Spring 2010

Masonic Cancer Center News

A publication for those who support cancer research, education, and care at the University of Minnesota

The race for ... prevention

Researchers unravel risk factors and test many ways of preventing cancer

When it comes to cancer research, the headlines tend to focus on the search for a cure or the next breakthrough in treatment. Without minimizing the lifesaving potential of those advances, consider this—the National Cancer Institute estimates that up to 50 to 75 percent of cancer deaths in the United States are caused by modifiable behaviors such as smoking, physical inactivity, and poor dietary choices.

Prevention is a major research focus at the Masonic Cancer Center, University of Minnesota, where dozens of investigators are exploring ways to help people reduce their cancer risk.

The Masonic Cancer Center is a world leader in preventing harm from tobacco use, the single most preventable cause of fatal cancers. Beyond tobacco, prevention research extends to many other lifestyle factors that affect a person's risk of developing cancer—including obesity, exposure to sunlight, and chemoprevention, or use of substances that may reduce cancer risk.

"We could do much to change the face of cancer in this state and this nation if we were to take a serious approach to prevention by simply applying what we already know to be effective," says DeAnn Lazovich, Ph.D., M.P.H., co-leader of the Masonic Cancer Center's Prevention and Etiology Research Program.

Photo by Scott Streble

Mindy Kurzer, Ph.D., is leading a clinical trial studying whether green tea can reduce a woman's risk of breast cancer.

A serious approach to green tea

Prevention research often starts with data from epidemiologic studies—research using information gathered from large populations that indicates a possible link between cancer rates and various dietary and lifestyle factors. From there, some researchers study the basic science of how those factors influence cancer development. Others test possible preventive strategies in clinical trials or help to craft public policies—such as reducing exposure

Continued on page 2

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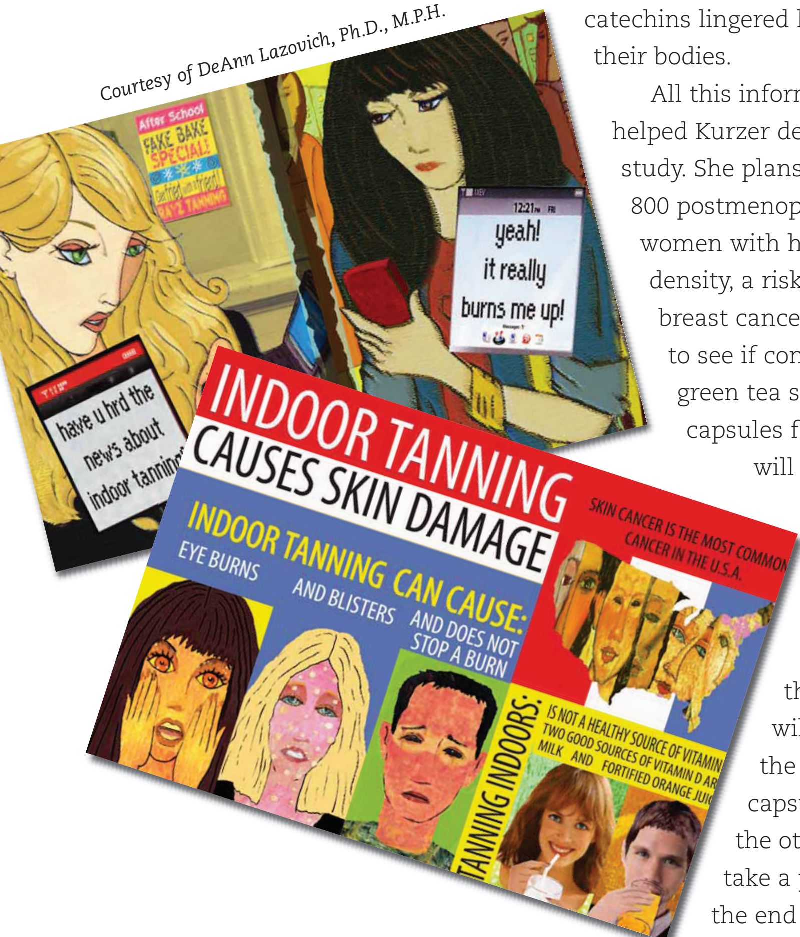
to tobacco smoke and mandating nutritional standards for school lunch programs.

One new clinical trial at the Masonic Cancer Center, for example, is looking into the cancer-preventing potential of green tea. Principal investigator Mindy Kurzer, Ph.D., started with strong epidemiologic evidence suggesting that green tea consumption might reduce breast cancer occurrence.

The data came from a study conducted by University researchers Jian-Min Yuan, M.D., Ph.D., and Mimi Yu, Ph.D., who evaluated the diets of women in Singapore. The reduced breast cancer risk was found almost exclusively in women who were genetically predisposed to more slowly metabolize green tea's catechins—compounds with antioxidant properties. The researchers hypothesized that these women had a lower cancer risk because catechins lingered longer in their bodies.



Courtesy of DeAnn Lazovich, Ph.D., M.P.H.

These postcards inform mothers and daughters about the risks of and alternatives to indoor tanning.

All this information helped Kurzer design her study. She plans to enroll 800 postmenopausal women with high breast density, a risk factor for breast cancer. "We want to see if consuming green tea supplement capsules for a year will reduce breast density," Kurzer explains.

Half of the women will receive the green tea capsules, while the other half will take a placebo. At the end of a year, if the women given the tea extract show a decrease in breast density, Kurzer hopes to conduct a follow-up, Phase III study with more participants.

The eventual outcome of this work might be a green tea supplement or a simple recommendation to drink more green tea—backed by solid scientific evidence.

Another reason to eat your vegetables

Like green tea, many of the substances under investigation may already be in our diets, says Stephen Hecht, Ph.D., leader of the Masonic Cancer Center's Carcinogenesis and Chemoprevention Research Program. His group is particularly interested in the cancer-preventing potential of cruciferous vegetables, such as cabbage, broccoli, bok choy, and watercress.

"One of the most common and plentiful chemopreventive compounds [that we get from] cruciferous vegetables is indole-3-carbinol, or I3C for short," Hecht says. I3C isn't *in* the vegetables, but it's released when we eat them, preferably raw, he says. "In animal models, it can prevent breast cancer and is active against lung cancer."

Much of Hecht's work involves decoding the ways I3C and other compounds interfere with cancer development. Understanding how a cancer-causing substance leads to mutations in DNA helps scientists learn which substances to target and which to avoid.

Another chemical that's abundant in some cruciferous vegetables is known as PEITC. A current clinical trial aims to find out whether PEITC can knock out the DNA-damaging properties of tobacco in human smokers, as it has done in rats.

"I think we're on the right track as far as chemoprevention of lung cancer," Hecht says. "The agents we're working with have an outstanding efficacy record in animals. The doses we're planning on using are nontoxic and not any greater than what one gets from normal vegetable consumption."

He points to lack of toxicity as a key feature of any study involving cancer prevention. "The agent has to be like a vitamin pill—something you're not going to notice at all, but it's still going to protect you," he says.

Stop-smoking vaccine, 'denicotinized' cigarettes move forward

Dorothy Hatsukami, Ph.D., has been perfecting a vaccine to help people stop smoking for years. The vaccine, called NicVax®, stimulates the immune system to create antibodies that bind nicotine molecules so they can't pass into the brain. This reduces the rate of nicotine delivery to the brain.

Working with the vaccine manufacturer, Hatsukami, who directs the Masonic Cancer Center's Transdisciplinary Tobacco Use Research Center, is now launching a Phase III clinical trial that will determine whether the medication is effective enough to gain approval from the Food and Drug Administration (FDA). The study will enroll 2,000 people at 20 sites across the country.

Meanwhile, Hatsukami has just published the results of a preliminary study looking at the use of "denicotinized" cigarettes to help people quit smoking. Compared with people who used either a nicotine patch containing 4 milligrams of nicotine or a low-nicotine cigarette containing 0.3 milligrams of nicotine, the group using the denicotinized cigarettes—with just 0.05 milligrams of nicotine—did well.

"People said, 'This is a great way to quit. We can smoke and quit,'" says Hatsukami.

The impetus for her study came from last year's federal act giving the FDA jurisdiction over tobacco. Now that the agency can regulate nicotine levels in tobacco products, Hatsukami and her colleagues are studying whether a gradual or dramatic approach to nicotine reduction will work best.

She's encouraged by what's she seen so far with the ultra-low-nicotine cigarettes.

"It helps people unlearn the association between cigarettes and reinforcing effects," she says. "They learn that cigarettes aren't really pleasurable, but they'll still have some nicotine on board to ... avoid nicotine withdrawal symptoms."

Dorothy Hatsukami, Ph.D.

The challenge of behavior change

Taking a pill to help prevent cancer would be easy, but many of the steps that people can take right now to reduce their risk involve changing habits. And, says Lazovich, "behavior change is really hard."

One behavior she's trying to change is indoor tanning. "We have compelling data showing that indoor tanning use is a strong risk factor for melanoma," Lazovich says.

She just completed a study looking at modifiable risk factors, indoor tanning among them, and melanoma prevention. Her team also developed a communications plan—including several cleverly illustrated postcards—to inform mothers and daughters about the risks of and alternatives to indoor tanning.

Another top area of prevention research is obesity, a risk factor for several types of cancer. Robert Jeffery, Ph.D., director of the University's Obesity Prevention Center, has designed a variety of innovative programs to help with weight loss and prevent weight gain.

Kurzer drew on Jeffery's work in proposing a new study of weight loss in breast cancer survivors. Kurzer also recently wrapped up the Women in Steady Exercise Research (WISER) study, which tested the effect of regular aerobic exercise on biomarkers of breast cancer risk. Her preliminary data look promising.

Kurzer says she knows that many people want a magic bullet for cancer prevention, but the data just don't exist to make the case for one particular cancer-fighting superfood.

"What we do know is that maintaining a low body weight reduces your risk of cancer," she says. "Exercising reduces risk of cancer. Consuming a largely plant-based diet reduces risk of cancer. If a person consumes a wide variety of foods, [he or she is] probably going to be consuming some of the specific foods that have been shown to reduce cancer risk."

For more information about clinical trials focused on cancer prevention, visit ***www.cancer.umn.edu.***

Better than mammography

U explores promise of new screening and treatment monitoring tools

Breast cancer screening made headlines late last year after the U.S. Preventive Services Task Force recommended against routine mammograms for women in their 40s and instead recommended screening every two years for women ages 50 to 74. The ensuing backlash—in which breast cancer advocacy groups continued to support annual mammograms for women starting at age 40—left many women feeling confused.

Patrick Bolan, Ph.D., is a world leader in using magnetic resonance spectroscopy to advance breast cancer research.

The controversy underscores the need for better screening technology, says Douglas Yee, M.D., a breast cancer expert and director of the Masonic Cancer Center, Univeristy of Minnesota. "While it is clear that women who are regularly screened by mammography are less likely to die from breast cancer, mammography is still an imperfect test," he says.

The quest for more accurate tests for diagnosing and treating breast cancer has led to a fruitful collaboration between the Masonic Cancer Center and the Center for Magnetic Resonance Research (CMRR), the University's magnetic resonance imaging (MRI) powerhouse. MRI can detect virtually any tissue abnormality and is currently used to screen women at high risk of developing breast cancer. However, MRI by itself has low "specificity" for cancer, meaning it can't always tell if a suspicious area is cancer.

That's where magnetic resonance spectroscopy (MRS) comes into play. This technology can detect the chemical makeup of cells. Breast cancer cells, for example, contain higher-than-normal levels of a chemical called choline. "MR spectroscopy adds additional information that can help us distinguish benign from malignant lesions," Yee says.

Tracking cancer treatment

In the last decade, CMRR researchers Patrick Bolan, Ph.D., and Michael Garwood, Ph.D., have become world leaders in using MRS for advancing breast cancer research.

Bolan has played a key role in a large, multicenter clinical trial in which choline levels are tracked before and after chemotherapy to quickly determine which patients are benefiting most from the treatment. A tumor that's responding to an effective drug can show a drop in choline within a single day.

Michael T. Nelson, M.D., a professor of radiology, is the clinical investigator for that trial and is also working with Yee on another large study that uses MRS to monitor treatment response.

"It's a breakthrough for oncology," Nelson says. "It's a big study, and Minnesota is leading the charge. ... The next challenge is to take what we've learned in breast [cancer] and apply it to other solid tumors, such as prostate, ovary, and liver."

On the horizon

The technical challenges of MRS—high costs and slower scanning speeds, among others—make it impractical as a screening strategy right now. But researchers believe its potential is too great *not* to pursue.

Other innovations are currently in the works, too. A technique called SWIFT, which Garwood helped invent, can capture information that would be invisible on a standard MRI.

If you think of magnetic resonance images as frames of a movie, SWIFT captures more frames per minute, explains CMRR research associate Curt Corum, Ph.D. "SWIFT gives us the possibility to preserve signals that would normally be lost,"

continued from page 4

says Corum, who is testing SWIFT to detect microcalcifications in early-stage breast cancer.

Bolan is also exploring high-field imaging using the powerful 7T magnet to increase the ability to detect more breast cancer chemicals.

For his part, Yee envisions wider use of an MRI machine designed specifically for breasts rather than the whole body in the near future. As a bonus, the procedure would be more comfortable than a mammogram.

Should you get a mammogram?

The simple answer is yes, says Masonic Cancer Center director Douglas Yee, M.D., but it's an individual's decision.

The U.S. Preventive Services Task Force report brought the controversy about first-screening age and screening intervals to light, but "the recommendations provide a useful discussion point about how we manage risk versus benefit," Yee says.

He suggests that women talk to their doctors about their risk and the pros and cons of cancer screening. The task force did say that if women follow the new guidelines, some cancers will be missed and more women will die of breast cancer, but there would be less harm done through false-positive test results and unneeded biopsies.

Yee believes that women who face a higher risk of developing breast cancer, such as those with a strong family history of the disease, should not follow these relaxed guidelines.

"Some women are willing to take on more risk by screening every other year or by not starting screening until age 50, and other women will not accept this increased risk," he says.

Assess your own risk of breast cancer at ***www.cancer.gov/bcrisktool****.*

U adds cancer, heart research space

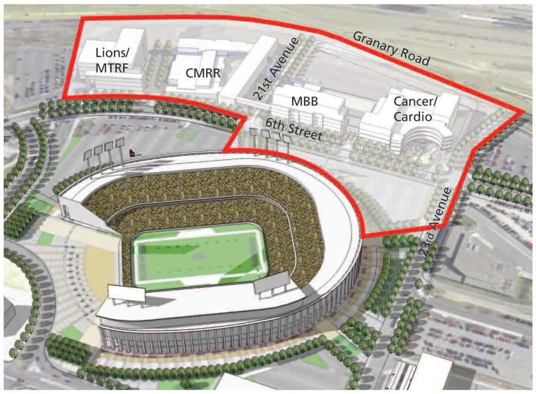
A new facility for cancer and cardiovascular research will be constructed at the University of Minnesota as part of a $292 million funding program approved by the state of Minnesota in 2008.

Thanks to the Legislature's commitment to keeping Minnesota a leader in biomedical advances, even during tough economic times, the University is constructing state-of-the-art research buildings in its Biomedical Discovery District, located on the north side of TCF Bank Stadium. The new buildings will provide high-tech space for faculty to conduct interdisciplinary research in areas such as cancer of the breast, lung, colon, and prostate; heart disease; Alzheimer's disease; brain and nerve disorders; infectious diseases; and immunology.

Cancer and heart researchers will share core resources in a new 280,000-square-foot building. Groundbreaking is scheduled for July 2011.

Also as part of the state-backed project, the University's world-renowned Center for Magnetic Resonance Research (CMRR), which is used frequently for cancer studies, is being renovated and expanded. The expanded building will house a new magnet that will be the largest ever attained for human studies. It will be completed this fall.

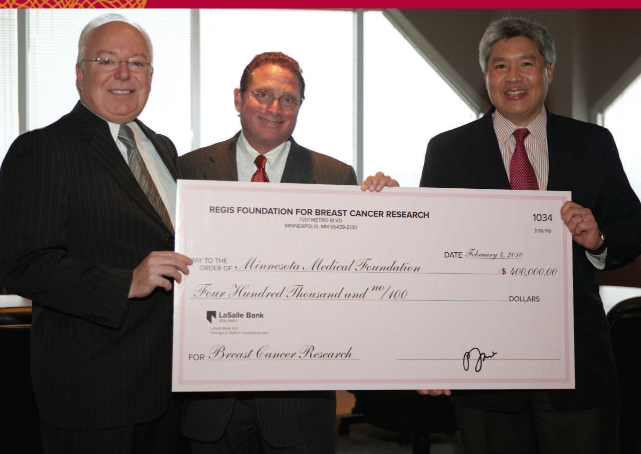
To learn how you can support cancer research in the new building, contact Catherine McGlinch at 612-626-5456 or c.mcglinch@mmf.umn.edu.



Rendering of the Biomedical Discovery District, courtesy of Architectural Alliance

Regis Foundation makes a new gift to breast cancer research

Regis Corporation chairman and CEO Paul Finkelstein presented a big check to the Masonic Cancer Center on February 4—with big intentions.



Regis CFO Randy Pearce (left) and chairman and CEO Paul Finkelstein (center) presented the check to Masonic Cancer Center director Douglas Yee, M.D.

The $400,000 check from the Regis Foundation for Breast Cancer Research will establish a permanently endowed fund to support research that advances the prevention and treatment of and search for a cure for breast cancer at the University. The Regis Foundation, sponsored by the global hair-care giant Regis Corporation, intends to contribute a total of $2 million to the fund over the next several years.

When the fund reaches $1 million, it will be used to create the Regis Professorship in Breast Cancer Research. When it reaches $2 million, the fund will establish the Regis Chair for Breast Cancer Research. At both levels, the fund will help the Masonic Cancer Center attract, retain, and support the work of leading researchers.

"The Regis Foundation has been a long-standing supporter of breast cancer research at the Masonic Cancer Center, having already given more than $1.1 million to our efforts," says Douglas Yee, M.D., director of the Masonic Cancer Center. "We are grateful for its sustained, generous support. This fund will help women who are at risk for and diagnosed with breast cancer by accelerating the translation of our research into promising new ways to prevent, diagnose, and treat the disease."

In 1990, Anita Kunin, a breast cancer survivor and wife of former Regis chairman Myron Kunin, founded the Regis Foundation for Breast Cancer Research. Since then, stylists from Regis Corporation have volunteered their time and talents to raise more than $6.5 million for breast cancer research through Regis's annual Clip for the Cure event.

"At Regis Corporation, we have an ongoing commitment to raise awareness and funds for breast cancer research," Finkelstein says. "We are proud to partner with the Masonic Cancer Center and support its important work in finding a cure for breast cancer."

A gift that returns the favor

You've heard the old adage that it's better to give than to receive. But through a charitable gift annuity with the Minnesota Medical Foundation, you can help advance world-class cancer research, education, and care at the University of Minnesota while you receive lifetime income and tax benefits.

A charitable gift annuity is a simple contract that does not require the services of an attorney. It provides a fixed annual payout that may well be higher than what is earned currently with certificates of deposit or money market accounts. Here are some examples for single life charitable gift annuities:

Age 65	5.3% annual payout
Age 70	5.7% annual payout
Age 75	6.3% annual payout
Age 80	7.1% annual payout

To learn more about charitable gift annuities and other planned giving opportunities, contact Catherine McGlinch at 612-626-5456 or 800-922-1663 or at c.mcglinch@mmf.umn.edu, or visit ***www.mmf.umn.edu/giftplanning****.*

Survivorship Series: Moving Beyond Cancer
8 a.m. to 1:30 p.m., Saturday, April 10
McNamara Alumni Center, University of Minnesota

This fifth annual educational conference focuses on questions and issues cancer survivors may face after treatment. Survivors, their families, and health-care professionals are welcome.

The conference is free, but reservations are required. For more information or to register, visit **www.cancer.umn.edu/survivorshipseries** or call 612-624-2620 or 1-888-CANCERMN.

Cancer U: Ask the Experts
Update on Prostate Cancer
6 to 8 p.m., Thursday, April 22
Radisson University Hotel, Minneapolis

University of Minnesota Center for Prostate Cancer director Badrinath Konety, M.D., M.B.A., will discuss current guidelines for screening, the diagnosis process, and available treatment options.

The program is free, but registration is requested. Please call 612-624-2620 or visit **www.cancer.umn.edu**.

Passing the torch

Breast cancer researcher Carol Lange, Ph.D., was recently named the new holder of the Tickle Family Land Grant Endowed Chair in Breast Cancer Research. The endowed position was previously held by Masonic Cancer Center director Douglas Yee, M.D. Lange co-leads the Women's Cancer Research Program at the University.

Photo by Stephanie Dunn

Sign up for e-updates

Join our mailing list to receive the latest cancer news from the University of Minnesota through e-updates at **www.mmf.umn.edu /subscribe**.

U researchers find two units of umbilical cord blood significantly reduce risk of leukemia recurrence

Acute leukemia patients who receive a transplant of two units of umbilical cord blood (UCB) instead of one have a significantly reduced risk of the disease returning, according to new research by two members of the Masonic Cancer Center, University of Minnesota.

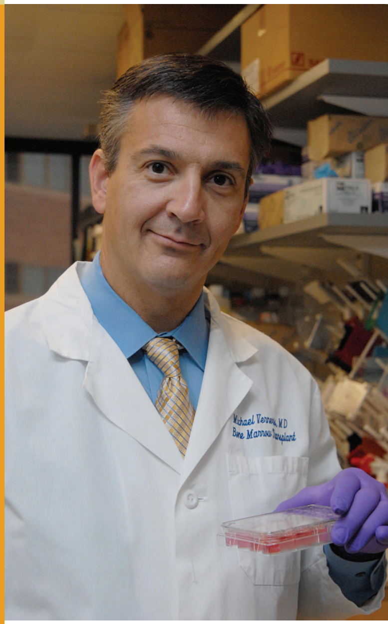
Michael Verneris, M.D., and John Wagner, M.D., found that 19 percent of patients transplanted with two units of UCB had recurrent cancer compared with 34 percent of patients receiving one unit. They believe that this finding has the potential to change the current practice of using one unit of UCB for patients at high risk for recurrent blood and bone marrow cancers.

Blood and marrow stem cell transplantation has been the mainstay treatment for patients with high-risk leukemia and other blood cancers for the past 30 years. Now UCB is routinely used throughout the world as an alternative to bone marrow transplantation. But because of the limited number of cells in UCB, it has been reserved for young children and small adults.

The practice of using two UCB units (from two individuals) was pioneered at the University of Minnesota about a decade ago.

"We now know that without this double transplantation procedure, the majority of the patients treated would have had no other reasonable treatment option for their leukemia," Verneris says. "The fact that they had less leukemia relapse was a wonderful surprise."

This work was funded by the National Cancer Institute and Children's Cancer Research Fund.

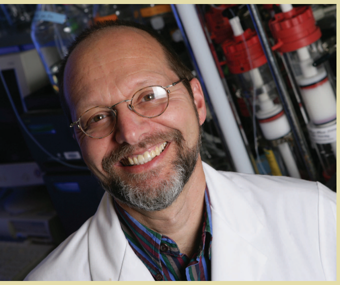


Michael Verneris, M.D.

University of Minnesota

Minnesota Medical Foundation
McNamara Alumni Center
200 Oak Street SE, Suite 300
Minneapolis, MN 55455-2030

First wave of Masons-funded research in action



Daniel Vallera, Ph.D., received funding to move new drugs he engineered into clinical trials.

When Minnesota Masonic Charities pledged $65 million to the Masonic Cancer Center, University of Minnesota, two years ago, the organization had one mission in mind: eliminating cancer as a scourge of humankind by investing in research.

Today the first research projects funded through this gift are under way, and all eyes are focused on improving outcomes for patients.

Masonic Cancer Center scientist Daniel Vallera, Ph.D., for example, in his University lab created a new line of biologically engineered drugs designed to kill cancer without harming patients' healthy tissue.

"They're very different from most drugs," he says, in that they selectively target cancer cells and, for the most part, leave healthy cells alone.

Because of the success they've had in animal models, Vallera and his team are now getting ready to move the drugs to a Phase I clinical trial evaluating the treatment's safety and effectiveness in patients with several types of cancer, including bladder, brain, breast, colon, head and neck, kidney, lung, ovarian, pancreatic, and prostate.

"We are excited about these drugs because they have proven highly effective against some of our deadliest cancers," says Vallera, adding that they'll be used to treat patients in Minnesota first.

The Minnesota Masonic Charities pledge is funding not only experimental therapeutics projects like Vallera's, aimed at bringing laboratory breakthroughs to patients, but it's also funding innovative pilot studies in the Masonic Cancer Center, recruitment packages for promising early-career scientists, and efforts of key physicians in the Medical School's Division Hematology, Oncology, and Transplantation.

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Nicole Endres, *Editor*
Lee Engfer, *Writer*
Lisa Haines, juju, *Design*

For more information, please contact:
Catherine McGlinch
Director of Development
612-626-5456 (direct)
800-922-1663 (toll free)
c.mcglinch@mmf.umn.edu

www.mmf.umn.edu
www.cancer.umn.edu

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