Building on Partnerships

COMMUNITY REPORT 2004

AcademicHealthCenter

UNIVERSITY OF MINNESOTA

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Community Report 2004

ACADEMIC HEALTH CENTER

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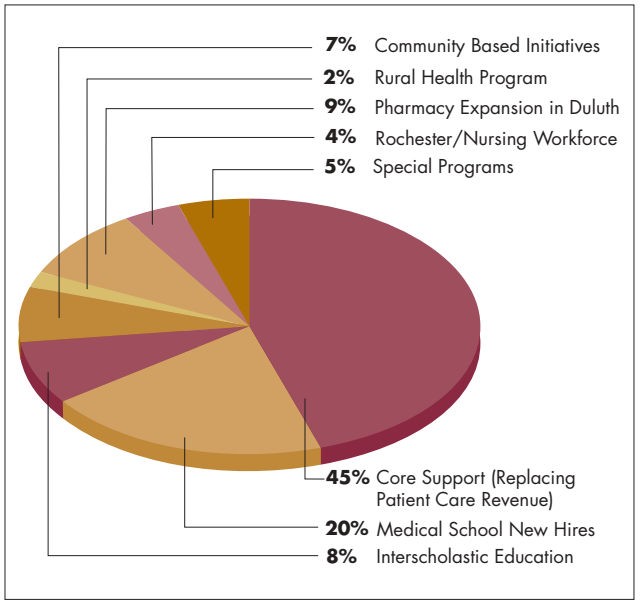
ESSENTIAL SUPPORT FROM THE STATE

Tobacco Funds



In fiscal 2004, the State of Minnesota replaced the endowments funded by settlements with tobacco companies with a 6.5 cent per pack state tax on tobacco sales, which is expected to result in annual funding to the Academic Health Center of $22.5 million.

Frank B. Cerra

BUILDING ON PARTNERSHIPS

Our Academic Health Center is being sought out by other top institutions in the health professions as a partner. Partnerships are the way we will continue to achieve the success for which we've worked so hard. Strategic collaborations, or partnerships, boost our AHC schools and colleges into the top tier of competition. As you will see from this community report, we are actively pursuing the help of our friends, as well as providing help to our friends.

We live in tough competitive times. We in the University of Minnesota's health professional schools live in the same economic environment as other enterprises. We have no protection, no ivory tower isolation, from budget cuts and declining interest in public goods, nor from expensive competitive contests for the best hires and struggles to retain top people. In addition, because of our special roles performing research and educating the next generation of health professionals, we must adapt to changes in scientific understanding, health-care delivery, and educational models.

Yet, we are poised to compete with the best higher-education institutions in the nation due to our focused investments of the past five years. As a result, when the Cancer Center reapplied for its elite designation as a comprehensive cancer center through the National Cancer Institute last year, it was approved and the center received a $17 million, five-year renewal grant. In addition, the University of Minnesota was recently designated a National Center of Excellence in Women's Health, an interprofessional initiative described in detail in this community report (page 11).

We have targeted our recruitments and attracted some of the top faculty in the country. Relationships with practitioners in the community, including full-time and part-time faculty, continue to contribute to our students' educational experiences (see page 6). And those students are remarkable for their excellence. We have renovated facilities, constructed new buildings for education and research, and broken ground for a conceptually and scientifically advanced building, the Translational Research Facility (see pages 6-7).

EVOLVING PARTNERSHIPS

We're working on a powerful partnership with the Mayo Clinic, which has drawn national attention from those who see the strength of such collaboration. It's called the Minnesota Partnership for Biotechnology and Medical Genomics. It represents a vision by Gov. Tim Pawlenty and the state Legislature that by funding an alliance between our two institutions, this state and this region can claim a position of leadership in this new industry. Read more about this exciting partnership on page 8.

To make progress, partnerships are essential, whether with Mayo, with private businesses, or with philanthropists. That's because we live in the era of Big Science. Today's science cuts across disciplines to draw on multiple approaches, requires access to sophisticated technology such as advanced magnetic resonance imaging equipment, and requires huge infusions of funding to fuel discovery.

> Partnerships are the way we will continue to achieve the success for which we've worked so hard.

On the other hand, no matter the level of investment, there's no way one institution could ever educate all our students, residents, and fellows. That's why we value our partnerships and relationships with Fairview Health Services, Regions Hospital, Hennepin County Medical Center, the Veterans Administration Medical Center, and Park Nicollet—and more than 350 other communities throughout the state, from hospitals with hundreds of staff to single practitioner clinics. Our affiliate relationships—our partnerships—with these clinics, these hospitals, and these communities are absolutely crucial.

Without these professionals who are willing to mentor and teach our students, there would be fewer doctors, pharmacists, dentists, nurses, public health professionals, and veterinarians practicing throughout Minnesota. We rely on them and thank them for their continued support.

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Educational partnerships are evolving, too. Through Area Health Education Centers, we bring to communities our students, our faculty, and educational resources. Communities, for their part, provide professional expertise, support, and funding. See the adjacent story to find out how these partnerships hold promise, as they encourage students to consider careers as health professionals serving communities in Greater Minnesota. This is a true two-way partnership where everyone benefits and everyone shares the financial risk.

Others of our numerous outreach and educational partnerships include the College of Pharmacy's establishment of a pharmaceutical-care program with Fairview that reviews patients' medications and results in better care and improved patient satisfaction. Another is the evolving relationship with Walker Methodist Transitional Care Unit. In that facility, family practice residents, nurse practitioner students, and pharmacy residents work together to improve the coordination of care for patients, as well as their efficient transition to less acute settings. The Walker experience has taught the AHC a great deal about establishing a financially self-sustainable model for providing education and practice opportunities for our students. As the model develops, the program may add a clinical research element.

FUTURE FOCUS ON CLINICAL RESEARCH

Until recently, we have focused on basic science breakthroughs and translational research; in the future, we will focus the same attention on clinical science. Clinical research that tells us what works—which of the discoveries in the lab will truly improve health outcomes. This is also an area of science critical to the education of health professionals. Our next generation needs access to this area of research and science to practice in the future.

University President Robert Bruininks has said that we cannot cut our way to greatness. I agree. The families and the communities of Minnesota demand greatness from us, and we will continue do the work necessary to meet that demand.

Frank B. Cerra, M.D.
Senior Vice President for Health Sciences

Education

PARTNERSHIPS IN GREATER MINNESOTA

Sections of northeast Minnesota suffer from limited access to the relatively small number of health-care providers. Yet formulating an antidote for this condition has become an increasingly formidable task in today's slumping economy, in which universities wield smaller budgets and communities battle sizeable economic downturns.

As the state's land-grant institution, the University of Minnesota has devised a strategy, the Greater Minnesota Strategy, that potentially will be fueled by the collaborative might of university-community partnerships. By sharing the risks and resources necessary to build and maintain innovative, community-based education programs, both partners will benefit, says Jennifer Stumpf Kertz, deputy director of the Minnesota Area Health Education Center (MnAHEC), which is designed to regionalize training of health-profession students in the state's underserved areas.

"This approach allows us to pursue goals that are mutually beneficial," she says. "Communities need our students and, in turn, our students get valuable experiences working in rural communities. And this allows us to be more responsive to what's happening in communities and determine how the University's resources—our faculty, our expertise and our students—can be used to help communities address the specific issues they face."

Brendan Ashby was recently appointed director of the Northeast MnAHEC, which was established

"Everything we do will be directed by the communities we serve," says Brendan Ashby, director of the Northeastern Minnesota Area Health Education Center.

with part of a $1.1 million federal grant and matching state funds. He began his tenure by traversing the region gathering stories from community leaders, health-care providers, hospital administrators, and anyone else interested in improving rural health care.

"Everything we do will be directed by the communities we serve," says Ashby, whose next task is to assemble a community-based advisory board to develop strategies for addressing health-care needs throughout the region. "It's through those community representatives that we will get our direction, which is going to vary by community. Some communities have severe mental-health issues—teen suicide and substance abuse, for example. Others might have challenges with, say, wilderness medicine—trying to get stranded backpackers out of the Boundary Waters to emergency care. It all boils down to improving

the health-care status across communities."

Of course, one way to do that is to increase the number of qualified health-care professionals working in the region. Such an effort requires a multi-tiered approach: Community outreach programs expose young people to the range of health-professional opportunities available to them. Continuing education programs in various disciplines can help retain rural professionals by providing them with ongoing educational opportunities. Meanwhile, early rural clinical exposure for health professional students increases the likelihood that they'll practice in these underserved areas when they've completed their training.

"Working together," Ashby says, "I really believe the sky's the limit in regards to how community-based education can support health professions, a healthy workforce, and healthy communities in this region of the state."

—Andrew Bacskai

Education

POPULATION PROTECTION

Will Hueston of the College of Veterinary Medicine and Debra Olson of the School of Public Health talk about their schools' new joint degree program.

In addition to their lethal capabilities, West Nile virus and Severe Acute Respiratory Syndrome (SARS) share another key characteristic: "They have an animal connection," says Will Hueston, director of the University's Center for Animal Health and Food Safety. West Nile, of course, is transmitted to humans through mosquito bites, while SARS appears to have been contracted by humans who consumed exotic animals. In fact, Hueston adds, "of the new and emerging diseases we see in humans today, three-quarters of those have an animal reservoir."

Recent outbreaks of such "zoonotic" diseases, coupled with the heightened threat of bioterrorism, have exposed a critical need for public health professionals with the skills and training necessary to police the volatile interplay between animal and human health. In response, the College of Veterinary Medicine and the School of Public Health launched a new dual Doctor of Veterinary Medicine/Master of Public Health (D.V.M./M.P.H.) degree program. By arming graduating veterinarians with public-health credentials, the program will prepare them to investigate new and emerging diseases, prevent and control food-borne viruses as well as viruses transmitted by mosquitoes and ticks (such as West Nile), and fortify the country's ability to respond to bioterrorism and public-health emergencies.

"We need to ensure the public health of the nation," Hueston says. "Our goal, essentially, is to train a new generation of professionals who are very well-equipped to work in this interface of human health and animal health—to make the world a safer place to live, to work, and to eat."

Traditionally, aspiring veterinary public heath professionals had to "stack" four-year D.V.M. and M.P.H. degrees. The University's new program offers a shorter, more direct path to the same destination. D.V.M. students from the University—or from any qualified veterinary program nationwide—take public health coursework online and during the summer months, which enables them to earn both degrees in as little as four years. The program also offers post-baccalaureate certificates in food safety and biosecurity to mid-career veterinarians and health-service professionals.

"We're responding to an urgent need in a more direct way," says Debra Olson, associate dean for public health education.

The M.P.H. curriculum includes a three-week Summer Public Health Institute, as well as a field experience and research project related to public health; it's designed to help students make immediate connections between the animal and human health sciences. Last summer, for example, D.V.M./M.P.H. students were dispatched to sites across the globe—including southern California, rural Minnesota, and Rome, Italy—to help investigate disease outbreaks, maintain food safety, and enhance bioterrorism surveillance systems.

"Our students are going to have a well-rounded skill set earlier in their careers than many of us in the profession had," says Hueston, who expects the first D.V.M./M.P.H. graduates to enter the workforce in 2005. "They're going to hit the ground running with an additional degree, some great networks, and some public health and leadership skills that are really going to set them apart."

—Andrew Bacskai

THE BIG PICTURE

In 2000, Meghan Cheyne earned an undergraduate degree in chemistry from Creighton University in Omaha, Neb., and promptly landed a job as a veterinarian's assistant. Within eight months, she'd concluded that a career as a traditional small-animal practitioner would not be in her future.

"In traditional practice you're treating animals one at a time," Cheyne says. "I'm a big-picture person—I was looking for something that could have a larger impact."

"I'm a big-picture person," says Meghan Cheyne, a student in the new Veterinary Public Health program.

That's why, in 2002, Cheyne pounced on the opportunity to be among the first students accepted into the University's new Veterinary Public Health program. "What appealed to me about getting into public health was that you're working with populations of animals and you're carrying that over into human health by making sure, for example, diseases that are on farms don't end up in our food supply."

Cheyne's on track to complete the dual-degree program in four years and graduate in August 2005. She hopes to land a government position doing surveillance for zoonotic-disease outbreaks. "My goal," she says, "is protecting human health."

—A.B.

Education
FROM CLASSROOM TO CLINIC

When John Song conceived of a clinic to provide health care to uninsured patients, he had two objectives in mind. The first was to provide high-quality health care to an underserved urban population; the other was to provide clinical learning opportunities for students at the front end of their medical training. If both objectives are fulfilled, then odds are that the University of Minnesota's new Phillips Neighborhood Clinic will soon help fortify the currently thin ranks of health professionals serving underserved populations.

"A lot of data suggests that when students have early exposure to underserved populations, they're more likely to work with these populations later in their careers," says Song, medical director of the Phillips Neighborhood Clinic and professor in the University's Center for Bioethics and Department of Medicine.

The Philips Neighborhood Clinic, which opened in March, is located in the basement of Oliver Presbyterian Church in Minneapolis. The clinic is run by volunteer medical professionals, who work with mostly first- and second-year medical students. "If we train even a half-dozen people who go on to serve underserved populations," Song says, "then thousands of patients will be positively affected down the line."

Such is the philosophy at the University of Minnesota's medical-education program on the Duluth campus, where early clinical exposure has been a central curricular component for more than two decades. The program's mission is to train family physicians who will practice in rural Minnesota communities. To that end, Duluth employs a unique preceptorship program, in which each first-year student is assigned to a Duluth-area family physician. Students shadow these physicians throughout the year. Then, at the end of their first year, students are teamed with rural family physicians, with whom the students live and work for four three-day stints.

"We're really trying to validate students' rural choice," says Ruth Westra, head of the Duluth family medicine department. "We've found that if we can provide them with positive experiences with mentors—successful family physicians working in the community—then there's great potential that they'll stay in rural medicine when they're done with their training."

Yet the value of early exposure to patient care extends well beyond grooming physicians for underserved areas. Consider the Minnesota Virtual Clinic, which debuted in fall 2002 at the University of Minnesota. It's a Web-based teaching tool that enables first- and second-year medical students to adapt classroom learning to a near real-world setting.

Almost every week, students log on to the site, where they're greeted by a lineup of "patients" awaiting care for a vast assortment of heath concerns, including hand lacerations, cirrhosis, childhood immunizations, Alzheimer's disease, and pregnancy-related issues. Students follow

"Early clinical exposure can help students keep their eye on the prize," says John Song.

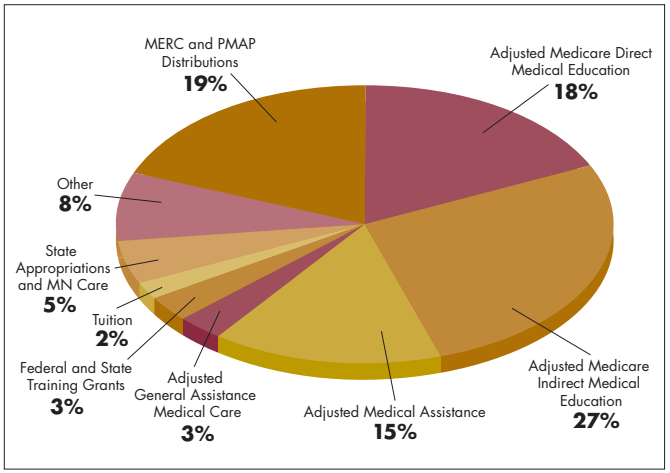
some of these cases, which are designed to correlate with class material, for up to two years. "We don't telescope the diseases, so students can observe their natural histories," says Catherine Niewoehner, professor of medicine at the University of Minnesota Medical School. As a result, she adds, students develop diagnostic and data-gathering skills, learn how to communicate with patients and other physicians, and react to changing situations.

And it all starts day one. "It's important to teach these things early on," Song says. "The first couple years of medical school can be very dry. Early clinical exposure can help students keep their eyes on the prize."

—Andrew Bacskai

REVENUES RECEIVED BY SITES THAT EDUCATE UNIVERSITY STUDENTS

$134.1 million



Data collected from state Medical Education & Research Costs application process; does not include College of Veterinary Medicine clinical costs.

SHORT COURSE

"I wanted to find about the new things happening in medicine," says Ann Meissner, "and the changes that had occurred since I was first trained."

Mini Medical School classes attract a range of people, from the high-school or college student considering medicine as a career to the bricklayer, small-business owner, or judge intrigued by health care. And the six-week course even attracts people with health-care experience.

Since 1950, Ann Meissner has earned a bachelor's degree in public nursing, a master's degree in education, a doctorate in rehabilitation counseling, and a post-doctoral master's degree in public health. She added to her robust roster of academic achievements when she graduated from the University of Minnesota's Mini Medical School. Mini Medical School is open to any member of the public (for details, see www.ahc.umn.edu/minimed).

Meissner, 79, a former public health nurse who's been a practicing Ph.D. psychologist for the past three decades, says "pure curiosity" compelled her to enroll in Mini Medical School. The course is designed to help educate Minnesotans about new and emerging health issues. Meissner says: "I wanted to find out about the new things happening in medicine and the changes that had occurred since I was first trained."

The results? "I gained from the experience in the respect that it pointed out areas I simply knew nothing about," she reports. "We don't know what we don't know. Just to be reminded of that fact is very useful."

—A.B.

PRACTITIONERS AS PARTNERS

Joyce Anacker, an alum shown seated here with dental students Sarah Melstrom and Craig Spieker, says that people involved in "hands-in-the-mouth" dentistry offer perspectives on all components of practice.

Part-time faculty members may teach only a few hours a week, but they make an outsized impact on their students and on the schools of the Academic Health Center. Their contribution as teachers, mentors, and role models for aspiring health professionals is invaluable. "We couldn't teach without them," says Paul Olin, a professor in the School of Dentistry.

The School of Dentistry, for example, has more than 300 adjunct faculty members who extend the capacity and augment the instruction of full-time faculty and staff. "They provide access to local practitioners here on the Range," says Jerry Pedersen, director of the Hibbing Clinic, where part-time, or adjunct, faculty members drive from across the Iron Range and Duluth to teach. "For our students, that's a real benefit."

Adjunct faculty primarily supervise patient treatments but they also offer insight into dental practice. It's that first-hand information, a "view from the field" from practicing dentists, that makes working with adjunct faculty such a rich experience for students. Alum Joyce Anacker has a general dentistry practice in St. Anthony and works one day a week at the dental school. "Dentistry is more than care delivery," she says. "It's administration, staffing and other business issues as well."

—Terri Peterson Smith

Research
A CAUSE FOR COLLABORATION

In 1998, Glaxo Wellcome Ltd. (a drug company now known as GlaxoSmithKline) began marketing Ziagen, an anti-HIV drug that today is one of the most effective available treatments for AIDS. The drug contains antivirals created in the late 1970s by Bob Vince, professor of medicinal chemistry in the University's College of Pharmacy. Roughly a decade later, Vince and his colleagues discovered the effect these antivirals had on the HIV virus.

"Dr. Vince took basic knowledge about the HIV virus, and viruses in general, and put it together with his knowledge of medicinal chemistry to design, synthesize, and do preliminary testing on some powerful antiviral drugs," explains College of Pharmacy professor James Cloyd. He describes Vince's work as a stellar example of translational research, which adapts laboratory breakthroughs into therapies for the prevention and treatment of disease.

For Vince's efforts, the University landed its single largest royalty agreement. The College of Pharmacy has earmarked a portion of those funds to help finance the University's new $37-million Translational Research Facility (TRF), which will house many of the heaviest hitters in the University's research lineup. The University broke ground on the new 96,000-square-foot facility, which will be a four-story facility next to the Lions Research Building, on Nov. 4, 2003. The facility is expected to open in 2005 with 33 principal researchers representing a constellation of research interests, including cancer and stem cell research, immunology, neurology, and infectious diseases.

"At perhaps the most basic level of translational research, you're simply trying to understand the metabolism and mechanics of how a cell works," says Charles Moldow, senior associate dean for research in the Medical School. "This facility is designed for investigators who are much closer to the human end of the spectrum, who are working on high-profile, clinically applicable research."

The College of Pharmacy, for example, has developed a new—and as-yet unfilled—endowed chair to facilitate the discovery and development of drugs for orphan diseases. "Because these disorders are uncommon, the pharmaceutical industry very often can't afford to spend lots of money trying to identify potentially effective treatments and take them all the way through development," Cloyd says. Through translational research, he adds, University researchers could help "accelerate the development of treatments for rare disorders."

Though translational research is hardly new to the University, the TRF will enable researchers to collaborate in ways they couldn't when they were segregated in their own older, often undersized laboratories. It's designed to be an open building that fosters scientific collaboration, Moldow says. "The laboratories aren't small, individual modular rooms. They have open designs, so the barriers won't be physical to scientific exchange and discussion. There will be open space outside laboratories, as well, to promote interaction and discussion."

"The goal is to put very talented scientists together and maximize their interaction," adds Cloyd. "We

"This [Translational Research Facility] is designed for investigators who are much closer to the human end of the spectrum," says Charles Moldow, "who are working on high-profile, clinically applicable research."

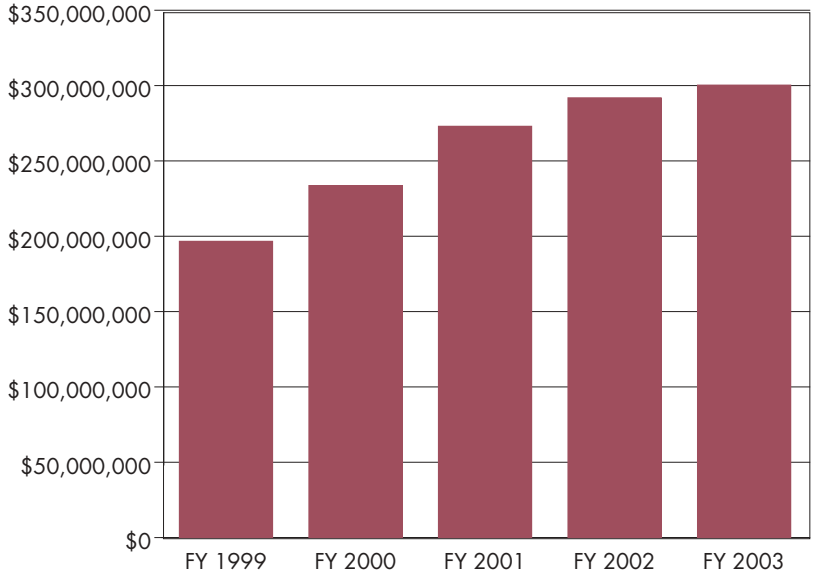
hope to take some of the basic discoveries that are occurring in areas such as genomics and pathophysiology and pharmacology and put people in place so they can translate that knowledge into what we consider to be new, safer, more effective, and more economical treatments for human disease."

—Andrew Bacskai

Across the AHC, in medicine, nursing, pharmacy, public health, dentistry, and veterinary medicine, more than 1,400 researchers strive to improve understanding in order to improve health and health care and to better prevent and treat diseases and disorders.

These AHC research faculty continue to be successful obtaining sponsored research awards from a variety of sources, primarily federal agencies. Contributing to this upward trend are increases in faculty productivity and new faculty recruits who generate new grants.

GROWTH IN SPONSORED RESEARCH, 1999-2003



PHILANTHROPY MAKES IT REAL

Biomedical researchers need sophisticated equipment, up-to-date laboratory space, and teamwork. And when philanthropists join their team, they gain essential support. Last year, the William W. and Nadine M. McGuire Family Foundation gave $10 million to the University's Translational Research Facility, a building where laboratory breakthroughs will be translated into patient treatments.

Philanthropist William McGuire pictured at the ground-breaking celebration for the Translational Research Facility in November 2003.

In spring 2003, the Minnesota Legislature's bonding bill for the facility was passed contingent on private support. Secured in summer 2003, the McGuire Family Foundation gift was essential. The facility, housing 33 researchers and their staffs, is also supported by funding from the College of Pharmacy.

Research has been behind every major advance in health, says William W. McGuire, chairman and CEO of UnitedHealth Group. He told a Minnesota Medical Foundation audience why he chose to contribute to the Translational Research Facility: "The decision to participate was easy because we understand what is at stake, what is already here, and what can emerge.... This is really about a need and the rewards that can accrue to millions of people here, in this country, and throughout our world."

—Allison Campbell

NEXT-GENERATION NURSES

"There is so much confusion about what our job description is. I think we need more critical thinkers," says new nurse Allison McVay-Steer.

In Allison McVay-Steer's opinion, the nursing profession lacks bodies—and definition.

"If you ask the average person what a nurse is, there are a million and one different answers," McVay-Steer says. This ambiguity, she contends, isn't confined to the general public. "There is so much confusion about what our job description is. I think we need more critical thinkers to help delineate us."

In December, McVay-Steer was among the inaugural graduating class of the University of Minnesota School of Nursing's new Post-baccalaureate Certificate Program, which was created, in part, to help fill the state's nursing pool, which has openings for more than 2,000 nurses. Launched in fall 2002, the 16-month program clears a less prohibitive path to nursing careers for people with a bachelor's or higher degree in another field.

McVay-Steer earned bachelor degrees in chemistry and exercise physiology. She worked at Fairview-University's Birth Center for a time and decided the direct contact with patients that nurses enjoy appealed to her.

"A lot of highly qualified people who thought they might want to pursue nursing wouldn't do it if they had to get another bachelor's degree," says program coordinator Mary Rowan. "We've been able to bring together people with wonderful, rich backgrounds, which will only improve and add to our discipline."

—A.B.

Research
M IS FOR PARTNERSHIP

To position Minnesota in the forefront of biomedical research, the University of Minnesota, the Mayo Clinic, and the state of Minnesota created the Minnesota Partnership for Biotechnology and Medical Genomics. This new collaboration brings together Minnesota's two renowned research institutions, which collectively manage major research projects amounting to $700 million in funding, a figure that has been substantially rising during the last few years.

Bill Alkofer

Frank Cerra

"The potential benefits of this partnership are great."

"The potential benefits of this partnership are great," says Frank B. Cerra, University senior vice president for health sciences, "for researchers, for the state, and especially for human health. Our goals are to improve life and sustain Minnesota's economy." Researchers at the University of Minnesota and Mayo Clinic already have made important medical discoveries in biosciences. They have unlocked some of the body's secrets, including genetic differences in drug reactions, specifically for children undergoing chemotherapy treatments; a unique genetic form of the most common form of Muscular Dystrophy in adults; and a gene related to Sudden Infant Death Syndrome (SIDS).

In seeking advances, Minnesota is not alone. Currently, more than 40 states in the United States and many other countries around the world are striving to develop centers of biotechnology and medical genomics, primarily through government-supported research funds and tax incentives. The University of Minnesota and Mayo Clinic have invested heavily in attracting essential scientific talent and developing the infrastructure to support a competitive research effort, but because of the significant costs of development for biotechnology and medical genomics, neither institution could continue to fund an initiative of this magnitude on its own. Support from the state was needed.

The partnership, announced in April 2003, represents a commitment from both institutions to unite on biotechnology and medical genomics research projects, leveraging their scientific and research strengths. The second part of the venture was securing the involvement of the state of Minnesota. Seed money of $1 million each from the Mayo Clinic and the University of Minnesota and an initial state commitment of $2 million have launched the synergistic research process. Among the 34 preliminary proposals submitted and reviewed by a joint committee of Mayo and

Hugh Smith

> "Advances in biotechnology and medical genomics should rank among the most important breakthroughs in history."

University scientists, nine have been selected to develop full proposals. These research proposals will be reviewed by a committee of distinguished scientists from outside institutions, and two to six awardees will be chosen and announced by February 2004, at which time the two-year projects will commence.

The partnership initially will aim for advances in biotechnology and medical genomics that have the potential to create breakthroughs in scientific understanding and patient treatments for cancer, heart disease, and neurological diseases. Over the long term the partnership is expected to contribute to Minnesota's economy by stimulating new businesses, creating quality jobs, and expanding the tax base.

"On a scale similar to how computers have changed our economy and the lives of most people," says Hugh Smith, chair of the Mayo Clinic Board of Governors, "advances in biotechnology and medical genomics should rank among the most important breakthroughs in history."

—Becky Ewert

BRINGING IDEAS TO MARKET

From fiscal year 1993 through fiscal 2002, the Academic Health Center's business activities—inventions, patents, licenses, and start-up companies—have contributed to new knowledge and to human health in ways that can be quantified.

	1993	1998	2002
Intellectual property disclosures	73	85	104
U.S. Patents issued	16	17	24
Start-up companies	1	2	3
U of M gross revenues	>$1 million	nearly $5 million	>$25 million

- Total number of start-up companies over 10 years 32
- Licenses completed 277
- Total intellectual property disclosures over 10 years 973
- Gross revenues over 10 years nearly $96 million

Revenues are primarily generated from licensing activities and licensing agreements.

PARTNERS IN CLINICAL EXCELLENCE

In hundreds of sites around Minnesota, volunteer faculty provide essential service as they educate the next generation of health professionals (see pages 1 and 6 for details). In the Twin Cities, partners Fairview Health Services and University of Minnesota Physicians give additional critical support to the Medical School.

In 1997, Fairview purchased University Hospital. The name changed to Fairview-University Medical Center and the institution provides top-tier care to patients while educating health professional students. A success programmatically and financially, this partnership with Fairview contributes significant support to the educational, research, and clinical missions of the Medical School. In 2003, Fairview named a new senior vice president for research and graduate medical education to serve as a liaison with the University and develop yet more effective education and research programs.

Another critical partnership was established in 1998 with the new faculty practice plan, University of Minnesota Physicians. In addition to being the place where University physicians practice medicine and train the next generation of physicians, this separate corporation pays its own expenses, including competitive salaries for the practitioners, and continues to make a substantial contribution to the Medical School for the education of medical students.

In 2004, these partners will seek to revitalize the clinical programs, including clinical research, and develop a plan for an integrated clinical center.

MAKING THE MOST OF MUTATIONS

The transposon concept, illustrated.

Engineering mutations could lead to treatments or cures—something University of Minnesota researchers and biotech start-up Discovery Genomics, Inc., are banking on. They believe University-created "transposon" technology may one day offer gene therapy for a host of diseases, which they see as the ultimate return on their investment.

With transposons, researchers can introduce a mutation into an organism. They then see how the organism is affected, which gives important clues to gene function. In the past, the tricky part has been orchestrating the mutation.

In 1997, University of Minnesota researchers developed a procedure reminiscent of Jurassic Park when they "reawakened" a defunct segment of DNA called a transposon, dubbed Sleeping Beauty. It is Sleeping Beauty's ability to "transpose" itself into another part of an organism that causes mutations. Transposons may also have potential for gene therapy—delivering a gene, instead of a pill, as treatment.

Discovery Genomics, Inc., was founded three years ago by four University researchers involved in this new technology. Today, the company is run by John Holland, a CEO from outside the University. "We have two portfolios," says Holland, "a discovery portfolio to find the function of genes and a delivery portfolio, using transposons to cure disease."

—Brenda Hudson

Research

CLOSE TO A CURE

Surgeon Bernhard Hering

Sherry Crocco recently asked her husband, "What does a person wish for when all of her wishes and dreams have come true?" Crocco became insulin independent after living with Type 1 diabetes for 30 years. An islet cell transplant by Bernhard Hering and David Sutherland at the University of Minnesota's Diabetes Institute made this miracle a reality for Crocco and more than 20 other people who have struggled with diabetes.

Diabetes occurs when a person's body either mistakenly destroys its own insulin-producing islet cells in the pancreas through an autoimmune system malfunction or when it cannot effectively use the insulin it produces. By transplanting islet cells from a human donor pancreas into a patient with diabetes, the patient is able to regain the insulin-producing properties of the pancreas.

The University of Minnesota launched the pursuit of a cure for Type 1 diabetes in 1966, when the first pancreas transplant was performed by Richard Lillehei and William Kelley. Beginning in 1978, Sutherland refined pancreas transplants for routine offering. In 1994, Sutherland and the University of Minnesota Medical School founded the Diabetes Institute to bring structure to the pursuit of a cure for diabetes through islet cell transplantation. Since then, Sutherland and Hering have worked tirelessly to find a cure for diabetes and seek through the institute to lead the world in successful islet cell transplantation.

Insulin independence was achieved for two patients in 1993 after Sutherland and Paul Gores performed the world's first successful human islet cell transplants. With assistance from the Diabetes Institute islet isolation and transplant team, Canada's University of Edmonton expanded on this success in 2000 by achieving insulin independence in seven patients with multiple islet transplants for each patient. Subsequently, Hering's team surpassed those results, achieving insulin independence in 16 of 18 patients using a single infusion or transplant of cells per patient. Reducing the number of organs used per patient is critical, as the supply of donor pancreases is limited.

The Diabetes Institute team is now undertaking next-generation islet transplant protocols. Theirs is a major achievement in moving islet cell transplantation from clinical investigation to clinical practice.

State-of-the-art islet processing is available to Hering and Sutherland's team at the Minnesota Molecular and Cellular Therapeutics facility on the St. Paul campus of the University of Minnesota. This facility, where all drugs and treatment materials for clinical trials at the University of Minnesota are produced,

Surgeon David Sutherland

provides quality assurance that the materials meet Food and Drug Administration standards and are safe for consumers. This is the stage in the drug and treatment research cycle where venture capitalists start to gain interest and invest money. Several years ago, Islet Technology, Inc., of St. Paul became acquainted with Hering and Sutherland's work and purchased the exclusive license to the islet cell isolation process developed at the University of Minnesota.

> The team is now undertaking next-generation islet transplant protocols.

Islet cell transplantation must be further studied and refined, and the supply of islet cells must be increased greatly to treat all who need them. Yet, the University of Minnesota Diabetes Institute is gaining ground every day. Unparalleled work in expanding the supply of islet cells is underway at the institute and Hering and Sutherland's cutting-edge research aims at developing a cure for diabetes, which would answer the needs of millions of people worldwide.

—Ashley Burt

Outreach

TOTAL APPROACH

Tim Rummelhoff

Reaching diverse women in Minnesota with top-tier health care is one of the goals of the new center. Center leaders include the director, psychiatrist Nancy Raymond (left), and co-directors maternal and fetal health specialist Daniel Landers and cardiologist Anne Taylor.

Reaching the whole woman, the whole family, the whole state—that is the promise offered by the University of Minnesota's new designation as a National Center of Excellence in Women's Health. Designated by the U.S. Department of Health and Human Services Office on Women's Health, a center of excellence is more than a physical center. It is a recognized, formal commitment to collaboration, integration, and coordination of women's health care services at the University with that of affiliate hospitals and community partners.

"Our faculty and partners allow us to address women's physical, psychological, and social health in rural and urban settings, and among the diverse cultural and geographic populations across the state," says Anne Taylor, cardiologist and co-director of the program. "Because women are the key health managers in families, improvement in women's health in Minnesota will strengthen family and community health."

Expertise and commitment to women's health already exists at the University, which has such clinics dedicated to women's health as the Women's Care Clinic, the Mature Women's Health Clinic, Reproductive Medicine, and the Breast Center. While vying for this national recognition, Taylor, psychiatrist Nancy Raymond, and others at the University gathered internal resources and support from the Medical School, the schools of nursing, public health, and pharmacy, and from affiliate hospitals and community partners. They also identified areas for collaboration and growth in addressing women's health needs in Minnesota.

"Reaching diverse women of Minnesota is central to the center's mission. Traditionally, immigrant, minority, low-income, and rural women have been marginalized in terms of access to health-care

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STRENGTHENING TRAINING

Jerry Vincent

Spine specialist David Polly, Jr.

In the body, the spine supplies essential connections. In his research on the spine, David Polly, Jr., connects essential expertise. An orthopedic surgeon who recently came to the University from Walter Reed Army Medical Center, Polly engages in biomechanical investigations of the spine and spinal surgery, as well as treating patients.

He pioneered a synthetic spine to test treatments for scoliosis, curvature of the spine. He seeks to develop a high-tech surgical simulator, in collaboration with other surgeons at the University, which would be used to train spine surgeons in new high-risk procedures.

"Training in a simulator is the future of surgery," says Polly. "And the University of Minnesota has all the necessary components to make this a reality—a robust Academic Health Center and superb engineering and computer science departments. The strong medical device industry presence in the Twin Cities will provide great partnership opportunities."

Polly knows the power of partnerships. He serves on two multi-center associations, the Spinal Deformity Group as co-chair and the Lumbar Spine Study Group, which focuses on best practices for spinal fusions and artificial disc replacement.

—Molly Portz

Outreach

TOTAL APPROACH

continued from page 11

Cardiologist Anne Taylor, center, says "improving the health of women will also strengthen family and community health."

treatment and culturally appropriate care," says Raymond, director of the program. With the help of the University's partners and affiliate hospitals—the Center of American Indian and Minority Health, the Rural Physician Associate Program, Pilot City Health Clinic, the Community-University Health Care Center, Veterans Administration Medical Center, and Hennepin County Medical Center—resources can be leveraged to address the needs of this underserved population of women.

The center, one of 19 in the country, aims to integrate and develop high quality, evidence-based approaches to clinical care and prevention services and to extend these services to underserved women through outreach and education. Another goal is to provide women with access to clinical trials and to innovations in women's treatment.

"We are in a unique position to bring the full weight of all the University's expertise in women's health to diverse women throughout the state." says Daniel Landers, co-director of the center and director of maternal and fetal medicine at Fairview-University Medical Center. "And the network of Centers of Excellence around the nation gives the University immediate access to their clinical care, treatment, and research developments."

As a National Center of Excellence in Women's Health, the University of Minnesota is in the company of other previously funded institutions, which include Harvard University, the University of Pennsylvania, and the University of California-Los Angeles.

—Molly Portz

Outreach

CONNECTIONS PROMOTE INNOVATION IN CARE

"As neurologic procedures go, deep brain stimulation is not very high risk," says neurosurgeon Robert Maxwell, shown with an Activa device.

"It's like I was doing aerobics all the time," says Bonnie Stockmo. "My right leg and arm were tremoring constantly." Nearly two years ago, Stockmo's tremors, a symptom of her Parkinson's disease, were so debilitating that she didn't want to go out in public. "I would be afraid my arm and leg would start up again. And I couldn't do anything about it."

But now, thanks to an innovative surgical procedure, Stockmo's tremors have stopped and she's living her life again.

Parkinson's disease is a progressive and degenerative neurological disorder that causes loss of control over body movements. Brain cells degenerate, depriving the brain of the neurotransmitter chemical dopamine. It is the reduced levels of dopamine that lead to the motor control symptoms and tremors associated with the disease.

For those in advanced stages of Parkinson's, routine activities like bathing, dressing, or eating become difficult or impossible without assistance.

Unfortunately, the cause of Parkinson's for each individual is often unknown and there is currently no cure. But researchers at the University of Minnesota are using a treatment to alleviate its debilitating symptoms. In conjunction with the medical technology company Medtronic, Inc., the University is treating patients with deep brain stimulation (DBS). This technique uses surgically implanted electrodes and pulse generators similar to cardiac pacemakers to deliver electrical stimulation to precisely targeted areas on each side of the brain.

"We now know that deep brain stimulation will be able to offer many patients greater control over their body movements," says University neurosurgeon Robert Maxwell.

A neurosurgeon, working with a neurologist specializing in movement disorders, determines which area of the brain needs to be stimulated, depending on how Parkinson's is affecting the patient's brain. The device, Activa Parkinson's Control Therapy, was developed by Medtronic.

> "We now know that deep brain stimulation will be able to offer many patients greater control over their body movements."

The pulse generator is implanted in a patient's chest and sends electrical pulses through a thin wire into the deep parts of the brain that influence motor control. When activated, the electrode causes tremors to diminish, along with stiffness and other movement abnormalities. Patients can turn the DBS on when needed and, using a small magnet, turn it off during sleep when tremors subside.

In a recent study, the device increased the amount of time patients were free of paralysis and rigidity from about four hours to up to 12 hours a day.

The University of Minnesota was involved in the Medtronic pivotal clinical trial for essential tremor in Parkinson's during the mid-1990s. Activa Therapy received FDA approval for essential tremor in 1997, using a single implanted electrode. In January 2002, the FDA approved DBS using two implanted electrodes (bilateral, meaning one on each side of the brain).

"As neurologic procedures go," says Maxwell, "DBS is not very high risk." In some cases, he explains, the device may need to be replaced due to mechanical failure. There is also a chance of infection and a small percentage of patients may find their voice volume is affected by the procedure.

Stockmo hasn't been affected by any of these risks, and although she found the actual surgery stressful and exhausting, she knows it was the right thing for her. "I'd do it all again if I had to," she says.

—Brenda Hudson

"We need to re-ground ourselves. These are kids and families first," says Linda Lindeke, second from right, above. Others pictured from the study team are, from left, Amy Wenger, Angela Jukkala, Carol Sumerfelt, and Lauren Johnson. Study team members not pictured are Mary Chesney, Sandra Lynch, Kay Savik, Lexi Maciej, and Miyuki Nakai.

ASKING THE RIGHT QUESTIONS

During a patient's hospital stay, members of the health-care team might focus on one very important aspect: improving that patient's condition. But if the patient is a child, there is much more to the experience. When researchers Linda Lindeke and Lauren Johnson sought to improve all aspects of the experience, they first asked children and their parents probing questions.

The parents and children surveyed ranked their satisfaction high on the following issues:

- Were they nice to your child?
- Did you feel safe here?
- Did they help your family stay with you as much as you wanted?
- Did the people in the hospital listen to you?
- Did they help you feel better?

But kids and parents surveyed ranked their satisfaction lower on the following issues:

- Did they find ways to make the hospital more like home?
- Did they help you when you felt lonely?
- Did they give you a chance to play?
- Did they let you make choices?
- Did they tell you what they were going to do before they did it?

Their study has already led to measures to improve care at Fairview-University Children's Hospital.

Outreach

IMPROVING CARE FOR KIDS

Adding spaghetti and granola bars to the kids' menu at Fairview-University Children's Hospital got the thumbs up in November. However, not everything recommended by the hospital's new Kids Council passed. "I don't think we can do Cocoa Puffs," says Steve Kroeker, the hospital's director of nutrition services. "We don't do a lot of sugar stuff."

Kroeker's response was met by mild protest, but the idea of kids making such recommendations is revolutionary and welcome, according to Linda Lindeke and Lauren Johnson. They are two members of the team at Fairview-University's Children's Hospital, where children with especially challenging conditions, like muscular dystrophy, heart disease, or health problems requiring organ or blood or marrow transplants, are treated by pediatric specialists from University of Minnesota Physicians. As members of the University of Minnesota Medical School faculty, these pediatricians are up-to-date on the latest advances in treatments and provide hope to families.

"It's hard for them to see this through their children's eyes."

Meshing the University's top-flight medical care with down-to-earth concern for kids' feelings is a focus for Lindeke, a School of Nursing professor, and Johnson, Fairview children's services special projects coordinator. They recently completed two studies measuring patient satisfaction at Fairview-University Children's Hospital from the viewpoint of children and their parents.

"Our real interest is the children's voice, but we're also interested in what parents say," Lindeke says. The standard practice is to measure only parents' views. Guess what? They differ.

"What we found is that children tend to be less satisfied than their parents, especially younger children," Johnson says. "Kids really pointed out that pain and discomfort was still a big issue and parents hardly mentioned that."

Why? Lindeke says it's partly because they are busy trying to communicate with physicians and nurses and wanting to get their child in and out as quickly as possible. "It's hard for them to see this through their children's eyes."

Overall satisfaction on the inpatient survey—completed by 121 families—was high with children rating satisfaction at 4.7 and parents at 4.9 on a five-point scale. Ages of youth respondents ranged from 4 to 20. An outpatient study currently is being analyzed. The School of Nursing's Densford Clinical Scholars program funded the studies.

Lindeke and Johnson hope to prompt other hospitals, along with Fairview, to be more aware and considerate of kids' feelings when providing care. Lindeke is presenting the findings at Mayo Clinic and other hospitals around the country.

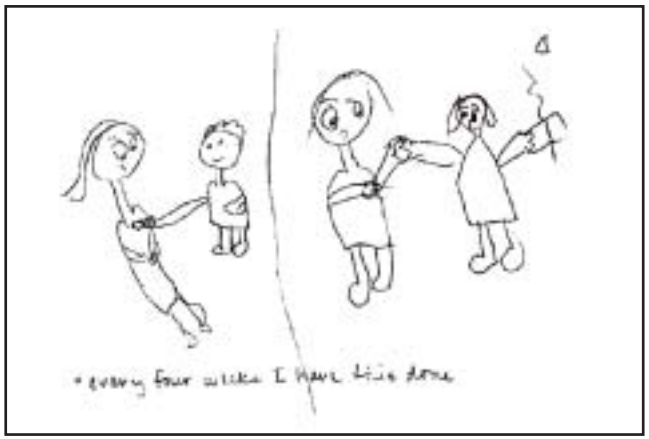
Their work has already resulted in change at Fairview. Kids complained about the scratchy, uncomfortable ID wristbands. "They hated wearing them," Johnson says. Fairview has found another material that is soft and pliable.

Another change was the creation of the Kids Council (see sidebar), which was in the works prior to the completion of Lindeke and Johnson's studies.

"I learned pediatrics in the '60s and the '70s when we were just developing this approach to care—that children and families need to remain intact when they are sick," Lindeke says, recalling a prior era when hospitals routinely limited visiting hours due to fear of spreading infections. In recent years, however, Lindeke says hospitals haven't kept up that family commitment, for varying reasons.

"We're not stopping to hear the child's direct points and seek their perspective because we're the experts and we're in a hurry and we are overworked and understaffed," she says. "But we need to re-ground ourselves. These [situations] are kids and families first."

—Mark Engebretson



A child patient illustrates a hospital experience.

KIDS COUNCIL HAVING AN IMPACT ON PATIENT CARE

Mark Engebretson

Fairview staffers Leah Okerstrom (left) and Harriet Kohen listen to tween-friendly suggestions from Zachary Baum, 12.

Eleven-year-old patient Shannon Harris is too old for the toys housed in the kids lounge at Fairview-University Children's Hospital and too young to hang out in the teen room. "I don't meet many kids my age around here," she says.

What's a tween to do? Get active.

Harris and 12-year-old Zachary Baum are two tweens who joined Fairview-University's Kids Council, created by the hospital earlier this year to improve patient care for kids. The council recently suggested seeking volunteers from local businesses to oversee tween activities. Food is another hot topic.

"The pizza isn't that good. I didn't like the macaroni and cheese either," says Baum. Three weeks into his new job, Steve Kroeker, director of nutrition services, promised to do better. "I think we definitely have that hospital-food mentality here and I want to change that."

For more information about Fairview-University's Kids Council, go to http://www.fairviewchildrens.org/

—M.E.

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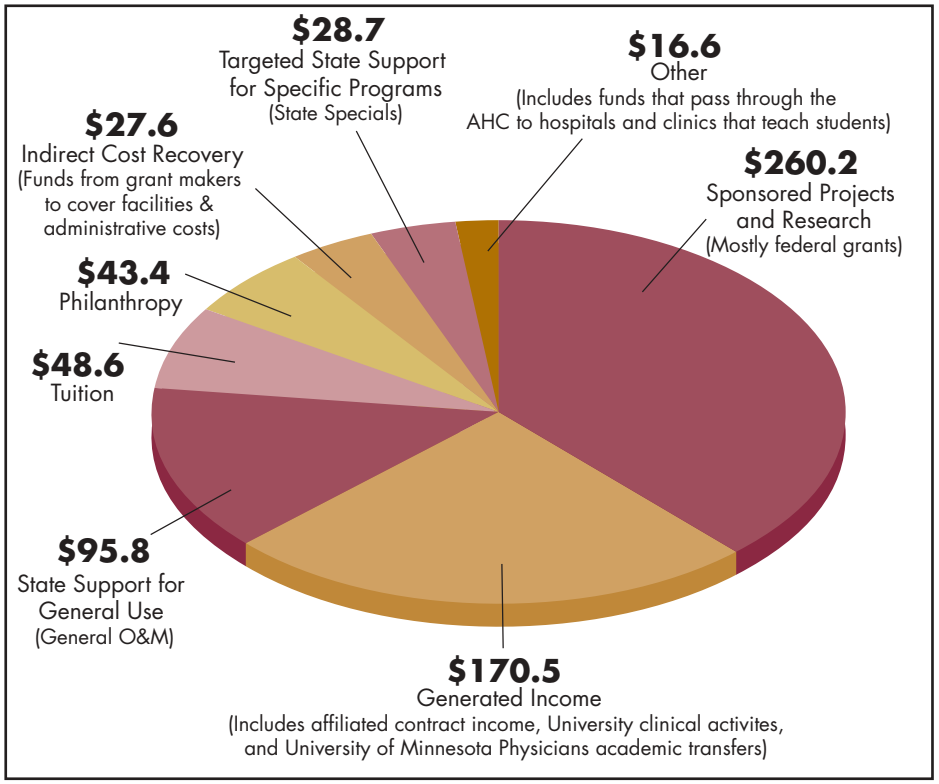
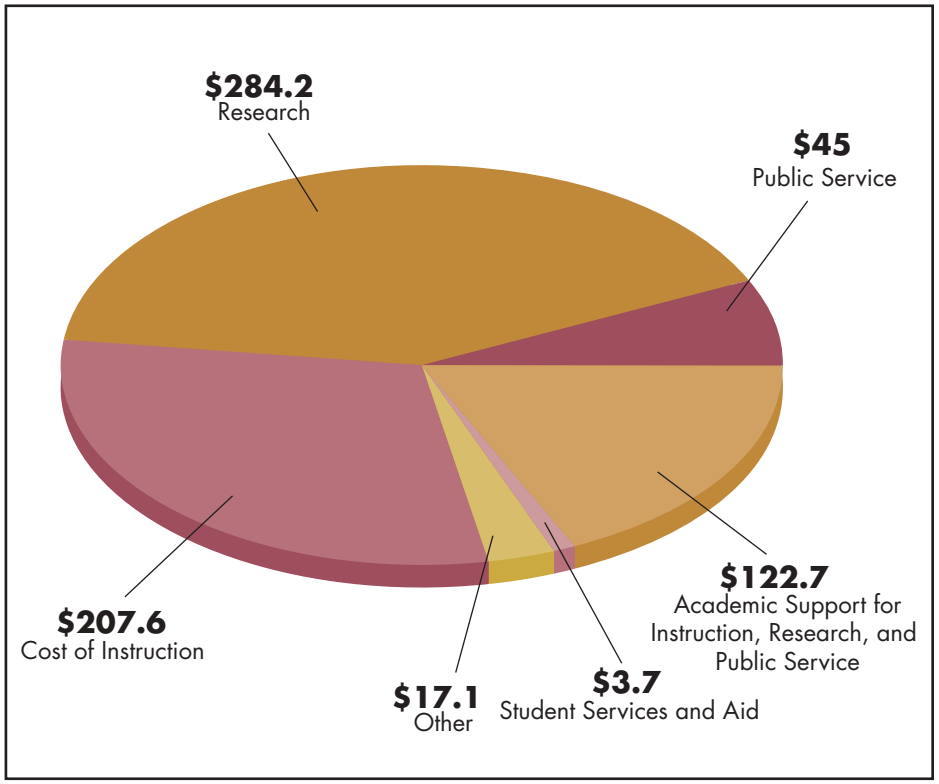
REVENUE
Fiscal Year 2003
Total $692 million



(in millions)

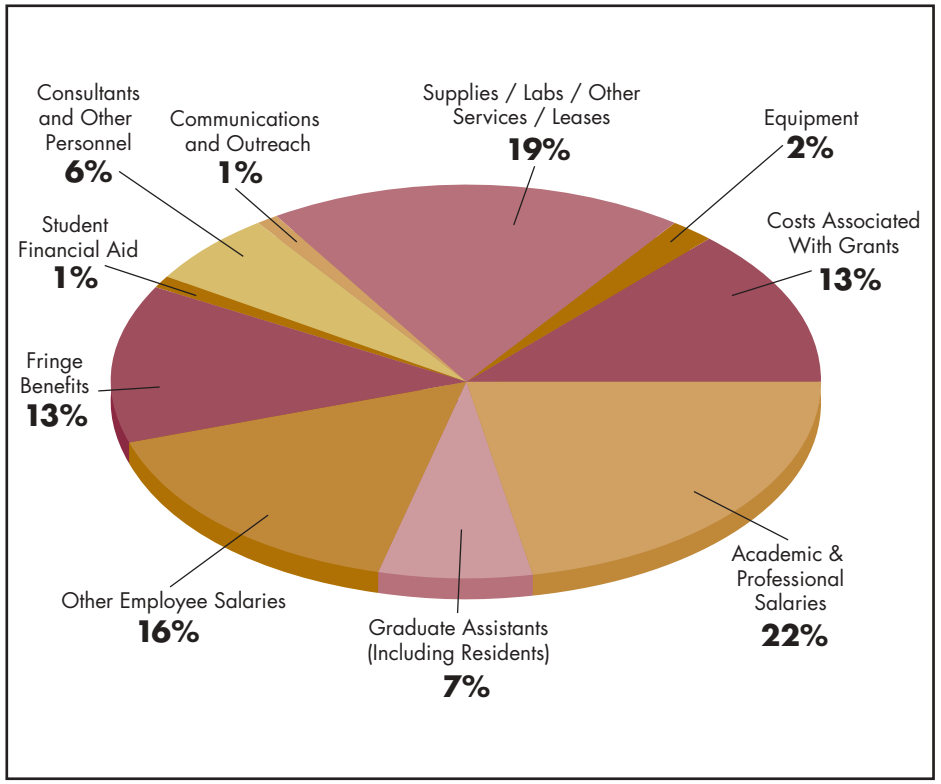
EXPENSES
Fiscal Year 2003
Total $689.6 million



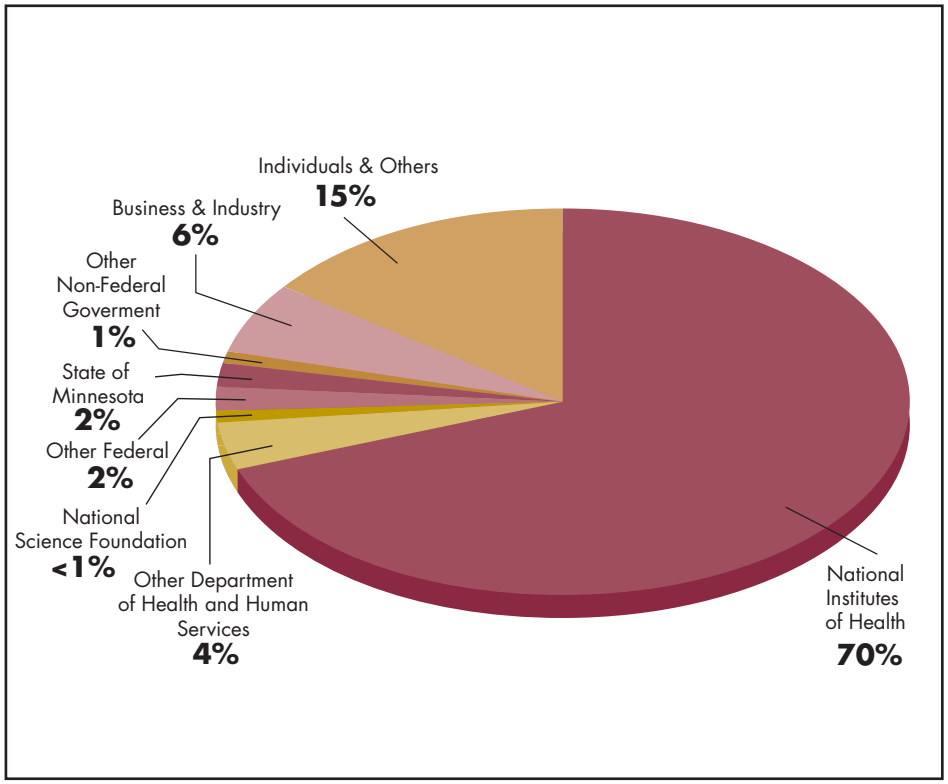
(in millions)

Academic Health Center

SPENDING ANALYSIS
Fiscal Year 2003
Total $689.6 million



SPONSORED PROGRAM EXPENDITURES
Fiscal Year 2003
By Department and Agency



Academic Health Center

RECENT ACCOMPLISHMENTS

- In February 2003, the School of Dentistry announced it reached number one in research funding from the National Institute of Dental and Craniofacial Research (part of the National Institutes of Health).
- In July 2003, the Cancer Center received renewal of its Comprehensive Cancer Center designation and a five-year grant of more than $17 million supporting its interdisciplinary cancer research.
- In July 2003, the Centers for Disease Control and Prevention chose the national testing site for monkeypox virus in animals—the University of Minnesota's Veterinary Diagnostic Laboratory. It was the first veterinary diagnostic lab selected as a full member of the CDC's Laboratory Response Network.
- In September 2003, the Medical School recruited renowned researcher Doris Taylor to the Bakken Chair in Cardiovascular Repair. Taylor works with members of the University's Stem Cell Institute under director Catherine Verfaillie in seeking cell and gene therapies for cardiovascular disease.
- In September 2003, the Health Careers Center officially opened. The center provides information on traditional and emerging health professions to both prospective and current students. For more information, see **www.healthcareers.umn.edu.**
- In fall 2003, the School of Public Health reached a record enrollment of 610 students.
- In October 2003, the College of Pharmacy celebrated its expansion to the Duluth campus.
- In October 2003, the School of Nursing was awarded a new federal grant to address one of the causes of Minnesota's nursing shortage, the difficulties new nurses encounter as they move from classroom to work setting.
- In November 2003, the University's Molecular and Cellular Therapeutics facility received a five-year, $7.7 million National Institutes of Health contract to test new cell therapies using adult stem cells, umbilical cord stem cells, tumor vaccines, and genetically modified immune system cells.
- In December 2003, the University of Minnesota was awarded a five-year, $2.5 million grant from the National Institute of Allergy and Infectious Diseases to investigate the genomics of infection and treatment response in HIV/AIDS.

AcademicHealthCenter

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