

Medical Bulletin

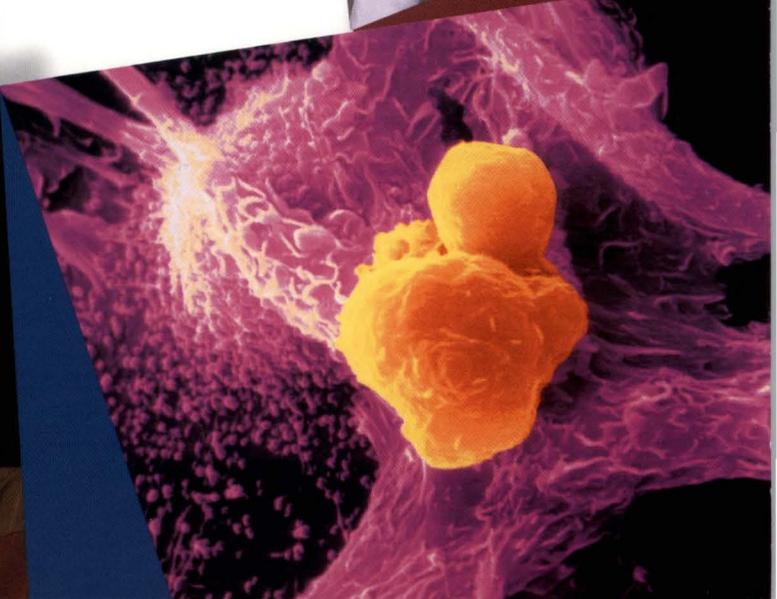
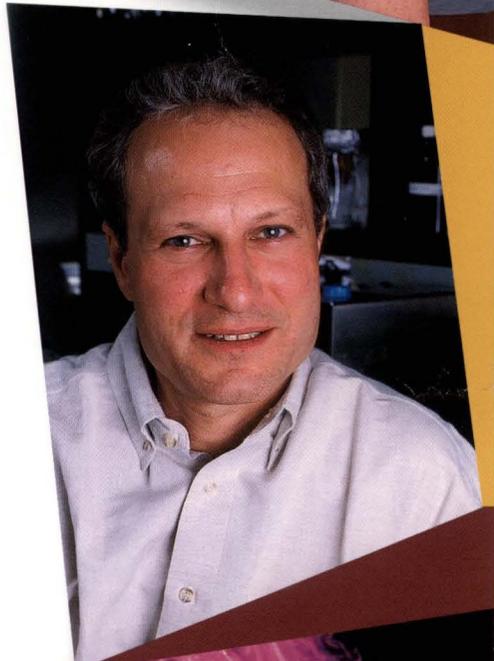
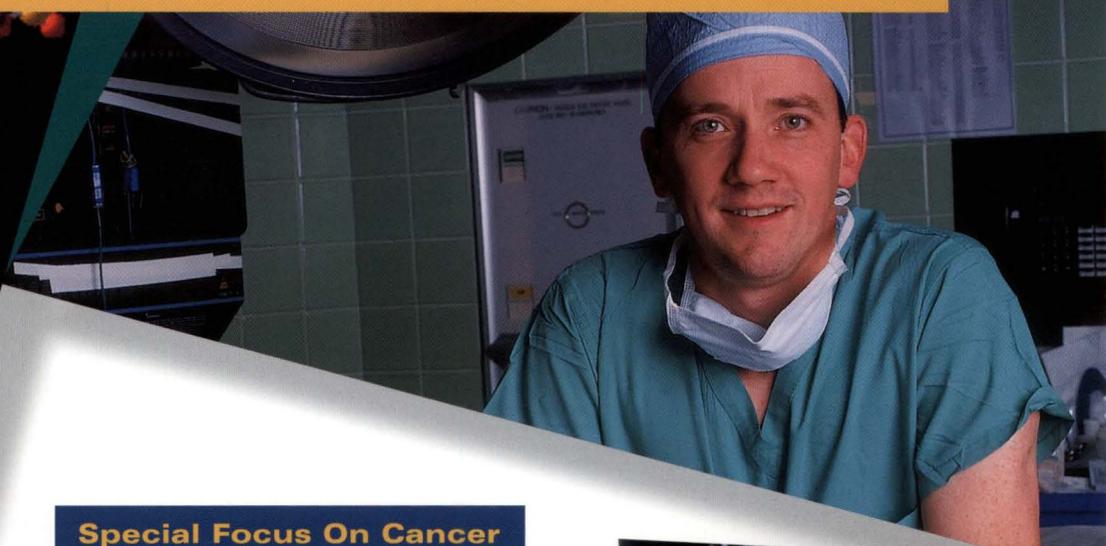
A PUBLICATION OF THE MINNESOTA MEDICAL FOUNDATION • WINTER 2000

Special Focus On Cancer

CANCER

*The multifaceted
challenge*

*The University of Minnesota Cancer
Center is developing new approaches
to managing cancer, armed with
expertise in research, education,
and patient care.*



MINNESOTA
MEDICAL
FOUNDATION

at the University of Minnesota

THE MISSION OF THE MINNESOTA MEDICAL FOUNDATION IS TO IMPROVE THE QUALITY OF LIFE FOR THE PEOPLE OF MINNESOTA, THE NATION, AND THE WORLD BY SUPPORTING THE ADVANCEMENT OF HEALTH-RELATED EDUCATION, RESEARCH, AND SERVICE AT THE UNIVERSITY OF MINNESOTA.



DEAN'S REPORT

We have turned the page on a century of extraordinary advances in diagnosis, treatment, and cure of many, many diseases and conditions. But at the same time, it was a century that gave us AIDS, diseases of aging, unhealthy hearts caused by unhealthy lifestyles, and perhaps the most feared of all – a dramatic increase in the multifaceted, mysterious disease known as cancer.

Very few of us go through life without being touched in some way by cancer. It does not discriminate – affecting our children, our parents, our friends, ourselves. It is the second leading cause of death in the United States, and there is still much we do not understand about it.

But we have come a long way, and biomedical research and clinical medicine have begun to deliver real hope – hope for a victory over cancer early in this new century.

At the University of Minnesota Medical School there is excitement and optimism among the more than 300 researchers who spend every day looking for answers to the perplexing cancer questions. The University of Minnesota Cancer Center brings together innovative research, education, patient care, and community outreach efforts – and the key word is collaboration. Teams of talented faculty members are working together to bring basic science breakthroughs to clinical applications as quickly as possible, and their efforts are paying off.

In this issue of the *Medical Bulletin*, we look at just a few of the pioneering efforts underway at the University of Minnesota – efforts that hold exceptional promise as we seek to close the chapter on cancer just as soon as possible.

A handwritten signature in white ink, appearing to read "Alfred F. Michael". The signature is fluid and cursive.

Alfred F. Michael, Dean
University of Minnesota Medical School, Twin Cities

UNIVERSITY OF MINNESOTA MEDICAL SCHOOLS

Medical Bulletin

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CANCER: THE MULTIFACETED CHALLENGE

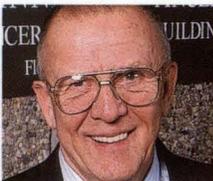
New endowed positions further strengthen the team of Cancer Center researchers.



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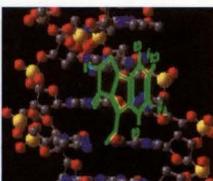
Five years ago, cancer patient Anne Rislove was given three days to live, but aggressive treatment and clinical trials at the Medical School gave her back her life.



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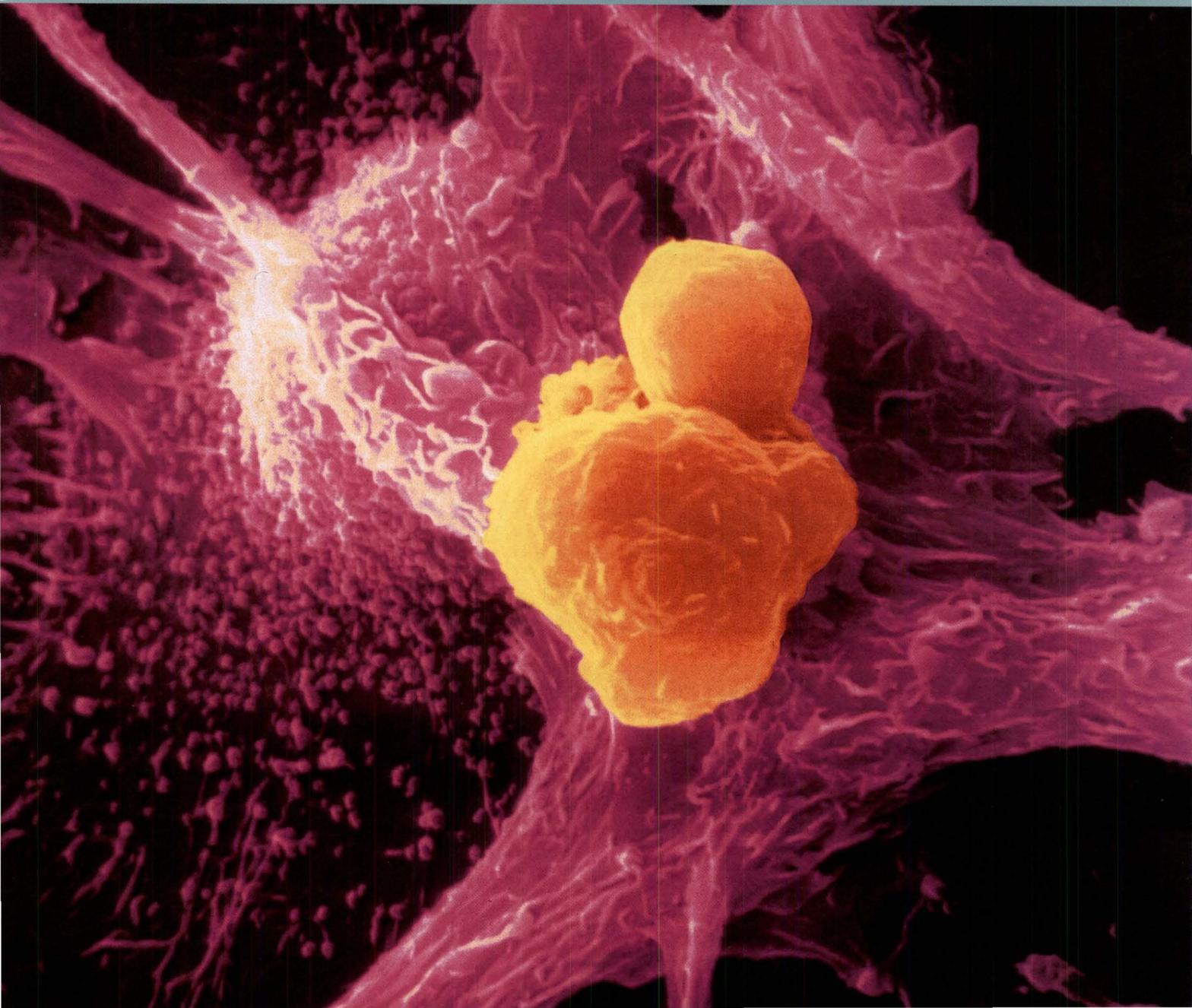
The multifaceted challenge

The University of Minnesota Cancer Center is developing new approaches to managing cancer, armed with expertise in research, education, and patient care

Cancer. Chances are everyone knows somebody who has cancer. A neighbor with lung cancer, a sister with breast cancer, a grandfather with prostate cancer, or a coworker with a not-so-familiar cancer. But what does anybody really know about it?

Cancer is not just a disease – it is many different diseases. In fact, there are more than 100 different kinds of cancer that may require just as many different treatments. In the United States, it's estimated that one out of every three people who live to the average expected age will develop cancer. To improve prevention and detection, and to create new treatments, scientists throughout the world are scrambling to understand this complex group of diseases.

The University of Minnesota Cancer Center is one team leading the race to discovery. By pulling together experts from the University, the Cancer Center creates a unique resource, capable of generating



impressive research results which translate into unequaled patient care.

"We have literally hundreds of people working together on the cancer problem," says John H. Kersey, M.D., director, University of Minnesota Cancer Center. "Our rich base of intellectual capital and our emphasis on bringing together diverse approaches to solve problems sets us apart from other cancer treatment centers."

For more than 70 years, the University of Minnesota has been a leader in cancer research, patient care, and education. The Cancer Center, created in 1991 to integrate all cancer efforts at the University, is especially strong in the areas of leukemia, childhood cancers, bone tumors, women's cancers, and head and neck cancers.

The Cancer Center's impressive track record in advancing cancer treatment has earned special recognition among an elite group of research institutions. In 1998, the Cancer Center was designated as a National Cancer Institute Comprehensive Cancer Center. This designation brings not only honor but also access to millions of dollars in research funds, unique opportunities to participate in new therapies, and enhanced ability to recruit top scientists and physicians.

Today, more than 350 physicians, scientists, nurses, social workers, dentists, veterinarians, and pharmacists from nine University colleges and schools work together to develop new approaches and treatments. This type of interdisciplinary teamwork is key to moving forward, in research and in patient care. "Collaboration is more important than ever before because of the complexity of solving cancer," says Kersey.

To facilitate collaboration, the Masonic Cancer Research Building was completed in 1996. The open design of the new Cancer Center facility encourages the sharing of resources, ideas, and inspiration among researchers from many disciplines.

Discoveries made at the research "bench" must also be translated to therapies for patients, which can be an arduous task. But the frequent interaction between scientists and clinicians, the excellent facilities, and the commitment to patients make it an attainable goal for the Cancer Center.

"We are bringing basic science breakthroughs to clinical applications. Our Cancer Center members work closely together in site-specific cancer research and treatment teams. These are the teams that will spawn new clinical trials," says

Kersey. "These are the teams that will bring the newest therapies to the patients."

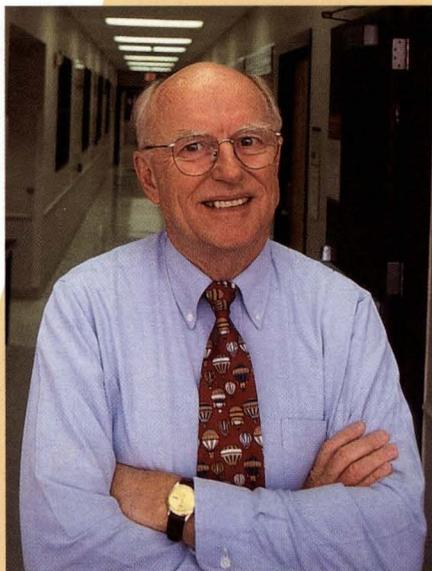
Improving patient care is the ultimate goal for the Cancer Center. A special kind of teamwork is needed for cancer patients, who face widely varied challenges. They may have to see a number of health professionals, including pathologists, radiologists, nurses, rehabilitation therapists, oncologists, and others.

Recognizing the potential difficulty of coordinating treatment, the Cancer Center supports several teams that usher patients through the often confusing or stressful process. The Cancer Center offers other options, such as the Palliative Care Program and the University Hospice, to help patients handle issues including pain management and home care.

The Cancer Center also shares its new discoveries and knowledge with the general public and the medical community. Last year, the Cancer Center helped educate the community in tobacco-related issues through a number of meetings with health care and civic leaders. As a leader in the quest for solutions to cancer, the Cancer Center serves as a model and a resource.

Sadly, cancer will probably still be here in 50 years. And most likely there will never be one "cure" for all cancer. But, the Cancer Center is a source of hope, offering new ideas, revelations, and therapies that bring us forward in the step-by-step "cure" process.

by Jodi Ohlsen Read



ABOVE: John H. Kersey, M.D., is director of the University of Minnesota Cancer Center.

LEFT:: Macrophage cell (purple) engulfing a cancer cell (yellow).

GREAT ACHIEVEMENTS

The University of Minnesota is home to some of the world's best cancer researchers. Highlights of their accomplishments include:

BONE MARROW TRANSPLANTATION

The Bone Marrow Transplantation program was the first in the world to perform successful transplants for immune deficiency and lymphoma. It continues to be a leader in improving transplantation and developing new applications.

PEDIATRIC ONCOLOGY

Major contributions were made to increasing the survival rate for children's cancers from 10 percent in 1959 to 70 percent today.

MEDICAL ONCOLOGY

The Medical School was a pioneer in establishing medical oncology as a formal discipline. Research in this field has boosted cancer survival rates and improved quality of life for cancer patients.

LEUKEMIA

University scientists have developed a method of detecting leukemia cells in the blood and bone marrow of patients in remission, which has drastically increased standard detection capabilities. Early detection is critical to higher survival rates.

CHEMOPREVENTION

The University was a pioneer in chemoprevention and dietary prevention of cancer. The University is noted for the discovery of cancer-preventing qualities of many foods.

WOMEN'S CANCER

The University of Minnesota Women's Cancer Center has achieved some of the highest survival rates in the United States for women with advanced ovarian cancer. It also ranks among the leaders for cervical and vulvar cancer treatment.

BONE AND SOFT TISSUE TUMORS

The Cancer Center's Bone and Soft Tissue Tumor Center is nationally known. Working closely with other specialties, it treats numerous cases annually of this rare form of cancer.

EPIDEMIOLOGY

Cancer Center epidemiologists have linked breast cancer to body fat distribution and have made significant contributions to research on smoking cessation and the addictive nature of nicotine.

JOINING FORCES AGAINST CANCER

New endowed positions further strengthen the team of Cancer Center researchers

This is an exciting time. Never before have scientists learned so much about cancer, so quickly. "We are riding the wave," says Denis Clohisy, M.D., associate professor in orthopaedic surgery, holder of the Roby C. Thompson, Jr. Chair in Musculoskeletal Oncology. "The labs are bursting with discoveries. It is a wonderful time."

But the solutions, the "cure," remain elusive. "The challenges are endless," says Clohisy. "One of the greatest scientific challenges is understanding why various cancers are different, and why their treatment should therefore be different. As in antibiotics, not all infections can be killed by penicillin. And, not all cancers will be cured by one magic bullet."

Cancer Center scientists and clinicians are combining forces to tackle as many aspects of cancer as possible, from many fronts. One researcher's scientific breakthrough complements the work of another, and advances the therapy options of yet another physician. At weekly and monthly meetings, researchers and clinicians from varied areas meet to share progress and receive feedback. Collaborations form through indirectly related projects, feeding the pace of discovery and fueling the motivation of many. Individuals shy away from taking credit for accomplishments; each names many others who have contributed to the advances.

A commitment to solving cancer unifies diverse team mem-

bers. The focus is on using research and hard science to move forward. "Improving our ability to prevent, detect, and treat cancer comes from first-rate science. That's how progress is made," says Tucker LeBien, Ph.D., deputy director of the Cancer Center and holder of the Apogee Enterprises Professorship in Cancer Research. "In a comprehensive cancer center at a large public university, that's what we do. We're in the business of research. That's what separates us from hospitals or centers that are involved solely in treating cancer."

"By designation [as a National Cancer Institute Comprehensive Cancer Center], it is assumed that we have expertise in basic research, population research, and clinical research. You can't be a comprehensive cancer center without expertise in all three of those research areas," says LeBien. "Progress comes through research. Period. It doesn't come by chance. We are where we are in detecting, preventing, and treating cancer in this country because of first-rate science."

But, first-rate science takes time, and it is expensive. It also requires top scientists and clinicians. Endowed chairs, fellowships, and professorships help provide the needed financial support and also provide a way to attract and acknowledge exceptional faculty. The following researchers have recently been awarded endowed chairs or professorships for their remarkable work.



Dr. Bruce Blazar, left, and colleague John Hermanson.

Changing Immune Response to New Bone Marrow

BRUCE R. BLAZAR, M.D.,
DEPARTMENT OF PEDIATRICS

Andersen Chair in Transplantation Immunology

Bone marrow transplantation can be an effective tool in battling leukemia. But there are often complications, such as Graft Versus Host Disease (GVHD). This side effect occurs when the donated marrow acts against the recipient's body. The effects range from very minimal – a limited skin rash, nausea, vomiting, or small changes in liver function tests – to more severe. GVHD can be a significant cause of death after transplantation.

Graft versus host disease is extremely common in situations where the patient's own marrow is not used. It occurs in 25 to 50 percent of brother/sister transplantations. In non-related transplants, it occurs in 75 to 80 percent or more.

Bruce R. Blazar, M.D., professor, Department of Pediatrics, is working on projects aimed at learning more about GVHD and improving the overall outcome of bone marrow transplantation (BMT). Blazar is holder of the Andersen Chair in Transplantation Immunology, which was made possible through a generous gift from the Andersen Foundation, a private foundation. Katherine B. Andersen had a strong interest in science, medical research, and particularly, the University's transplantation program. She was instrumental in directing this gift to the University of Minnesota Cancer Center.

"We have two distinct approaches," says Blazar. "One is to change the cells going into

the body so they are incapable of causing GVHD by treating them in the test tube before they are infused. The second approach is to affect the cells' response after they are infused."

Blazar and his group are examining ways to change the body's immune response to the new bone marrow. "We've looked at ways we can prevent the T-cells, which are the major players in graft versus host disease, from dividing and from attacking the patient as being foreign. When the T-cells see differences between the donor and the patient, they recognize those differences. Then they become activated and divide so that there are many more of them. The T-cells go into the tissues associated with GVHD and damage the tissues," explains Blazar.

Conditioning regimens – radiation and chemotherapy – are used to prepare patients for BMT. This makes them more prone to GVHD because some tissue injuries are associated with chemoradiation therapy. "We're trying to attack each point by minimizing the damage induced by chemoradiation, by preventing the T-cells from becoming activated. If they are activated, we want to prevent them from expanding. And, if they do expand, we hope to prevent them from entering the tissues or causing destruction. It is a multipronged approach because there are multiple aspects that need to be inhibited," says Blazar.

Blazar received his M.D. degree from Albany Medical College in 1978. He has been at the University of Minnesota since serving his residency at the University Hospital, and currently is associate director and professor in the Division of Pediatric Bone Marrow Transplantation.

Manipulating White Blood Cells to Prevent Relapse

WEI CHEN, M.D., PH.D., DEPARTMENT OF PEDIATRICS

Children's Cancer Research Fund/Lehman Family Chair in Pediatric Cancer Research

Bone marrow transplantation can have another major drawback in addition to Graft Versus Host Disease. Despite chemotherapy and radiation, some patients suffer a relapse.

Wei Chen, M.D., Ph.D., assistant professor of pediatrics, is focusing on developing a new therapy for prevention and treatment of recurrence of tumor following bone marrow transplantation. Chen is holder of the Children's Cancer Research Fund/Lehman Family Chair in Pediatric Cancer Research. The chair was established in 1998 through the support of golfer Tom Lehman and his family, and every year a portion of the proceeds from the Dayton's Challenge golf tournament is contributed to the fund.

"The idea is to use the patient's own white blood cells and manipulate them in the laboratory to make them leukemia-specific killer cells. Then we can give these T-cells back to the patient to kill the leukemia cells," says Chen. "It will be a more specific therapy than radiation and chemotherapy, which kill more than leukemia cells. The therapy will be safe with less side effects. Ideally the cells will have long-term immunomemory. Whenever leukemia comes back, the T-cells will react and attack the leukemia cells."

Chen and Blazar's projects directly complement each other, with Chen focusing on bringing the therapies from models to humans. "I am working on developing the human translational research for the immune-based therapy program. The idea is to translate the findings we have in animal studies and take them one step forward – to initiate clinical trials, to treat patients with these T-cells."

This type of immunotherapy is not limited to blood-based malignancies but also applies to solid tumors and other forms of cancer. "The research will help us understand how the body's immunosystem fights against cancer," says Chen. "Learning about the mechanisms involved – how the immunosystem kills the cells not needed

– will help us understand how cancer develops. The study we are doing will also show us how the tumor escapes the immunosystem and is allowed to grow. This knowledge will help us better understand how cancer works and thus be able to develop better therapies."

Chen joined the University of Minnesota in May 1999. He received his M.D. degree from Shanghai Medical University in Shanghai, China, in 1982 and his Ph.D. degree in immunology from the same university in 1987. Prior to coming to the University of Minnesota, Chen was a research assistant professor at the University of Washington School of Medicine.





Researching Bone Cancer Pain to Improve Treatment

DENIS R. CLOHISY, M.D.,
DEPARTMENT OF ORTHOPAEDIC
SURGERY

*Roby C. Thompson, Jr. Chair in
Musculoskeletal Oncology*

When cancer spreads, it often moves to the bone. In patients who die from lung cancer, breast cancer, and prostate cancer, nearly all of them have bone cancers.

"Cancer pain is a very real problem," say Denis R. Clohisy, M.D., associate professor, Department of Orthopaedic Surgery. "It affects probably over two million people in the United States per year and the number one cause of cancer pain is bone cancer."

Clohisy, holder of the Roby C. Thompson, Jr. Chair in Musculoskeletal Oncology, is working to understand tumor growth in bone and related cancer pain. The Roby C. Thompson, Jr. Chair was established to honor Dr. Thompson for his lifetime achievement in orthopaedic surgery. Generous gifts from longtime friends W. Duncan MacMillan and John M. Morrison helped create the endowment. Colleagues, proteges, friends, the Academic Health Center, and grateful patients have subsequently contributed to the chair to support research in musculoskeletal oncology.

Clohisy and his colleagues have

already developed models to effectively study tumor growth in bone. "We've basically proven that tumors cannot grow without destroying bone. That applies to all species, and all tested cancers," he says.

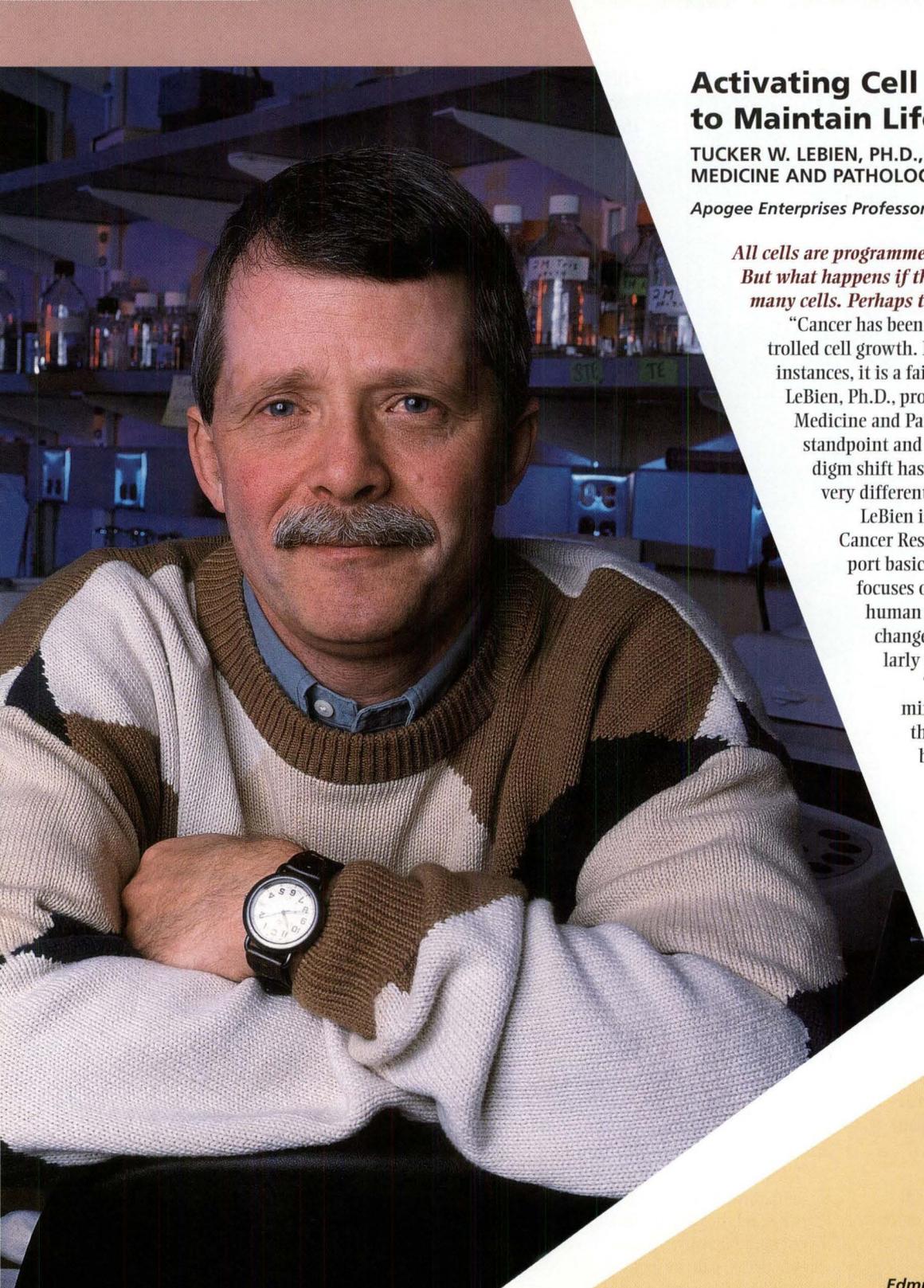
Now he is developing a strategy that manipulates osteoclasts, a normal cell on which tumors rely to grow. "We have evidence that without osteoclasts, the tumor will grow very slowly or it will not grow at all. While our findings are in carefully constructed animal models, there is clear evidence that this same type of strategy would be effective in humans," says Clohisy. "It's just a matter of time and how quickly it can be done."

The other area Clohisy focuses on is cancer pain, through a collaboration with Patrick Mantyh, M.D., in the University neurosystems laboratory. "There are scientific ways to define pain by looking at the spinal cord and the peripheral nerves, and seeing what substances they're making. There are clear definitions of two types of pain: inflammatory pain, like in arthritis, and neuropathic pain, like in nerve injury," explains Clohisy. "Through research with Dr. Mantyh we've discovered that cancer pain is neither of these. It is a new kind of pain that has not been previously described. This is a novel concept and it provides some hope for developing completely new therapies."

Clohisy and Mantyh will continue to study cancer pain and hope to identify new therapies. At this time, they are determining if their findings are generalized to all cancers or if they're specific to individual cancers. For example, they hope to find out if bone cancer pain that originated from breast cancer is different from other types of cancer pain.

"The other exciting thing is that discovering how a tumor is causing bone pain may lead to improved understanding of all bone pain – whether it's from a fractured bone, a loose joint replacement, infection, or overuse," says Clohisy. "Understanding the mechanisms of bone cancer pain may be a way to improve treatment of all bone pain."

Clohisy received his medical degree from Northwestern University Medical School in 1983. He came to the University of Minnesota for his internship and residency, and then completed a fellowship in musculoskeletal oncology at Massachusetts General Hospital and Boston Children's Hospital, Harvard Medical School, before joining the University of Minnesota faculty.



Activating Cell Death to Maintain Life

TUCKER W. LEBIEN, PH.D., DEPARTMENT OF LABORATORY MEDICINE AND PATHOLOGY

Apogee Enterprises Professor in Cancer Research

All cells are programmed to die – this is called apoptosis. But what happens if they don't die? There would be too many cells. Perhaps this is part of how cancer works.

"Cancer has been historically described as uncontrolled cell growth. Now we view it differently. In many instances, it is a failure of cell death," says Tucker W. LeBien, Ph.D., professor, Department of Laboratory Medicine and Pathology. "From an experimental standpoint and a treatment standpoint, this paradigm shift has forced us to think about cancer in a very different way."

LeBien is the Apogee Enterprises Professor in Cancer Research, which was established to support basic research in leukemia. His research focuses on the developmental biology of the human immune system and developmental changes that can lead to leukemia, particularly acute lymphoblastic leukemia (ALL).

"My laboratory is interested in determining how leukemia cells develop in the complicated environment of the bone marrow, and the identity of the growth factors that regulate their survival and growth. We are especially interested in how death occurs in these cells," says LeBien.

"Why are these

Generating Bone Marrow through Stem Cell Cultivation

CATHERINE M. VERFAILLIE, M.D.,
DEPARTMENT OF MEDICINE

Andersen Chair in Stem Cell Biology

Edmund Wallace Tulloch and Anna Marie Tulloch Endowed Chair in Stem Cell Biology, Genetics, and Genomics

Stem cells are essential for generating all blood elements and are especially useful in treating cancer. If stem cells can be "grown" or modified, they could be used for even more effective bone marrow transplants (BMT).

Catherine M. Verfaillie, M.D., associate professor of medicine, is developing a stem

cells not undergoing apoptosis?"

There are genetic changes that give rise to leukemia and other cancers. "The genetic changes subvert normal programmed cell death," he explains. "In patients with leukemia, these leukemia cells are growing and growing or not dying and not dying – depending on how you look at it. Once you treat with chemotherapy and radiation, the leukemic cells often undergo apoptosis. But there are other types of leukemia that are not so sensitive and don't respond as well to treatment."

LeBien and his colleagues have set up several successful model systems for studying the death of leukemic cells. They hope that understanding apoptosis will help them develop a treatment strategy that activates the cell death program, which could be another way of managing leukemia.

"One of the things we predict is that the lessons we learn from our leukemic cell model will apply to other types of cancer that go to the bone marrow," says LeBien. "We're right in the thick of things trying to understand how these death pathways are activated or blocked. That's probably the key to cancer therapy in many cases."

LeBien received his Ph.D. in medical

microbiology/immunology from the University of Nebraska Medical Center in 1977. He came to the University of Minnesota in 1977 for postdoctoral training and was appointed to the faculty in 1980. He is deputy director of the Cancer Center.



cell cultivation technique to produce marrow for transplantation.

She uses a small number of stem cells taken from the patient. These normal cells are reproduced in a laboratory and later infused back into the patient, after treatment to remove cancerous cells in the patient's marrow.

Verfaillie is holder of the Andersen Chair in Stem Cell Biology. A generous gift from the Andersen Foundation, a private foundation, made this chair and the Andersen Chair in Transplantation Immunology (see Bruce Blazar p. 5) possible. Verfaillie also holds the Edmund Wallace Tulloch and Anna Marie Tulloch Endowed Chair in Stem Cell Biology, Genetics, and Genomics. A \$5 million gift from the estate of University alumnus Edmund Tulloch made this chair possible.

"We are trying to understand how we could manipulate the stem cells outside the body to either make more stem cells or genetically modify them to do bone marrow transplants better," says Verfaillie.

One of the problems with stem cells is

that there often are not enough of them for an effective bone marrow transplant. Bone marrow stem cells are also easily killed by high doses of chemotherapy. "We have developed methods to increase these stem cells, which can now be used in a clinical trial," she says.

Verfaillie is also exploring the role of stem cells in chronic myeloid leukemia. She hopes to gain a better understanding of what makes cells leukemic and to develop methods to improve therapy.

The more primitive stem cells found in umbilical cord blood could be used to generate many tissues in the body. It may be possible to "make" blood using these cells, or, because these cells can generate bone, they could be used to correct lesions in the bone caused by tumors, explains Verfaillie. "We are able to make the lining of blood vessels, and hope to use it to repair dam-

age," she says. "Even though it's very far from actual therapy, it is very promising."

These cells might ultimately prove useful to help regenerate organs damaged by cancer. "Eventually, stem cell transplantation in general could be used for any disease that is chemotherapy sensitive," says Verfaillie.

Verfaillie received her medical degree from the University of Leuven Medical School, Leuven, Belgium. She was a post-doctoral fellow at the University of Minnesota and became an instructor in the Department of Medicine in 1989. She has been the director of the Stem Cell Biology Program since 1996.

Developing Individualized Strategies for Breast Cancer

DOUGLAS YEE, M.D., DIVISION OF HEMATOLOGY, ONCOLOGY, AND TRANSPLANTATION

Tickle Family Chair in Breast Cancer Research

All women who have breast cancer do not necessarily have the same disease. Consequently, some therapies will be appropriate for some and not for others. To understand which therapies will be most effective, and to develop better treatments, researchers are studying the roles of growth factors in breast cancer.

Douglas Yee, M.D., associate professor, Division of Hematology, Oncology, and Transplantation, is specifically looking at alternatives to estrogen-based treatments. Yee is holder of the Tickle Family Chair in Breast Cancer Research, which was established by Marilyn Tickle Bryant and her brothers Robert and Richard Tickle.

Some chemicals in the body signal breast cancer cells to grow rapidly. If those signals can be blocked, the cancer cell growth could be significantly affected. One current strategy is to block estrogen from reaching cancer cells and stimulating their growth. This therapy has proven to be effective for many. But not for all.

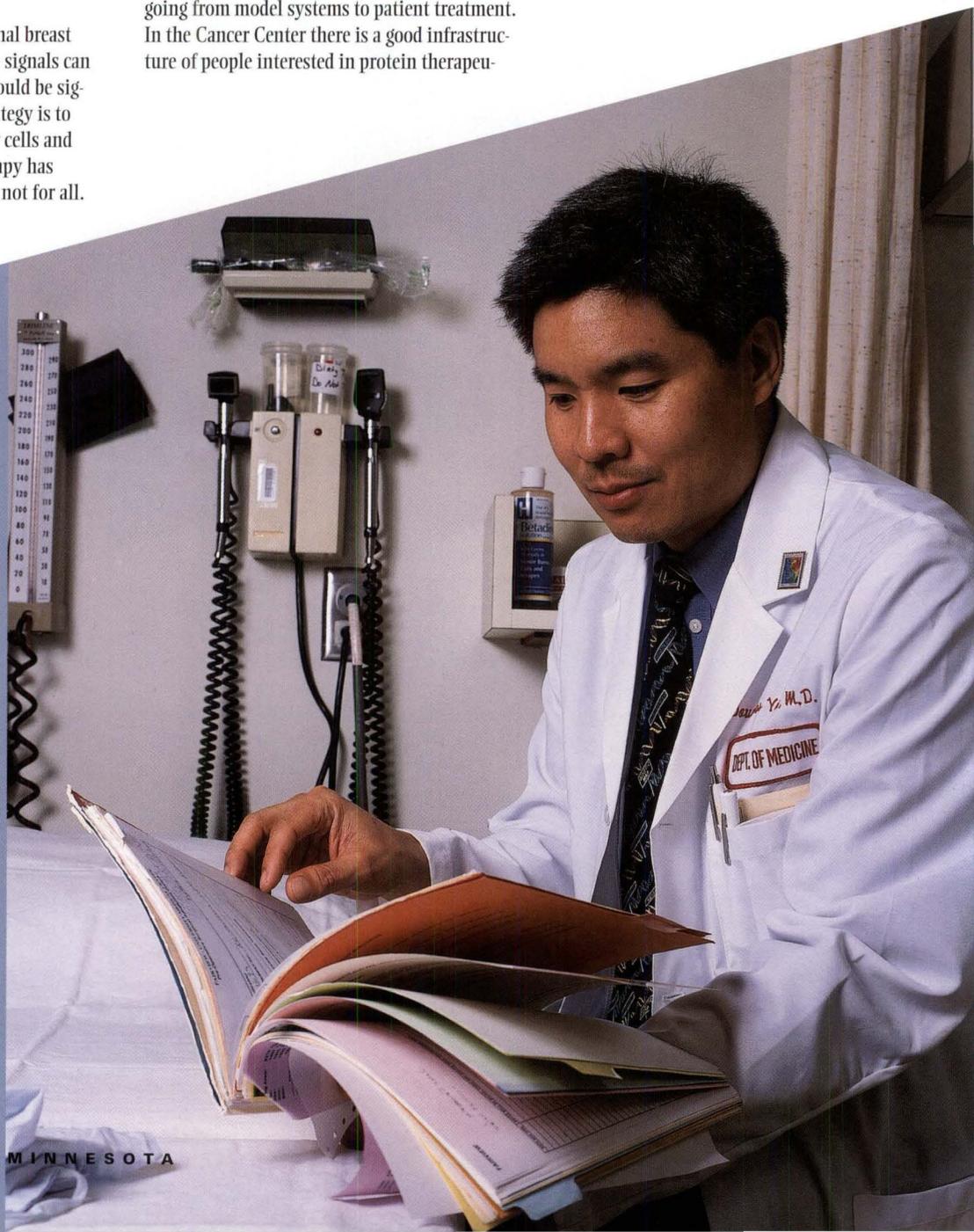
Yee is working with another chemical that could play a similar role – the insulin-like growth factor (IGF). “If blocking estrogen receptors was effective in breast cancer therapy, then inhibiting IGF could also be worthwhile therapy in slowing breast cancer growth,” he says.

“First, we need to understand this system and its importance in breast cancer proliferation. Then we need to develop ways to block its action,” says Yee.

“We are working on an IGF neutralizing strategy, and this approach works in animal models. We’re now challenged with translating it into therapies for people, and it’s a big leap going from model systems to patient treatment. In the Cancer Center there is a good infrastructure of people interested in protein therapeu-

tics, or peptide therapeutics. Also, there is a facility on the St. Paul campus with the potential to make the needed proteins. One of the attractions for me in coming to Minnesota was being able to try to develop this strategy in a university setting.”

Yee is also interested in gene therapy as a way to more specifically transfer genes that act like chemotherapy to tumor cells in animals. By inserting a particular gene into breast cancer cells, Yee makes the cancer cells vulnerable to a specific drug. Treating the patient with this drug then destroys the cancer cells that are



in the gene. "It's a great idea in concept. In execution it's been much more difficult to optimize. In some ways, it's fancy chemotherapy. But if we can get it to work, it's a way to give chemotherapy to just the tumor cell," he says.

Yee came to the University in March 1999 from the University of Texas Health Science Center at San Antonio. He received his medical degree from the University of Chicago in 1981 and did his internal medical residency at the University of North Carolina and his medical oncology fellowship at the National Cancer Institute.

Collaboration brings results

Each of these projects involves many investigators and scientists from numerous disciplines, which every researcher is quick to mention. This sense of teamwork is at the heart of the surge in new discoveries.

"What we've been able to do epitomizes what the University should be doing," says Clohisy. "It epitomizes what universities are for – they are for taking expert clinicians and allowing them access to the best scientists to tackle the most difficult problems.

"At one extreme is the day-to-day work of taking care of patients. At the other extreme is the true basic science expertise. This environment has allowed us to connect them. That is what it is about. It improves the relevance of research, and it helps the care of patients."

by Jodi Ohlsen Read

SUPPORTING PROGRESS

Cancer research requires substantial financial input. Thanks to generous donations, special funds are established to provide ongoing support. Endowed chairs, professorships, and fellowships are created through private gifts to give extraordinary faculty the freedom to pursue advanced research and scientific work.

Dollars generated from an endowed fund directly support research activities by funding equipment purchases, graduate student assistance, manuscript preparation, and other requirements. Through endowed faculty funds, researchers can pursue areas that wouldn't otherwise be funded, often leading to preliminary findings that attract support from other sources such as the National Institutes of Health.

Endowed chairs are funded with a minimum of \$1 million. Professorships require a minimum of \$500,000. Fellowships require a minimum of \$250,000.

Through the generosity of benefactors, the Medical Schools currently provide endowed chair and professorship positions to nearly 70 faculty members – the most of any University college or school.

Endowed positions involving cancer research include:

Chair/Professorship Name	Chairholder
W.W. Allen/Elsa U. Pardee Foundation Chair in Cancer Biology	Leo T. Furcht, M.D.
American Cancer Society Professorship in Clinical Oncology	Bruce A. Peterson, M.D.
Andersen Chair in Stem Cell Biology	Catherine M. Verfaillie, M.D.
Andersen Chair in Transplantation Immunology	Bruce R. Blazar, M.D.
Apogee Enterprises Professorship in Cancer Research	Tucker W. LeBien, M.D.
Children's Cancer Research Fund Chair in Pediatric Cancer Research	Leslie L. Robison, M.D.
Children's Cancer Research Fund Land Grant Chair in Pediatric Oncology	John H. Kersey, M.D.
John P. Delaney Chair in Surgical Oncology	open
B.J. Kennedy Chair in Medical Oncology	open
Children's Cancer Research Fund/Lehman Family Chair in Pediatric Cancer Research	Wei Chen, M.D., Ph.D.
Seymour H. Levitt Chair in Clinical Radiation Oncology	open
Masonic Professorship in Cancer	B.J. Kennedy, M.D., emeritus
Margaret Harvey Schering Land Grant Chair in Cancer Research	open
Shirley A. Sparboe Endowed Chair in Women's Cancer	Sundaram Ramakrishnan, Ph.D.
Roby C. Thompson, Jr. Chair in Musculoskeletal Oncology	Denis R. Clohisy, M.D.
Tickle Family Land Grant Chair in Breast Cancer Research	Douglas Yee, M.D.
Winston R. and Maxine H. Wallin Chair in Cancer Prevention and Genetics	Stephen S. Hecht, Ph.D.
Cecil J. Watson Land Grant Chair in Medicine	Philip B. McGlave, M.D.

Five years ago, cancer patient Anne Rislove was given three days to live, but aggressive treatment and clinical trials at the University of Minnesota Medical School gave her back her life.

Anne Rislove couldn't believe her ears when doctors informed her that she had three days to live. Her ovarian cancer was far too advanced for treatment. Go home, they advised, and make a video for your young children to remember you by.

The ovarian cancer diagnosis came after nearly 14 months of Rislove not feeling well and worrying that something was wrong. Doctors had assured her, however, that the bloating and tiredness were common for forty-something women like her. It wasn't until her waist had swollen to more than 60 inches and she could feel a spongy football-sized mass in her lower abdomen that doctors ordered ultrasound and a CAT scan.

"I knew it was a critical mass," recalls Rislove, who has a family history of fast-growing cancers. Yet, the diagnosis and a prognosis without hope was devastating.

"I prayed at 5:00 a.m.," says Rislove. "God, if it is your will for me to live, please have three people call me by 10:00 a.m. with the name of a doctor who will treat me."

The sign came in the form of three phone calls from friends and family in different parts of the country. The message was the same: Go see Dr. Leo Twiggs in the Department of Obstetrics, Gynecology and Women's Health at the University of Minnesota. The following day, Rislove was admitted to Fairview-University Medical Center. Twiggs recommended an aggressive treatment of surgery and chemotherapy. In addition, he wanted Rislove to enroll in a clinical trial to test new combinations of chemotherapy drugs.

Rislove agreed. She underwent an eight-hour surgical procedure during which 10 pounds of tumor were removed, leaving two pounds. She then began chemotherapy as part of a clinical trial which looked at combination treatments of the drugs taxol and cisplatin to determine which was most effective.

"I was thrilled to participate in the research," says Rislove. "I had been given three days to live. If what they learned from me could help other women with ovarian cancer, I figured it was a good way to spend the last few months of my life."

That was five and half years ago. Rislove became one of the 20 to 30 percent of ovarian cancer patients to survive more than five years. In the randomized study, she had received the taxol/cisplatin combination, which did prove more effective than taxol or cisplatin alone. Since then, subsequent studies have indicated that other platin agents combined with taxol are just as effective but less toxic and those are now preferred for chemotherapy.

In April of 1994, Rislove had been given three days to live. By September, the tumor was gone. "I couldn't believe it when they told me," she says.

Rislove, who credits the aggressive treatment she received through clinical trials with helping to prolong her life, went on to participate in several other clinical trials. She was part of a study to determine if the use of drugs to prevent anemia in chemotherapy patients would be effective, reducing the need for blood transfusions. She also participated in a trial to see if taking oral antibiotics would prevent cancer patients

from getting infections. Finally, she was part of a quality of life study that required her to complete questionnaires about how living with cancer affected her family life, emotional state, and physical well being.

"I did feel like one of their favorite white rats," Rislove laughingly says of her experience in clinical trials, but, she continues, "They gave me exceptional care and tracked everything very carefully. Because the protocols on clinical trials are so tight, they watch you closely and that's a positive."

Rislove also understands the value of clinical trials in advancing medical science. "Clinical trials allow researchers to come up with the latest and greatest treatments," she says. "Research has saved many lives or given additional years of life to patients."

For Rislove, participating in the clinical trials has allowed her to watch her children grow up. Her daughter was 11 and her son 9 when she was told she had three days to live. This spring she will watch her daughter graduate from high school and her son "is turning into a young man." These last five years have been most precious.

Today, Rislove continues her battle. "My cancer has recurred faithfully every year," she explains, which has required countless chemotherapy treatments. She is now on what she calls "routine chemo," receiving the drugs at regular intervals.

In spite of her disease, Rislove leads an active life. She volunteers as a speaker at cancer seminars, as a leader of cancer support groups, and as a member of the American Cancer Society.

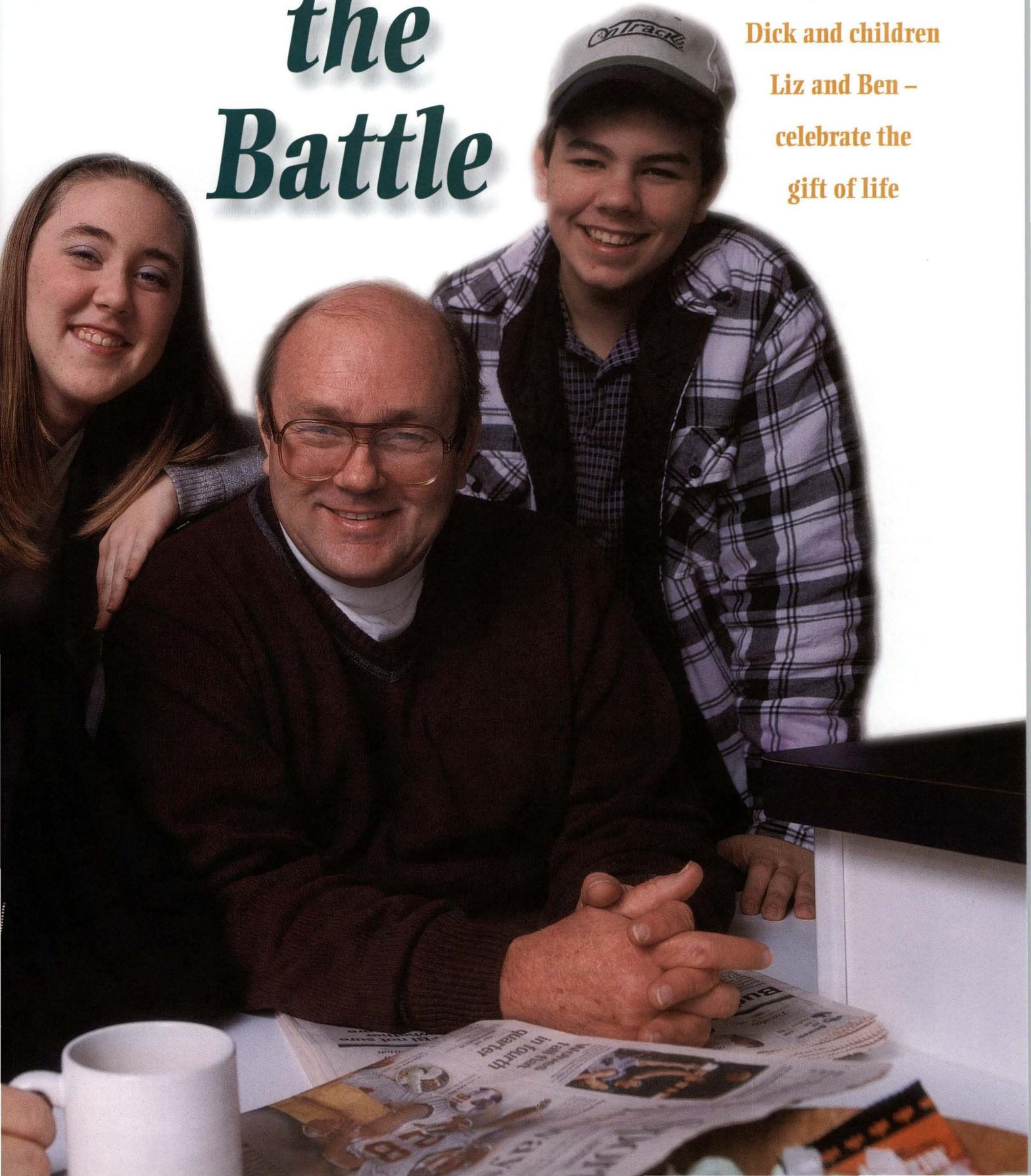
Every time she walks into the Cancer Center at the University of Minnesota, Rislove says she is reminded of the many studies that have been completed since she first came to the University. Watching scientists collaborate and share ideas, she explains, brings home to her how new ideas can trigger other new ideas. "It gives us all hope," she says.

by Elaine
Cunningham



WINNING *the* *Battle*

Every day, Anne
Rislove and her
family – husband
Dick and children
Liz and Ben –
celebrate the
gift of life



THE IDEA BACK IN 1956 was to build a hospice – a place where people could die with dignity. But somewhere along the line, the Freemasons of Minnesota changed their plans. Instead, the Masons raised \$1 million and committed it to building the Masonic Memorial Cancer Hospital, a two-story, 40-bed hospital dedicated to cancer research and patient care, which opened its doors at the University of Minnesota in 1958.

Thus began a 40-plus year partnership between the University of Minnesota and the Masons of Minnesota – a partnership that has advanced cancer research and benefited countless cancer patients. Through the years, the Masons have given more than \$15 million to the University.

The Masons are the oldest fraternal organization in the world, dating back to medieval times and the stone worker guilds, founded on the tenets of brotherly love, relief, and truth. Modern day Masons have long followed a universal philosophy to help all people. The Minnesota Masons do this through their three main charities – the Masonic Foundation, which awards scholarships; Masonic Homes, which sponsors long-term care facilities; and the Masonic Cancer Fund,

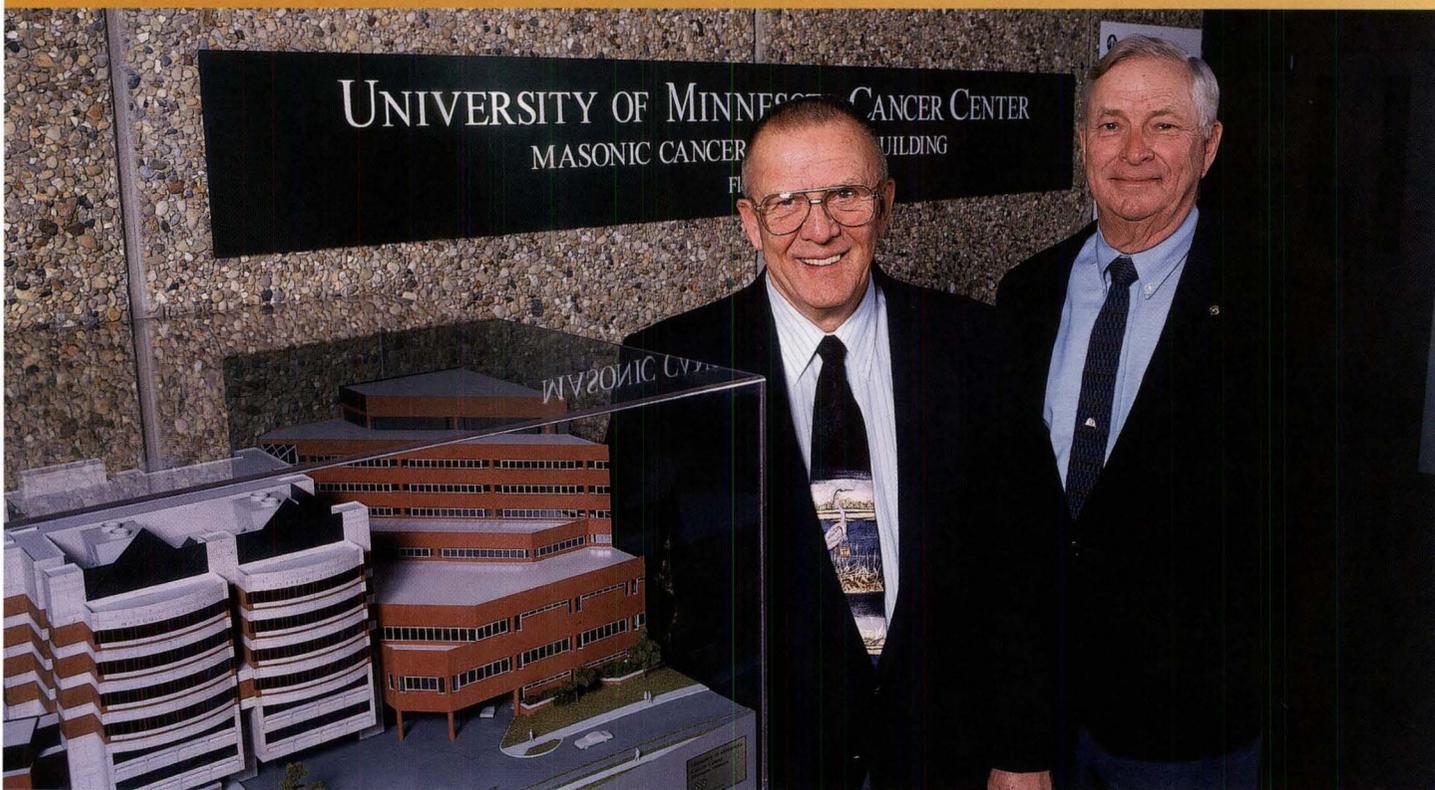
which supports cancer research and patient care at the University of Minnesota.

The Masons' record of supporting cancer research and treatment is impressive. In 1963, the group conducted a second campaign raising \$1.1 million to add two stories to the Masonic hospital. In 1970 they established a Professorship in Oncology. Additional contributions built conference rooms, a library, laboratories, and the Oncology Clinic in the Phillips-Wangensteen Building. Then in 1994, they made a \$5 million commitment to help build a cancer center at the University of Minnesota.

The Masonic Cancer Research Building became a reality in 1996, bringing together the University's leading cancer specialists to collaborate on research, to improve cancer prevention

BUILDING STORIES

The Minnesota Masons and the Children's Cancer Research



The Masons of Minnesota raised \$5 million to help build the Masonic Cancer Research Building. Pictured are Roger Ledding, left, and Don Severson, long-time members of the Masons who serve on the Masonic Cancer Center board of directors.

The Masonic Memorial Cancer Hospital opened at the University in 1958.



has positioned investigators to apply for and receive additional funding through granting agencies, while enabling clinicians to provide state-of-the-art services to patients. Philanthropic support is a critical component of our success.”

In the area of patient care, physicians in the Division of Hematology, Oncology, and Transplantation are currently involved in several clinical trials including using immunotherapy for the treatment of metastatic breast cancer, using different chemotherapy regimens and/or radiotherapy in the treatment of lung cancer, devising immunotherapy protocols for renal cell carcinoma and melanoma, and looking at herceptin and taxol in the treatment of head and neck cancers.

Current cancer research in the division focuses on the areas of stem

G PARTNERSHIPS

and are working with the Medical School to combat cancer

and treatment, and to find ways to enhance quality of life for patients. The center quickly has become one of the nation's top research institutions, recognized as such by being named a Comprehensive Cancer Center by the National Cancer Institute in 1998.

Today the Masons continue to give annual gifts to support cancer research at the University. The majority of the money comes from the group's endowment and “the rest comes in over the transom,” according to Don Severson, long-time Mason and current secretary of the board of directors.

“The only two campaigns we've ever conducted were the first two to build the hospital. Now people know about us and they make donations or leave bequests,” explains Severson.

Buildings may be the most visible legacy of the Mason's commitment to cancer treatment and research at

the University and the most apropos to their stone worker heritage, but the support has not stopped there. Annual contributions to the Masonic Professorship and to the Division of Hematology, Oncology, and Transplantation have provided funds for recruiting scientists in the areas of gene therapy and immunotherapy; supported the creation of medical oncology investigative teams in the areas of lung cancer, gastrointestinal/colorectal cancer, and genito-urinary cancer; and allowed for the hiring of a cancer care coordinator to oversee all aspects of the needs of cancer patients.

“The Masons have been consistent supporters of cancer research, education, and care at the University of Minnesota,” says Mary Hayes, administrative director for the Division of Hematology, Oncology, and Transplantation. “This support

cell biology, insulin-like growth factor, immunotherapy, and gene therapy. Faculty in the division predict that in the near future, cancer research will move into the areas of transplant biology and therapy, genetics, carcinogenesis, and chemoprevention.

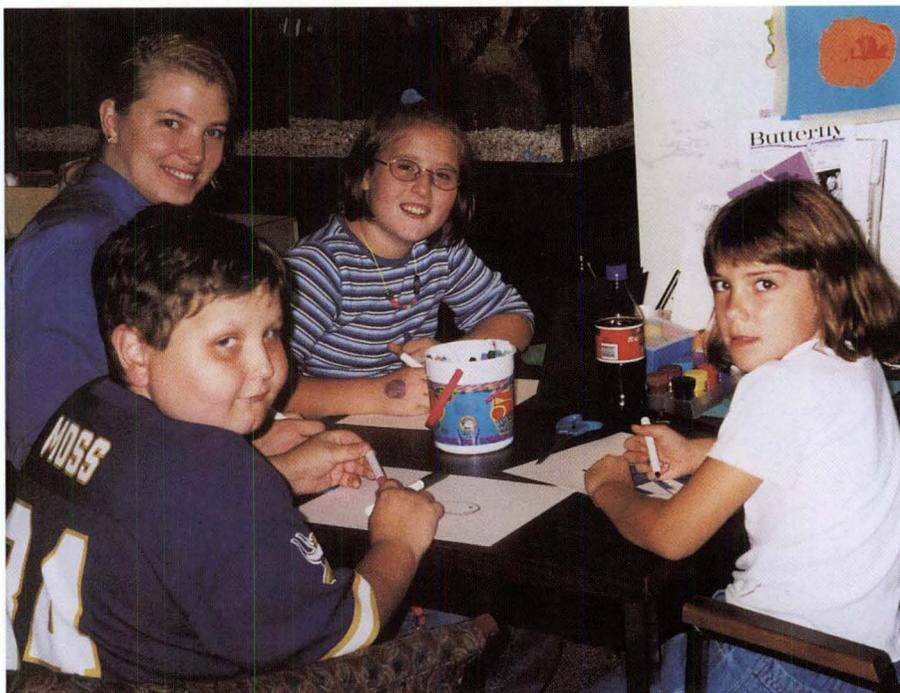
The Masons have followed closely the advances the University has made in the past 40 years in cancer treatment and research, and are proud of the contributions they have made toward improving the lives of those with cancer.

As to the future, Severson states, “The Masons will continue to support cancer research and patient care as long as we're able, and look forward to continued advancements.”

by Elaine Cunningham

EVERYONE INVOLVED WITH the Children's Cancer Research Fund (CCRF) shares a dream – a dream of a world where there are no children with cancer. CCRF is families, volunteers, and physicians, all working toward the prevention and cure of childhood cancer.

The CCRF story began in 1978, when 13-year-old Katie Hageboeck was diagnosed with leukemia. Her parents looked for the best possible treatment facility for their daughter, and found it at the University of Minnesota. Katie received a bone marrow transplant and follow-up



Care Partners volunteer Jennifer Vendel provides arts and crafts activities and materials to patients and family members in the BMT and Hematology/Oncology Clinics.

PURSuing A DREAM

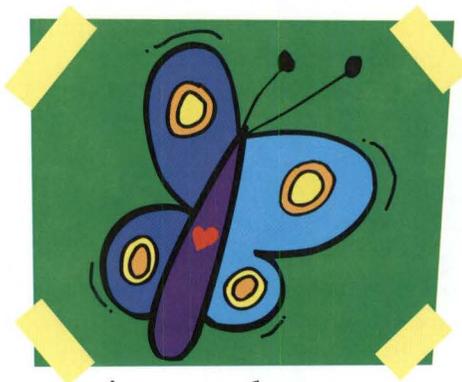
The Children's Cancer Research Fund

treatment at the University, but died in 1979 after a valiant fight with cancer. During her illness, she asked her parents to take the money she had saved for a bicycle and help other kids with cancer – and the Children's Cancer Research Fund began.

CCRF has provided financial support for studies in the Pediatric Oncology Division of the University of Minnesota Medical School for 20 years. Originally, CCRF concentrated its efforts on leukemia research, but now supports training and research studies on all types of childhood cancer.

CCRF is working to improve the life expectancy of children with cancer and to assist patients and their families in the process of recovery. The fund is operated entirely from personal and corporate contributions and special events, with more than \$20 million raised since 1980.

Children's Cancer Research Fund



the wings of a dream

Premiere Twin Cities events held by CCRF include Fash Bash, hosted by Dayton's; Dawn of a Dream, the largest gala benefit in the Twin Cities; and Dayton's Challenge, a three-day golf tournament hosted by Minnesota native Tom Lehman.

Three CCRF endowed chairs have been established at the University of

Minnesota Medical School. They include the Children's Cancer Research Fund Chair in Pediatric Cancer Research, held by Leslie L. Robison, M.D.; the Children's Cancer Research Fund Land Grant Chair in Pediatric Oncology, held by John H. Kersey, M.D.; and the Children's Cancer Research Fund/Lehman Family Chair in Pediatric Cancer Research, held by Wei Chen, M.D., Ph.D.

With thousands of children diagnosed each year, researchers at the Medical School are working hard to understand the causes of the many types of childhood cancer, in order to improve prevention, treatment, and ultimately to one day cure cancer in children. With the help of the Children's Cancer Research Fund, that day may come soon.

For more information about CCRF, visit their website at: www.childrenscancer.com

Enlisting Marine Life in the Fight Against Cancer

What if cancer could be treated, or even prevented, with a pill, similar to how penicillin works? Such an idea is not far-fetched to University of Minnesota researcher David H. Sherman, Ph.D., and his colleagues in the Department of Microbiology, recent recipients of a Minnesota Medical Foundation equipment grant. A new project sponsored by the National Cancer Institute (NCI) has them plumbing the ocean for anti-cancer drugs. The grant allows them to purchase a centrifuge for processing samples taken from the sea.

One promising source of new drugs has been the so-called natural products, the chemicals made by microorganisms. Natural product drugs – those derived from bacteria, fungi, or plants – are not new. Penicillin, made from common bread mold, has been in use for over 50 years to fight infections. Erythromycin and tetracycline are other frequently used antibiotics derived from common soil bacteria. The optimal drug is a pill with magic-bullet qualities and very low side effects.

Microorganisms such as bacteria live in soil or marine environments where they

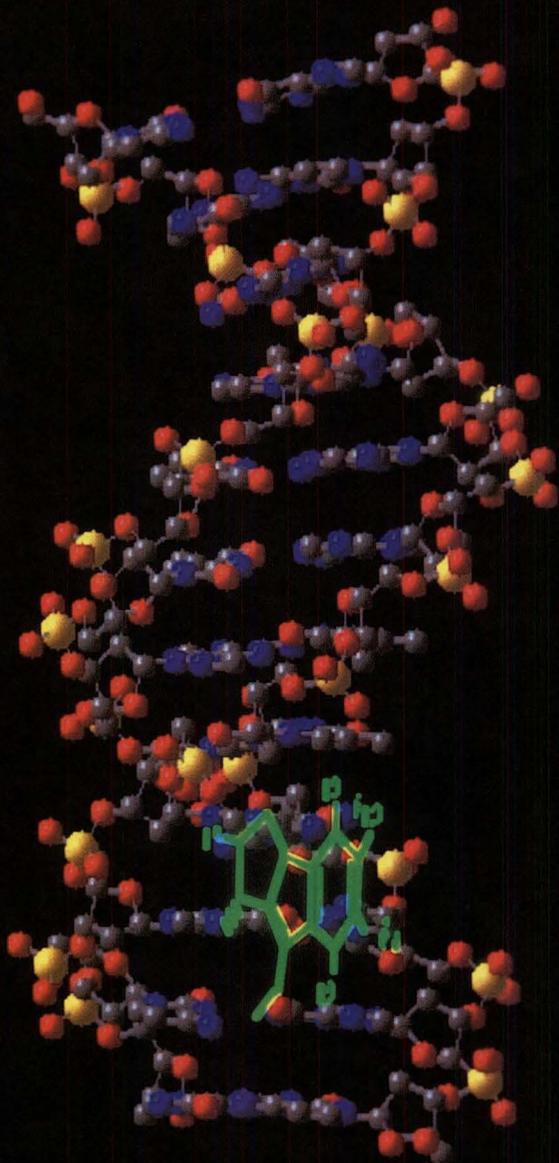
are constantly threatened by predators. They protect themselves by producing chemical defense molecules as part of their natural metabolism. Marine microbes thrive in symbiotic relationships with the marine animals, such as corals and sponges. The larger animals are actually dependent on the microbes to protect them with their chemical defenses. The goal of natural product drug research is to take these complex chemical defense compounds and see if they will work against diseases found in humans and animals.

What's new about Sherman's work is using marine microorganisms in the battle against cancer. Microbiology as a field has been in existence for approximately 100 years, and less than 1 percent of all the microorganisms on earth in general have been discovered in that time. The marine environment is one of the least studied and least tapped areas for new microbial discovery. Says Sherman, "It amazes me how little is known about this and how rich a source of new microorganisms the marine environment is."

Sherman has colleagues at the University of California-Santa Cruz, Oregon State University, and Harbor Beach Oceanographic Institute in Fort Pierce, Florida, who are world experts in marine biology and marine natural products chemistry. They collect the microorganisms from both reef and deep-sea environments during annual expeditions to New Guinea, the Great Barrier Reef, other islands in the South Pacific, Madagascar, and also the Caribbean. Sherman will be joining them in April for a 10-day trip to Madagascar. These teams of microbiologists also perform chemical structure analysis before sending the samples to Sherman's lab.



David H. Sherman, Ph.D., received an equipment grant for a new centrifuge from the Minnesota Medical Foundation.



Anti-cancer drug molecule bound to DNA in a cancer cell. (Image provided by David H. Sherman).

The University of Minnesota plays a key role in analyzing the genomic DNA of these new organisms that have been isolated from the marine environment. A little over a year ago Sherman and his colleagues invented a new technology for harnessing the ability of microorganisms to produce natural products. They go into the genome to isolate the genetic instructions of these microorganisms and then create libraries of complex chemical compounds.

Once extracted, the genetic instructions are put into an engineered host system, which Sherman's lab specializes in making. The compound may be directly produced by the host organism according to the genetic instructions as is, or the

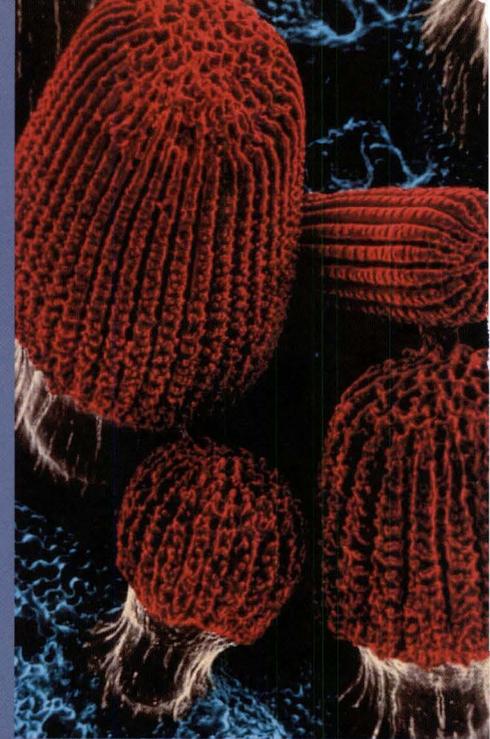
instructions may be re-engineered, since compounds isolated from the wild usually need some improvement to make them better drugs. "It's like taking a blueprint for a house and starting to shift rooms around, raising ceilings and putting in a basement," explains Sherman. "We can rearrange or redesign a set of genetic instructions – the blueprint – and in that way make other new compounds."

Sherman and his Minnesota colleagues make libraries of new compounds and send them to Novartis Pharmaceuticals to be tested for improved activity. Novartis has the sophisticated equipment necessary to determine if any of these sets of genetic instructions works in an anti-cancer function.

Sherman's project stands out not only for its use of marine microorganisms and the new technology for creating libraries of compounds. "Typically we think of microbial genomics as an exercise in going into pathogenic microbes to learn as much as we can about

them and why they cause diseases. Our application of microbial genomics is completely different," states Sherman. "We're going into these organisms and sequencing their genomes to learn why they make exciting biologically active molecules. Why do they do it? How do they do it? How can we improve and change those blueprints? We're doing microbial genomics to make something new – to make a new compound."

The NCI program, entitled "Cancer Drug Discovery: Diversity Generation and Smart Assays," encompasses both near and long-term goals. The near-term goal is to discover and create as many new molecules as possible, thereby generating structural diversity. The more compounds available, the greater chance there will be a "smart assay," a compound that lights up the screen as a drug lead. The University of Minnesota project,



Hidden within the beauty and geometry of immature sea urchin spines (above) and a golden algae chrysophyte (below) is the potential for anti-cancer compounds.

"Combinatorial Creation of New Anti-Cancer Agents," is supported by a five-year grant from the NCI as part of its overall project. The title refers to the use of microbial genomics in creating the libraries of compounds for testing. "Cancer is a multi-factorial disease. It's not just one disease," explains Sherman. "We rely on Novartis and their expertise to screen these compounds to find the right molecule for the right problem."

The scope of the NCI program goes beyond finding anti-cancer drugs. Sherman sketches the long-range possibilities of the project: "The application can be broadened substantially because this technology allows us to create new compounds which can be screened against any target – anti-bacterial, anti-fungal, anti-parasitic, diabetes, obesity – that involves a metabolic pathway, or any target within the body that either has to be blocked or needs to be enhanced. The new molecules can be used in screens against any potential disease, not just cancer."

The NCI initiative breaks new ground with its



multidisciplinary approach requiring at least three organizations to collaborate. Sherman's project exceeds the requirement with five organizations: the University of Minnesota, which he calls "Mission Control"; the University of California-Santa Cruz (Sherman is a graduate of UCSC and is now collaborating with his undergraduate research adviser on this project); Oregon State University; Harbor Branch Oceanographic Institute in Fort Pierce, Florida, a private marine research institute; and Novartis Pharmaceuticals.

The NCI grant of \$5 million enables Sherman to have four full-time researchers in Minnesota, provides for lab supplies, and also pays for the work sub-contracted to the three marine microbiology institutions. "All of them provide the same level of expertise, but there is so much work to do and there is so much diversity in these microbes that they all have specific areas of expertise," says Sherman.

The Minnesota Medical Foundation's equipment grant for a new centrifuge is crucial to the project. Sherman's lab already has a centrifuge which handles his regular projects. This new project requires a second centrifuge to handle the significantly increased workload of spinning down the microorganism samples.

"This is a highly coordinated and collaborative project," says Sherman. "We'll be working very closely together at all stages of this project. A lot of people will be coming to Minnesota from these other organizations and we'll be going there as well to visit. It's really the way science runs well, with people from many groups interacting on a regular basis. The results are quicker and more innovative with group effort."

by Andrea J. Peterson



FOUNDATION APPROVES FACULTY GRANTS

The Minnesota Medical Foundation Research and Special Grants Committees recently approved awards totaling \$417,693 – \$209,729 for research projects and \$207,964 for equipment purchases.

FACULTY RESEARCH GRANTS include: *Kenneth W. Adolph, Ph.D.*, Biochemistry, Molecular Biology and Biophysics, Angiogenesis: role of thrombospondin 2 protein; *Hartmuth Bittner, M.D.*, Surgery, A closer look at off-pump coronary artery bypass grafting; *Y. Chandrashekhar, M.D.*, Medicine, Behavior of VEGF-receptors during chronic VEGF therapy in the ischemic heart; *Janet Dubinsky, Ph.D.*, Neuroscience, Mitochondrial calcium responses in Huntington's disease; *Cheryl A. Gale, M.D.*, Pediatrics, The role of SWE1 in morphologic switching in *Candida albicans*; *Ronald Jemmerson, Ph.D.*, Microbiology, The fate of an intracellular antigen in cell death; *Catherine M. Jordan, Ph.D.*, Pediatrics, Neuropsychological and neurophysiological correlates of aggressive behavior in children; *Nigel S. Key, M.D., F.R.C.P.*, Medicine, Methodologic development to evaluate tissue factor in human and lupine hemophilia; *Arthur C. Klassen, M.D.*, Neurology, The genetic analysis of migraine headache; *Cornelius H. Lam, M.D.*, Neurosurgery, Crainosynostosis model in the rat; *Tucker W. LeBien, Ph.D.*, Laboratory Medicine and Pathology, The role of notch receptors in normal and leukemic human B cell development; *Paula M. Ludewig, Ph.D., P.T.*, Physical Medicine and Rehabilitation, Measurement of shoulder complex motion; *Michael A. Maddaus, M.D.*, Surgery, Detection of occult micrometastases in stage 1 non small cell lung cancer; *Anne M. Murray, M.D., M.Sc.*, Geriatric Medicine, The epidemiology of dementia in Native Americans in urban Minnesota; *Theodore R. Oegema, Jr., Ph.D.*, Orthopaedic Surgery, The role xylose kinase plays in control of chondroitin sulfate synthesis; *Lee A. Reed, M.D.*, Laboratory Medicine and Pathology, Phenotype correlations in frontotemporal dementia; *Beatrice "Bean" Robinson, Ph.D.*, Family Practice and Community Health, Evaluation of WISH (Women's Initiative for Sexual Health); *Wufan Tao, Ph.D.*, Medicine, The study and function of *lats2*, a novel tumor suppressor in mammalian tumorigenesis; *David Walk, M.D.*, Neurology, Heart pain in small fiber sensory neuropathy; *James Y. Wang, Ph.D.*, Pediatrics, Molecular mechanisms of IL-10 and TNF alpha in regulation of apoptosis in bile duct cells; *Robert Chun Zhao, M.D., Ph.D.*, Medicine, Beta 1 integrin mediated adhesive defects in novel human primary CML model; and *Ben G. Zimmerman, Ph.D.*, Pharmacology, Interaction of vascular endothelial growth factor and angiotensin II in kidney.

FACULTY EQUIPMENT GRANTS include: *Malcolm N. Blumenthal, M.D.*, Medicine, Thermodynamic characterization of binding reactions between allergens and immunoglobulins in allergic and healthy humans; *Linda M. Boland, Ph.D.*, Neuroscience, Rescue of synaptic plasticity in a mouse model of Alzheimer's disease; *Patricia Ferrieri, M.D.*, Laboratory Medicine and Pathology, Emergency replacement of failed -70 degree freezer; *Christopher M. Gomez, M.D., Ph.D.*, Neurology, Inverted fluorescence microscopy for patch clamp recording of diseased ion channels; *Kalpna Gupta, Ph.D.*, Medicine, Purchase of a storm 860 phosphorimager; *Edward N. Janoff, M.D.*, Medicine, Restoring the research flow cytometry laboratory at the VA Medical Center; *Stephen A. Katz, Ph.D.*, Physiology, Renin and cathepsin D measurements to study left ventricular hypertrophy and heart failure; *Eric Nussbaum, M.D.*, Neurosurgery, Laser doppler system for measurement of cerebral blood flow; *Vitaly A. Polunovsky, Ph.D.*, Medicine, A novel approach to increase breast cancer chemosensitivity: disruption of the anti-apoptotic function of the translation of factor 4E; *M. Elizabeth Ross, Ph.D.*, Neurology, Molecular genetic studies of neurodevelopment; *Khaled J. Saleh, M.D.*, Orthopaedic Surgery, Effectiveness and efficiency of failed knee arthroplasty: a prospective cohort design; *Elsa G. Shapiro, Ph.D.*, Pediatrics, Recording children's in-home tantrums; *David H. Sherman, Ph.D.*, Microbiology, Creation of new chemical entities by combinatorial biosynthesis; *Timothy D. Sielaff, M.D., Ph.D.*, Surgery, Investigations of the bioartificial liver and fulminant hepatic failure.

M O L E C U L E S T

Now that mapping of the human genome is nearly complete, the huge task of using this information to prevent and cure diseases begins. Scientists in the University's new Molecular and Cellular Biology Building will help carry that work out.

When sequencing of the human genome is completed in three years, it will fill the equivalent of thousands of Minneapolis phone directories. And scientists in the University's new Molecular and Cellular Biology Building will be poised to begin making calls on its 100,000 genes.

Research focus will switch from

structure to function – learning how genes work, what happens when they don't, and how to fix them to prevent or cure serious diseases. Functional genomics is expected to revolutionize medicine.

"The health and economic benefits will be tremendous," says Charles Moldow, senior associate dean for research in the Medical School. "That's why it's so impor-

tant to invest human and financial resources in functional genomics now."

The 1999 Minnesota Legislature provided the University with \$35 million for construction of the \$70 million Molecular and Cellular Biology Building, which will be the center of functional genomics research. This year the University will go back to the Legislature to ask for the remaining \$35 million needed to complete construction.

"Thirty-five million for a new building is a very good and generous start," Moldow says. "But we need to be aware that all around the country, universities are making huge investments in molecular and cellular biology. Not just the Harvards and Stanfords, but large public universities such as Michigan, Wisconsin, and Iowa."

The University of Minnesota's new building is the centerpiece of



O M I R A C L E S

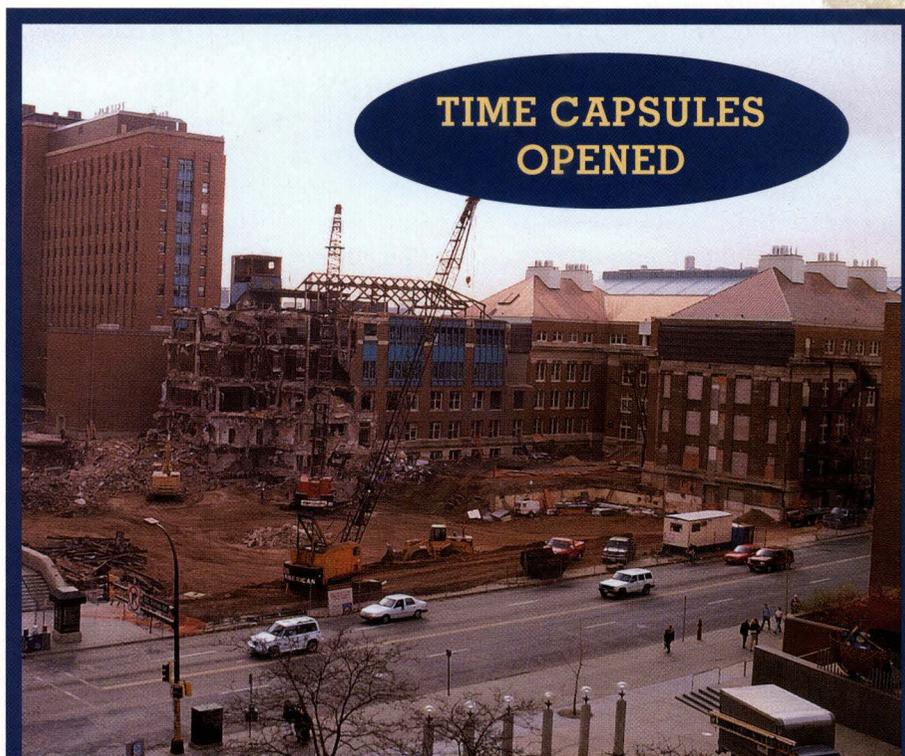
President Mark Yudof's molecular and cellular biology initiative, which involves scientists on the Minneapolis, St. Paul, and Duluth campuses. The 230,000-square-foot, eight-level building will be located in the Academic Health Center. Situated on Washington Avenue between Church and Harvard Streets, it will provide a literal and figurative entryway to the University's health sciences schools and programs. Ground was broken this past fall, and construction is scheduled to be completed by December 31, 2001.

Planning for the building has been accompanied by a University-wide reorganization of basic sciences departments to support molecular and cellular biology and make more effective use of human and physical resources. Scientists who will occupy the building will come from three new departments that grew out of the reorganization: Biochemistry, Molecular Biology, and Biophysics; Genetics, Cell Biology, and Development; and Neuroscience. Additionally, new faculty with expertise in functional genomics will be recruited.

Research programs will likely focus on existing strengths, such as neuroscience and neurodegenerative diseases, immunology, cancer, and diabetes, Moldow says. Scientists also will be linked by interests in developing and using common biotechniques to probe and manipulate genetic information.

"Biomedical scientists today are working with about 1 percent of the information they will have after the function of human genes is fully understood," Moldow says. "It's really a miracle that we can treat illness as well as we can, given how little we know about the underlying molecular basis of diseases."

by Peggy Rinard



Millard, Lyon, and Owre Halls (background) have been demolished to make room for the new Molecular and Cellular Biology building. Jackson Hall, right, has been renovated.

Preparation for the future brought glimpses of the past as Owre, Lyon, and Millard Halls were demolished to make room for the new Molecular and Cellular Biology Building. Two copper time capsules were located, providing a window on medical and dental history at the University early in the 20th century.

A 1911 Medical School time capsule was found in a Millard Hall cornerstone, while Owre Hall demolition unearthed the 1931 Dental School archive.

The Medical School box contained yellowed medical journal articles, a model of the Medical School curriculum, a copy of the old *Minneapolis Journal* newspaper, and pictures of the campus. The Dental School box yielded giant plaster teeth, dentures made of hard rubber, and a syringe with reusable needles and an intact vial of Novocain.

The items will be put on display in the new building when it is completed.

FOUNDING FATHERS

Medical School and School of Dentistry leaders who ushered in the last century will be memorialized in a history corridor planned for the new Molecular and Cellular Biology Building.

The buildings named in their honor have housed generations of scientists, including two Nobel Prize winners, and witnessed nearly a century of advances in biomedical research. But memories of Perry Millard, Elias Lyon, Alfred Owre, and Clarence Jackson – early leaders of the Medical School and School of Dentistry – have faded with time.

This past summer, Millard Hall, Owre Hall, and Lyon Laboratories were torn down to make room for the new Molecular and Cellular Biology Building. Jackson Hall was completely renovated. The demolition and reconstruction created a revival of interest in the buildings and their namesakes.

Here's a glimpse of who these men were and what they accomplished.

PERRY MILLARD

(1848-1897) moved to Stillwater, Minnesota, in 1872 after losing everything he owned in the great Chicago fire. Often summoned to logging camps to treat injuries, he soon established a thriving practice. When he became president of the Minnesota Medical Association in 1882, he lobbied to create a medical school in the state. In 1887 the regents named him dean, and in only three months he had appointed a faculty, established a three-year curriculum, and set admissions and graduation requirements and fees.

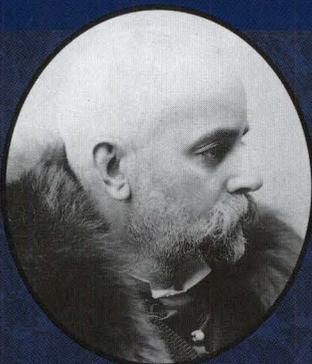
ELIAS POTTER LYON

(1867-1937), dean of the Medical School from 1913 until his retirement in 1936, was considered one of the chief engineers of the school and "a sincere, modest intellectual with a humorous expression and a kindly glance." He was devoted to medical students, and advocated applying research to clinical problems. He also helped advance education for nurses. Early in his career, Lyon was an instructor at Woods Hole Marine Biology Institute and served as biologist on a scientific expedition to Greenland.

ALFRED OWRE

(1870-1935), School of Dentistry dean from 1905 to 1927, had degrees in both medicine and dentistry. His mission was to unify the two fields, believing that physical and dental health were inseparable. Owre was noted for his research on tooth decay, and he was president of the

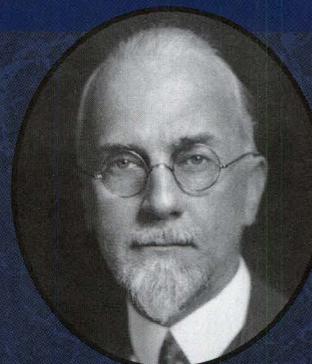
PERRY MILLARD



ELIAS POTTER LYON



ALFRED OWRE



A Medical School for the Community

From anatomy to infectious diseases to complementary care, the University of Minnesota's first Mini Medical School proved there is a great desire in the community to learn more about science and medicine.



Minnesota Dental Association. A man of eclectic interests, he authored a book on diet called *Prunes and Pancakes*, collected cloisonne artifacts, and was a tireless hiker. His obituary in the *New York Times* says that he had hiked the U.S. from coast to coast.

CLARENCE JACKSON

(1875-1947), born in What Cheer, Iowa, became dean of the University of Missouri Medical School at the age of 34. In 1913 he gave up the job and took a pay cut to head anatomy at the University of Minnesota, where he became one of the school's most popular teachers and administrators. A colleague wrote that he was "tall and handsome with a splendid physique," and that "his voice inspired confidence." He won many professional honors, and served as acting dean of the Graduate School twice before retiring in 1941.

CLARENCE JACKSON



Doctors Without Borders Awarded Nobel Peace Prize

For two University of Minnesota Academic Health Center faculty members, October 15 will be a day they remember for a long time. It was the day the international medical relief organization Doctors Without Borders won the Nobel Peace Prize for its humanitarian work around the globe.

John McGill, M.D., associate professor at the Medical School and emergency room doctor at Hennepin County Medical Center, and his wife Juliette Fournot, a clinician at the Dentistry School, are president and treasurer, respectively, of the American chapter of Doctors Without Borders, known internationally as Medecins Sans Frontieres.

McGill and Fournot met while working in a relief effort in Afghanistan, and have devoted many years of their lives to the humanitarian organization. They have worked under extremely difficult and dangerous situations in order to treat victims of war, natural disasters, and poverty.

Doctors Without Borders is currently bringing medical assistance to people in more than 80 countries. Since its founding in 1971, the organization has engaged in numerous cross-border operations as well as in direct humanitarian action working with local authorities and training medical health staff.

For more information on Doctors Without Borders, contact their website at: www.msf.org

A New Vision for the AHC

"Choices and Challenges: The Future of the University of Minnesota Academic Health Center" was the subject of an October address by Senior Vice President for Health Sciences Frank Cerra. In calling for a new vision for the Academic Health Center, Cerra said it was important to focus on two issues: "Where are we going, and what are the right choices for our faculty, our students, and for the people of Minnesota."

Cerra outlined the recent accomplishments of the AHC, the challenges that lie ahead, and the steps necessary to ensure a healthy future for the Academic Health Center.

Accomplishments noted by Cerra include the continued delivery of high-quality research, education, and clinical services; improved communication and consultation between faculty and admin-

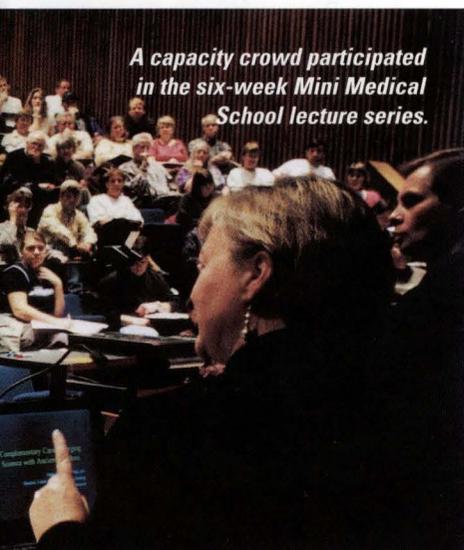
istration; becoming a leader in interdisciplinary education and research; and investments in facilities and technology.

Cerra listed a number of challenges faced by the AHC, including the rapidly evolving health care marketplace and the need for more support from the federal government and the Minnesota legislature.

In developing the vision for the AHC, Cerra will organize work groups of faculty and staff to discuss the questions and articulate the options. By the end of June he will appoint a faculty-administrative partnership to formally develop the vision. The group will be instrumental in developing a plan that will meet the challenges of the next several years.

To read Cerra's speech in its entirety, see the Academic Health Center website at: www.ahc.umn.edu

A capacity crowd participated in the six-week Mini Medical School lecture series.



The October-November Mini Medical School was an overwhelming success, with more than 2,000 people expressing interest in the six-week lecture series. The classes are designed for no more than 350 participants – those unable to attend this past fall will be first in line for the second Mini Medical School in the spring.

The free series on six different topics is taught in evening sessions by top University faculty. The fall classes included sessions on anatomy, infectious diseases, physiology, genetics, cancer, and complementary care.

"Mini Medical School is a program designed to fulfill the curiosity that so many people have expressed," says Dr. Gregory M. Vercellotti, senior associate dean for education. The program is modeled after a similar program at the National Institutes of Health, which has also received an overwhelming response. NIH also serves as a resource to universities interested in starting their own programs.

For more information on the Mini Medical School, call 1-800-864-0819 or visit the Mini Medical School website at: www.ahc.umn.edu



A CAMPAIGN FOR M

University sets \$1.3 billion goal

The University of Minnesota has launched a campaign to raise \$1.3 billion by 2003 – the most ambitious fundraising drive ever for a public university

“We have an unprecedented opportunity to be a greater-than-ever resource for the state of Minnesota,” said President Mark Yudof at the October 21 kickoff event at Coffman Memorial Union, “and one of the premier research universities of the world.”

Campaign Minnesota will focus strongly on three areas:

- recruiting, developing, and retaining top faculty
- attracting students with promise and helping them succeed
- investing in Minnesota’s future

Goals include \$275 million for faculty distinction, \$225 million for student success, \$40 million for strategic opportunities, \$350 million for research, \$345 million for service and outreach, \$15 million for libraries, and \$50 million for new facilities. About half of the \$1.3 billion goal has already been raised in the “quiet phase” of the seven-year campaign, which began in 1996.

“The University of Minnesota affects each of our lives,” says Campaign Minnesota Chair Russell Bennett, “whether we are citizens of Minnesota, the state, or the world. With Campaign Minnesota, we have an opportunity together to help shape the future of this great institution for our children and grandchildren.”

President Yudof believes the University has never been more important to the state and its citizens than it is today. He emphasizes:

- Within the next decade, a million new jobs will be created in Minnesota. These jobs will demand high levels of analytic ability, creativity, and technological literacy. The University provides 50,000 students annually with the education they need to fill these jobs.
- We are in the midst of an explosion of research breakthroughs in molecular and cellular biology, medicine, human and plant genetics, digital technology, and other disciplines. University faculty members are world-renowned in these and other areas. Their innovations and breakthroughs will help Minnesota’s businesses and citizens continue to be leaders in this scientific revolution.
- In this rapidly changing environment, lifelong learning is more important than ever. Minnesotans depend on the University for the continuing education, extension, and other outreach services they need to keep up with the pace of change.

A major focus of the campaign will be to increase the number of endowed faculty positions at the University. Currently there are 260 such positions, which include chairs endowed for \$1 million each and professorships endowed for \$500,000. These are the University’s most prestigious appointments, and are effective in attracting and nurturing outstanding scholars. The endowments allow faculty members to conduct costly research and hire research assistants without the pressure of locating funding for their projects.



MINNESOTA

A Defining Moment

According to President Yudof, "Every institution has its defining moments — points in time when talented individuals, working cooperatively, can influence the course of events for generations to come. I believe this is one such moment for the University of Minnesota.

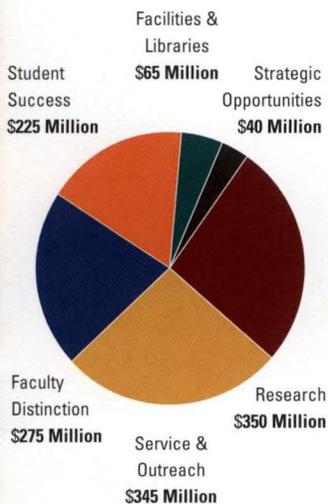
"But other universities across the nation are also vying for pre-eminence in teaching, research, and outreach. The competition for the most outstanding faculty and students is keener than ever, and it will intensify during the next decade."

Yudof says that to be a leader in the 21st century, the University must have the needed talent and resources. He notes that tuition and government assistance provide for core operating needs, but to achieve the level of excellence valued by students, alumni and friends, and the citizens of Minnesota, the University must also be able to attract private financial support. "History has demonstrated, time and again, that philanthropy makes the difference between the average university and the pre-eminent one," he says.

"Timing is critical. If this defining moment is lost — if our vision and leadership slacken, if we settle for 'good enough' and no more — then the consequences will affect not only the University's future, but also that of all Minnesota."

CAMPAIGN PRIORITIES

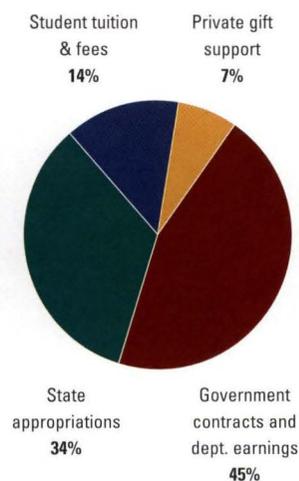
Grand Total: \$1.3 Billion



History has demonstrated, time and again, that philanthropy makes the difference between an average university and a pre-eminent one. The goal of Campaign Minnesota is to ensure the University's pre-eminence in the 21st century.

U OF M REVENUE SOURCES

1998 Total: \$1.7 Billion



The state provides only a third of the U's revenues with some colleges receiving less than 15%. Philanthropic support is essential for a great university, and has grown to where it now provides 7% of the U's annual revenues.

Faculty Achievement

U of M faculty include some of the most renowned teachers and researchers in the world. Current and former faculty members have earned countless national and international honors, including:

- 9 Nobel Prizes
- 4 Pulitzer Prizes
- 59 Fulbright Scholarships
- 18 members of the National Academy of Engineering
- 30 members of the National Academy of Sciences
- 3 members of the Institute of Medicine of the National Academy of Sciences
- 5 Guggenheim Fellowships
- 22 members of the American Law Institute
- 23 members of the American Academy of Arts and Sciences

After Graduation

The University enrolls more than 50,000 students a year and awards 10,000 degrees, making it one of the largest universities in the country. Its graduates are:

- Founders of more than 4,000 companies worldwide
- Half of Minnesota's "Teachers of the Year"
- 97% of Minnesota's dentists
- 66% of Minnesota's physicians
- 64% of Minnesota's pharmacists
- 70% of Minnesota's veterinarians

Top Universities R & D Investments

UNIVERSITY	\$ IN MILLIONS
Johns Hopkins	\$704
Washington, Seattle	357
Stanford	338
U of Michigan	294
California, San Diego	262
U of Pennsylvania	262
MIT	251
Minnesota	250
California, San Francisco	243
Harvard	242

An Unprecedented Opportunity for Medical Advancement

Medical Schools Campaign Kickoff Set for May 5

The explosion of biomedical research, with breakthroughs in human genetics, the neurosciences, new therapies and transplantation, and many other areas, is enabling physicians and scientists to do things that were unimaginable only a few years ago

As part of the University's \$1.3 billion Campaign Minnesota, the Medical School seeks to generate \$335 million to enable the School to play a key role in this extraordinary era of discovery. The Medical Schools' kickoff date for Campaign Minnesota is May 5.

Campaign funds will provide resources for several critical areas: research and faculty support, medical education and students, ongoing program support, and annual and unrestricted support.

Specifically, Campaign Minnesota will help ensure that:

- Laboratories for 21st century research are outfitted with the latest technology and the best support personnel
- Minnesota investigators have access to critical seed money to explore new areas of research – start-up funding necessary to leverage multi-million dollar grants from the National Institutes of Health and other sources
- Minnesota can attract and retain top-flight faculty members to train tomorrow's doctors
- Future medical students aren't deterred from choosing a profession that carries a tremendous financial burden for them and their families
- Minnesota can attract more medical students into the promising careers of biomedical research

Supporting research and faculty

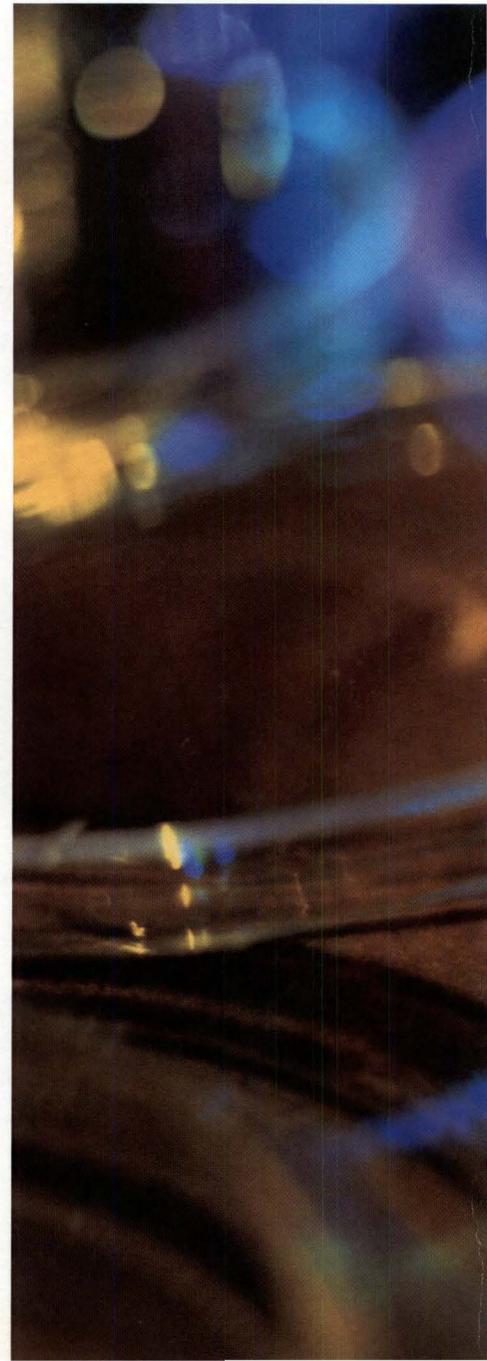
New discoveries require top-flight research facilities and state-of-the-art technology, but successful research depends largely on people – the faculty member physicians and scientists who conduct the research that improves patient care. Recruiting and retaining the best and brightest researchers is a top priority for the Medical School in Campaign Minnesota.

Endowed positions are one of the most effective incentives for attracting talented faculty. Chairs, professorships, and fellowships funded through private gifts give faculty members the freedom to pursue advanced research or scientific work. Thus far in Campaign Minnesota, 16 new endowed positions have been created.

Based on current research strength and the most promising areas for new discoveries and impact, the Medical School will focus on 10 research priorities in Campaign Minnesota, including Aging, Cancer, Cardiovascular and Pulmonary Health, Children's Health, Diabetes, Immunology and Infectious Diseases, Neurosciences, New Therapies, Transplantation, and Women's Health.

Supporting medical education and students

Two-thirds of Minnesota's physicians were trained at the University of Minnesota Medical School, and their impact on the



state's health and well-being is unmistakable. But the cost of a quality medical education is greater than ever, and academic institutions must respond to numerous changes in technology and in the medical marketplace.

Through Campaign Minnesota, the Medical School will channel gifts to six areas of importance in educating physicians, researchers, and scientists of the future, including Scholarships, Graduate Education, International Health, the Medical Education Center, Biomedical Ethics, and Prevention and Wellness.

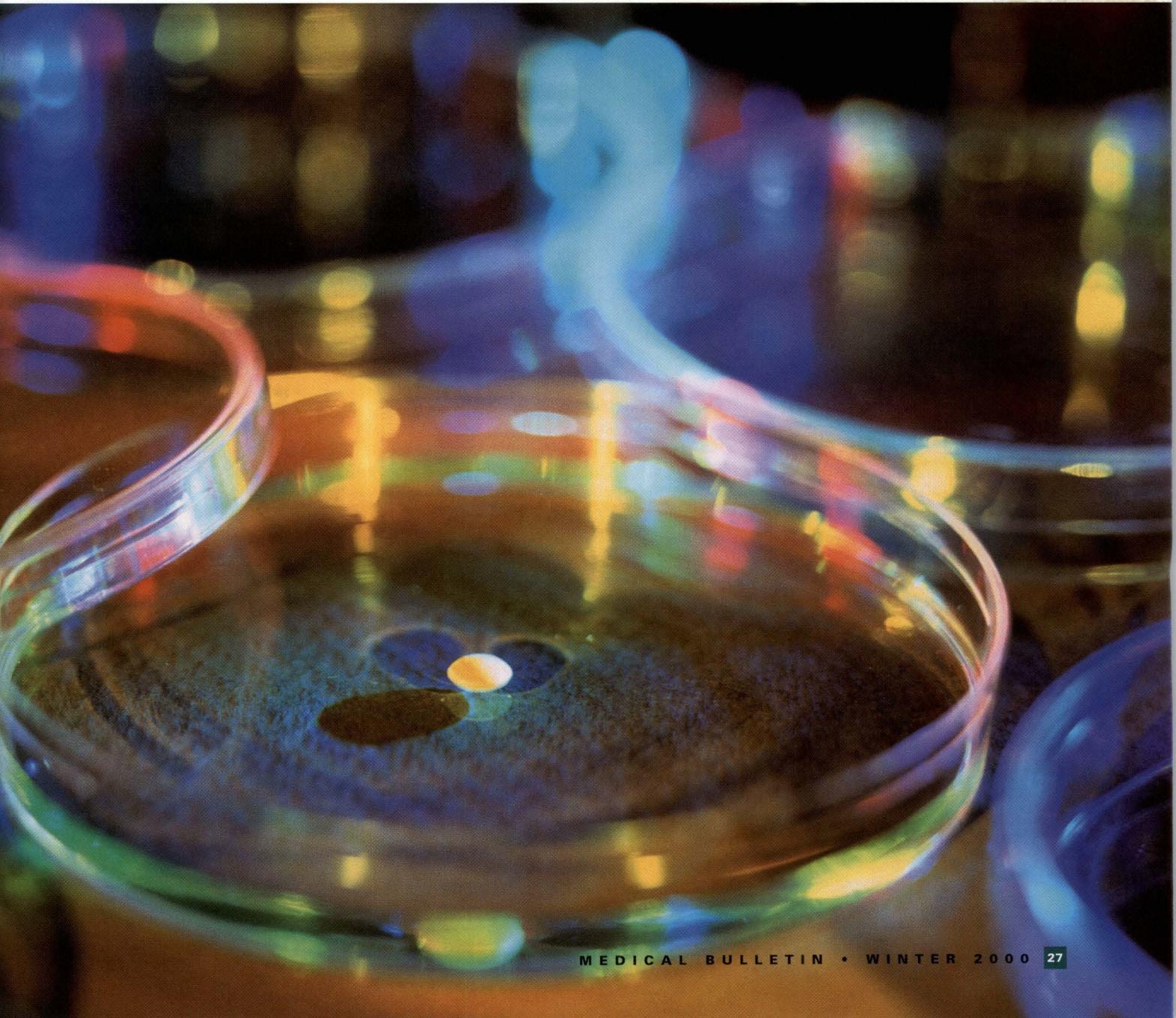
Changing the face of health care at UMD

Nearly 30 years ago, leaders in medicine, education, and politics launched an effort

to bring more physicians to Minnesota's small and rural communities. The result was a unique, two-year medical school opened specifically to meet those needs – the University of Minnesota, Duluth, School of Medicine.

The UMD School of Medicine has dramatically influenced health care throughout much of Minnesota. To meet growing needs, however, the School must enhance its physician preparation, its research initiatives, and its rural health commitment. As part of Campaign Minnesota, the School's goal is to raise \$11 million, with a special focus on preparing primary care physicians for rural practice, training American Indian health care providers, and enhancing research in the areas of rural health and American Indian health as well as basic biomedical research.

*Look
for the
Spring 2000
Medical Bulletin –
a special
Campaign
Minnesota
issue*



Welcome new Presidents Club members

Because of their generous support, the following people have recently become members of the University of Minnesota Presidents Club. Their gifts have been designated (all or partially) to the Medical Schools, School of Public Health, Cancer Center, or other areas served by the Minnesota Medical Foundation.

REGENTS SOCIETY

N.L. and Nancy Bentson

TRUSTEES SOCIETY

Bioanalytic Microsystems LLC

Robert Wasson and Helen Wasson Coulter

William J. and JoAnne M. Edlefsen

CHANCELLORS SOCIETY

Dr. Nancy Speert Slater

FOUNDERS SOCIETY

Drs. Jerome H. and Shirley Graves Modell

HERITAGE SOCIETY

Dr. Toshio J. and Suzanne Akamatsu

Dr. Stuart L. and Evelyn B. Arey

Dr. Charles I. Benjamin

Dr. Larry J. and Jan Brettingen

Cornelia A. Burrill

Dr. Wayne A. Chadbourn

Dr. Raymond C. and Velmabelle Cornford

Robert Wasson and Helen Wasson Coulter

Dr. David M. and Carol Jean Craig

Dr. James C. and Marilyn Rollwagen Dahl

Dr. Frank J. and Marion E. Dixon

Russell S. and Janice I. Dunlop

Dr. Francis J. and Gail Eason

Dorothy M. Ellstrom

+Dr. Garth W. and Mary M. Englund

Dr. Paul F. and Janet F. Engstrom

Dr. Carl B. and Bonnieclare Erling

Dr. Emily H. Gates

Dr. Leland J. Green and Mary Louise Boyler

Dr. Paul J. and Betsy Hauser

Dr. Robert B. and Ellen T. Howard

Dr. John H. and Anne Nelson Kersey

Dr. Russell H. and Karen A. Larsen

Dr. Van S. and Dulcie W. Lawrence

Dr. Gerald T. Lester

Dr. Roger D. and Ellen Lillemoen

Dr. Paul A. and Beckie Lunseth

Dr. Fred A. and Naomi Lyon

Dr. Robert H. Maisel

Dr. Paul D. Mayer and Pamela Hartvig

Dr. Richard A. and Patricia N. Meland

Drs. Robert L. and Charlotte T. Merrick

Marian F. and +George H. Moose

Dr. Eldore B. and Lois E. Nash

Yvonne Pollard Oaks

Bernice S. Olson

Dr. Michael M. and Treva R. Paparella

Dr. Richard M. and Marcie C. Powell

Dr. Konald A. and Phyllis J. Prem Robert C. Raiter

Dr. John D. and Barbara O. Rice

Linda D. Ridgway

Dr. Robert T. and Ruth Rowland

Donald C. and Mary Joan Savelkoul

Charlotte M. Seguin

Dr. James M. Smith

Jane Zagaria Stern and +Henry Stern

Dr. Harvey W. and Evelyn L. Stone

+Dr. Bernard and Mary Louise Street

Carol A. Thera

Dr. James J. and Marilyn S. Tiede

Dr. Michael A. and +Lee Wainstock

Dr. A. Cabot and Jean W. Wohlrahe

+ deceased

Generous benef

Many thanks to the following donors who have made recent commitments of \$50,000 or more to the future progress of health-related education, research, and service at the University of Minnesota.

The Frederick E. and Doris Bjorklund Endowed Fund in the Department of Ophthalmology has been established with a gift from the estate of *Frederick E. Bjorklund*.

Nancy Mills Boyce, Minneapolis, has made a life income gift in memory of her father, Walter Mills, for unrestricted support of the School of Public Health.

Dr. Wayne A. Chadbourn, Edina, Minnesota, has made a life income gift to the University of Minnesota Medical School, a portion of which will support the Class of 1943 (March) Scholarship Fund.

The Vivian V. Drenckhahn Scholarship in Public Health has been established with a gift

Earl E. Bakken, Waikoloa, Hawaii, has committed \$1.25 million to establish two new funds at the Minnesota Medical Foundation.

The Cardiac Arrhythmia Center Bakken Gift Fund in the Division of Cardiology, Department of Medicine, will support new basic research in the latest techniques for cardiopulmonary resuscitation of cardiac arrest victims. The Halberg Center for Chronobiology Fund will be used to assist University investigators in applying the principles of chronobiology, the study of the human body's natural rhythms. The Halberg Center will also initiate a stroke and catastrophic cardiovascular disease prevention project at the Academic Health Center.

"I give to the University as a result of my background there – my schooling and many years of work with the different departments and faculty – and my interest in the exciting work being done under Frank Cerra (senior vice president for health sciences)," says Bakken.

Bakken is the co-founder and chairman emeritus of Medtronic, Inc., and current president of Five Mountain Medical Community in

ors show commitment to the future

from the estate of **Vivian V. Drenckhahn**, who devoted her life to the public health of people of the United States and the world.

Dr. William R. and Ruth Y. Foster, Los Altos Hills, California, have made a life income gift which will establish the Dr. William and Ruth Foster Endowed Scholarship at the University of Minnesota Medical School.

Gifts from the estate of **Ernest and Elizabeth Fraenkel** will support renal research in the Department of Medicine, leukemia research in the Cancer Center, and education and research in the Department of Physical Medicine and Rehabilitation.

The Oluf and Margaret Haugrud Endowed Scholarship has been established with a gift from the estate of **Oluf and Margaret Haugrud**. This gift will provide scholarships to outstanding students at the University of Minnesota, Duluth, School of Medicine.

Gifts from the estate of **Eva Kraus** will support heart, kidney, and bladder research in the Department of Medicine, cancer research in

the Cancer Center, and hearing research in the Department of Otolaryngology.

Murlan J. Murphy, Sr., Shaker Heights, Ohio, made a gift to support the research of Dr. Henry Buchwald in the Department of Surgery.

Dr. Eldore B. and Lois E. Nash, Plymouth, Minnesota, have made a life income gift which will establish the Dr. Eldore B. and Lois E. Nash Endowed Scholarship.

A gift from the estate of **Marie F. Peters** established the Marie F. Peters Leukemia Research Fund at the University of Minnesota Cancer Center and will serve as a lasting tribute to the vision and generosity of Marie F. Peters.

A gift from the estate of **Robert M. Reed** will benefit the University of Minnesota Cancer Center Fund for cancer research.

Patricia A. and Dr. Wayne H. Schrader, Jensen Beach, Florida, have made a life

income gift which will establish the Wayne H. Schrader, M.D., Endowed Pathology and Laboratory Medicine Award Fund at the University of Minnesota Medical School.

An additional gift from the estate of **Dr. Harry N. Simmonds** was made to the Dr. Nellie Barsness Scholarship, which provides scholarships for women medical students. The scholarship was established in honor of his aunt, Dr. Nellie Barsness.

Dr. Frederick M. Stark, Sioux City, Iowa, has designated a gift to establish the Frederick M. Stark, M.D., Endowed Fund.

A gift from the estate of **Walter H. Valentine** will be used for the charitable purposes of the Minnesota Medical Foundation in support of medical students and educational and research activities.

The Harry Weiner, M.D., Endowed Fund has been established with gifts from the estate of **Sally L. and Dr. Harry Weiner**.

Hawaii. While working closely with Dr. C. Walton Lillehei, University professor and world-renowned open-heart surgery pioneer, Bakken invented the first external, wearable, battery-operated pacemaker. Today, the internal pacemaker is standard treatment for a variety of common heart ailments, and Medtronic employs more than 20,000 people worldwide.



Dr. Michael M. and Treva R. Paparella recently have given over \$1 million of their stock to set up a charitable remainder unitrust with the Minnesota Medical Foundation. Their gift will establish the Paparella Endowed Fund in the Department of Otolaryngology to provide faculty support.

"We believe in the fundamental greatness of the University of Minnesota with its mission of education, research, and service," says Paparella, who was chair of the Department of Otolaryngology for 18 years and continues to be involved in the Otopathology Laboratory at the University. "If you're going to have innovative care, you need to have improved funding and resources to support



research and education. It behooves us who have encountered good fortune to help others," he says.

In addition to his work at the University and at the Minnesota Ear, Head, & Neck Clinic, P.A. Paparella founded and is director of the International Hearing Foundation (IHF), an affiliate of the Minnesota Medical Foundation.

"This gift is a beginning. We hope to do more, as long as our investments continue to do well," says Paparella.

Medical School Alum Margaret MacRae to her terminally ill cancer patients

A tiny Yorkshire terrier named Bopper romps on the lawn with Sasha, a beautiful white Samoyed, and Valentino, a sweet and very affectionate English setter – never far from the watchful eye of their owner. A velvety rabbit named Cocoa nuzzles her shoulder, while Peaches, a lovely pink cockatoo, and Charlie, a long-haired inquisitive cat, perch nearby.

The household is alive with dogs of all sizes, cats, rabbits, birds, and even two goats. These adopted pets are loved and tenderly cared for, as were their previous owners – the terminally ill cancer patients of Dr. Margaret MacRae.

MacRae offers a wonderful, comforting gift to her patients, assuring them that she will give a home to their pets if family members or friends are unable to do so. Many of these pets are quite old, and unlikely candidates for adoption from an animal shelter.

The pet adoption began 25 years ago when a friend of MacRae's died of AIDS, and a lively green parrot named Morgan came to stay. Morgan still rules the roost in one of MacRae's "bird rooms."

The goats – Grasshopper and Cricket – belonged to a man who died of cancer three years ago. They have a roomy enclosure in MacRae's 5-acre yard – and love to be let out to dance on their hind feet and receive crackers and ear scratches from MacRae.

A shy newcomer – a Yorkshire terrier named Buttons – is still getting used to his frisky companions, and gets plenty of attention from MacRae. She has learned over the years the best ways to introduce and integrate new pets, who may be stressed at the loss of their owners and in need of special care.

"The animals meant so much to the people who owned them," she says, "and now they mean so much to me."

MacRae bought her home south of the Twin Cities with the pets' needs in mind. The current count of furry and feathered inhabitants is 15 dogs, 25 cats, 2 goats, 17 rabbits, 12 big birds, and 10 little birds – and they have



the blessing of the local animal authorities.

An oncologist at Mayo's new Mankato clinic, MacRae has been caring for people and animals much of her life.

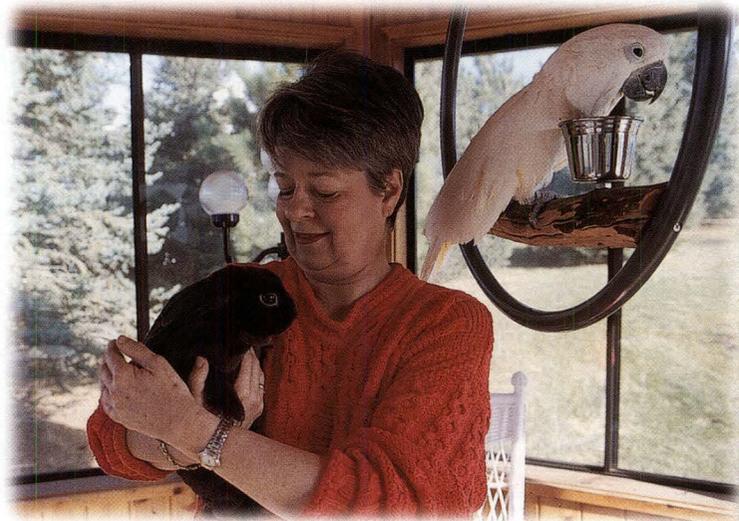
"My mother died of breast cancer when I was 15 years old," she says, "and I knew then I wanted to be a doctor. My grandmother also had cancer – she told me once that I would be good in a career that involved helping people."

MacRae graduated from the University of Minnesota Medical School in 1974. She has been active in the Medical Alumni Society, serving as president in 1990. She treats patients with all kinds of cancer, but specializes in breast cancer, and has been named a *Mpls. St. Paul* magazine "Top Doctor" every year the list has appeared.

"It's so good to come home each day to the animals," says MacRae.

For Charlie, Valentino, Grasshopper, Peaches, and all the others, it's so good just to have a home.

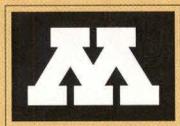
by Jean Murray



ffers *A Gift of Love*



Join UMAA in the New Year!



UNIVERSITY OF MINNESOTA
ALUMNI ASSOCIATION

As we kick off a new year and look forward into the new millennium, there's no better time to become a member of the University of Minnesota Alumni Association (UMAA). Membership brings many benefits, including a free subscription to *Minnesota* magazine, hotel and car rental discounts, special prices on many University events, and more.

Your support helps the UMAA sponsor Medical Alumni Society initiatives, advocate for capital improvements through the legislative network, and honor outstanding professors. For more information on joining more than 43,000 other alumni and friends in UMAA membership, call 612-624-2323 or 1-800-UM-ALUMS (862-5867) or visit the web site at www.uma.umn.edu.

Mentor a Medical Student

At the White Coat Ceremony on January 15, first-year medical students were introduced to their new mentors as part of a program recently developed through a collaborative effort between the Medical School dean's office on the Twin Cities campus and the Medical Alumni Society. The intent of the program is to provide medical students (and perhaps their spouses) with a way to meet and interact personally, socially, and professionally with community physicians. It is hoped that these relationships will last throughout the students' four years of medical school and possibly even beyond.

In an effort to match next year's first-year students with their mentors during the summer, before ori-

entation and classes begin, we are now seeking a new group of Twin Cities Metro area physicians to participate in this program with the entering class. If you have friends or colleagues who attended other medical schools and might be interested in this program, please encourage them to register as well. Several of this year's mentors graduated from other schools around the country.



For more information on the First-Year Medical Student Mentoring Program for the class of 2004, please contact Julie Crews Barger, director of alumni relations, at 612-624-9161 or j.barger@mmf.umn.edu or Dr. Helene Horwitz, associate dean of student affairs, at 612-624-8101 or horwi001@tc.umn.edu.

Call for Diehl and Alumni Recognition Award Nominees

The Medical Alumni Society board invites nominations for the 2000 Harold S. Diehl and Alumni Recognition Awards. Both awards will be bestowed upon their recipients at the Reunion Weekend Deans' Dinner on Friday, June 2, 2000, at the new McNamara Alumni Center.

Given in honor of the University of Minnesota Medical School's fifth dean, Harold Sheely Diehl, M.D., the award is presented to an individual who has made outstanding professional contributions throughout his or her career. The Diehl Award has been presented to the 79 people listed on this page since its inception in 1962.

Qualifications for nomination and criteria used in the selection process are: 1) preferably a graduate of the

University of Minnesota Medical Schools; 2) not currently engaged in an academic capacity; 3) outstanding contributions to the Medical Schools, the University, alumni, and the community; and 4) relatively long experience in the field of medical service or a related field.

In contrast to the Diehl Award's recognition of lifetime achievement, the Alumni Recognition Award is presented to a graduate of the Medical Schools for outstanding accomplishments over the past five years. This year's winner will be the third recipient of this award. Dr. June LaValleur, '87, was the inaugural recipient, and last year's award was presented to Dr. Richard L. Stennes, '69. Selection for the award is based on exemplary achievements in the community or

field of medicine, or for outstanding service to the University of Minnesota Medical Schools.

Letters of nomination and supporting materials for both awards should be received by March 10, 2000, and should be sent to: Medical Alumni Society Awards Committee, McNamara Alumni Center, University of Minnesota Gateway, 200 Oak Street SE, Suite 300, Minneapolis, MN 55455-2030.

Harold S. Diehl Award Winners

1962	Owen H. Wangensteen, '21
1963	Donald J. Cowling
	Charles G. Sheppard, '35
1964	Vernon D.E. Smith, '30
1965	Karl W. Anderson, '23
1966	J. Arthur Myers, '20



Medical Alumni Society Wins Award

The Medical Alumni Society was presented with a 1998-99 Hats Off Award by the University of Minnesota Alumni Association at an October ceremony.

The UMAA recognizes outstanding events, volunteers, and groups each year with national awards. The Medical Alumni Society won for its 1998-99 academic year focus called "Alumni Helping Students."

MAS has a number of initiatives designed to support medical students, including a mentoring program, the Residents Away From Home program which locates housing for students interviewing for residencies, student awards and scholarships, and a \$20,000 donation this past year to renovate the student lounge.

Dr. Gene Olilla, center, president of the Medical Alumni Society, received the 1998-99 Hats Off Award from UMAA National President Nancy Lindahl, left, and UMAA Executive Director Margaret Carlson.

Mark your Calender for Reunion Weekend!

The 2000 Medical School Reunion Weekend is just months away, and a host of activities is in the works for this year's celebration. The festivities will take place June 1-3, 2000, with the classes of 1940, 1945, 1950, 1960, 1965, 1970, 1975, and 1990 gathering on the University campus for this special occasion.

Reunion Weekend activities will include a tribute to the Class of 1950 at the Half Century Luncheon, stimulating

Continuing Medical Education programming from some of the most prominent and prolific members of the Medical School faculty, a special deans' dinner at the new McNamara Alumni Center, and the weekend's highlight – private class dinners at the Radisson and Marriott Hotels in downtown Minneapolis. Several other events will fill out the busy reunion schedule, including a couple of new items that should prove to be great additions to the weekend's agenda

of fun and reminiscing.

Members of the celebrating classes should expect more information on Reunion Weekend in the coming weeks, and invitations will be sent in mid-April. If you have questions in the interim, please direct them to Julie Crews Barger (612-624-9161) or Sue Clark (612-626-0619). E-mail inquiries can be sent to MAS@mmf.umn.edu. If you are calling from outside the Twin Cities, please call 800-922-1663.

1967 Theodore R. Fritsche, '30
 1968 Walter H. Halloran, '15
 Anderson C. Hilding, '18
 Carl H. Holmstrom, '29
 1969 Karl R. Lundeberg, '25
 1970 Robert N. Barr, '30
 LeRoy J. Larson, '20
 1971 William C. Bernstein, '27
 J.C. Grant, '42
 1972 J. Richards Aurelius, '22
 Barbara M. Puumala, '59
 Marie Bepko Puumala
 Reino Puumala
 Ricard R. Puumala, '59
 1973 Phillip Halenbeck
 Olga Hansen Litzenberg, '15
 1974 Ann Arnold
 Roger A. MacDonald, '46
 Carl O. Rice, '25
 R.S. Ylvisaker, '26
 1975 Reuben Berman, '32
 Bror F. Pearson, '31
 Lawrence Richdorf, '20
 1976 Milton M. Hurwitz, '39
 Leonard Lang, '28
 Russell O. Sather, '32

1977 Ruth E. Boynton, '20
 Virgil J.P. Lundquist, '42
 1978 Lester H. Bendix, '28
 Herman E. "Tiny" Drill, '29
 1979 Miland E. Knapp, '29
 Harold E. Wilmot, '23
 1980 Helen L. Knudsen, '43
 Donald E. Stewart, '37
 1981 Eva Jane (Ostergren) Larson, '38
 Carl Ragnar Wall, '28
 1982 Stuart Lane Arey, '31
 Kristofer Hagen, '42
 1983 John J. Eustermann
 John J. Regan, Sr., '43
 1984 Arnold S. Anderson, '43
 John W. Anderson, '51
 1985 Kenneth W. Covey, '43
 Frank E. Johnson, '43
 1986 A. Boyd Thomes, '42
 1987 Marcy L. Ditmanson, '54
 Malcolm M. Fifield, '50
 1988 Chester A. Anderson, '44
 Robert B. Howard, '44
 Arnold J. Kremen, '37
 1989 Howard L. Horns, '43
 Austin M. McCarthy, '42

1990 M. Elizabeth "Peggy" Craig, '45
 John P. Stapp, '43
 1991 Dorothy Bernstein
 Irving C. Bernstein, '42
 1992 Frederic J. Kottke, '45
 William A. O'Brien, Jr., '46
 1993 John I. Coe, '45
 Howard B. Burchell
 N.L. "Neal" Gault, Jr, '50
 Tague Clement Chisholm
 1995 Stanton A. Hirsh, '45
 Melvin Sigel, '56
 1996 Stanley Goldberg, '56
 Severin H. Koop, Jr, '55
 1997 Joyce L. Funke, '50
 Thomas A. Stolee, '58
 1998 Jesse E. Edwards
 John B. Sanford, '48
 1999 B.J. Kennedy '45
 C. Walton Lillehei '41
 Ben P. Owens '47

Alumni Recognition Award:

1998 June M. LaValleur, '87
 1999 Richard L. Stennes '69

CLASS NOTES

1941

Dr. Alfred M. Freedman, New York, New York, received a Special Presidential Commendation in recognition of the 25th anniversary of his American Psychiatric Association presidency, and of the successful effort he has led to better understanding of sexual issues and preferences. Freedman was awarded this tribute in May 1999, at the convocation of the Annual Scientific Meeting of the APA in Washington, D.C.

1945

Dr. Aaron Lerner, Woodridge, Connecticut, received a Japanese Government Imperial Decoration called "The Order of the Rising Sun with Gold Rays" in June 1999. Only 33 people

around the world have received this order. Lerner is also author of an autobiography called "My 60 Years in Pigmentation" for the *Pigment Cell Research Journal*.

1961

Dr. William C. Conrad, Warner Robins, Georgia, is the founder and president of Gansu, Inc., established in 1990 to bring eye care, through teaching and surgery, to the Gansu Province of Northwest China. Cataract surgeries are performed in rural areas of Gansu Province for people who otherwise have no access to care. In September 1998, Conrad and his colleagues received China's "Friendship Award" for their work.

1979

Dr. Charles B. Rodning, Mobile, Alabama, recently published a book

titled *Tradition of Excellence: A Pictorial History of Surgical Education at the Mobile General Hospital and College of Medicine/Medical Center, University of South Alabama, Mobile Alabama* (American Literary Press).

Rodning is currently vice-chair, Department of Surgery, and professor, Departments of Surgery and Structural and Cellular Biology, College of Medicine, University of South Alabama, Mobile, Alabama; Fellow, International College of Surgeons; and Fellow, American College of Surgeons.

1980

Dr. Ruth M. Goehle, St. Paul, is returning to Africa to practice her specialty of internal medicine, first in Cameroun and then in Liberia for the Lutheran Church.

THE CLASS OF 1964

celebrated its 35-year reunion last June. Some of the class members provided updates on their careers and activities.



1964

Dr. Donald S. Asp, Minneapolis, assistant medical director of International Health Service (IHS), has been doing mission work in Honduras for the past three years. In the wake of Hurricane Mitch, 111 IHS health-care workers – including physicians, dentists, nurses, and

pharmacists – spent two weeks in remote areas, bringing all their own medical, surgical, and pharmaceutical supplies. The IHS teams saw more than 10,000 patients.

Dr. Robert M. Blaese, Rockville, Maryland, recently moved from the National Institutes of Health to become chief scientific officer of Kimeragen, Inc.,

a small biotech company based in Maryland that focuses on molecular medicine and gene therapy.

Dr. Stephen F. Hodgson, Rochester, Minnesota, is a professor of medicine at the Mayo Clinic, and is the current president of the American College of Endocrinology and past president of the American Association

IN MEMORIAM

DR. ROBERT J. ANDERSON, Class of 1939, Arlington, Virginia, died July 24 at age 85. He was appointed to head the Communicable Disease Center in Atlanta in 1956. During his tenure the first national flu vaccines were administered and a center headquarters was built. Anderson was the managing director of what became the American Lung Association, and also served on the White House Council on Science and Technology. He was former chief of the organization which became the Centers for Disease Control and Prevention, and retired in 1966 as assistant U.S. surgeon general. Anderson was a native of Minnesota and graduated from Carleton College. He is survived by his wife, Ruth, and two children.

DR. JOHN W. BALKINS, Class of 1966, Rochester, Minnesota, died October 16 at age 60. He began his medical practice in

California, but returned to Minnesota after a year and was a physician at the North Clinic in Robbinsdale for 16 years. In 1983 he moved to Rochester, and continued as a physician with the Olmstead Medical Group until he retired in 1997. He is survived by his wife, Patricia, and three children.

DR. KAREN W. GRANLUND, Class of 1986, Burnsville, Minnesota, died in September at age 39. Karen graduated from Gustavus Adolphus and received her master's degree from the University of Minnesota. She was a family practice physician at Park Nicollet Clinic in Burnsville. She is survived by her husband, Jack, and three children.

DR. STANLEY W. MORIS, Class of 1931, Boise, Idaho, died October 29 at age 93. He served in China and Africa for 33 years as a missionary doctor. He is survived by his wife, Juliet.

DR. BYRON O. MORK, Class of 1931, LaJolla, California, died July 9 at age 91. He practiced family medicine in Worthington, Minnesota, at the Worthington Clinic from 1932-49. He returned to the University of Minnesota and received his master's degree in Public Health in 1950. Later that year he moved to California where he worked in the Los Angeles Department of Health from 1950-56; was associate clinical professor at UCLA School of Medicine from 1956-60; regional medical coordinator for the California Department of Health, Los Angeles, from 1959-65; and public health consultant to the California Department of Public Health, San Diego, from 1965-74.

COL. JOHN P. STAPP, M.D., Ph. D., Class of 1943, Alamogordo, New Mexico, died November 13 at age 89. Stapp began his Air Force career in 1944 as a general duty medical officer at Pratt Army Air Base, Kansas. He subsequently served as an industrial medical officer, flight surgeon, research project officer, chief medical scientist of a research division in the AF Systems Command, and as a consultant to the Surgeon General USAF and to NASA. Stapp was called the "fastest man on earth" for his 1954 rocket sled ride in which he accelerated in 5 seconds to 632 miles per hour, then decelerated to a stop in 1.4 seconds. This experiment subjected him to pressure 40 times the pull of gravity. He retired from the USAF in 1970. He wrote numerous papers on medical and aerospace medical research. Stapp was the winner of the 1990 Harold S. Diehl Award. He is survived by his wife, Lillian.

COL. BUDD APPLETON, M.D., St. Paul, died August 28 at age 70. Appleton, a retired Colonel from the U.S. Army, was a clinical professor in ophthalmology at the University of Minnesota Medical School and on staff at United and Regions hospitals in St. Paul. He is survived by his wife, Linda, and three children.

DR. CARLO A. TERZUOLO, Biella, Italy, died recently at age 74. A professor emeritus of physiology, Terzuolo joined the faculty of the Physiology Department in 1959 as its first neuro-physiologist and the Hill Family professor. His work over the next 35 years resulted in major contributions to current programs in neuroscience at the University. He retired in 1994.

of Clinical Endocrinology. In June 1998 his daughter, Karen E. Hodgson, became the third generation of Hodgsons to graduate from the University of Minnesota Medical School. Dr. Karen Hodgson is currently doing her surgical residency at the University of Minnesota.

Dr. Richard V. Johnson, Wayzata, Minnesota, plays cello with the University's Health Sciences Orchestra and with a chamber music group. He also plays jazz piano.

Dr. Charles G. Koski, Fargo, North Dakota, associate professor of neuroscience at the University of North Dakota, is a member of the American College of Surgeons Committee on Trauma.

Dr. George J. Nemanich, Minneapolis, is a volunteer member of International Health Services and participated in medical missions in 1997 and 1999. He is also a volunteer with Health Volunteers Overseas and participated in a surgical mission in 1998.

Dr. John A. Reichert, Hopkins, Minnesota, has done volunteer medical work in Nicaragua from 1996-98 and in Tanzania from 1998-99.

Dr. Robert H. Richardson, West Linn, Oregon, was appointed director of Kaiser Permanente Ethics Services in April 1998.

He is also assistant director and community liaison for the University of Oregon Center for Ethics in Health Care.

Dr. Alvin Shemesh, Capistrano Beach, California, published an article entitled, "Australian Tea Tree Oil: A Natural Antiseptic and Fungicidal Agent" with Dr. William L. Mayo in the *Australian Journal of Pharmacology*.

Dr. James J. Tiede, Spicer, Minnesota, is chief of staff at Rice Memorial Hospital in Willmar. He recently completed 10 years as chair of the Education Committee at Rice Hospital and was past president of the Willmar Chamber of Commerce. He also served three terms as alternate delegate of the American Medical Association.

Dr. Stephen C. Weisberg, Minneapolis, is past chair of the Consortium of Children's Asthma Corps and is current chair of "Asthma Roadways," a family focused, community-based research project measuring behavioral and economic outcomes of children with asthma and their parents.



Dr. Richard and Jaci Lindstrom: Giving Back to the Medical School and the Community

Dr. Richard L. Lindstrom understands firsthand the importance of having ongoing support for research and fellowship training. A member of the Medical School Class of 1972, Lindstrom completed his residency and fellowship at the University of Minnesota. After serving as a professor of ophthalmology and holding the Harold G. Scheie Research Chair at the University, he went into private practice and is now the managing partner of Minnesota Eye Consultants, P.A. of Minneapolis.

While in medical school, Lindstrom met Dr. Donald Doughman. "Don was a young, talented, and exciting ophthalmologist full of new ideas," he says. "He influenced me to become an ophthalmologist." Lindstrom worked with Doughman in the laboratory to develop a corneal preservation solution which is now used worldwide.

An internationally recognized leader in corneal, cataract, refractive, and laser surgery, Lindstrom holds 25 patents in ophthalmology, including intraocular lens implant technology and corneal preservation, and lectures throughout the world. His wife Jaci took a special interest in ophthalmology while working for Dr. Malcolm McCannel, a leading ophthalmologist in the Twin Cities, and became a certified ophthalmic technician, eventually working at the University of Minnesota in the Department of Ophthalmology. She is currently executive director of the International Intraocular Implant Club.

With this background the Lindstroms felt it was important to designate the Department of Ophthalmology as a beneficiary of their revocable living trust. Their trust designation will benefit the Minnesota Medical Foundation after their lives and reduce their estate taxes.

Of greater importance to the Lindstroms is being able to show their thanks by giving back to the University and the community. Their gift creates a personal legacy which will establish the Richard L. Lindstrom Ophthalmology Chair to support research in the area of cornea, anterior segment, and refractive surgery. As a former chairholder himself, Lindstrom knows the chair will help not only the researcher chosen to hold it and the University, but the entire community. The discoveries made by the chairholder have the potential to improve the lives of people everywhere. The Lindstroms are rewarded with the knowledge that they will make this possible through their planned gift.

The Lindstroms' designation of the Minnesota Medical Foundation as a beneficiary of their living trust is the latest in a series of philanthropic efforts in support of the Department of Ophthalmology. Lindstrom chaired the committee that hired Susan Dunlop, now associate director of planned giving, as the first director of development for the Department of Ophthalmology. The Lindstroms contribute annually to the existing Richard L. Lindstrom Fellowship Fund, which Lindstrom established in 1988 to provide support for a fellowship in anterior segment surgery.

The Lindstroms' generosity will provide for future generations of ophthalmologists to follow in Lindstrom's footsteps, creating a legacy of innovation and research into sight-saving and sight-improving techniques. One could say they have great foresight.

If you would like more information about the tax benefits of a living trust designation or about permanent named endowment funds at the Minnesota Medical Foundation, please call the Office of Planned Giving at 612-625-1440 or 1-800-922-1663.

by Andrea J. Peterson



The Minnesota Medical Foundation is a non-profit organization which raises and disburses funds for education and research at the University of Minnesota Medical Schools in the Twin Cities and Duluth and the School of Public Health.

For more information about the Minnesota Medical Foundation or to update your address, call or write:

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University of Minnesota Gateway
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Minneapolis, MN 55455-2030
Phone 612-625-1440 or
1-800-922-1663.
Web address: www.mmf.umn.edu

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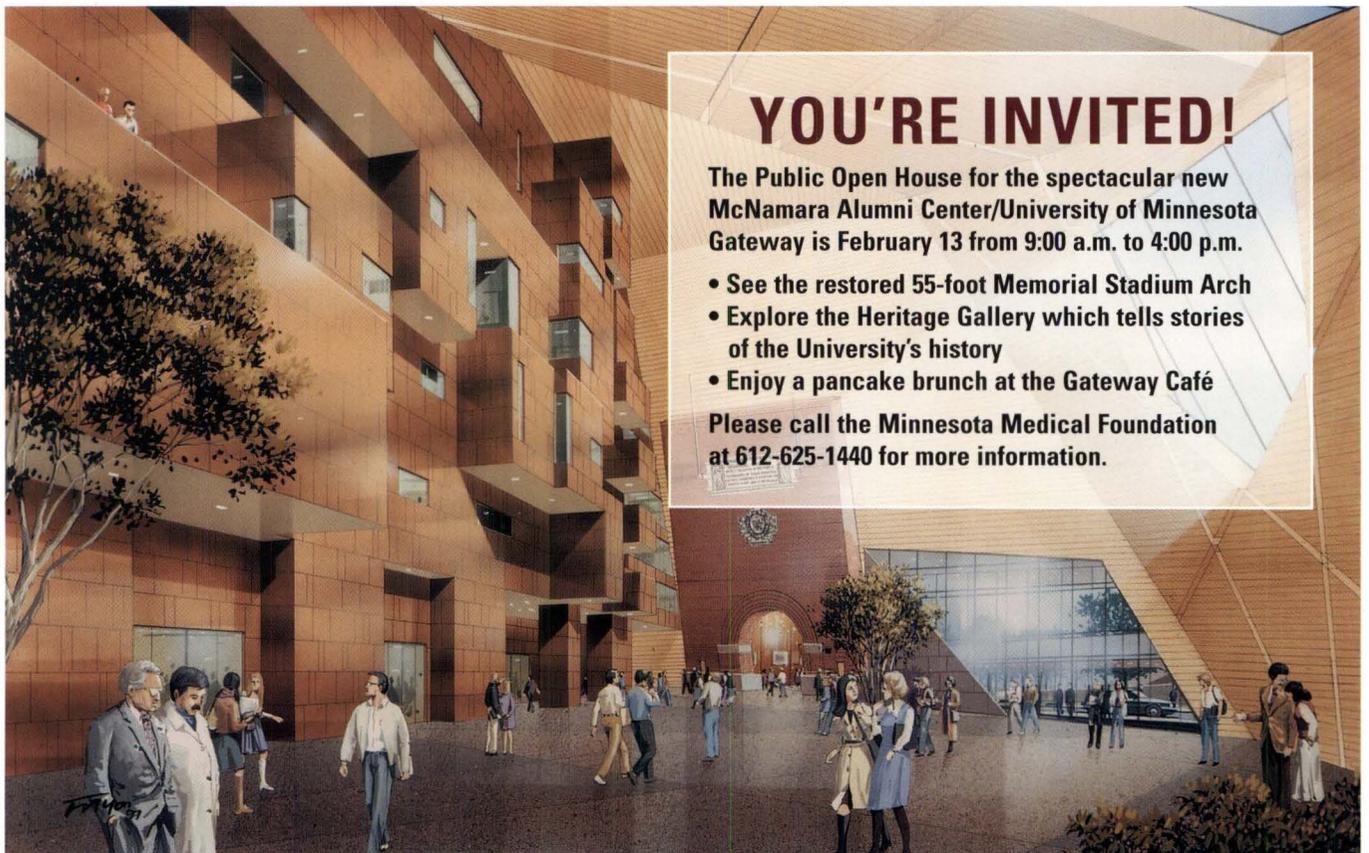
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- See the restored 55-foot Memorial Stadium Arch
- Explore the Heritage Gallery which tells stories of the University's history
- Enjoy a pancake brunch at the Gateway Café

Please call the Minnesota Medical Foundation at 612-625-1440 for more information.