that provides: 1) the sponsor's name; 2) the sponsor's contact address and telephone number; 3) deadline dates; 4) program titles; 5) objectives or interest areas of the sponsor; and 6) restrictions that would affect the submission of a proposal. This set of profiles is sent to the requestor.

Effective September, 1990, the SPIN indexes became available for on-line review through ORTTA's Electronic Bulletin Board (See the September, 1990 *Research Review* for information on Bulletin Board contents and access instructions—or call 624-9004 for a copy of the instructions.) The Bulletin Board contains a section devoted to SPIN and offers users the opportunity to review the Keyword Index alphabetically or within the topics shown above.

Since the Bulletin Board is accessible at any time, faculty and staff can browse the indexes at their convenience and find *keyword codes* of interest to them. From within the Bulletin Board they can forward a note to the Bulletin Board Editor requesting a SPIN search based on the chosen keyword codes (limit, 20 keywords).

Additional **Specialty Codes** used by SPIN that may help in choosing key words appropriate to the project for which funding is sought are:

- | | |
|-----------------------------------|--|
| International Travel | Opportunities to travel to countries or to study their cultures. |
| Opportunities Abroad | Support to travel identified by country, region or continent. |
| Equipment/Facility Support | Use code that relates to project, not what is being purchased. |
| Professional Development | Largely Postdoctoral opportunities. |
| Student Support | For students seeking external funding support. |
| Foreign Scholar Support | Bringing foreign scholars to this country or seeking programs in the U.S. for which they are eligible. |
| Conference Support | Funding to hold or conduct a conference, symposium, or workshop. |
| Publication Support | Support to prepare or complete a work or for actual cost of publishing a completed work. |
| Sabbatical Support | To undertake or supplement sabbatical leaves. |

For further information regarding the SPIN system, please contact ORTTA at 624-9004.

SPIN searches are also available through the Research and Development Office in the College of Liberal Arts, the Agricultural Experiment Station, the Research Support Office at Duluth, and the Grants Development Office at Morris.

Office of Research and Technology Transfer Administration

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- To Add/Delete/Change a faculty name on this list, departmental officers must submit a Staff Directory Card to Administrative Information Services (AIS). (AIS labels are characterized by a string of numbers above the name.)
- Please check with your departmental office or AIS (624-9000) if you need assistance.

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 - b) staff; and
 - c) off-campus
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RESEARCH REVIEW

Research and Technology Transfer Administration

May, 1992

Senator Durenberger and Dr. Bernadine Healy Visit Campus

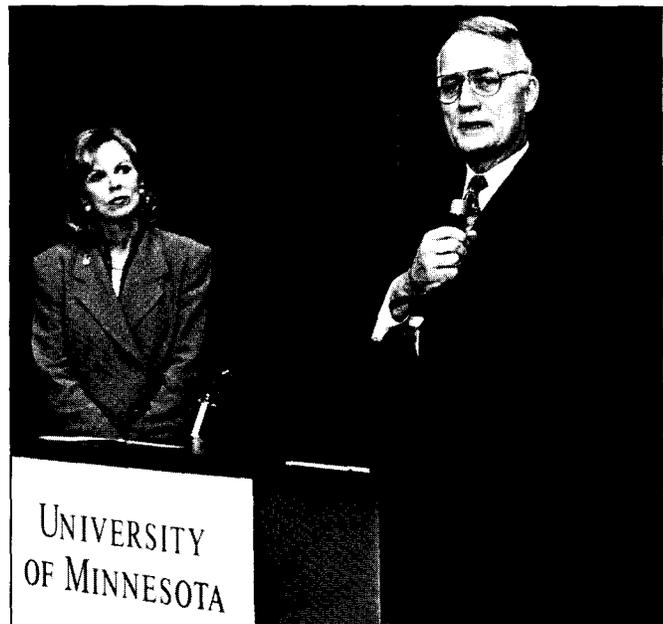
On April 24, Senator David Durenberger and Dr. Bernadine Healy, Director of the National Institutes of Health, paid a brief visit to the Health Sciences at the University of Minnesota. This is a partial transcript of their remarks and answers to questions posed during their visit. Dr. Robert Anderson, Vice President for Health Sciences, served as moderator.

Senator Durenberger: I hope you know the pride with which I welcome Dr. Healy to be with us here this morning in a project shared by all Minnesotans and by everyone who represents you. This is a difficult time to talk about health policy; I'm not going to make a health policy speech. I've been making them all over the state of Minnesota lately, while the Health Right has been progressing through the legislature. Let me just say that probably never, at least in my lifetime, has what you do for the rest of your society been more needed, nor has it been more challenged, principally in the way that it is done. I represent an institution which for many years has been lacking the capacity to meet today's needs with today's resources, or to plan for tomorrow's needs today. We are a federal government that is currently four trillion dollars in debt; we this year are spending 315 billion dollars servicing that debt. That's larger than we spent on defense in any of the biggest years of defense.

So it's very difficult for me, having made that kind of a commitment to yesterday's expenditures, to come here and say 'I want to introduce to you the head of an institution that only gets nine billion dollars a year to invest in people like you, not only in my state but all over this country. But I'm going to do it anyway because I'm so proud of her.

I am pleased with the fact that the President selected Dr. Healy just exactly a year ago to take over the National Institutes of Health. I'm sort of even pleased with all the

Healy, Continued On Page 20



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Change in Indirect Costs

Minor changes have been made in the Indirect Cost Agreement. Effective immediately, the *rate agreement date* is **February 6, 1992**. In addition, the Research Rate for SAFHL is **58.05**, and for the Hormel Institute it is **44.0**. These changes are reflected in the chart at right.

National Science Foundation

Duplicate Proposal Submission Policy

After June 1, 1992, proposals submitted to programs within the Directorate for Biological Sciences (BIO) of the National Science Foundation (NSF) *cannot be duplicates of proposals submitted to any other federal agency* for simultaneous consideration.

The only exception to this policy is proposals from beginning investigators who need to explore all opportunities for launching support of their research careers.

Submission of distinctly different proposals by the same investigator to NSF and to other agencies would not be affected, and in fact is desirable, taking into account the program interests of different agencies.

RESEARCH REVIEW

Volume XXI/Number 11

May, 1992

Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, creed, color, sex, marital status, national origin, disability, public assistance status, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/92-6/30/94 rates should be used. **The rate agreement is dated February 6, 1992.** This date should be used where required on proposal applications. **Please call Marilyn Surbey at 624-4850 with questions on Indirect Costs.**

	07/01/91 06/30/92	07/91/92 06/30/94
Research		
On-Campus	40.00	40.00
Off-Campus *	21.00	21.00
SAFHL	60.00	58.05
Hormel	53.00	44.00
Other Sponsored Activity		
On-Campus	20.00	20.00
Off-Campus *	10.00	10.00
Instruction		
On-Campus	52.00	52.00
Off-Campus *	16.00	16.00

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call **Vivian Fickling at 624-2009**.

Current actual rates from July 1, 1991 through June 30, 1992 are:

Faculty	28.75
Civil Service	25.25
Graduate Assistants	8.50

For proposals being submitted with start dates **after July 1, 1992**, the estimated fringe benefit rates to be budgeted are:

Faculty	31.25
Civil Service	29.50
Graduate Assistants	10.50

Estimated rates after **July 1, 1993** are:

Faculty	28.00
Civil Service	30.50
Graduate Assistants	31.25

As rates change they will be reflected in this section.

Promoting the FACTS of Animal Research

The idea came to a group of University of Minnesota neuroscience students frustrated by misinformation disseminated by animal rights groups: organize a group of science students to educate the public about the benefits of animal research and how that research is carried out as humanely as possible. As the idea took shape, their mission expanded to include supporting researchers individually targeted by protesters, coordinating the scientific community in responding to attacks and misinformation, and helping to interest young people in science careers. The name they adopted, FACTS, stands for Focus on Animal Contributions To Science, which is what they've been doing since January of 1991.

FACTS President Elizabeth Jansen, a graduate student in neuroscience, says she and her fellow students grew tired of seeing misinformation go unquestioned in the media. "You can't fault the public for not understanding what really goes on in laboratories, because often all they see is the publicity generated by animal rights protesters."

As a first step in countering that imbalance, FACTS organized a Research Awareness Week at the University in April 1991, immediately preceding the week in which animal rights organizations stage demonstrations annually around the world. "We got a very positive response, both from the University community and the media. WCCO TV did a *Dimension* series report on us, and Minnesota Public Radio and KUOM also did reports. Our experience has been that the media are eager to cover both sides of the story, but it's been hard for them to find people in the scientific community who are willing to step forward and talk about the need for humane animal research," Jansen says.

Public opinion polls have consistently found that a large majority of Americans support the need for animal research, but that many individuals harbor doubts about how humanely research animals are treated. A recent poll in Maryland by the organization Research!America, for example, found that 82 percent believe the use of animals in research is necessary for medical progress, but that only 47 percent believe that such animals are treated humanely.

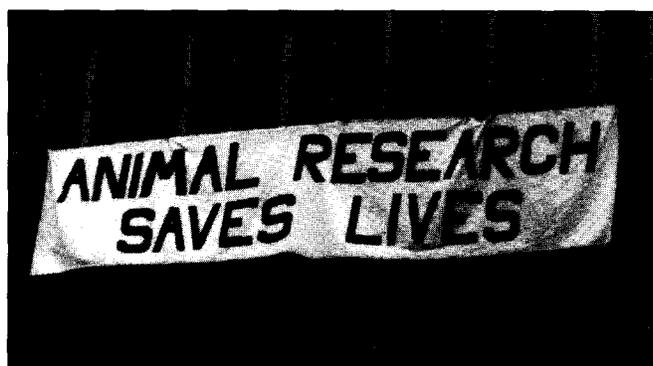
To answer those reservations, FACTS members describe how animal research is regulated and reviewed when they talk to the media, and through literature offered to the public. "We aren't interested in forcing our views on anyone," Jansen says. "We just want to help people get the facts so

they can make an informed decision, and so they understand the difference between animal welfare and animal rights. Most scientists are proponents of animal welfare, and many—including some of our members—are working on alternatives to using animals. But the fact is that it is just not possible yet to do the necessary research without animals."

FACTS has stepped up its efforts in 1992, sponsoring an expanded series of events during two weeks from April 13 through April 24. The group cosponsored a reception and lecture April 13 by Brenda O'Connor, regional director of the National Association for Biomedical Research, titled "Can Animal Rights Activists Set the Agenda for Biomedical Research." FACTS also sponsored a lecture April 21 by Dr. James Giordano, assistant professor of pharmacology at Drake University, titled "Animal Rights and Wrongs: New Vistas on Ethical Issues in Animal Research." Research

Awareness Week activities also included FACTS information booths in the Health Sciences complex, at Coffman Union, and at the St. Paul Student Center, and placement of a banner across the Lyons Laboratory building facing Washington Avenue, which read "Animal Research Saves Lives."

So far the financial support for FACTS activities has come mostly from individuals who donate \$20 in exchange for a FACTS t-shirt, and from a \$500 grant from the Graduate and Professional School Association of the University Council on Graduate Students. Jansen says the group is looking for all the moral and financial support it can get. "We think we have a unique viewpoint as students who can speak knowledgeably but without being perceived as defending something we've been part of for a long time. We are willing to take on the public speaking and media relations that need to be done to get the facts out, not just about animal research, but to tell young people what science careers are really like."



Committee on the Use of Human Subjects in Research

Class Protocols for Research Methods Courses

Courses in research methods or class assignments that involve research with human subjects should be reviewed and approved by the Committee on the Use of Human Subjects in Research prior to initiation of the research tasks. While the class exercise may not fit the standard definition of research in the sense that the results are not intended for publication or for generalization to other situations, the potential for risk to subjects who participate in research class exercises requires that the protocol and consent information be reviewed by the Committee.

When the overall objective of a class assignment is to learn about how research projects are designed and conducted and data analysis will occur for learning purposes only, a request for approval for a "Class Protocol" should be filed with the Committee office. The objective is to ensure that the class assignment includes appropriate precautions for protecting the human subjects involved in the class exercise. Given the scope and nature of the assignments, the Committee may require minor modifications in subject population or topic areas for the research to ensure protection of human subjects, i.e., very ambitious projects or projects involving sensitive topics and vulnerable populations are not suited to class exercises.

Projects are approved with the understanding that all students participating in the class exercise will conduct similar research projects.

Independent class projects, Senior theses, Undergraduate Research Opportunity Programs, Master's projects, etc., require independent submission for Committee approval by the student-researcher.

The Committee on the Use of Human Subjects in Research has granted approval for Class Protocols that continue along the same theme for subsequent quarters or are offered numerous times during the academic year. Annual updates are required to ensure that the approved guidelines are maintained.

Sample

A sample "Class Protocol" submitted for a psychology course series involves approval for a cluster of independent projects conducted by the students in the course series. The course is offered several times per year by different mem-

bers of the department faculty. In this case, students complete Committee applications forms and submit them to their instructors for review and approval to ensure that the proposed projects are in keeping with the following terms:

- Student projects will be reviewed by course Faculty (projects will be closely supervised as they are developed);
- Students will draw research subjects from the student population. (If student extra credit points are awarded, a faculty member involved will determine the appropriateness of points awarded for time spent ratio);
- Student projects will not involve any personal, sensitive or incriminating topics or questions which could place subjects at risk;
- Projects will not manipulate behavior of students beyond the range of "normal" classroom activity or college life;
- Projects will not involve physically invasive contact with the subjects.

The approval for the class series has been extended to other instructors offering the same course design, with written assurance that the above noted guidelines are in effect.

Any individual student project for this course that deviates from the approved class protocol will require individual submission to the Committee.

Questions

In some instances, faculty have incorporated a guest lecturer from the Committee on the Use of Human Subjects in Research to outline the general and practical concerns involved with research using human subjects. To schedule such a session, call the Committee office.

If you have any questions on class protocols or other areas regulated by the Committee on the Use of Human Subjects in Research, please call Moira Keane at 624-1889.

Honeywell/Sweatt Lecture:

“The Founding Fathers Are Dead - Long Live Schumpeter”

Why are so many U.S. corporations in turmoil, seemingly unable to compete effectively in a world in which whole new industries and industrial practices are swept in and out with the technological tide? Because too few American industrialists have heeded the words of Austrian economist Joseph S. Schumpeter (1880-1950), asserted Donald Frey April 16 in the second of this year's Honeywell/Sweatt series sponsored by the Center for the Development of Technological Leadership.

Frey is a professor in the Department of Industrial Engineering & Management Science at Northwestern University's McCormick School of Engineering and Applied Sciences. Before joining academia, he spent 17 years at Ford Motor Company as a research manager and as project manager for the Ford Mustang. In the 1970s he became C.E.O. for Bell and Howell Company, where he introduced an early CD-ROM data base information system and built the first integrated manufacturing plant in the United States for videocassettes.

In explaining the title of his lecture, Frey said that the founding fathers of our great corporations had a vision and an ability to create new products and to build stable businesses which they maintained for decades. But they and their corporate management teams often became insulated from the real world, especially from the uncertainties and risks of the innovative process. They maintained great research and development laboratories, but not the innovative risk-taking behavior that got them started.

Frey gave several examples: “Kodak, with one of the world's finest research divisions, somehow missed the video age. IBM built worldwide success in main frame computers, but in its insulated internal world couldn't contemplate two things: that it would have to face competition in main frames, and that personal computers would soon sit on nearly every desk. The irony is that IBM was an early player in the PC business and had created a good low-cost product. But then the corporate bureaucracy took over and killed its real potential by making it a closed system.

“The Board of Directors of General Motors continued to reward the company's CEO even as it lost a point and one half of market share each year, and as the Japanese took over one third of U.S. auto sales and over one half of total production.” The GM situation reflects a pattern of responses by corporations that fail to compete in a changing world, Frey noted. First, there is denial: “It can't happen here because they don't know what we know.” Then there is slow realization that the competition is real and extremely competent: “Who are these guys?” Then comes fear and terror as the market share declines and there are no more

“Things will be better next year” speeches. This leads to panicked buying of other businesses, tax writeoffs, new strategies that lead to more writeoffs, and finally, if the cash lasts, the corporation might get back to some type of stability.

Schumpeter called his antidote to that pattern of decline “management of duality,” Frey said. The first part is what most business schools teach: how to successfully run a bureaucratic, mature company. The second part of the duality is what saves companies after the original line of products is no longer competitive. It requires reinvesting in the future by supporting the development of new products for new, often nonexistent markets, with all the intrinsic uncertainties, stresses, and failures that must be withstood until one or more successful products emerge. “In running the second half, management needs to assume the same chaotic, messy process of innovation that led to the founding of the company in the first place. There is no such thing as “The Idea”; multiple ideas must be tested and pursued to figure out which ones will work.”

Frey cited 3M as one of the U.S. corporations that has been able to continually reinvent itself by nurturing innovative R&D laboratories and by rewarding its employees for bringing good ideas to management.

Frey cautioned, however, that you can't plan the process of innovation and you can't predict how it will turn out, “but you have to go through it constantly or you end up with the corporate basket cases.” Frey pointed out the continuing role that chance and repeated failures before success have played in the history of innovation: Pasteur, when asked how he repeatedly came upon major discoveries that revolutionized industry, said that “Chance favors the prepared mind.” That is the business strategy which nurtures the innovative side of Schumpeter's duality, Frey said. It provides structure for the long-term research and development needed to expose weaknesses in new ideas and to be prepared for the chance event that launches a new product or industry.

Effective dual management leaders can impose a bureaucracy and short-term financial outlook on their existing business, while accepting a highly contingent world as the driving force for their innovative pursuits. In both sides, however, they do not insulate themselves from new ideas and solutions, no matter who they come from and whether they come from inside or outside the company. Frey cited a student's experience of discovering that a long-time em-

Lecture, Continued On Page 8

Licenses Negotiated

January - March, 1992

- 1. Titles: Family of Noise-Immune Logic Gates and Memory Cells
Complementary Noise-Immune Logic**

Purpose: Semiconductor circuit design to minimize hardware failures caused by electronic noise.

Licensee: Minnesota Semiconductor Design, Northfield, Minnesota - Exclusive License

Inventors: Raymond M. Warner, Jr., Electrical Engineering; Roger J. Gravrok, formerly Electrical Engineering
- 2. Title: Red Maple Tree Named Autumn Splre**

Purpose: A unique variety with upright, broad-columnar form, early autumn maturity, winter hardiness, excellent autumn leaf color, and absence of seeds.

Licensee: Handy Nursery Company, Portland, Oregon - Nonexclusive License

Inventors: Harold M. Pellett, Horticultural Science and Landscape Arboretum
- 3. Title: Apple Tree: Honeycrisp**

Purpose: A unique variety with fruit that ripens early and uniformly, stores well, and tastes sweet but tart, juicy and crisp.

Licensee: Willow Drive Nursery, Ephrata, Washington - Nonexclusive License

Inventors: David S. Bedford, James J. Luby, Horticultural Science and Landscape Arboretum
- 4. Title: Apple Tree: Honeycrisp**

Purpose: A unique variety with fruit that ripens early and uniformly, stores well, and tastes sweet but tart, juicy and crisp.

Licensee: New York Fruit Testing Cooperative Association, Geneva, New York - Nonexclusive License

Inventors: David S. Bedford, James J. Luby, Horticultural Science and Landscape Arboretum
- 5. Titles: Polypeptides with Fibronectin Activity
Polypeptides with Laminin Activity
Bandage Comprlsing a Fibrous Surface Coated With Polypeptides with Type IV Collagen Activity
Polypeptides with Type IV Collagen Activity
Prosthetic Devices Coated with Polypeptide Type IV Collagen Activity
Synthetic Polypeptides with Type IV Collagen Activity
Polypeptide with Type IV Collagen Cell Adhesion, Spreading & Motility Activity**

Purpose: To improve biocompatibility of medical implants and to aid in wound healing.

Licensee: Sentron Medical, Inc., Cincinnati, Ohio - Exclusive License for orthopedic and dental applications.

Inventors: Leo T. Furcht, James B. McCarthy, Aristidis S. Charonis, Photini-Effie C. Tsilibary, Laboratory Medicine and Pathology; Mary K. Chelberg, Orthopaedic Surgery
- 6. Titles: Same as #5.**

Purpose: To improve biocompatibility of medical implants, to aid in wound healing, to assist nerve regeneration, and to prevent the spread of cancer.

Licensee: Sentron Medical, Inc., Cincinnati, Ohio - Option License for other fields of use

Inventors: Leo T. Furcht, James B. McCarthy, Aristidis S. Charonis, Photini-Effie C. Tsilibary, Laboratory Medicine and Pathology; Mary K. Chelberg, Orthopaedic Surgery
- 7. Title: Microbiological Agent for Thistle Control**

Purpose: A natural method of controlling Canadian thistle weeds.

Licensee: Mycogen Corporation, San Diego, California - Exclusive Option

Inventors: Donald Wyse, David R. Johnson, Agronomy and Plant Genetics
- 8. Title: Monoclonal Antibody Designated MCA-IV-1**

Purpose: A biological compound used in research.

Licensee: Duke University, Durham, North Carolina - Exclusive Miscellaneous Agreement

Inventors: Jon I. Scheinman, formerly Pediatrics
- 9. Title: Interactive Presentation Manager**

Purpose: To efficiently combine various media for coordinated presentation.

Licensee: Educational Multimedia Concepts, Ltd., Minneapolis, Minnesota - Exclusive Software License

Inventors: Richard Peifer, General Biology Program; Steven Fifield, Plant Biology; Timothy Sundell, Academic Personnel

10. Title: Monoclonal Antibodies to Unreduced, Nonenzymatically-Glycated Proteins

Purpose: A method of evaluating blood glucose levels over time in people with diabetes.

Licensee: Polymer Technology Systems, Zionsville, Indiana - Exclusive Option

Inventors: Leo Furcht, Laboratory Medicine and Pathology, Joseph Tarsio, formerly Laboratory Medicine and Pathology

11. Title: Monoclonal Antibodies to Unreduced, Nonenzymatically-Glycated Proteins

Purpose: A method of evaluating blood glucose levels over time in people with diabetes.

Licensee: Polymer Technology Systems, Zionsville, Indiana - Exclusive License

Inventors: Leo Furcht, Laboratory Medicine and Pathology, Joseph Tarsio, formerly Laboratory Medicine and Pathology

12. Title: Biodegradable Plastics Made with Starch from Agricultural Sources

Purpose: To improve biodegradability of plastic products.

Licensee: Environmental Technologies, Minneapolis, Minnesota - Exclusive License

Inventors: Mrinal Bhattacharya, Utpal Vaidya, Agricultural Engineering

13. Title: Septal Defect Closure Device

Purpose: A device to minimize cardiac surgery needed to close holes in chamber walls.

Licensee: Microvena Corporation, Vadnais Heights, Minnesota - Exclusive License

Inventors: Gladwin Das, Medicine

U.S. Patents Issued

January - March, 1992

1. Title: Radial Drive for Fluid Pump

Purpose: Device to propel fluid, such as blood, in a cardiac assist device.

Inventors: Frank D. Dorman, Mechanical Engineering

2. Title: Split-Gate Field Effect Transistor

Purpose: To decrease electron transit time and thereby speed operation of semiconductor devices.

Inventors: Michael S. Shur, Electrical Engineering

3. Title: Optically Nonlinear Aromatic Carboxylic Acid Complexes

Purpose: Crystalline compounds that can double the frequency of a laser beam emitted from optical mixers, oscillators, and modulators.

Inventors: Gayle Frankenbach, Margaret C. Etter, Chemistry

4. Title: Synthetic Polypeptides with Type IV Collagen Activity

Purpose: Polypeptides potentially useful for increasing implant biocompatibility, wound healing and nerve regeneration, and to inhibit the spread of cancer.

Inventors: Leo T. Furcht, Photini-Effie C. Tsilibary, Laboratory Medicine and Pathology

5. Title: Polypeptide with Type IV Collagen Cell Adhesion, Spreading and Motility Activity

Purpose: Polypeptides potentially useful for increasing implant biocompatibility, wound healing, nerve regeneration, and to inhibit the spread of cancer.

Inventors: James B. McCarthy, Photini-Effie C. Tsilibary, Laboratory Medicine and Pathology; Mary K. Chelberg, Orthopaedic Surgery

6. Title: Attachable Guide Ring for Dog Head Collars

Purpose: An improvement to the Gentle Leader™ dog halter.

Inventors: Robert K. Anderson, School of Public Health

7. Title: Red Maple Tree Named Autumn Spire

Purpose: A unique variety with upright, broad-columnar form, early autumn maturity, winter hardiness, excellent autumn leaf color, and absence of seeds.

Inventors: Harold M. Pellett, Horticultural Science and Landscape Arboretum

Patenting by Top 20 U.S. Universities in 1991

1.	Massachusetts Institute of Technology	105
2.	University of California	87
3.	University of Texas	83
4.	Stanford University	57
5.	University of Wisconsin	45
6.	University of Florida	44
7.	Cornell	41
8.	Iowa State University	38
9.	California Institute of Technology	36
10.	University of Minnesota *	31
11.	State University of New York	26
	Johns Hopkins University	26
13.	University of Michigan	22
14.	Washington University	21
15.	University of Pennsylvania	19
16.	University of Virginia	17
17.	University of Pittsburgh	16
	Rutgers University	16
19.	University of Tennessee	15
	Ohio State University	15

Prepared by Ronald T. Coslick, Jr. at the University of Buffalo, for the Association of University Technology Managers.

* The University of Minnesota ranked fourth in 1990 and 1988, and seventh in 1989.

ployee running a bottling system knew the way to prevent the line from crashing, yet no one listened to his ideas until the student came along and easily fixed the problem by following his advice. "Just ask somebody who might know, no matter who they are," Frey stressed. "It's called empowerment. There are plenty of people in companies with good ideas."

In a question and answer session after his talk, Frey noted that few corporations take good advantage of new technologies and ideas generated by university researchers, because most corporate leaders are technologically illiterate. "You don't have to be an engineer to make good technological decisions, but you do have to be willing to listen to the people who know technology, and to trust their judgment."

Frey also noted that universities do not do a very good job communicating with industry. He said this is an unexpected consequence of the postwar federal policy decision to support university research as a way to generate new technologies for the civilian economy. Federal agencies, run by academics with little contact with industry, soon were providing 90 percent of universities' research funds, crowding out industry funding and depriving faculty and students of contact with real-world problems and needs. This isolation from industry was exacerbated by the development of a reward system based on

academic publication which is unconnected to public industry and the economy. This is starting to change as faculty are consulting more for industry and involving their students in more internships and technology transfer activities, but both industry and universities have to change a great deal more to compete in the unstable world of technological innovation and worldwide competition, Frey said.

The third and final lecture in the Honeywell/Sweatt 1992 series will be by Rias J. van Wyk, Professor and Assistant Director of the Graduate School of Business, University of Cape Town, South Africa. His address is titled, "Towards Corporate-Wide Technological Literacy," and will be delivered Thursday, May 14, at 4 p.m. in 3-210 Electrical Engineering/Computer Science Building on the East Bank of the University of Minnesota.

Procedures Used to Create Objects on ORTTA Accounts

With the advent of "presence control," any documents that reach Disbursement Services to incur charges against objects that do not exist on that particular CUFS account will be returned.

All documents with this problem generated by departments on sponsored accounts will be returned by Disbursement Services to ORTTA, regardless of the dollar amount. ORTTA will return the documents to the appropriate department with a form requesting the information needed to set up the object. The department will provide the information requested and return the form with the documents attached. The ORTTA Grant Administrator (GA) will process the EB and ORTTA will retain a copy. The document then will be sent on to Disbursement Services. No copy of the EB or other notification will be sent to the department.

If the document in question has been initiated by an ISO or requires special handling, Disbursement Services will send the document or a copy of the document with a note to the Grant Administrator. If allowable, the GA will process an EB transferring funds from supplies or other unrestricted object, generally using 7300 or 7320 to cover the charge and establish the object code. The GA will return the document or the copy to Disbursement Services through ORTTA document delivery. If the object cannot be approved, the GA will mark the note with that information. Disapproved charges will be returned to the ISO or department by Disbursement Services and the ISO or department will be responsible for obtaining a valid account number and resubmitting the document.



Doris Preus, left, and Winifred A. Schumi at the retirement party held in honor of Mrs. Preus.

Women's Health Initiative

The 14-year, \$625 million National Institutes of Health (NIH) Women's Health Initiative is on its way.

At a presentation to the National Cancer Advisory Board, William Harlan, scientific director of the study, outlined the first phase of the project: a nine-year, multifaceted, randomized study of approximately 50,000 50-to-79-year-old post-menopausal women.

Initial funding of \$25 million will go for contracts to establish a coordinating center and 15 clinical centers to recruit participants, refine strategies and materials, conduct feasibility studies and develop protocols for the full study, which will expand the base to include 30 new clinical centers. The coordinating center contract has been awarded and RFPs for the 15 clinical centers are expected out soon.

The NIH Office of Research on Women's Health, headed by Vivian Pinn, was established in FY91 with a budget of \$1.8 million; it has an FY92 budget of \$10.5 million. Pinn's focus is to identify and increase research to fill gaps in knowledge in women's health, particularly in new and current issues. The office has no grant authority. Related research is funded and administered by the appropriate institute or center through the usual NIH peer-reviewed process.

From the Washington FAX

Doris Preus Retires

Doris Preus is retiring from the University of Minnesota at the end of May, having worked for the University since 1965 and for ORTTA since 1988.

Mrs. Preus was educated at Yale and Vassar. She began her career at the University in the Department of Zoology, working with electron microscope studies of cell membrane structures. She continued this work in the Department of Genetics and Cell Biology. As technology changed, she became more and more fascinated by computers and began shifting her professional orientation to computer assisted graphics and data management. In 1986, after a lapse in grant funding, she began working with computers in earnest—essentially changing her career when most people think about retirement. She ultimately assumed the responsibility as Coordinator for the Administrator Computer Group of the College of Biological Sciences.

At ORTTA, Mrs. Preus was part of the team that helped the department go from one computer to a network of 90; she had a major role in helping staff make the transition to computers, databases, and word processors. Her skill and patience in teaching endeared her to her colleagues. Mrs. Preus and her husband have retired to a farm in Wisconsin.

NIH Announces Minority Health and Research Initiative

A \$45 million Minority Health and Research Initiative based, in part, on the report of a fact-finding team on minority programs, has been unveiled by the National Institutes of Health (NIH).

The initiative was announced by Bernadine Healy, NIH director, in testimony before the House Appropriations Labor, Health and Human Services, Education, and Related Agencies Subcommittee in March.

The president's FY93 budget proposal asks an overall increase of 62.8% for a total of \$162 million for trans-NIH minority programs, which include—in addition to the Minority Health and Research Initiative—Minority Biomedical Research Support, Minority Access to Research Centers, Research Centers in Minority Institutions, the Research Apprenticeship Program for Minority High School Students, the Office of Minority Health, and the Minority Extramural Construction Program.

The fact-finding team, for the purposes of their report, identified four specific ethnic groups as minorities: African Americans, Hispanic Americans, American Indians, and Asian Americans.

The report takes into consideration the disparity of 60,000 "excess deaths" each year among blacks, compared to mortality rates among the country's majority population. It lists as the primary causes of these excess deaths: heart disease, stroke and hypertension; homicide and preventable accidents; cancers; infant mortality and perinatal morbidity; cirrhosis and liver failure; and diabetes.

The team made 13 recommendations in two areas: four in the area of life-span and disease conditions and nine in minority participation in research.

The proposal allots \$5 million each in the FY93 budget for all but one of the following minority health initiatives.

Regional Research and Training Centers. The centers will involve a consortium of academic institutions. The program currently is being planned and the RFA is expected for FY93.

M.S./Ph.D. Program in the Biological Sciences. Many minority students who pursue M.S. degrees in biological sciences do not continue on for a Ph.D. This program provides support for those students to continue their education by formally linking M.S.-granting institutions with research universities. The RFA for the pilot projects came out in March.

2-Year/4-Year Bridge Program. A substantial percentage of minority high school graduates continue their education at two-year institutions. This program provides incentives and support for students to continue their education in the biomedical sciences at a four-year school after acquiring the two-year degree.

Pre-college Intervention Program. In partnership with the National Science Foundation, the NIH Office of Minority Programs will support middle and high school academic enrichment programs in the biomedical sciences.

Minority Infant Mortality. The program focuses on infant mortality and low birth weight through Washington DC-based intervention trials to test methods of outreach aimed at early prenatal care, social support, and behavioral interventions and perinatology research on nutrition, toxemia, and premature labor. The RFA is expected later this spring.

Health Behaviors of Adolescent Minorities. The program aims at identifying, implementing and evaluating behavioral interventions for youths aged 10-24 with emphasis on violence and the sequelae of sexual behavior and on community or school-based intervention. The RFA was issued in December, 1992; the application receipt date is May, 1992. Funding is for three awards and a data center in FY92.

Health Behaviors of Young Minority Adults. The focus is on minority participation in periodic health screening and enhanced patient adherence to medical and behavioral treatment regimens. The program is targeted for minorities aged 25-39. The RFA will be out this summer.

Problems of Older Minority Americans. The program focuses on factors affecting the severity and progression of chronic diseases or conditions and the relationship of disease severity to specific types of functional impairment. There will be a new RFA in Summer, 1992. This program is funded at \$2 million for FY93.

From the Washington FAX

NAS Says U.S. Science and Technology Policy Must Be Broadened

Federal support must go beyond basic research to include pre-commercial R&D and establishment of a \$5 billion "Civilian Technology Corporation" (CTC), says a National Academy of Sciences (NAS) panel.

Commercial R&D is defined in the academy report, *The Government Role in Civilian Technology*, as the area beyond basic research that "falls short of product- or process-specific applied R&D." It ends "just before a prototype of a product is built," Harold Brown, chair of the NAS panel told members of a Senate Committee at a recent hearing.

Pre-commercial R&D remains an area where there are significant barriers to the private sector's ability to develop a potentially marketable product. Because of the lack of commercial promise, private industry cannot become financially involved, even though there may be significant "public good" achieved as a result of the pre-commercial R&D investment.

The NAS report, requested by Senator Ernest Hollings, D-SC, focuses on why the federal government should work with industry to develop and market new technologies. It also examines ways in which an expanded federal effort might be organized to help U.S. industries become and remain competitive. The rationale for pre-commercial R&D investment by the federal government is the same as for basic research: it contributes to the generic knowledge base.

During the hearing, Senator Hollings described the effort behind the report as "Congress going about the business of parenting industrial policy."

The Civilian Technology Corporation (CTC) would be a new, private, quasi-governmental institution intended to "guide financial support for middle ground pre-commercial R&D in key technology areas that are significant to the nation's technology base."

Financing for CTC would be made available through a one-time appropriation by Congress of \$5 billion. The CTC board of directors might take up to five years to expend these funds in R&D projects. It is estimated that the \$5 billion would be sufficient investment to affect positively the rate of commercialization in the United States in a number of industrial sectors.

The CTC, which would operate outside of existing government agency structure, would be required to submit to Congress and to the president a report on its activities after four years. Depending on the results of a review by an outside panel, the funding could then be augmented or the CTC could be dissolved, depending on its success and efficiency.

According to the report, the federal financial commitment to pre-commercial R&D should be closely linked to commercial markets in areas with wide potential industrial application, and projects under the program should be proposed and structured by industry. Further, the choice of R&D projects for these programs should be insulated from political pressure, says NAS.

The report stresses that the United States needs to improve its performance in all areas that promote productivity growth. Long term productivity growth rates remain lower in this country than in the countries of our foreign competitors. Investment in civilian technology to achieve higher rates of technology commercialization is one part of the solution to this problem.

In addition, the report recommends that:

- The Defense Advanced Research Projects Agency's role in developing technologies that have both military and civilian use—especially in the area of information technology—should be encouraged;
- a small number of the 700 federal laboratories should be selected to work with private firms in an effort to increase technology transfer;
- the scope of some government agency research and development programs should be enlarged to include pre-commercial projects;
- funding for the federal Small Business Innovative Research Program should be increased;
- the budget for the Advanced Technology Program at the Department of Commerce should be reviewed by an independent panel to determine its appropriate size; and
- a new "Industrial Extension Service" should be created at the Department of Commerce to speed the use of new technology by U.S. industry.

From the Washington FAX

U.S. Expenditures for Research and Development Declining, Says New Science and Engineering Indicators Report

Total U.S. research and development (R&D) expenditures continue to exceed those of America's closest industrial competitors. However, according to the just-released National Science Board (NSB) report, *Science and Engineering Indicators-1991*, national investment in R&D slowed during the second half of the last decade, and began to decline slightly in constant dollars after 1989.

The Science and Engineering Indicators report, required by congressional legislation, is submitted by the National Science Board to the President, who in turn provides it to the Congress. This volume is the tenth in the biennial series begun in 1972 by the NSB, the policy making body of the National Science Foundation (NSF).

Science and Engineering Indicators is designed to provide decision makers in government, industry, and the academic world with a broad base of data about U.S. science and technology, including information on research and development, education, employment, expenditures, and public attitudes.

Says James Duderstadt, NSB Chairman, "Clearly the scope and competence of the research system in the United States are unmatched by any other in the world. However, as this report indicates, a slowdown in research expenditures in industry and academia, and problems in education, should give us real concern for the continued vitality of our research enterprise."

The Federal government is estimated to have reduced its inflation-adjusted R&D expenditures from 1988 to 1991, reflecting global political and economic changes. Current estimates for development expenditures exhibit the sharpest downturn—a negative trend in constant dollars since 1988, according to Science and Engineering Indicators. The estimated trend in applied research, too, has been negative since 1989.

The rate at which American companies are spending money on R&D has also leveled off, says the report. The average annual increase in total U.S. R&D expenditures between 1985 and 1991 (in constant dollars) was 1.2 percent, compared with an annual growth rate of 6.9 percent from 1980 to 1985. The most recent estimates on change from 1989 to 1991 also show declining R&D expenditures.

Internationally, total U.S. R&D expenditures continue to exceed those of its four closest industrial competitors combined, despite the fact that two of these countries (West Germany and Japan) outpace the United States in terms of R&D expenditures as a percentage of gross national product (GNP). As of 1989, these four countries together (the two

named above, plus the United Kingdom and France) spent 12 percent more than the United States on non-defense-related R&D activities.

Although academic R&D continued to grow during the late 1980s, it was at a slower rate than during the first half of the decade. Major investments were made during the 1980s in research instrumentation (with support coming primarily from Federal agencies) and the construction and refurbishment of research facilities (supported primarily by the institutions themselves). However, financial problems loom for research universities as the recession hits both state budgets and the various sources of income for private institutions, and as pressures mount for lower indirect cost reimbursement rates on Federal research grants and contracts.

Other indicators of the health of U.S. and international science and engineering fields addressed in the report are:

- U.S. Technological Innovation

According to the report, the United States has seen further slow erosion of its shares in global markets for high-technology goods. For example, in 1988 the United States supplied 37 percent of the world's high-tech products, slightly down from 40 percent in 1980. Although the country continues to maintain a trade surplus in "high-tech" goods, its 1988 balance was half the size of its 1980 balance. A more positive trend in the area of technological innovation is the upturn in patenting by U.S. inventors between 1983 and 1989.

Lastly in this area, an incipient trend is a possible tendency for U.S. corporations to spend an increasing portion of their corporate R&D funds at facilities abroad.

- Science and Engineering Personnel

The U.S. science and engineering workforce extended its long growth trend through 1989 at an annual rate of approximately 4 percent. Expansion of science and engineering employment continued at a faster rate in non-manufacturing jobs (primarily in the services sector) than in manufacturing jobs. The proportion of these jobs within the non-manufacturing sector increased from 1.2 percent in 1980 to 1.7 percent in 1989; this rise translated into a nearly 50-percent increase in job opportunities in this sector during the decade. The increase in the science and engineering share of manufacturing jobs was also sizable—from

Continued On Next Page

3.7 percent in 1980 to 5.1 percent in 1989—despite a decrease in total manufacturing jobs.

Adequacy of the supply of new scientists and engineers during the 1990s continued to prompt concern, especially in light of relatively unfavorable demographic factors. Indicators of supply and demand examined here suggest relative stability in these labor markets during the 1990s: lower demographic growth will be matched by generally slower economic growth. Within this framework, however, it can be expected that rapid technological change will almost certainly generate discontinuities and spot shortages in specific areas, says the report.

- **Precollege Science and Mathematics Education**

Concerns also continued to be raised about the quality (and quantity) of U.S. science and mathematics education and the attractiveness of science and engineering careers to U.S. citizens. In international comparative achievement tests in science and mathematics, U.S. boys and girls score lower than their peers in many other countries. An exploratory study suggests that U.S. grade schoolers receive significantly less exposure to mathematics and science instruction in early years than do their peers in Japan and Taiwan.

- **Higher Education for Scientists and Engineers**

Undergraduate science and engineering degrees continued their long, gradual decline as a share of all degrees. Data on the plans of freshmen entering college in 1989 and 1990 suggest, however, that degrees in the natural sciences, engineering, and computer sciences may be “bottoming out,” and might begin to increase in the early 1990s. Meanwhile, the proportions of foreign citizens enrolled in U.S. natural science, mathematics, computer science, and engineering graduate programs and receiving science and engineering doctoral degrees continued to increase. In 1990, foreign citizens accounted for about one in four graduate students in these fields and for one in three doctoral degree awards in these fields, says the report.

- **Public Perceptions of Science and Technology**

As measured in NSF's biennial survey of public perceptions of science and technology matters, U.S. adults remain strongly supportive of the scientific enterprise in general and of Federal support for basic research in particular—even if it brings no immediate benefits. The public did, however, express increased concern about the use of animals in research. U.S. adults showed a mounting concern about the quality

NSF Electronic Proposal Submission

ORTTA staff would like to begin submitting proposals electronically to the National Science Foundation (NSF). We are looking for faculty who are planning to submit a proposal to NSF within the next couple of months, and who would be willing to work with us in the pilot submissions. This process is not intended as a means to beat an agency deadline. Rather, since this is a new process for us, we might need more lead time than normal to process the proposal by the deadline.

Participants must be currently using or be willing to use a computer text processor in the production of their proposals. Please call Winifred Schumi, Assistant Director, Information Services at 624-5750, if you would like to participate.

Background: The Electronic Proposal Submission (EPS) Project is the initial phase of the transition from paper-based to electronic of NSF's and participating universities' proposal processing. The EPS software and procedures provide the capability for principal investigators (PI's) and university administrative staff to enter the NSF proposal forms data, combine them with PI-created documents (including graphics), print the proposal, and send the proposal over university electronic networks as well as over the Internet for submission to NSF. The actual submission is via FTP (File Transfer Protocol) followed by the faxing of the signed cover sheet.

of science and mathematics education in U.S. schools. There was a significant increase between 1985 (60 percent) and 1990 (71 percent) in the proportions who felt that too little money was being spent on education in the United States. Comparative data from the United States, Canada, and 12 countries of the European Community on public knowledge about science and technology show strikingly similar degrees of knowledge. These new comparative data also indicate that Americans and Canadians view science and technology more positively than do Western Europeans, according to the Science and Engineering Indicators report.

Note: Copies of the report, *Science and Engineering Indicators — 1991* (stock number 038-000-00587-1) are available for \$29 from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Research Corporation

Agency Profile

The main activity of the Research Corporation is the support of scientists and their work. Historically, most Research Corporation awards have supported research or research-oriented programs. Awards are made within academic settings in the disciplines of astronomy, chemistry and physics. The foundation also has the flexibility to respond to promising new opportunities. The emphasis of the foundation has been on support of people and their programs rather than bricks and mortar or broad institutional initiatives.

General Grants

Research Corporation is open to opportunities within fields of activity that fall outside the regular programs. Proposals for support of projects that will enhance science research or that bear on the infrastructure of science can be considered. Occasionally, proposals may also be encouraged for research projects that are exceedingly novel, that run counter to scientific paradigms and are unlikely to achieve support from more traditional sources. Because resources are limited, only the most challenging and innovative proposals are likely to have success. Requests for funding that might be obtained from other more appropriate sources, to supplement already substantial funding, or to simply extend funding for mature projects, are not encouraged.

Renewing Research by Senior Scientists

Even proven academic scientists may sometimes need help to re-establish or re-direct their research in promising new directions. The federal support system identifies and targets support for what are perceived as the most promising areas and most talented investigators. Funding for mid-career shifts in research directions and seed money for the development of new research have been woefully inadequate. Recent trends in federal support and the shortage of funds have combined to magnify this problem.

Mid-career awards for tenured science faculty are aimed at re-establishing vigorous research programs. Restricted to Ph.D. granting departments of astronomy, chemistry and physics, the first step is a nomination by the department chair. Applications are then solicited from nominees whose cases are deemed most promising.

Student Support

A major goal of Research Corporation is to encourage and support programs that may attract and motivate students to-

ward careers in science. Declining student interest threatens the foundations of U.S. science and technology. Women and under-represented minorities have traditionally by-passed careers in science, accentuating the problem even more. Equally important is attracting the best young scholars to science. Three foundation programs provide an array of approaches:

Cottrell College Science Awards

These awards encourage research with undergraduates. Equipment, summer stipends and supplies are provided for.

Partners in Science

Awards are made to colleges or universities to support collaborative summer research between a high school chemistry or physics teacher and a faculty mentor. The partnership concept is stressed strongly in this attempt to build bridges between research scientists and high school teachers.

Department Development Program

A small group of undergraduate colleges have been conspicuously successful at producing science graduates. While individual schools that make up the group will change with time, the number of these highly productive schools is not growing. Research Corporation will invite proposals from promising candidates in private or public undergraduate chemistry and physics departments that have the potential to join this group.

Inquiries should be addressed to: Brian Andreen, Director, Science Advancement Programs, Research Corporation, 6840 East Broadway Boulevard, Tucson, Arizona 85710-2815; 602/296-6771.

National Institutes of Health

NRSA Short-Term Research Training Positions

The National Institutes of Health (NIH) announces the availability of short-term training positions for health-professional students on National Research Service Award (NRSA) predoctoral or postdoctoral institutional research training grants (T32). These short-term training positions are part of a continuing effort to increase the involvement of physicians and other clinically trained individuals in biomedical and behavioral research and particularly clinical research.

Next Page....

Short-term research training positions are available to students in schools that grant degrees in medicine, osteopathy, optometry, pharmacy, dentistry, and chiropractic and veterinary medicine. These schools, for the purpose of this announcement, are termed health-professional schools. Short-term research training positions are intended to provide health-professional students with an opportunity for a time-limited exposure to research during "off-quarters" and summer periods and an opportunity to consider a career in research. Students selected for this program are encouraged to engage in at least two but no more than four short-term training appointments during the period of their professional predoctoral training.

Institutions may incorporate a request for short-term research training positions into new or competing continuation institutional research training grant applications beginning with the May 10, 1992 receipt date. Existing training grants with three or more years remaining in the award period may request short-term training positions as a competitive supplement for the September 10, 1992 and subsequent receipt dates. Prospective applicants are strongly advised to contact the appropriate NIH program administrator for specific information about application procedures and other special requirements.

Guidelines for short-term traineeships are contained in the announcement that appeared in the March 20, 1992 NIH Guide. It may be requested from ORTTA by calling 624-9004 or by sending a note through the bulletin board.

National Center for Nursing Research

Small Grants Program for Nursing and Biology Interface

The small grants program of the National Center for Nursing Research provides limited support for meritorious research to develop and test innovative biological techniques for solving nursing problems and answering nursing clinical questions. The innovative biological technique proposed must be an integral part of an ongoing NIH or extramurally funded research program designed by a nurse biological scientist or a nurse scientist in collaboration with a biological scientist. The Small Grants Program should result in novel preliminary data using state-of-the-science bioinstrumentation or biological technology that would strengthen a subsequent research (R01) application.

As Principal Investigator, it is preferred that the nurse applicant: 1) be actively engaged in biological or biobehavioral research with previous or current NIH or other extramural funding, and 2) have formal or the equivalent of postdoc-

toral experience in the biological or biobehavioral topic under investigation.

It is estimated that \$250,000 will be committed to fund five applications under this program. Each grant is limited to \$50,000 in total project costs for a period up to two years. A small grants program award is nonrenewable.

An optional letter of intent is requested by June 1, 1992; the final application deadline is **August 24, 1992**. Programmatic issues may be directed to: Hilary D. Sigmon, Ph.D., R.N., Nurse/Health Scientist Administrator, National Center for Nursing Research, Westwood Building, Room 754, Bethesda, MD 20892; 301/496-0523.

National Cancer Institute

Clinical Cancer Therapy Research

The National Cancer Institute (NCI) seeks grant applications to conduct clinical therapeutic studies of neoplastic diseases in humans. Clinical research, by definition, involves a clinician/patient-subject interaction with a therapeutic intent. This program announcement encompasses a full range of therapeutic studies and clinical trials employing drugs, biologics, radiation, and surgery. The intent of the announcement is to encourage clinical researchers to translate insights in cancer biology and the development of new agents into innovative cancer therapeutic studies.

Clinical studies must involve human subjects and be designed to improve cancer treatment. The applications may include single or multi-institutional research studies with appropriate biological correlates linked to these studies. New clinical therapeutic studies may employ drugs, biologics, radiation, or surgery used as single agents/modalities or in combination. Biological correlative studies that have clinical relevance to cancer therapies and are aimed at improving cancer treatment are also appropriate.

The mechanisms of support are the R01 and the R29 (FIRST) awards. This is an ongoing program with yearly application deadlines of **February 1, June 1, and October 1**. A complete copy of the announcement is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board. Programmatic inquiries may be directed to: Dr. Roy S. Wu or Ms. Diane Bronzert, NCI Program Directors, Cancer Therapy Evaluation Program, Division of Cancer Treatment, National Cancer Institute, Executive Plaza North, Room 734, Bethesda, MD 20892; 301/496-8866.

U.S. Department of Agriculture

Biotechnology Risk Assessment Research Grants

Proposals are invited for competitive grant awards under the Biotechnology Risk Assessment Research Grants Program. Under this program, USDA will award grants to support biotechnology risk assessment research to help address concerns about the effects of introducing certain biotechnology products into the environment and to help regulators develop policies concerning the introduction of such products.

Proposals are invited in the area of biotechnology risk assessment research as appropriate to agricultural plants, animals and microbes. Emphasis will be given to risk assessment research involving genetically modified organisms, but model systems using nongenetically modified organisms also will be considered if they may provide information that may lead to improved assessment of risk associated with the introduction of genetically modified organisms into the environment.

Examples of topics considered pertinent to this solicitation are:

- Research to predict the fate and effects of pollen from genetically modified plants;
- Evaluation of the potential for plant virus component reversion or recombination from genetically modified plants;
- Study of the environmental safety and mechanisms of toxic action of *Bacillus thuringiensis* delta-endotoxin from genetically modified plants, such as insect resistance or effects on nontarget species;
- Research to predict the consequences of genetically modified fish escaped from confinement;
- Study of the environmental fate and effects of genetically modified plant-associated microorganisms in soil ecosystems.

Total available funding in FY92 for this program is \$1,405,000; indirect costs are limited to 14% of total direct costs.

The proposal deadline is **June 1, 1992**. For additional information please contact: Dr. David MacKenzie, Cooperative State Research Service, U.S. Department of Agriculture, Suite 330, Aerospace Center, Washington, DC 20250-2200; 202/401-4892.

Procter & Gamble Company

Animal Alternatives Research Program

The Procter & Gamble Company is offering a new program entitled, "Animal Alternatives Research Program." The program focuses on key aspects of the development and validation of new alternative methods to research involving animal subjects. These methods are:

- New *in vitro* biochemical and cellular approaches to efficacy and safety testing that could **replace** *in vivo* testing methods;
- **Noninvasive** *in vivo* methods for evaluating drug efficacy and safety that **reduce the distress** imposed on animals;
- The identification of new procedures or models to *reduce the use* of animals or the distress imposed on animals.

Proposals will be selected for funding based on the following criteria:

- The extent to which the proposed research will lead to the development of practical methods that replace, reduce or refine the current use of animals in efficacy of safety testing;
- The potential of the proposed research to lead to alternative animal testing that would be acceptable to regulatory agencies;
- The qualifications of the investigators to carry out the proposed research;
- Documentation of compliance of the research facilities with appropriate animal welfare guidelines.

There is no application deadline. Agency address: Procter & Gamble Company, Animal Alternatives Research Program; Miami Valley Laboratories, P.O. Box 398707, Cincinnati, Ohio, 45239-8707.

The Sponsored Project Information Network (SPIN) is a computerized locator system of funding opportunities (federal, nonfederal, and corporate) for faculty and institutional research, development, and education program support. It is available free of charge to University faculty and staff through ORTTA.

Based on a description of your research areas and / or the type of support sought, faculty and staff can search the SPIN Keyword Index to identify sources within specific areas of interest. The Keyword Index, a taxonomy developed by SPIN to catalog funding sources, is divided into the following ten major classifications:

Agriculture / Food / Forestry
Arts / Culture / Humanities / Communications
Business / Economics / Management
Education
Health / Medical Sciences
International Affairs / Area Studies
Miscellaneous / Other
Science / Technology
Social / Behavioral Sciences
Social Welfare / Public Affairs

The result of a search is a set of profiles of applicable funding sources that provides: 1) the sponsor's name; 2) the sponsor's contact address and telephone number; 3) deadline dates; 4) program titles; 5) objectives or interest areas of the sponsor; and 6) restrictions that would affect the submission of a proposal. This set of profiles is sent to the requestor.

Effective September, 1990, the SPIN indexes became available for on-line review through ORTTA's Electronic Bulletin Board (See the September, 1990 *Research Review* for information on Bulletin Board contents and access instructions—or call 624-9004 for a copy of the instructions.) The Bulletin Board contains a section devoted to SPIN and offers users the opportunity to review the Keyword Index alphabetically or within the topics shown above.

Since the Bulletin Board is accessible at any time, faculty and staff can browse the indexes at their convenience and find *keyword codes* of interest to them. From within the Bulletin Board they can forward a note to the Bulletin Board Editor requesting a SPIN search based on the chosen keyword codes (limit, 20 keywords).

Additional **Specialty Codes** used by SPIN that may help in choosing key words appropriate to the project for which funding is sought are:

International Travel:	Opportunities to travel to countries or to study their cultures.
Opportunities Abroad:	Support to travel identified by country, region or continent.
Equipment/Facility Support:	Use code that relates to project, not what is being purchased.
Professional Development:	Largely Postdoctoral opportunities.
Student Support:	For students seeking external funding support.
Foreign Scholar Support:	Bringing foreign scholars to this country or seeking programs in the U.S. for which they are eligible.
Conference Support:	Funding to hold or conduct a conference, symposium, or workshop.
Publication Support:	Support to prepare or complete a work or for actual cost of publishing a completed work.
Sabbatical Support:	To undertake or supplement sabbatical leaves.

For further information regarding the SPIN system, please contact ORTTA at 624-9004.

SPIN searches are also available through the Research and Development Office in the College of Liberal Arts, the Agricultural Experiment Station, the Research Support Office at Duluth, and the Grants Development Office at Morris.

Faculty Research, Training, and Service Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please send the pertinent data, as listed below, to Michael Moore at ORTTA.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
March, 1992	330	52,088,540
Awards Processed		
March, 1992	277	18,730,986
Proposals Submitted		
July, 1991 - March, 1992	3,214	523,036,507
Awards Processed		
July, 1991 - March 1992	2,330	191,066,629
Proposals Submitted		
July, 1990 - March, 1991	2,734	380,938,288
Awards Processed		
July, 1990 - March, 1991	2,239	179,744,386

Neuronal Populations and Behavior

Apostolos P. Georgopoulos, Physiology
Northwestern University
\$178,202 - 09/91-08/92

Scott County Geologic Sensitivity Project

Hans-Olaf Pfannkuch, Geology and Geophysics
St of MN: Natural Resources
\$168,880 - 01/92-12/94

Bioremediation Study of Leachate Contaminated Soil and Aquifers

Walter J. Maier, Civil and Mineral Engineering
St of MN: Pollution Control Agency
\$160,000 - 02/92-02/94

Fracture Intervention Trial

Richard Grimm, Jr., Epidemiology
Merck, Sharp and Dohme
\$145,407 - 10/91-12/91

Studying Scale Invariance in Remotely Sensed Rainfall

Efi Foufoula, St. Anthony Falls Hydraulic Laboratory
NSF
\$142,408 - 02/92-07/94

Glutamate Analogues on Hippocampal Neurons

James F. Koerner, Biochemistry, (MS)
Rodney L. Johnson, Medicinal Chemistry
NIH, NINDS
\$132,573 - 03/92-02/93

Motivational Foundations of Behavioral Confirmation

Mark Snyder, Psychology
NSF
\$130,084 - 03/92-08/94

Development of Instrumentation for Measuring Sub-0.5 Micron Particles in Semiconductor Processing Equipment

Peter H. McMurry, Mechanical Engineering
David B. Kittelson, Mechanical Engineering
Stephen A. Campbell, Electrical Engineering
Semiconductor Research Corporation
\$125,035 - 08/91-08/92

Bedrock Geologic Mapping, Duluth Area, FY92-93

David L. Southwick, Geology and Geophysics
James Miller, Minnesota Geological Survey
John C. Green, Geology, UMD
St of MN: Natural Resources
\$113,000 - 11/91-06/93

National Center for Research in Vocational Education

Charles R. Hopkins, Vocational and Technical Education
U.S. Department of Education
\$119,962 - 01/92-12/92

Evaluation of an Experimental Model of Neuropathic Pain

Keith C. Kajander, Oral Sciences
NIH, NINDS
\$108,932 - 03/92-02/93

U of M Designated Driver Program

David Dorman, Boynton Health Education
St of MN: Public Safety
\$20,000 - 10/91-09/92

International Finance and Democracy

John R. Freeman, Political Science
NSF
\$87,322 - 02/92-03/95

Democracy and Leadership

Lawrence Jacobs, Political Science
NSF
\$25,191 - 02/92-01/94

Transitions and Defects in Crystals

Richard D. James, Aerospace Engineering & Mechanics
USDOD, Army
\$33,124 - 12/91-12/92

Matching Funds for Glass Duplicates of New Palomar Sky Survey

Roberta M. Humphreys, Astronomy
NSF
\$48,000 - 01/92-06/95

Processing and Properties of Ceramics From Two Phase Dispersions

Lorraine Francis, Chemical Engineering & Materials Science
Minnesota Mining and Manufacturing
\$20,000 - 01/92-12/92

Reactions in Continuous Mixtures

Rutherford Aris, Chemical Engineering & Materials Science
American Chemical Society, Petroleum Research Fund
\$43,000 - 01/92-08/94

Micro-Optic Fibers for Optical Sensing and High Resolution Imaging

William H. Smyrl, Chemical Engineering & Materials Science
Chris S. McMillan, Chemical Engineering & Materials Science
NSF
\$50,000 - 02/92-07/93

Synthesis and Reactivity of Mixed-Metal Gold Cluster Compound

Louis H. Pignolet, Chemistry
NSF
\$91,000 - 03/92-08/93

Development of a Regional Multi-Layer Analytic Element Groundwater Model

Otto D. Strack, Civil & Mineral Engineering
City of Inver Grove Heights
\$99,171 - 03/92-10/93

On-Line Strategies for Optimal Intersection Control

Yorgos J. Stephanedes, Civil & Mineral Engineering
Panos G. Michalopoulos, Civil & Mineral Engineering
Eil Kwon, Civil & Mineral Engineering
St of MN: Administration
\$35,000 - 12/91-11/92

Stochastic Dynamic Traffic Assignment and Real-Time Network

Yorgos J. Stephanedes, Civil & Mineral Engineering
Gary A. Davis, Civil & Mineral Engineering

NSF
\$76,380 - 01/92-06/93

Novel External Laser Cavities for Diode Laser Arrays

James R. Leger, Electrical Engineering

NSF
\$98,979 - 02/92-07/93

Computational Studies of the Thermodynamic and Electrostatic Properties of Water

David A. Yuen, Geology and Geophysics
J. Woods Halley, Physics and Astronomy

NSF
\$52,855 - 02/92-01/94

Linear Algebra for Signal Processing

Avner Friedman, Institute for Mathematics and Its Applications
Willard Miller, Mathematics

USDOD, Air Force
\$30,000 - 02/92-01/93

Future Varieties of Barley: Improving Productivity and Profitability

Donald C. Rasmuson, Agronomy & Plant Genetics
Minnesota Barley Research and Promotion Council

\$20,000 - 12/91-06/95

Nutritional Regulation of Aromatase Enzyme and Hydroxylase

Mindy S. Kurzer, Food Science and Nutrition

Nutrition Foundation
\$30,000 - 01/92-12/93

Modulation of Keratinocyte Function

Mark V. Dahl, Dermatology

Minnesota Medical Foundation
\$10,000 - 03/92-02/93

Regulation of Immunoglobulin Gene Expression in a Hybridoma Cell Line

Stella Davies, Pediatrics
Ambika Mathur, Pediatrics and Oral Science

American Society of Clinical Oncology
\$26,500 - 07/92-06/93

Forest Herbicides: Applicator Use and Possible Genotoxicity

Vincent F. Garry, Laboratory Medicine & Pathology

USDA, Forest Service
\$48,000 - 03/92-05/93

Structure of Antibodies to Similar Sites on Cytochrome C

Ronald Jemmerson, Microbiology

NSF
\$85,000 - 02/92-07/93

Giant Cell Tumor: Receptor Analysis and Effect of Cytotoxin

Edward Y. Cheng, Orthopaedic Surgery
Theodore R. Oegema, Jr., Orthopaedic Surgery

Orthopaedic Research and Education Foundation
\$55,935 - 02/92-01/93

Regulation of Inflammation Mediators for Rabbit TMJ

James Q. Swift, Diagnostic/Surgical Sciences, Dentistry
Kenneth M. Hargreaves, Restorative Sciences, Dentistry
American Association of Oral and Maxillofacial Surgeons

\$35,000 - 03/92-02/93

The NACDS—Prime Index: A System for Monitoring Drug Pricing

Stephen Schonndelmeyer, Pharmacy Practice

National Association of Chain Drug Stores
\$59,984 - 10/91-12/92

Synthesis of PHB with Yeast

Friedrich Srien, Biological Process Technology Institute
Minnesota Technology, Inc.
\$38,059 - 01/92-06/92

Clostridium Difficile in Tube-Fed Patients

Donna Z. Bliss, Nursing
Sue K. Donaldson, Nursing
Dale N. Gerding, Nursing

NIH, NCNR
\$21,600 - 03/92-02/93

Cost Analysis of Low Fat Intervention Diet

I. Marilyn Buzzard, Human Development and Nutrition, Public Health
Elaine H. Asp, Food Science and Nutrition

NIH, NHLBI
\$49,703 - 02/92-01/93

Synthesis of Biodegradable Plastics in Microbial and Crop Plant Systems

Friedrich Srien, Biological Process Technology Institute
David A. Somers, Agronomy and Plant Genetics

St of MN: Administration
\$75,000 - 10/91-09/93

Role of Local Vascular Fibrinolysis in Acute Laminitis

Ava M. Trent, Clinical and Population Sciences
Raymond Geor, Clinical and Population Sciences
Douglas Weiss, Veterinary Pathobiology

Minnesota Racing Commission
\$36,178 - 02/92-06/93

Developing Thought and Language: A Cross Linguistic Investigation

Maria D. Sera, Institute of Child Development

NIH, NICHD
\$79,172 - 03/92-02/93

Positive Parenting Groups for At-Risk Youth

Patricia R. McCarthy, Educational Psychology

St of MN: Public Safety
\$82,000 - 01/92-11/93

Innovation and Organization

Paul Light, HHH Institute of Public Affairs

Duke University (Prime: Ford Foundation)
\$95,000 - 01/92-09/92

Action Research in Building Institutions for Sustainable Development

Zbigniew Bochniarz, HHH Institute of Public Affairs

MacArthur Foundation
\$79,000 - 01/92-12/92

Reactions to Evidential Structures Using Belief Functions

Shawn P. Curley, Information & Decision Sciences

NSF
\$50,400 - 02/92-07/93

Liberation of Problem Taconite Ores

Rodney L. Bleifuss, Natural Resources Research Institute, UMD
Blair R. Benner, Natural Resources Research Institute, UMD

St of MN: Natural Resources
\$17,500 - 03/92-12/92

Numerical Model for Differential Photorefectance

Michael Sydor, Physics, UMD

Research and Development Laboratories
\$20,000 - 01/92-01/93

Commercial Aquaculture: Implications for Water Quality in Minnesota

Richard Axler, Natural Resources Research Institute, UMD
Michael E. McDonald, Natural Resources Research Institute, UMD

Minnesota Iron Range Resources & Rehabilitation Corporation
\$25,000 - 12/91-08/92

controversy that seems to surround her because that means somebody in Washington is making decisions. Somebody in Washington is taking a stand, someone is saying what's on their mind and their heart as it comes. She can speak for herself in this regard during the course of our time together today. She's a very accomplished person; she's a very gifted person. From Hunter College High School to Vassar to Johns Hopkins to the Cleveland Clinic to all the things that she's done as a technology advisor to the President and now the director of the National Institutes of Health, Bernadine Healy has always distinguished herself.

Healy: Thank you very much Senator Durenberger. It is a pleasure to be here in Minnesota and to be so graciously hosted by the Senator and his staff. People often ask me, 'Isn't it terrible that NIH has become so political?' and I always respond, 'NIH is political; how can you not be political when you have a nine billion dollar budget which is

I think many of the problems we face today as a community are simply that the public doesn't quite understand how important this entity NIH is .

entirely the taxpayers' money, and when the budget is developed through the political process of the Department of the OMB, and is approved by the Congress. Not too long ago someone told me, 'Dr. Healy you have to understand that we exist to serve the Congress.' Well I think we exist to serve the public, and Congress is the entity that oversees us. And it is good to have Senator Durenberger providing the support for what we're doing at NIH.

Let me just make a few introductory comments. I have learned in the most intense sense of the word that I am your public servant. I take that seriously. What you learn quickly is that NIH, whenever it's shaken in the view that we all share, there's probably no government agency more important than the National Institutes of Health. It really serves a noble mission. Advancing NIH is not just important to us because that's our profession, because we're the stakeholders in an immediate sense, but I am at times even overwhelmed by the value of this agency to every man, woman and child in this country, and throughout their life.

The fact is that we have delivered to the American people a return on investment that I think is unheralded, unrivaled anywhere in the world and anywhere within the government and anywhere within the private sector. I think sometimes we're too modest in letting that word out. I think the main reason to let it out is not to be an irritating brag, but more importantly because unless the public understands, the enter-

prise will not be sustained and will not grow. I think many of the problems we face today as a community are simply that the public doesn't quite understand how important this entity NIH is—and remember; NIH is all of us, the NIH campus is the United States. We fund over 1500 institutions, the University of Minnesota is in the top 20 in terms of NIH funding. You are a part of NIH as much as I am a part of NIH or that the intramural scientists are a part of NIH. I think all of us have a job to do, and it's why I'm particularly pleased to be here with Senator Durenberger, because he represents all who have struggled. It is important to work with him and through him and with your other elected officials to get the word to the public, that we will only exist as long as we are serving the people appropriately, and they will only hear that we are serving them appropriately if we get the word to them.

I understand that this is mainly a Q and A session, so I will turn it over Dr. Anderson.

Anderson: What is your perception about the future of NIH-funded small science against big science,—big science, i.e. the genome project?

Healy: Well I think that the distinction may be a little bit artificial. It's one of those things that is characterized as big science versus little science, but in the world of science, if you look across the sciences when you talk about big science, we really mean something like the SSC [Superconducting Supercollider], which is a multi-billion dollar single science project, or the Space Station, which is a multi-billion dollar single science project. The biggest of

What drives the human genome project is no different than what drove conceptually the sense of a National Cancer Institute.

our science is measured in millions of dollars, not billions of dollars.

What drives the human genome project is no different than what drove conceptually the sense of a National Cancer Institute. NIH is an institution at which we are not doing science for science' sake; we are not doing science solely to support the individual talents of scientists with great ideas, but in fact in the very beginning we have been charged to do science as part of the public mission to advance the health of the public. For that reason we started in the fifties, when the modern NIH was crafted, to be an enterprise which is targeted. Our research is targeted toward cancer, toward heart disease, toward Alzheimer's disease, toward aging. I view the Human Genome Project as an extension of that, except I think a very clever extension of it, because what it says is that all of these diseases are coming together, because there is a common fundamental base of information which lies within the genetic composition of living organ-

isms and of humans, where all disease can be understood. I mean 5,000 disease genes within the human genome, and that by going after those 5,000 disease genes we are going to be increasing understanding across the entire spectrum of disease. You don't chop the Human Genome Project up into a little piece for Cancer and a little piece for the Heart Institute, but rather it has to be viewed as a single effort. If you look at how it's being executed, however, it's being executed in a mix of what we might conventionally say are R01s and P01s and subcontracts. The actual mechanisms that are being used to achieve the goal of the Human Genome Project are very similar to what another institute would use.

So I think it's an unfair characterization to pit that program against any of our other major targeted efforts. And I also think it's a mistake for scientists to say targeted research is

...one of the things about the women's health initiative is that it really brings women together from all walks of life.

bad. I mean NIH is the essence of targeted research—we're the National Institutes of Health, we're not the National Institutes of Science, we are not the National Science Foundation. I think that's something we should be proud of. The best way to achieve the robust scientific enterprise that we know, that we value, that has been so extraordinarily successful, is to understand that this is a brain-intensive business, and the way to achieve those targets and those goals is through a decentralized system in which every scientist's creative brain can compete against anybody else, regardless of gender, age, race and that they compete solely on the basis of their ability to perform in the scientific sense. I think that's been the strength of NIH, the peer review system, the fact that 90 percent of our resources are sent outside of the intramural federal laboratories and across the country tapping into the diversity of brainpower across this country, and the different ways that people look at the same problem. So the mechanism, the R01 concept is right—the individual investigators pursuing their ideas. But that has to interface with the sense of target, the sense that it doesn't matter how brilliant a scientist's project is, we will fund research if it relates to the broad health mission of NIH. The targets are very broad and I don't think the notion of individual brainpower is incompatible with the sense of target. I don't think they should be pitted one against the other.

Anderson: What have been the implications and the impact of the women's health initiative that you began a year ago?

Healy: I personally think it's been an amazing success, and it's gotten much more attention and much more enthusiasm than we ever would have imagined a year ago. I think that is

a tribute to the fact that it's right, that the community was not only ready for it, but they felt that it was a need that had to be addressed. It was also a statement of the fact that women in this country feel that there is maybe a middle class revolution in terms of women's concerns about their rights in our society. I think that one of the things about the women's health initiative is that it really brings women together from all walks of life. Whatever end of the political spectrum they find themselves, they come together on the issue because the issue is the right issue. I think that what happened in some of the neglect—and it wasn't perhaps as dramatic as sometimes portrayed—but there was some neglect of gender gap in our science knowledge base for women's health. A lot of that was a reflection of things that are deeply ingrained in our society at large. I don't think it was anything unique to our profession or science or biomedical research.

Like scientists and like physicians we identify a problem and we address it. One thing that I have learned, and I'm sure Senator Durenberger has known for many years, is that very often what gets the energy or the drive to correcting a problem that one might diagnose is often the contention surrounding it. That's something none of us are really used to. We like to think that you identify a problem, you don't look for people to blame, you just address it, and that's what we're used to doing. But I have learned that it's the swirl of controversy around it that gives it the political energy to make it move. I'll tell you it's probably the easiest 45 million dollars we've ever gotten out of Congress.

Anderson: What is your view of training grant support, and how do we address the manpower needs of science tomorrow?

Healy: I am a strong supporter of R01 grants, but you know after a while you're not going to have anybody to do R01 grants if we ignore the needs of the young, if we're not training people, bringing them into the system. I think the hardest thing in the world right now is to get trained. People who are training in medical research, either PhDs or MDs, are facing debts of \$10,000, \$50,000, \$100,000, they then go into training programs and accept stipends that are less than the NSF stipend. Then the worse thing that happens is

I am a strong supporter of R01 grants, but you know after awhile you're not going to have anybody to do R01 grants if we ignore the needs of the young.

that they get out to do their research career and I don't think NIH—or anybody for that matter—adequately provides for that period of time when they first leave their research fellowship. They're ready to start at the instructor or assistant professor level and they're ready to establish an inde-

pendent laboratory, and to go from a research fellowship to suddenly compete in the world even of MERIT awards and FIRST awards is very, very tricky, and it usually takes several years to succeed at that level. I think we need something to address that gap, and that all has to do with training. I view training as not just the period of the research fellowship but its that critical period of getting started, of being seeded, and right now the whole responsibility for seeding scientists is in the hands for the most part of the universities and the research institutes. I think it's a critical need we have to address.

But on the other hand, we in the community have been so successful in selling the priority of R01 grants, which is right, but nevertheless behind the scenes there is this cry that whatever you do, at all cost, people know that the real political issue is if you've kept up the R01 line. So behind the scenes everything does get cannibalized to keep the R01 line up. People say 'Oh great, you've kept it up to 6,000 grants, that's wonderful!' You might have negatives on every other mechanism going down a huge budget page, but that's where we are.

That's one reason why we need a strategic plan, because what a strategic plan says is 'Wait a minute, you have to look at the total picture.' That doesn't mean you can't sing loudly for R01 grants—I mean if we don't have people doing investigator-initiated research we don't have an NIH. That is a major priority. But, you can't say it is the only priority. The same can be said for infrastructure, for contracts, for centers, for some of our special programs for the underserved. I think the bottom line is we in the community have to address it because in a way we got ourselves there. We were very effective in selling the OMB and selling the Congress R01 at all cost.

Anderson: The next item relates to the patenting of human material such as hematopoietic stem cells and gene fragments, and you're thoughts about that.

Healy: Let me specifically focus on the cDNA, or the gene fragments issue, because that's the one I'm directly involved in. The human stem cell story is one the patent office has spoken on and has kind of settled it. Over the past ten or more years we have seen the application of a magnificent 200-year-old system, the U.S. patent law system, started by Thomas Jefferson, being applied to areas of discovery in biology and the life sciences that probably no one ever expected it to be applied to. I'm sure even Thomas Jefferson, the great farmer and great naturalist, would have had no ready solution to how to apply the patent system and intellectual property rights system to discoveries of the secrets of Mother Nature, if you will. That's the situation we're in, and I think it's unfortunate that it be played out in the press as such a black and white issue and such a contentious issue. If anybody's honest, this is an issue we're all struggling with. Remember the controversy over the Chakrabarty pat-

ent, remember the patent on microorganisms, where the researcher had patented biologically engineered microbes, the contention over the Stanford Boyer-Cohen patent, and also the contention over the Harvard mouse patent. The only thing different between that and the cDNA issue that we're involved with now, is that the controversy and the excitement and the interest didn't occur until after the patent was issued. It was a *fait accompli*. Even the stem cells was a *fait accompli*—the patents are there. OK what do we do now? Its OK that they were challenged in court like the Chakrabarty, and rose right up to the Supreme Court; in other cases they're challenged in a lower court and that's how it got all into the open. The patent first issues and then the controversy ensues.

Now what's happened—it's actually just an interesting little quirk—is that it was an NIH scientist, not an NIH-funded scientist, but an NIH scientist in the Bethesda laboratory

The real scary thing to people is that it's like 5,000 or 10,000 of these genes, when in fact up until now we only knew about a few thousand of the 50,000 to 100,000 human genes that are there to be discovered.

who developed a system to massively sequence cDNA. You still have the situation where you are sequencing a human gene, a cDNA, an expressed human gene, from tissue, in this case brain genes that are being expressed. You're sequencing that gene and you don't know its true biological function. It may have some utility, perhaps, in some therapy, in gene therapy; it might have it in diagnostics, it might have it as a probe, but you don't know the full downstream significance. You don't know if that particular gene could be a receptor because of some homology it might have. The fact is that you don't know its full biological function—why that gene is being expressed in the brain. The real scary thing to people is that it's like 5,000 or 10,000 of these genes, when in fact up until now we only knew about a few thousand of the 50,000 to 100,000 human genes that are there to be discovered. It was sort of a paradigm shift to suddenly see this happening. The big thing is, the scientist back in the spring—and I'm embarrassed to admit to you— filed this patent without my knowledge. People say, 'What? Don't ever admit that. You're supposed to know everything going on at that agency.' But the fact is I really didn't know it. I found out about it in September when somebody came into my office during a staff meeting and said 'There's going to be something in *Science* tomorrow that you'd better know about.' Of course it was in "Science News and Comment" it wasn't in the scientific section. At that point they told me that this little brush fire was becoming a forest fire and I'd better quick learn about the thing. So I suddenly was reading all about patent law, the Chakrabarty patent, reading

their patent. Indeed I became immersed in the policy issues sometime last fall. It was percolating first, submerged by the notion that, 'Oh, who would ever issue a patent on that?' Then I think by the end of the summer people started to talk about it, and it dawned on somebody that 'Oh my god, what if this is patentable?' So it came to me and I became immersed in the patent issue initially sometime last fall and in the past six months we've been struggling with it.

Let me just simply reduce this to where we are now. Very quickly, first the NIH has not come out with any policy which says this is the right thing to do or the wrong thing to do. That would be absurd, because this is such a complicated issue having to do with many, many things. NIH cannot say no to an NIH scientist when he statutorily can do it. Congress has said that an NIH scientist can file for patents. The University of Minnesota is one of the biggest patent filers [among universities] in the United States. When you file for patent you don't have to ask us for permission, you don't have to ask Senator Durenberger for permission, the government has delegated that to you—you get all the rights to handle the licensing and it's in the interest of competitiveness and tech transfer—of getting the discoveries out there. That's an extraordinary right. You don't have to ask us. The difference is when you have a federal employee, a public servant—even though we have those rights and statutes, an NIH scientist can file for patent just like you can—somehow the public thinks, even you guys think, that you can tell that scientist what to do because he's a federal employee. I don't think the scientific community who are harshly criticizing the patent filing are thinking, 'Hey wait a minute, if we can stop NIH from filing a patent does that mean that all the universities across the country are suddenly going to have big brother intruding on what patents they file?' Well of course, because if the reason to stop NIH from filing is to achieve a policy objective, then that means

There is a certain merit in [the debate] occurring before the patents issue, because then it can be a somewhat loftier dialogue, where nobody has a hardened position because they are sitting on a fistful of patents.

suddenly NIH will have to exert its march-in rights on all these universities and start meddling in their knitting about what patents they file and what they don't. So be careful what you buy. You know that old story, be careful what you pray for because you might get it. So that is one policy issue, but it is only one of many.

Is filing a patent a way to protect our interest in the biotech industry? Probably the most important industry we have in this country now and certainly in the future is biotechnology. Minnesota is one of the most important states in this

area. Maybe that's an abstract concept to us as scientists, but you know it's jobs, it's mouths to feed, it's economic competitiveness. If we don't have a strong economy in this country there's not going to be money to support NIH, and there's not going to be money to support this university. I think a lot of the problems that state universities are facing across this country are because regional economies are down, state budgets are shrinking. I don't think we as scientists can say, 'Oh money, we don't worry about that. Corporate America, we don't worry about that.' Industry, we don't worry about that. Well patents are part of the reason the biotech industry developed in this country—patents on things having to do with biological discoveries.

So I don't think we can jump too precipitously and decide whether or not filing a patent—and remember, we just filed, we didn't get anything issued—is procompetitive, or anti-competitive. Until we can answer that we shouldn't make a firm decision. In fact, I met with the IDA, which is a group of CEOs of biotech companies worldwide, and I thought they were going to give me an answer. I said I want you guys to tell me one thing, is it procompetitive or anti-competitive to have patents on these cDNA? There were as many opinions in the room as you can conceivably imagine. Industry isn't sure either. So until we can work it all through and decide what's the right thing to do, again, it would be dumb to pull our patents.

I think the other thing is, the reason that this debate is on the table—I mentioned that all the other debates typically came out after the patent issued—is that we in the federal government have no secrets. Everything we do is in the public domain, even filing for patents. If you file for patents here, you can keep it a secret. When industry files for patents they never tell anybody when they are filing; they would never reveal what's in a patent. You cannot go to the patent office and ask, 'How many other cDNA patents have been filed, and from what countries?' You can't get that information. But NIH has to divulge everything we do, and I think that's right. We are the ultimate public institution using public money. As a result, this policy debate hit the street, so to speak, a couple of years before it might otherwise have done. In fact my colleague Dr. Watson, when I first met with him to ask, 'Hey what's going on here?' said, 'Remember, this debate is inevitable. I'm just very sad that it is occurring now as opposed to two years from now.' I think that there is more value in it occurring now, there is a certain merit in it occurring before the patents issue, because then it can be a somewhat loftier dialogue, where nobody has a hardened position because they are sitting on a fistful of patents. Remember, there's also an international issue here. We can do anything we want and we can say all right NIH you can't file for patents, and you here at the University of Minnesota can't file either. But what's going to keep Genentech or Merck from filing patents? What's going to keep the French and the Japanese or the British from filing patents? Nothing—it's a free world. So unless we achieve some

international harmony in our thinking here, it doesn't make sense for NIH to act on this one patent as some sort of a religious symbol.

And finally, there are many reasons not to seek patents on these genes. One of the most compelling for me is the whole issue of patent clutter. You're just going to have thousands and thousands of patents on genes, and that could create chaos in the tech transfer scene. So all I can tell you, is I hope I've at least convinced you that it is a much more complex issue than you see in one sound bite on the news or read about in one paragraph in a journal. And this again is something for which we need to have the wisdom of the

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academic community, the wisdom of scientists, and the wisdom of industry, and we also need to achieve some international dialogue on this.

Anderson: Senator Durenberger, what do you think about the animal rights movement?

Durenberger: I've sat down with these people over time. The first time I got to spend some time with them was with the Draize rabbits. Of course there were victims there that we could all relate to, and there were propagators that we could all be offended by, like the perfume industry. So I initially became a hero to rabbit lovers all over America. That was sort of my introduction, but since then I've spent a great deal of time just listening to people who are somewhere in this movement, and I find the movement—like the environmental movement and everything else—goes all the way across a wide variety of people and everyone has a different approach to it. I guess this is kind of a political answer—that there is no simple solution to the problem—but all of us know that medical research and health research generally is so dependent on appropriate access of researchers to animals, that our job as public policy makers is to ensure that access takes place. We can guarantee to those who worry about it and those who care about it, that it will be done in an appropriate fashion, that it will be done in a supervised fashion, that somehow we're going to have to have the courage to face up to the animals involved.

Anderson: How do you and your colleagues protect NIH against your colleagues who have special areas in the NIH budget that they specifically want to support?

Durenberger: You don't. That isn't the way the process works. One of the things that we're anticipating this year is one of those elections that sweeps everybody out of office

and we're all going to start from scratch. The reality is you're not going to sweep out of office the chairman of the House Appropriations Committee who's been there 52 years now. You're not going to sweep out of office Robert Byrd from West Virginia, who's been in office now for 38 years. And if you don't sweep out the people who run the appropriations process, in one way or another strategic plans and all those wonderful things, are going to be subject to what I don't mind characterizing, (because I've never been on the Appropriations Committee), as the whims of those who live by bringing home the bacon or responding to the greatest near-term need. Lowell Weicker when he was on the Appropriations Committee was a fighter for unpopular causes. Lowell Weicker did so much for so many people who were voiceless in our society, and that's sort of the other side of it. There was a person who, at least in my opinion, used the appropriations process, also used his role as a Republican in a Republican administration on the authorizing process to fight for priorities that nobody inside the administration would raise. So the appropriations process works both ways. Too often, the answer to that question is the rest of us are cut out of the appropriations work.

Anderson: Dr. Healy, what can the people in this room do to be of most help to you?

Healy: Well, I think it's really mostly to help our shared value of the NIH—I happen to be the lucky one who drew the short straw and am in the hot seat—but I think the issue is that NIH has problems, and how can we make NIH better and how can we raise NIH on the radar screens as a national priority? Dr. Bob Petersdorf of the AAMC is trying to address a thorny issue, and one that harms us, and that is the notion of there being so much contention within the scientific community that we spend a lot of time shooting at each

I think that we have to have a sense that we can squabble among ourselves behind closed doors but publicly we have to have more of a sense of unity.

other and not mobilizing together. The disease-oriented focus also tends to reinforce that notion, where it doesn't matter what happens to the rest of the budget as long as the cancer budget goes up, or it doesn't matter what happens as long as the arthritis budget goes up. I think that we have to have a sense that we can squabble among ourselves behind closed doors but publicly we have to have more of a sense of unity.

One of the things that Lowell Weicker—Senator Durenberger just mentioned him and I would echo the things that he said—one of the things Lowell Weicker did when he first left Congress was to organize a group called Research!America. His vision was, 'Listen scientists, get

together! This is one research enterprise that we have to support, and let's realize that the tide brings up all boats.' I think that we need more of that thinking and we need action. That doesn't mean we aren't going to disagree on some of

Scientists are the toughest lot in terms of going after each other. I think there are times when we sure better pull together, or we're not going to have anything to pull for at all.

these issues, like indirect costs, or R01 grants, or how to solve the training problem, but I think that we have to understand that one voice at some times can be heard better and louder.

And I think that we also can't be timid. I see in some of the problems surrounding Stanford right now—although no one can help but be concerned about some of the mess they got themselves into—is that we have to be sympathetic to some of the problems Stanford is addressing. Stanford is one of our great American universities, and there has to be a sense that, OK let's fix the problems and move on. But Stanford is coming under assault that goes way beyond any problem. Stanford is the popular whipping boy and I see all the people hiding under the bed, saying, 'Gee, maybe if I hide under the bed I won't get hit too.' Whereas there has to be some sense of fair mobilization on the part of the community. I tell you one of the common things I sense is that we get blamed for helping each other anyway, even when we don't. I see it in the OSI matter. We're always hearing, 'Oh, all the scientific community wants to do is whitewash each other.' That is not true! Scientists are the toughest lot in terms of going after each other. I think there are times when we sure better pull together, or we're not going to have anything to pull for at all.

Anderson: The next question relates to your strategic planning effort and does the fact that we're going at this effort at this late date imply that other countries are ahead of us, or are we breaking new ground?

Healy: Gosh I don't think that we're doing it at a late date. As a matter of fact, it is very unusual for a federal agency to have a strategic plan—it's almost unheard of! I think in many ways we are a pace setter, because I'm now hearing that a directive has come down that FTA is supposed to develop a strategic plan. I've also now heard that NSF is supposed to develop a strategic plan. So I think we are really way out in front. If the comparison to the international community means that by strategic plan we mean some kind of rigid central planning as you might see in some countries, such as Japan to some extent, or the MRC, the answer is that's not what the strategic plan is all about.

The strategic plan is to look at what is unique and wonderful and strong and vibrant about the biomedical enterprise that has grown up in this country, and say, 'OK, where it's worked how can we sustain it and make it work even better, and where we have problems how can we address them as a community so we can keep what we have and make it better?' It's all about us participating in the planning of our future. You know, if you reflect on it, NIH is a community and you as scientists have really not participated in the shaping of it, other than your individual service on peer review groups. Now that's important, but it tends to be a microinvolvement. But there are big issues—issues like, OK, shall we have another institute at NIH? Have you as a community ever participated on a question like, have we solved the problem of scientific integrity? Have you really as a community participated? That doesn't mean we will ever be the sole determinant of our fate, because again we are a political agency and we're going to have all the stakeholders participating—most importantly the public, our elected representatives, the White House—but NIH has to be at least a participant in the strategic plan, in reducing it to its simplest form. It's for us and the scientific community to participate in shaping our future. Believe it or not, that has never really happened.

Anderson: I think that was what was meant by 'late date.' The last question concerns the initiative in structural biology, and how did this area get to be so important so fast?

Healy: Well that's something that actually bubbled up right from the strategic planning process. Actually it was the way we initially came up with our first draft that was disseminated in February. I might tell you that in February when we had our San Antonio meeting which was sort of the unveiling of the draft, there was a lot of criticism like, 'Gee, why weren't we all involved in developing it to this point?' Well, first of all, somebody had to do a first draft. Secondly, it's hard to get 100,000 people to write a first draft. So we decided we'd start with the people who are paid to be the leaders of NIH. We started with the Institute directors and we actually involved about 100 to 200 people at NIH in coming up with the first draft.

But we also went around to every council. I personally visited every single council of our institute—20 councils—and told them back a year ago, 'This is what we're planning; help us. This is the informal stage—anything you write will have input.' I met with many of the lobby groups, the volunteer health agencies, FASEB, AAMC, etc. and said, 'Help us, this is the early stage, if you want to have input into the first draft you have it.' Many people helped us; a lot of people didn't.

And then we unveiled it in February. What you saw in February was both a combination of people who sent in

informal comments, and also the NIH leadership. There were a couple of things that came out that were very impressive to me. For example, structural biology came right up on the list as one of the crucial disciplines of science that does need more attention. It also is very resource intensive, infrastructure expensive, and that is not something you're going to solve with a couple of R01 grants. You really are going to have probably to invest more resources in order to get more attention in this field. This came right to the top of the list.

Another thing that came up very quickly, which I was impressed by and which we will be acting on, is the whole area of basic biology and the environment. You know, NIH has as one of its institutes the National Institute of Environmental Health Sciences, located in North Carolina, and it has been kind of a neglected institute. But this process has said, 'Wait a minute, the environment is important, and we're learning, by some of the elegant biology that's been done, to identify orphan receptors in the human body that seem to have ligands that are in nature. I mean, that's an intriguing concept. But the whole area of the basic biology of how a human organism interacts with its environment and how that feeds back into the pathophysiology of disease deserves to be a priority. When you think about it, that's a self-evident priority, and why was it neglected for so long? Of course, in our present environment, where we have environmental problems around us, I think it's timely to address. In our regional meetings everybody resoundingly endorsed that as a scientific priority, and it's been one that's been pitifully neglected by NIH.

So there is an example of how a strategic planning process can work, whether it be structural biology or whether it be the environment and basic biology. And I'll tell you, at the regional meetings when we asked, 'What should we kick off the list?' Nobody wanted to take off structural biology. So I think the process is working. We're still in the process by the way. Let me quickly tell you about a few of things

So we are really trying to get the strategic plan to be something that bubbles up from the scientific community. If you have any creative ideas, let us know.

we're doing. We're having five panels of extramural scientists coming to Bethesda to work on the writing and developing of the document.

Also, the article I was telling you about that I was working on the phone this morning—if *Science* accepts it—is about the strategic plan. And we're trying something cute—this was *Science's* idea—we will have an electronic town meeting, if you will. It will be an electronic or fax town meeting where the article will ask six questions to the scientific community and then we ask them to fax their reply. The replies

will go to *Science*, not to us, because then you can't say, 'Oh, maybe you threw away the ones you didn't like.' So the replies will go to *Science* and then they'll send them to us. En route, they'll look at them and they might write some articles. It's going to be an interesting way to solicit the 100,000 people out there who are stakeholders directly in NIH, as well as the public.

So we are really trying to get the strategic plan to be something that bubbles up from the scientific community. If you have any creative ideas, let us know.

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RESEARCH REVIEW

Research and Technology Transfer Administration

June, 1992

Minnesota Lags Behind Rest of Country in R&D Spending

According to a report published by Minnesota Technology, Inc., (formerly the Greater Minnesota Corporation), Minnesota has not kept up with the nation's increases in research and development spending.

Based on statistics from the National Science Foundation (NSF), between 1985 and 1989, national investments in R&D increased by slightly more than 30%, compared to an increase of 8.5% in Minnesota. Those figures include R&D performed by private industry, the federal government, universities, nonprofit organizations and other entities on the state and national level.

According to the report, Minnesota's private industry ranked ninth among all 50 states in R&D performance per capita in 1989. Using both internal funds and grants and contracts from the federal government and other sources, private industry conducted more than \$2 billion of the State's \$2.4 billion total R&D expenditures in 1989.

The report also indicates that "overall federal research and development performance in the state ranks far behind the national average. Minnesota ranks 38th in the nation in R&D performed by federal labs and agencies, accounting for 0.2% of all such spending."

Among the other findings:

- Minnesota state government allocated slightly more than \$50 million for research and development in FY91. Of that \$50 million, 26% went toward R&D for agriculture and food science; 22% for computers, communications and microelectronics; and 20% for natural resources.
- While the University of Minnesota ranks seventh in research and development spending nationwide, the State of Minnesota ranks 18th among the 50 states in

Increases in R&D Performance 1985-1989

<i>Performed By:</i>	<i>% Change In Minnesota</i>	<i>% Change In the U.S.</i>
Private Industry	+4.8%	+29.9%
Federal Government	0.0%	+13.2%
University	+49.8%	+48.8%
Nonprofit/Other	+19.4%	+19.3%
Total	+8.5%	+30.1%

(In current dollars)

Source: National Science Foundation

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R&D, Continued On Page 7

Levels and Trends

The publication *Levels and Trends in Sponsored Programs* for FY 1991 and its appendix were distributed to departments and external organizations during the last two weeks in May. This annual report includes data on amounts of funding for research, training, and public service projects received by the University from federal and state agencies, foundations, associations, industry, and private sources. The main publication reports fiscal year data and comparisons to recent years for each college of the University. The appendix reports data by department. If you would like a copy but have not received one, or would like additional copies, please call Mary Bendtsen, at 624-0583.

ORTTA Electronic Bulletin Board

Since September, 1990 ORTTA has operated an Electronic Bulletin Board under the University Public Access Information Service. The Bulletin Board is menu-driven and designed to be used with no printed documentation. Once logged onto the Bulletin Board, there is sufficient information on screen or within the online Help screens to use it.

Bulletin Board users can send electronic messages to the Bulletin Board Editor to request additional information on program announcements, to request proposal application kits, to request a SPIN search, etc. The Bulletin Board also lists all ORTTA staff and telephone numbers, information needed to prepare proposals, i.e. fringe benefits rates, indirect cost rates, agency deadlines, and the NIH Guide.

The Internet address is: 128.101.109.1 or PUBINFO.AIS.UMN.EDU. For further information, call Kim Makowske at 624-9004.

RESEARCH REVIEW

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Editor: Michael P. Moore

Editorial Assistant: Tove Jespersen

Associate Vice President: A.R. Potami

Research Review is a monthly publication of the Office of Research and Technology Transfer Administration. Its purpose is to inform faculty and administrators who are involved with Sponsored Research and Technology Transfer on procedures and policies of granting agencies; on institutional policy and other information necessary to the preparation of research proposals; and on funding opportunities.

Research Review welcomes ideas and comments from all readers. Write to Research Review at 1100 Washington Avenue South, Suite 201, Minneapolis, MN 55415-1226, or call Michael P. Moore at 624-9398.

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, creed, color, sex, marital status, national origin, disability, public assistance status, age, veteran status, or sexual orientation.

Indirect Cost & Fringe Benefit Rates

Indirect Cost Rates

The *provisional* rates for July 1, 1991 through June 30, 1994 are listed below. When budgeting for periods beyond 6/30/94, the 7/1/92-6/30/94 rates should be used. **The rate agreement is dated February 6, 1992.** This date should be used where required on proposal applications. **Please call Marilyn Surbey at 624-4850 with questions on Indirect Costs.**

	07/01/91 06/30/92	07/91/92 06/30/94
Research		
On-Campus	40.00	40.00
Off-Campus *	21.00	21.00
SAFHL	60.00	58.05
Hormel	53.00	44.00
Other Sponsored Activity		
On-Campus	20.00	20.00
Off-Campus *	10.00	10.00
Instruction		
On-Campus	52.00	52.00
Off-Campus *	16.00	16.00

* A project will be considered off-campus if more than 50% of the direct salaries and wages of personnel employed on the project are incurred at a site neither owned nor leased by the University.

Fringe Benefit Rates

If you have questions regarding fringe benefit rate development or need the breakdown of charges, call **Vivian Fickling at 624-2009.**

Current actual rates from July 1, 1991 through June 30, 1992 are:

Faculty	28.75
Civil Service	25.25
Graduate Assistants	8.50

For proposals being submitted with start dates **after July 1, 1992**, the estimated fringe benefit rates to be budgeted are:

Faculty	31.25
Civil Service	29.50
Graduate Assistants	10.50

Estimated rates after **July 1, 1993** are:

Faculty	28.00
Civil Service	30.50
Graduate Assistants	31.25

As rates change they will be reflected in this section.

Avoiding Conflicts of Interest in Industry-Academe Partnerships

Diligence and flexibility in negotiations are required to avoid potential conflicts of interest between commercial firms and nonprofit institutions and their employees, says Dennis Harp, manager of business development at the biotechnology company Genetics Institute, Inc.

Harp spoke recently at the National Council of University Research Administrators (NCURA) meeting in Boston. He outlined several different forms of relationships that Genetics Institute has with the research community, including technology licenses from research institutions, sponsored research collaborations with research institutions and their employees, consulting arrangements with employees of research institutions, transfers of proprietary Genetics Institute technology and materials to employees of research institutions for research purposes, and paid post-doctoral fellowships at Genetics Institute.

These kinds of interactions among research institutions, their employees and commercial firms give rise to potential conflicts of interest, Harp said, and he outlined four kinds of conflicts of interest that can arise. Then, he described briefly ways in which research institutions, their employees and industry can work together to address these conflicts.

The first potential conflict of interest discussed is the need to publish versus the need to maintain secrecy. "Generally we all can agree that timely disclosure of information is necessary for the advancement of science and its consequent benefit to society at large. Many of us would also agree that the disclosure of information, in the form of publication in prestigious journals, is necessary for the advancement of an academic career.

"Standing against the academic collaborator's interest is the desire for the commercial firm—and often the research institution as well—to protect proprietary intellectual property rights. Where a collaborator's work leads to patentable discoveries, it is usually in everyone's interest to delay publication for a reasonable length of time. In our experience, a 60-day notice prior to submission of a paper for publication usually provides adequate time for preparing and filing patent applications," explained Harp.

However, in situations that do not involve patentable subject matter, it may be necessary to maintain secrecy for longer periods of time. These kinds of situations may not be appropriate for academic research and should be carefully considered prior to initiating a collaboration, Harp said.

The second possible area of conflict that Harp identified could arise from pooling of resources. The fruits of the labor of pooled resources can lead to diverging interests later on, said Harp. Conflicts of interest can still arise when any

party attempts to marry the joint technology with that of a third party or to carry out further research on the joint technology with funding from a third party, he warned.

To avoid such future conflicts, "the parties could provide for mutually exclusive fields of use in their collaboration agreement, as well as restrictions on commingling of research funds," said Harp. He cautioned that such restrictions should be thoughtfully and carefully entered into so that the commercialization of new technology is not unduly hindered.

Harp listed as his third potential conflict of interest, consulting versus employee obligations. He said that consideration (payment) for consultants can take several forms, including cash, access to specialized technology or confidential information, grants of stock or stock options, or royalties on product sales.

For this kind of consideration, Harp said commercial firms generally insist that consultants agree not to compete commercially in the field covered by the consulting arrangement and to assign any inventions the consultant may make to the commercial firm. This is the provision, he said, that causes the most problems for universities, because virtually all require that employees assign to the institution any patentable inventions made using the university's resources.

One way to resolve this conflict is to ensure that the consultant's work for the commercial firm not use any of the research institution's resources and, further, that the research institution give its consent to the consulting arrangement. The interests of the research institution, its employee and the commercial firm can be protected if the consulting arrangement is coupled with a formal collaboration and/or license agreement with the research institution.

Harp warned that in this area both research institutions and commercial firms must "scrupulously monitor consulting arrangements" to ensure that academic freedom is not compromised.

The last area of potential conflict Harp identified is tension between satisfying scientific interests and satisfying commercial interests. The commercial firm has an interest in funding basic research, and this interest is in agreement with that of the scientist. But at some point, development work must be undertaken to advance the commercialization of products. Commercial firms would gladly pay for the development work, but sadly, development work is often viewed as unglamorous and unscientific and most academic scientists avoid it, said Harp.

From the Washington Fax

Committee on the Use of Human Subjects in Research

Suitability of the Investigator

The Committee on the Use of Human Subjects in Research is charged with prospective review of research proposals involving human subjects. One component of the review process is an assessment of the "suitability" of the investigator to the proposed task.

The Committee trusts that the departmental and advisor signatures on the application forms will have satisfied most of the requirement with respect to suitability.

However, there are instances, especially with new faculty or student research proposals, where the Committee may request *vitae* information to ensure that the training and experience of the investigator are suited to the proposed plan involving human subjects. This inquiry is designed to ensure that the rights and welfare of research subjects are appropriately protected.

In some studies, extensive delegation of recruitment or intervention is proposed. In those instances, where the principal investigator will delegate important tasks to research associates, an explanation of the training component of a proposal should be provided with the application.

Sabbatical, Extended Leave, or Termination

When an investigator leaves the University for sabbatical, an interim principal investigator should be appointed and the Committee notified in writing of the temporary change in personnel. An explanation of the qualifications of the interim PI should be included in the written notice.

If a researcher leaves the University but the project continues, irrespective of funding source, notice of interim investigator and/or replacement should be provided to the Committee.

The Committee cannot assure that the rights and welfare of the study subjects are protected in the absence of the principal investigator.

If you have questions, please call Moira Keane at 624-1889.

Environmental Protection Agency

Change in Organization Accounting Codes

Investigators who have support from the U.S. Environmental Protection Agency (EPA) should be aware of a forthcoming change in the administration of their grants. The change, to be effective with all awards and/or amendments received after July 1, 1992, requires ORTTA to assign a new CUFS organization code (org) each time the *budget period* changes. Please note that the fund and area portion of the CUFS account string will remain unchanged.

This change—although certain to be popular with no one (including ORTTA)—is necessary because of the unique way in which EPA requires ORTTA to report expenditures on our EPA letter of credit.

If one understands the structure of an EPA award number, one can easily determine when EPA changes an award to a new budget period. For example: for the account number EPA/CR8166635—XX-Y, CR8166635 is an EPA identifier unique to the project, XX refers to the budget period, i.e., 01, 02, 03, etc., and Y refers to a specific amendment within a budget period.

Thus, 01-1, 01-2, 01-3 are all amendments to the 01 budget period and *would not* require a new org. However, if the budget period changed from 01 to 02, a new org would be necessary.

If you have questions about this new requirement, contact Rick Dunn at 626-2265.

National Institutes of Health

Mailing Address for Principal Investigators

Correspondence from NIH to applicant Principal Investigators is sometimes returned to NIH due to an insufficient address. The investigator address used by NIH for such correspondence is taken from Item 3e of the PHS 398 application.

Correspondence includes snap-out mailers with assignment information and snap-out mailers with percentile and priority score information.

PIs are urged to ensure that the mailing address given on the grant application is as specific as possible. In addition to the street, city, state, and zip code, please include any additional information that might assist in mail delivery within the institution, such as a room number, department, and/or building.

NAS Proposes a Scientific Integrity Advisory Board

A proposal to establish a new Scientific Integrity Advisory Board (SIAB), made by a National Academy of Science panel in its report, *Responsible Science, Ensuring the Integrity of the Research Process*, will be given extra effort by way of a special meeting aimed at ensuring that the idea is not lost for lack of a sponsor.

On the occasion of the report's release this week, NAS President Frank Press said the academy will make the effort to bring together the scientific community at large to find ways to launch the proposed board.

SIAB, as proposed by the NAS panel, would not be a scientific board, although it would have scientists as members, said Ed David, Chair. Scientists on the panel would probably be in the minority, he said. Other members might come from ethics, law, business, education, and the lay public. The David panel recommends that SIAB be established under the umbrella of a non-science, prestigious organization such as the National Academy of Public Administrators.

SIAB would exercise leadership in addressing ethical issues related to research conduct. It would frame model policies and procedures for handling allegations of misconduct in science consistent with the standards of due process and confidentiality that should govern the handling of complaints, explained David.

As envisioned by NAS, SIAB also could monitor the activities of the Office of Science and Technology Policy, the Public Health Service, the National Science Foundation and other agencies to review and comment publicly on policies and procedures for handling allegations of misconduct in science. SIAB also would have the responsibility of collecting and analyzing data on episodes of misconduct in the research environment.

National Institutes of Health

Modification of Review Criteria for NRSA Institutional Research Training Grants

In October, 1989, NIH issued a report entitled, *The Review of the NIH Biomedical Research Training Programs*, which summarized the recommendations of three NIH task forces on Research Training established by then NIH Director, Dr. James Wyngaarden.

These task forces recognized the important role of NIH research training programs in the development of productive researchers and the advancement of biomedical sciences.

They also reiterated NIH commitment to ensuring the training of an adequate number of individuals with appropriate skills to meet future personnel needs in biomedical research.

After a careful analysis of existing programs, the task forces developed a series of recommendations designed to enhance those aspects of institutional training programs known to be correlated with the production of successful researchers. Many of these recommendations will be implemented by the modification of review criteria. The changes are designed to improve the efficiency of NIH funded research training programs.

Four policy changes were published in the March 20, 1992 NIH Guide. The article is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the Bulletin Board.

National Institutes of Health

Short-Term Research Training Positions on Institutional NRSA Grants

NIH has announced the availability of short-term training positions for health-professional students on National Research Service Award (NRSA) predoctoral or postdoctoral institutional research training grants (T32). These short-term training positions are part of a continuing effort to increase the involvement of physicians and other clinically trained individuals in biomedical and behavioral research and particularly clinical research.

Short-term research training positions are intended to provide health-professional students with an opportunity for a time-limited exposure to research during "off-quarters" and summer periods and an opportunity to consider a career in research. Students selected for this program are encouraged to engage in at least two but no more than four short-term training appointments during the period of their professional predoctoral training.

Existing training grants with three or more years remaining in the award period may request short-term training positions as a competitive supplement for the **September 10, 1992** and subsequent receipt dates. Prospective applicants are strongly advised to contact their appropriate NIH program administrator for specific information about application procedures and other special requirements.

Short-term training awards were announced in the March 20, 1992 NIH Guide. Copies of the complete announcement are available from ORTTA and may be requested by calling 624-9004 or by sending a note through the Bulletin Board.

Honeywell/Sweatt Lecture:

Towards Corporate-Wide Technological Literacy

Concerns about economic competitiveness can best be addressed by improving the technological literacy of corporate directors and managers, specifically by developing and teaching basic criteria and formats for analyzing technology, said Rias J. van Wyk, in the third and final lecture in the 1992 Honeywell/Sweatt series sponsored by the University of Minnesota Center for the Development of Technological Leadership (CDTL).

Van Wyk is Professor and Assistant Director of the Graduate School of Business, University of Cape Town, South Africa. He has been a visiting academic in the Management of Technology Group at the Massachusetts Institute of Technology; the International Institute for Management Development, Switzerland; and the Interdisciplinary Centre for Technological Analysis and Forecasting, Israel. Van Wyk spent part of this past spring quarter as the first Honeywell Visiting Professor at CDTL.

A large and growing part of every manager's experience—not only the technology manager but anyone whose job is technology oriented—is the notion of a “technological landscape...within which we will be doing our business, and... which gives us the new ideas, the new products, the new processes.” This rapidly changing landscape is driven by linkages in which an improvement in one technology spills over to and affects many others, creating the phenomenon of technology clusters.

“The changing landscape provides a unique challenge, something that all managers must be able to do. It requires the ability to seek and identify emerging technologies that are commercially significant,” van Wyk said. This ability is especially important for members of corporate boards of directors, which is an area that has not received the attention it should, he added. “The Board reviews and sanctions strategy; the Board endorses the choice of destiny that the company formulates for itself. It has an awesome responsibility. It must think about the company's technological interests, and it must determine the mission statement... The Board has to be aware of the technological landscape... The mission statement doesn't determine technological interests, the technological interests determine the mission statement.”

How do we achieve technological literacy? van Wyk asked. There are two options, both of which are valid and should be pursued: “We can either teach our technological specialists something about management, or we can teach our managers something about technology.” Most academic programs attempt to do the former, he said [including CDTL's Master of Science in the Management of Technology, a practitioner-oriented program for professionals employed in

technical positions]. As more of these types of programs are developed, including MBA programs, some fear that they may neglect to continue to emphasize the importance of technology, and thereby “wash the technical expertise out...We do hope that there is some residue of technical expertise that remains.”

Regarding the second option of teaching technology to managers, van Wyk cited the old business saying, “You can't manage unless you know your business.” “When you ask the managers who say this what they mean by ‘Know your business,’ they say ‘It means understanding technology.’” This calls for “a field of knowledge that could cut across all technologies, and that could give us access to all, but not necessarily expertise in any particular one,” van Wyk said.

In the late 1970s, van Wyk and colleagues started developing the structure for such a field, which they call “technology analysis.” They started with the definition of technology as “created capability.” They then began creating a set of conceptual tools and formats for analyzing the type of capability offered by a technology. This became a basic kit of five tools:

1. Standard format for describing individual technologies, to enhance communication between technical people and nontechnical people, and across technical fields.
2. System for classification of technologies by function and within the types of environments in which they are used, rather than by industry or technical discipline.
3. Core trends in the technology, to provide a structured way of understanding change and its effects.
4. Breakthrough zones, a chart of key technical constraints that if solved could provide opportunities for new products, processes, or entire industries.
5. Socio-technical preference profile covering government regulations, social or cultural preferences or trends that affect how the technology will be accepted.

Van Wyk said that in his experience with companies that have implemented this technology analysis system, they tend to be cured of “future shock” reactions to changes affecting the industry. It also streamlines internal communication, such as when managers and engineers set up a design schedule or discuss a product protocol. He has also seen improved technical auditing, in which a corpora-

tion decides which key technologies to control in order to develop new products.

One major area of technology analysis—technology scanning, or observing changes and opportunities in the technology landscape—appears to be declining just when it is becoming of vital importance for technological competitiveness, van Wyk observed. “At a time when the technology landscape is changing more rapidly than ever before, when one is entering a time of turbulence and political upheavals internationally, scanning is becoming a declining activity. I think part of the reason is that we never learned how to do it properly; we didn’t have proper framework, proper theories of evolution in all those environmental categories, so that the common mind can do it with a certain amount of ease.

“With technology analysis we can develop a system of scanning which involves everybody in the corporation. In fact...scanning starts with the board. The board produces a profile of technological expectations. The board signals ‘We are vitally interested in this field. This is what we think might happen in the technological landscape.’ When individual experts then bring back their information, there is a point of reference, and the dialogue between the board and experts is hastened and somewhat improved.”

Finally, technology analysis is very useful in formulating strategy. “We don’t have a technology strategy unless we spell out which technologies we want to be in, the depth of capability in each, and what range of capabilities we want to develop. The only way we can do that is to have formats for expressing our interests in technology,” van Wyk said.

“I’m firmly convinced that technological literacy is one objective that we can and should pursue. It’s the one thing that we can agree on, and we don’t have to wait for government. We can go out, and using the tools that are becoming available, advance technological literacy throughout the entire corporation as well as the boardroom.”

The Center for the Development of Technological Leadership (CDTL) was established in 1987 with an endowment from the Honeywell Foundation. The mission of CDTL is to promote leadership in technology by providing Institute of Technology students and technical practitioners with educational opportunities for increased breadth and depth in liberal arts, business, and management

CDTL is an interdisciplinary center with participation from the Institute of Technology, the Curtis L. Carlson School of Management, The College of Liberal Arts, the Hubert H. Humphrey Institute of Public Affairs, and the College of Agriculture.

The Center conducts four programs:

- *Master of Science in the Management of Technology—a practitioner-oriented program for technical professionals*
- *Integrated Degrees in Engineering, Arts, and Science (IDEAS)—a dual degree program for students in the Institute of Technology and the College of Liberal Arts*
- *Management Minor for Undergraduate Students in the Institute of Technology*
- *The Honeywell/Sweatt Lectures in Technological Leadership*

For more information, call 624-5747.

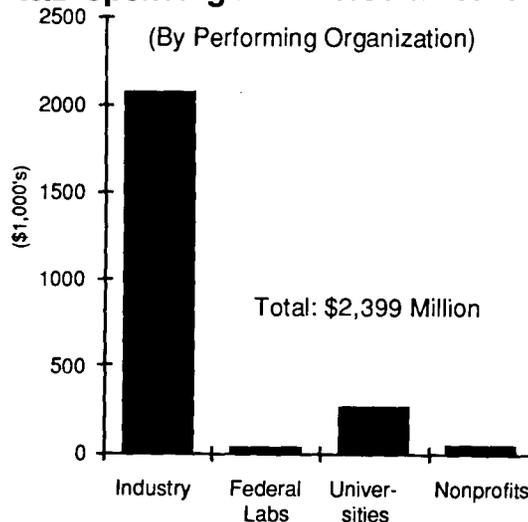
R&D, Contined From Page 1

the amount of R&D funding received by major research institutions.

- Minnesota ranks fifth among all states in the number of patents issued per million residents. In 1990, 330 patents were issued per million residents, behind Massachusetts (344), New Jersey (392), Connecticut (457), and Delaware (662).

The study of Minnesota’s R&D expenditures, described in the first issue of *Minnesota Technology Trends*, also highlights Minnesota’s research and development spending by private industry, the federal government, and Minnesota state government through the University of Minnesota and other organizations. The quarterly publication is available free to Minnesota residents. Contact: Minnesota Technology, Inc., 111 Third Avenue South, Suite 400, Minneapolis, MN 55401; 612/338-7722.

R&D Spending in Minnesota - 1989



Source: National Science Foundation

NSF Electronic Award Transmission

NSF has announced that it is expanding its process of sending award letters to grantees via electronic mail. It expects this method to become standard agency practice. Budgets are also sent electronically with the award letter when changed by NSF from the grantee's proposed budget. The PI's copy of the proposal reviews will continue to be sent through regular mail. The Grant General Conditions (GC-1) will not be forwarded by NSF with the award.

In response to NSF's announcement, ORTTA is planning to change its procedures for NSF award notification effective July 1, 1992. NSF will send the award letters electronically to ORTTA, and we in turn will forward them electronically to Principal Investigators for whom we can find an e-mail address. We will append a copy of the Grant General Conditions to the award. The Notice of Grant or Contract Review form will be processed as it is now, following setup of the award funds. If we are unable to locate an e-mail address for a Principal Investigator, we will forward the award letter by campus mail to the Principal Investigator.

If you have questions, please call the appropriate grant administrator or Mary Cybyske at 624-6085.

National Science Foundation Engineering Education Coalitions

In order to encourage participation and allow prospective proposers adequate time to prepare quality proposals, the National Science Foundation has extended the deadlines for the Engineering Education Coalitions Program.

The extended deadlines are:

- Phase I - July 1, 1992
- Phase II - October 15, 1992

Rules in effect this year allow proposers to decide whether or not to enter Phase II competition as a result or regardless of the Phase I review. This means that even if the Phase I review is less than favorable, the Phase II proposal, if submitted, will still receive full consideration if the shortcomings and weaknesses of the Phase I proposal are adequately addressed.

Those who have already mailed their Phase I proposals to NSF before seeing this notice will be given the opportunity to revise the proposals for resubmittal, if they desire, thereby taking advantage of the extended deadlines.

Please direct all inquiries to Dr. Win Aung, Senior Staff Associate of the Engineering Education and Centers Division, at 202/357-9707; internet: waung@note.nsf.gov.

New Era Will More Directly Connect Basic Science and Industry, Press Says

Frank Press, president of the National Academy of Sciences (NAS), in his yearly address to the academy said, "If I am right about a future in which the boundaries between basic and applied research fade, commercial relevance will be an intrinsic feature, if not a stated goal, of most science."

In his address Press declared a new post-Vannevar Bush era in science, an era in which the United States will have to excel in product design and manufacturing equally as well as in science and technology in order to succeed. [Vannevar Bush implemented the post-war transformation from military research to federal sponsorship of basic research.] In this new era, research that builds economic security and quality of life will drive federal support for science in much the way defense research has driven it in the past, Press said.

In 1945, Press pointed out, Bush influenced change in the relationship between scientific research and the federal government with his statement: "The scientist doing basic research may not be at all interested in the practical applications of his work, yet further progress of industrial development would eventually stagnate if basic scientific research were long neglected."

"The new reality," said Press, "will be an even more direct connection between fundamental science and engineering and their commercial application." Press also called for improved federal funding for fundamental research, and formulation of a national technology policy.

Basic scientists are overcoming their fear that thinking about commercialization of their results will somehow taint their research, asserted Press. Where cooperative agreement among government agencies, academe and the private sector were once suspect, they are now pursued with enthusiasm, he said.

Research-based technologies, technologies stemming from research in fundamental science or engineering, will be the mark of the new era, said Press. "The ascendancy of these research technologies that are seeded in advances in fundamental research rather than in refinements of existing processes and products...is where we already are strong. I believe it represents our best chance for not just matching but outshining other nations," he said.

From the Washington FAX

American Cancer Society

In accordance with its commitment to support clinical research training, the American Cancer Society has established two new awards for physicians who wish to pursue a career in clinical research.

Physician's Research Training Award

The Physician's Research Training Award will replace the Physician's Research Training Fellowship effective October 1, 1992. (Fellowships presently in effect will be continued for the duration and stipend as originally awarded).

Candidates must be citizens or legal permanent residents of the United States. They must have an MD, DO, DDS or equivalent degree to be eligible. Candidates who have an MD/PhD degree are *not* eligible for this award but may apply for a postdoctoral fellowship.

The stipend will be \$40,000 in year one, \$42,000 in year two, and \$44,000 in year three of the initial three-year award. During the third year awardees may apply for a two year competitive renewal, at year three funding levels.

Awards *will not* be made to applicants who have completed five or more years of research training prior to the activation date of this award, irrespective of the source of support. A portion, but not more than one year of the initial three year award may be part of a research requirement of certain residency protocols.

The application receipt date is **October 1, 1992**.

Junior Clinical Research Award

The Junior Clinical Research Award has been established, effective October 1, 1992. The award is designed to provide partial salary support for clinical investigators to enable them to reduce their teaching and clinical activities and devote more time to clinical research.

Clinical research is defined by the American Cancer Society as follows: Studies that investigate human subjects or materials and have direct application to the prevention, diagnosis or treatment of cancer in the individual or group of individuals under study, or the rehabilitation (including quality of life issues) of the patient.

Candidates for this award must be citizens or legal permanent residents and must have an MD, PhD, MD/PhD, DO, DDS, or equivalent degree and must have an appointment and conduct research in a clinical department.

The initial award will be for three years with a stipend of \$25,000 in year one, \$26,000 in year two and \$28,000 in year three. During the third year recipients may apply for a competitive two year renewal at year-three funding levels.

Applicants may, but are not required to, have a senior faculty member as a close collaborator or advisor.

The application deadline is **October 1, 1992**.

A copy of the guidelines for the two new programs is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board.

Department of Transportation

Studies of Safety Belt and Motorcycle Helmet Use Benefits

The National Highway Traffic Safety Administration, U.S. Department of Transportation, announces a discretionary cooperative agreement program to support studies to determine the benefits of safety belt and motorcycle helmet use in motor vehicle crashes, and it solicits applications for projects under this program.

Project studies under this program will obtain information by linking existing state traffic records systems with other existing medical outcome and charge and reimbursement data. The linked records systems or CODES (Crash Outcome Data Evaluation Systems), will be used to evaluate the impact of safety belt and motorcycle helmet utilization on crash outcome.

Project studies will involve statewide, population-based data for a twelve month period after January 1, 1990, so that crash victims can be traced via computer from the scene through disposition/final recovery. Project studies must be completed by April 1, 1994 to meet a Congressional mandate for a report on the benefits of safety belt and motorcycle helmet use.

Applications must be received by **July 15, 1992**. A full copy of the announcement is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the Bulletin Board. For further information contact: Chuck Venturi, Highway Safety Management Specialist, NHTSA, Room 6125 (NRD-31) 400 7th Street SW, Washington, DC 20590; 202/366-4709.

Agency for Health Care Policy and Research

Health Services Research on Rural Health

The Agency for Health Care Policy and Research (AHCPR) has announced a program entitled *Health Services Research on Rural Health* (PA-92-71), to stimulate the development of new research in the areas of delivery, organization, and financing of rural health services.

New rural health problems have developed in recent years and some rural health problems have worsened. Newly emerging rural health issues such as AIDS, State and Federal policy changes, and increased emphasis on managed care have been woven into the research agenda with long-standing issues, such as the supply of health professionals, emergency services, and care for indigent persons. There is also increasing interest in learning whether or not differences in care delivered to rural residents, compared to urban counterparts, are associated with different health outcomes.

The following topic areas and questions are illustrative of relevant research needed to improve the scientific base for informed rural health policy recommendations:

- Access
- Health Professionals
- Emergency Care Delivery Systems
- Rural Hospital and Hospital-based Delivery Systems
- Alternative Delivery Systems and Managed Care
- Provision of Primary Health Care
- Health Promotion and Disease Prevention
- Technology

Research is encouraged on the delivery of services to people with AIDS, the homeless, the elderly, rural poor, mothers, children, and adolescents, and rural/ethnic minority populations. Examples of research needed are:

- Studies of health care utilization, health status and access to coordinated community services for special populations in rural areas, and basic demographic studies of their social characteristics.
- Studies of variations in informal caregiving among the rural elderly by racial and ethnic characteristics.

This is an ongoing program. The first application due date is **October 1, 1992**; after that proposals will be due on the regular receipt dates of February 1, June 1 and October 1. A copy of the full announcement is available from ORTTA and may be requested by calling 624-9004 or by sending a note

through the Bulletin Board. A Grant Announcement discussing research issues in the PA will be available by June 15, 1992 from the AHCPR Publications Clearinghouse, PO Box 8547, Silver Spring, MD 20907; 1/800/358-9295.

Centers for Disease Control

Injury Prevention and Control

The Centers for Disease Control (CDC) announces that applications are being accepted for Injury Prevention and Control Research Grants. This announcement is related to the priority areas of Violent and Abusive Behavior, and Unintentional Injuries.

The purposes of the program are: a) to support injury prevention and control research on priority issues, as indicated above; b) to encourage professionals from a wide spectrum of disciplines such as engineering, medicine, health care, public health, criminal justice, behavioral and social sciences, and others, to undertake research to prevent and control injuries; and c) to evaluate current and new intervention methods and strategies for the prevention and control of injuries.

The focus of grants should reflect the broad-based need to control injury morbidity, mortality, disability, and costs. Grant applications for both intentional and unintentional injury control are sought. Special consideration may be given to applications requesting one or two years of funding; one-year pilot projects are encouraged. The three phases of injury control are defined as prevention, acute care, and rehabilitation. The disciplines of biomechanics and epidemiology may be of importance in addressing each of these phases.

Approximately \$2 million is expected to be available in FY93 to fund approximately 6 to 10 grants for periods of up to three years, with the average new award in the range from \$60,000 to \$225,000 (including both direct and indirect costs).

An optional, non-binding letter of intent is requested no later than two months prior to the planned submission deadline. This is an ongoing program; the next deadline is **October 1, 1992**. For further information please call: 404/332-4561. You will be asked to leave your name, address and phone number and will need to refer to Announcement Number 912.

National Science Foundation

Research on Science and Technology

The National Science Foundation established the Research on Science and Technology (RST) Program in January, 1992. The objective of the program is to fund research on science and technology that will help address two major responsibilities of NSF:

- To develop and improve approaches, methods, techniques, data, information, and knowledge for addressing research and technology questions and issues;
- To analyze significant research and technology questions and issues to serve users and decision makers, especially in the Federal government, but also in academia, industry, state and local governments, and the public.

The scope of this program includes support of:

- Studies of the processes, inputs, outputs, impacts, and especially the interrelationships among these in scientific and engineering research and technological change—both domestic and international;
- Studies of the human resource aspects of science and technology;
- Improvement of the methods, data, information, and analysis associated with such studies; and
- Assessment of research summarizing what is known about an important science and technology question, how good that knowledge is, what it suggests and does not suggest about options, and what are the next most important steps for improving knowledge of the subject.

It is anticipated that this program will make roughly 10-20 small awards, some jointly funded with other programs, from an allocation for FY92 of \$400,000.

Proposals may be submitted **at any time**, allowing for approximately six months of review and processing time. A complete copy of the announcement is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board. Agency contact: Len Lederman, Research on Science and Technology-SBE, National Science Foundation, Washington, DC 20550; 202/357-0366, fax: 202/357-7654, electronic mail: llederma@nsf.gov.

National Science Foundation

Materials Research Laboratories

Material's Research Laboratories (MRLs) are supported by the National Science Foundation to undertake materials research of a scope or complexity that would be difficult or not feasible under traditional funding of individual projects. MRL funding is intended to provide a central focus for interdisciplinary materials research at qualified universities, and to complement, not substitute for, individual investigator awards.

Essential activities at each MRL include, but are not limited to: major research programs or "thrust areas" where sustained cooperative effort by several investigators with diverse backgrounds is needed to make satisfactory progress; the development, operation and maintenance of central research facilities; and seed funding for new initiatives, new investigators, and novel concepts and ideas in materials research.

Funding levels for MRLs currently range from about \$1 million to almost \$5 million annually.

Proposals must be received by **October 2, 1992**. A complete copy of the announcement is available from ORTTA and may be requested by calling 624-9004 or by sending a note through the bulletin board. Agency contact: Program Director, Materials Research Laboratories, Division of Materials Research, NSF, 1800 G Street NW, Washington, DC 20550; 202/357-9791, fax: 202/357-7959, electronic mail: mrl@nsf.gov.

U.S. Department of Agriculture

Water Quality Program

The U.S. Department of Agriculture (USDA) is inviting proposals for competitive grant awards under the Special Grants Water Quality Program. The purpose of the research will be to focus on soil and plant testing methods and adoption of improved practices to reduce nitrates that leach into water supplies. Proposals are to be specifically focused on the evaluation and improvement of current tests for nitrogen availability to crops, as well as the development of new tests, and the adaptability and integration of these tests into farm-scale recommendations for nitrogen management.

The following research problem areas will be supported:

- Evaluate and improve current tests for nitrogen availability to crops. Proposals should address a range of applications (soils and crops) of currently used tests, and should also assess the amount of nitrogen not used or needed by the crop and evaluate the potential for leaching of the excess nitrogen into groundwater. Calibration, validation, and comparison of tests may be appropriate to the research.
- Develop new tests for nitrogen availability to crops and for leaching potential. Proposals should focus on new technology that would improve accuracy, reduce costs, or reduce the time required to complete the test. Research to determine the range of application, validity, leaching potential, and comparison with other tests may be appropriate.
- Integrate nitrogen tests for soils, plants, manures, and other organic materials into farm-scale recommendations. Proposals should address the region of adaptability and integration of state-of-the-art nitrogen tests into management plans for sustainable farming systems.
- Incentives and barriers to adoption of improved nitrogen tests. Proposals should address methods to remove barriers and improve the rate of acceptance, adoption, and implementation of improved nitrogen tests.

A total of approximately \$700,000 will be available in FY92 for support of these grants. Maximum total funding will be \$60,000 per proposal for a funding period of two years; first year funding may not exceed \$30,000 and second year funding will be subject to the availability of funds.

The application deadline is **June 22, 1992**. A copy of the announcement is available from ORTTA and may be requested

by calling 624-9004 or by sending a note through the Bulletin Board. For further information contact: Dr. Maurice L. Horton, Dr. Berlie L. Schmidt, Dr. Birl Lowery: 202/401-4504, FAX: 202/401-1706.

Department of Energy

Human Genome Program

The Office of Health and Environmental Research, Office of Energy Research, U.S. Department of Energy, is interested in receiving applications for Special Research Grants in support of the Ethical, Legal, and Social Issues applied to activities of the Human Genome Program (HGP). (Program Notice 92-14).

The Human Genome Program is a coordinated, multidisciplinary research effort aimed at developing creative, innovative resources and technologies which will lead to a detailed understanding of the human genome at the molecular level. This particular research notice encompasses research and conference grants that address ethical, legal and social issues that may arise from applications of knowledge and materials from the Genome Program.

DOE especially encourages the submission of applications to conduct multidisciplinary empirical research in the area of privacy as it pertains to genetic information. This may include (but is not limited to) issues of ownership and control of genetic information, consent to disclosure and use of genetic information, the impact on scientific collaboration and candor, and the role(s) of high performance computers in information management relevant to genetic data.

DOE is also soliciting for the preparation and dissemination of educational materials in any appropriate medium that will enhance public understanding of both the scientific aspects and the ethical, legal and social aspects of the HGP. In addition, DOE is encouraging conferences focusing on specific issues or areas of concern related to the ethical, legal and social implications of the HGP.

The application deadline is **August 7, 1992**. For further information contact: Dr. Daniel W. Drell, Office of Health and Environmental Research, ER-72 (GTN), Office of Energy Research, U.S. Department of Energy, Washington, DC 20585; 301/903-6488.

Faculty Research, Training, and Service Awards

This section contains statistics on proposals and awards recently processed by ORTTA. In addition, we have randomly selected awards received by faculty during preceding months. If any faculty member has received an award s/he would like mentioned in a future Research Review, please send the pertinent data, as listed below, to Michael Moore at ORTTA.

Proposal and Award Summary

	Number	Amount
Proposals Submitted		
April, 1992	273	\$ 53,765,045
Awards Processed		
April, 1992	133	12,354,087
Proposals Submitted		
July, 1991 - April, 1992	3,487	576,801,552
Awards Processed		
July, 1991 - April, 1992	2,463	203,420,716
Proposals Submitted		
July, 1990 - April, 1991	3,026	429,501,690
Awards Processed		
July, 1990 - April, 1991	2,479	206,348,885

Otitis Media Pathogenesis Research Program

G. Scott Giebink, Pediatrics

NIH, NICHD
\$1,662,439 - 01/92-12/92

Abnormal Blood Cell Membranes in Disease

Harry S. Jacob, Medicine

NIH, NHLBI
\$218,683 - 02/92-01/93

Psychophysics of Reading: Normal and Low Vision

Gordon E. Legge, Psychology

NIH, NEI
\$204,946 - 12/91-11/92

Developmental Genetics of Caenorhabditis Elegans

Robert K. Herman, Genetics and Cell Biology

NIH, NIGMS
\$156,474 - 03/92-02/93

Permeability Regulation in Mitochondria

Douglas R. Pfeiffer, Hormel Institute

NIH, NHLBI
\$271,019 - 12/91-11/92

Biology and the Structure of Personality and Emotion

Richard A. Depue, Psychology

ADAMHA, NIMH
\$229,327 - 04/92-03/93

Red River Trade Corridor Development Projects

Jerry Nagel, Division of Business, Crookston

USDA
\$189,332 - 03/92-08/93

Ionophore Catalyzed Cation Transport

Douglas R. Pfeiffer, Hormel Institute

NIH, NHLBI
\$177,607 - 12/91-11/92

Interfacial Regulation of Phospholipases

Howard L. Brockman, Jr., Hormel Institute

NIH, NHLBI
\$174,894 - 12/91-11/92

Glycolipid Transfer: Regulation by Membrane Interfaces

Rhoderick E. Brown, Hormel Institute

NIH, NIGMS
\$167,031 - 05/92-04/93

Press Phase II Evaluation of Ductile Connections for Precast Frame Systems

Catherine E. French, Civil and Mineral Engineering

NSF
\$140,000 - 03/92-08/95

Integrated Public Use Microdata Series

Steven Ruggles, History
Russell R. Menard, History

NSF
\$138,512 - 04/92-09/93

State-To-State Dynamics of Molecular Energy Transfer

W. Ronald Gentry, Chemistry
Clayton Giese, Physics and Astronomy

U.S. Department of Energy
\$130,000 - 04/92-03/93

Characterization of Aeroallergens

Malcolm Blumenthal, Medicine

Multi-Data, Inc
\$28,620 - 03/92-02/93

The Use of Ozone-Treated Dicotyledonous Lignocellulose as a Silage Additive; Nutritional Studies

Marshall D. Stern, Animal Science

Binational Agricultural Research and Development Fund (BARD)
\$85,000 - 11/92-11/95

Transcatheter Experimental Atrial Septal Defect Closure With the DAS-Microvena Occluder

Robert Wilson, Medicine

Microvena Corporation
\$15,000 - 11/91-10/92

Urea Cycle Enzymes in Thermal Injury

Mendel Tuchman, Pediatrics

USDOD, Army
\$8,000 - 01/92-12/92

NMR Imaging of Flow and Metabolites in Hollow Fiber Bioreactor

Bruce E. Hammer, Radiology

Minnesota Medical Foundation
\$10,000 - 04/92-05/93

Energy Metabolism in the Immature Myocardium

John A. St. Cyr, Surgery
John E. Foker, Surgery

Minnesota Medical Foundation
\$5,000 - 04/92-03/93

Innervation of the Maxillary Sinus in Rats

Keith C. Kajander, Oral Sciences

NIH, NIDR
\$35,428 - 04/92-03/93

Role of Peripheral CRF During Inflammation and Pain

Kenneth M. Hargreaves, Restorative Sciences, Dentistry

NIH, NIDR
\$85,248 - 04/92-03/93

Evaluation of Opioid Regulation of Inflammation

Kenneth M. Hargreaves, Restorative Sciences, Dentistry

ADAMHA, NIDA
\$70,000 - 03/92-02/93

Quantitation of Canine Physiological Responses to Canine Training Halter

Phillip Ogburn, Small Animal Clinical Sciences

Alpha-M, Inc.
\$4,930 - 12/91-07/92

Interactions of Pseudorabies with Porcine Immune Systems: Immunosuppression, Vaccination, and Immunotropism

Jerry L. Tortison, Clinical and Population Sciences
S. Chinsakchai, Clinical and Population Sciences
Thomas W. Molitor, Clinical and Population Sciences
National Pork Producers Council
\$15,000 - 10/91-09/92

Pilot Study to Determine the Effect of Feeding Meats and Bone Meat Naturally Contaminated with Salmonella

Robert A. Robinson, Clinical and Population Sciences
Donald E. Otterby, Animal Science
Fats and Protein Research Foundation
\$15,895 - 04/92-12/92

Large Gap Insulator on Gallium Arsenide and Related Materials

Marshall I. Nathan, Electrical Engineering
Alfonso Franciosi, Chemical Engineering and Materials Science
NSF
\$36,821 - 03/92-08/93

U.S.-France Workshop on High Performance Polymers

Matthew V. Tirrell, Chemical Engineering and Materials Science
NSF
\$15,750 - 04/92-03/93

Electro-Chemical Study of Copper, Nickel, and Platinum

Karl A. Smith, Civil and Mineral Engineering
Iwao Iwasaki, Civil and Mineral Engineering
St of MN: Natural Resources
\$3,417 - 01/92-06/92

High Strength Concrete

Catherine E. French, Civil and Mineral Engineering
Roberto Leon, Civil and Mineral Engineering
St of MN: Transportation
\$45,000 - 03/92-03/95

Assessment of Rock Weakening Using Fracture Mechanics

Joseph F. Labuz, Civil and Mineral Engineering
Charles Fairhurst, Civil and Mineral Engineering
HDRK Mining Research, Ltd.
\$39,900 - 03/92-08/92

Fuzzy Logic Approach to Physical Design of VLSI and PCB

Eugene Shragowitz, Computer Science
NSF
\$46,913 - 04/92-09/93

CISE Research Instrumentation

Keshab K. Parhi, Electrical Engineering
Ramesh Harjani, Electrical Engineering
Gerald Sobelman, Electrical Engineering
NSF
\$76,000 - 04/92-09/93

Self-Sealed Planar Vacuum Microelectronics

Dennis L. Polla, Electrical Engineering
Honeywell, Inc.
\$20,000 - 02/92-12/92

MOS GAAS Interface Studies

Marshall I. Nathan, Electrical Engineering
Alfonso Franciosi, Chemical Engineering and Materials Science
NSF
\$43,379 - 03/92-08/93

Implementation of LRC Core Lab Facility

Kerry Kelts, Geology and Geophysics
NSF
\$93,225 - 03/92-10/94

Subcooled Jet Impingement Boiling/Condensation Control

Avram Bar-Cohen, Mechanical Engineering
Paul J. Strykowski, Mechanical Engineering
IBM
\$59,789 - 03/92-02/93

Plasma Waste Pyrolysis and Production of Valuable By Products

Emil Pfender, Mechanical Engineering
Blandin Foundation
\$55,000 - 04/92-03/93

Historical Building Research and Documentation

Robert Mack, Architecture
Minnesota Historical Society
\$3,000 - 11/91-07/92

Establishment of Continuous Avian Cell Lines

Douglas Foster, Animal Science
Solvay Animal Health, Inc.
\$30,597 - 04/92-03/93

Lake Minnetonka Bass Tracking

Mary G. Henry, Fisheries and Wildlife
St of MN: LCMR
\$85,000 - 07/91-06/93

Annual Plan of Work for the Minnesota Research and Development Center for Vocational Education

James M. Brown, Vocational and Technical Education
St of MN: Board of Vocational Technical Education
\$95,000 - 07/91-09/92

Possible Geometric Isomers in Adducts of Rare Earths

Larry Thompson, Chemistry, Duluth
American Chemical Society/Petroleum Research Fund
\$20,000 - 06/92-08/94

Engineering and Economic Analysis of a Wood Hydrolysis Project

Kjell R. Knudsen, Center for Economic Development, Duluth
Mark Mueller, Center for Economic Development, Duluth
Minnesota Power and Light Company
\$20,000 - 03/92-12/92

Marketing Training and Entrepreneurial Assessment

Kjell R. Knudsen, Center for Economic Development, Duluth
M. Lee Jensen, Center for Economic Development, Duluth
Northeastern Minnesota Initiative Fund
\$12,900 - 04/92-03/94

Fluxed Pellet Pot-Grate Firing Tests

Harold E. Goetzman, Appl Research & Tech Development Cntr, Duluth
Cyprus Minerals
\$13,000 - 02/92-03/92

Magnetite Oxidation Study

Rodney L. Bleifuss, Appl Research & Tech Development Cntr, Duluth
Cyprus Minerals
\$5,500 - 02/92-01/93

Blast Fragmentation Study

Rodney L. Bleifuss, Appl Research & Tech Development Cntr, Duluth
Harlen B. Niles, Natural Resources Research Inst, Duluth
St of MN: Natural Resources
\$29,750 - 12/91-06/92

Agricultural Residues: Alternative Turkey Litter

Thomas Malterer, Appl Research & Tech Development Cntr, Duluth
Agricultural Utilization Research Institute
\$92,399 - 02/92-05/93

St. Louis River Watershed GIS Database Development

Lucinda Johnson, Center for Water and Environment, Duluth
St. Louis County Community Social Service Board
\$21,741 - 03/92-12/92

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Research and Technology Transfer Administration

July, 1991 — June, 1992

Volume XXI

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