



## U.S. Cancer Death Rates Continue to Drop

**T**HE LATEST NATIONAL STATISTICS show that the overall death rates from the most common cancers are declining steadily. This news is encouraging not only for patients, but also for the doctors and researchers whose careers are devoted to reducing cancer's devastating effects.

"Cancer death rates have fallen consistently for a decade now, so it's clearly a trend and not just a blip," said Michelle M. Le Beau, PhD, Arthur and Marian Edelstein Professor of Medicine and director of the University of Chicago Medicine Comprehensive Cancer Center (UCCCC).

### By the Numbers

A report issued by the National Cancer Institute (NCI) stated that from 2000–2009, cancer death rates fell by 1.8% per year among men and 1.4% per year among women. Cancer mortality rates among children also decreased by 1.8% per year. The 5-year relative survival rate for all cancers diagnosed between 2002 and 2008 is 68%, up from 49% in 1975–1977, according to the American Cancer Society. The NCI estimates that there are over 13 million cancer survivors in the U.S. today.

"Cancer is gradually changing from a disease you die from to one you live with," said Dr. Le Beau.

### Improvements in Prevention, Early Diagnosis, and Treatment

The decline in cancer death rates reflects significant progress made over the past few decades in cancer prevention, early diagnosis, and treatment. In some cases, cancer death rates have fallen due to public health measures. For example, cigarette smoking among adults 18 years of age and older decreased by half, from 42% to 21% between 1965 and 2004.

In other cases, death rates have fallen due to scientific research that has translated into improvements in all aspects of cancer care.

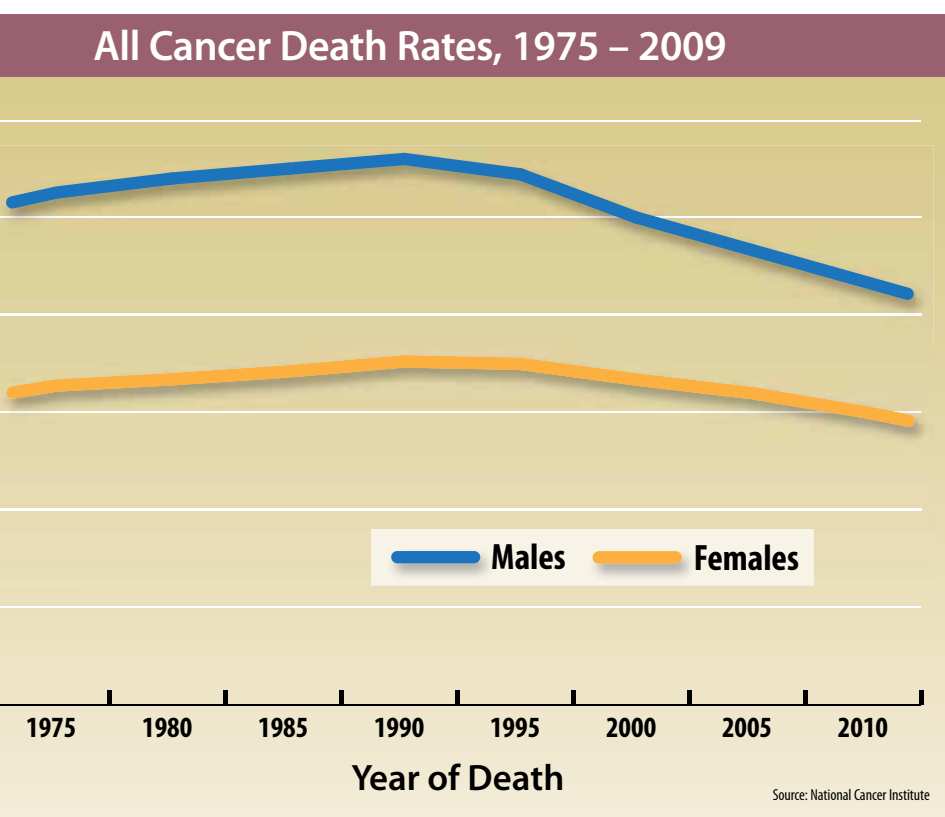
Researchers are using systems-level science to analyze the interactions between vast networks of genes, the environment,

and other factors in an effort to map the causes of cancer, predict cancer risk, and design personalized prevention and treatment approaches. The UCCCC is applying these strategies to high-risk individuals through its Cancer Risk Clinic. These patients include both cancer survivors with a high risk of recurrence and individuals with a family history or personal genetic profile that make them more susceptible to the disease.

UCCCC experts have made major contributions to screening and diagnosis by discovering new approaches to detection and improving computer technologies that aid radiologists in analyzing images. For example, computer-aided diagnosis, pioneered by Professor of Radiology Maryellen Giger, PhD, is allowing physicians to use enhanced magnetic resonance imaging (MRI) scans, rather than a biopsy, to determine whether a common breast lesion (ductal carcinoma in situ) is invasive.

Studies focused on the molecular underpinnings of cancer have facilitated the development of targeted therapies. For example, crizotinib is a drug that targets the mutated anaplastic lymphoma kinase (ALK) protein. Ravi Salgia, MD, PhD, professor of medicine, was among study authors who found that the drug can halt or reverse the growth of lung tumors in more than half of the patients with the genetic abnormality.

Research has also improved the precision of radiation therapy so that it selectively targets the tumor, without causing damage to surrounding healthy tissue. Everett Vokes, John E. Ulmann Professor of Medicine and Radiation Oncology, and Daniel Haraf, MD, MS, professor of radiation and cellular oncology, and colleagues pioneered



a combined chemotherapy and radiation treatment that has improved survival and has become the standard of care for head and neck cancer in the U.S.

Also encouraging is the progress made in pediatric cancer. The 5-year survival rate for all childhood cancers combined has

studies have played an integral role in the development of more effective, less toxic therapies for pediatric cancers."

### Our Best Defense

Despite the progress made in the past several decades, investments in federal funding for cancer research have been on the decline since 2003. Automatic budget cuts created by the sequestration are further endangering life-saving cancer research.

"It's important to acknowledge the remarkable progress we have made with cancer," Dr. Le Beau said. "As a nation, we must place a high priority on investing in biomedical research—it is our best defense against cancer."

Sources: The American Association for Cancer Research Cancer Progress Report 2012, American Cancer Society Facts and Figures 2013, and the NCI Annual Report to the Nation on the Status of Cancer, 1975–2009

Cancer is gradually changing from a disease you die from to one you live with.

**Michelle M. Le Beau, PhD**

increased from 58 percent in the 1970s to more than 80 percent today. The improved survival rate is due to significant advances in treatment. Susan L. Cohn, MD, professor of pediatrics, said, "Pediatric cooperative group clinical trials and translational research



Michelle M. Le Beau, PhD

## FROM THE DIRECTOR

*The Summer edition of Pathways to Discovery presents a well-rounded perspective of the remarkable progress we have made in understanding cancer and how each new scientific discovery holds potential to improve the field further.*

In one story, we describe the seminal finding of the estrogen receptor, made by one of our scientists in the 1950s. This discovery led to a test that is still used to guide treatment for patients with breast cancer today, saving or prolonging the lives of countless women. Another story reports on the study of an advanced MRI technique to measure breast density. In the future, this may become a valuable tool to assess breast cancer risk, allowing for better prevention and earlier detec-

tion of breast cancer.

We also describe the latest statistics showing that national cancer death rates have been on a steady decline for the past decade. This not only highlights the improvements we have made in early detection and treatment, but also the value of research in developing life-saving medical interventions.

You will read about how our researchers analyzed the genetic profile of head and neck cancer and found five distinct types. This may

allow physicians to personalize care more effectively by targeting treatment according to the tumor type. In addition, we share the personal story of one man's experience with head and neck cancer. Our nationally recognized team of head and neck cancer experts helped him overcome cancer with a combined chemoradiation treatment developed at University of Chicago Medicine. No surgery was needed, sparing him from life-altering effects.

Finally, we are excited to debut a series of articles focused on personalized medicine, which takes into account an individual's environmental, social, and biological

factors to tailor prevention and treatment strategies. In the first installment, we explore the field of pharmacogenomics, which studies how genetics influence drug response. We hope this series will serve to enlighten and inform you about how personalized medicine is transforming cancer care.

Regards,

**Michelle M. Le Beau, PhD**  
Director, The University of Chicago Medicine Comprehensive Cancer Center; Arthur and Marian Edelstein Professor of Medicine



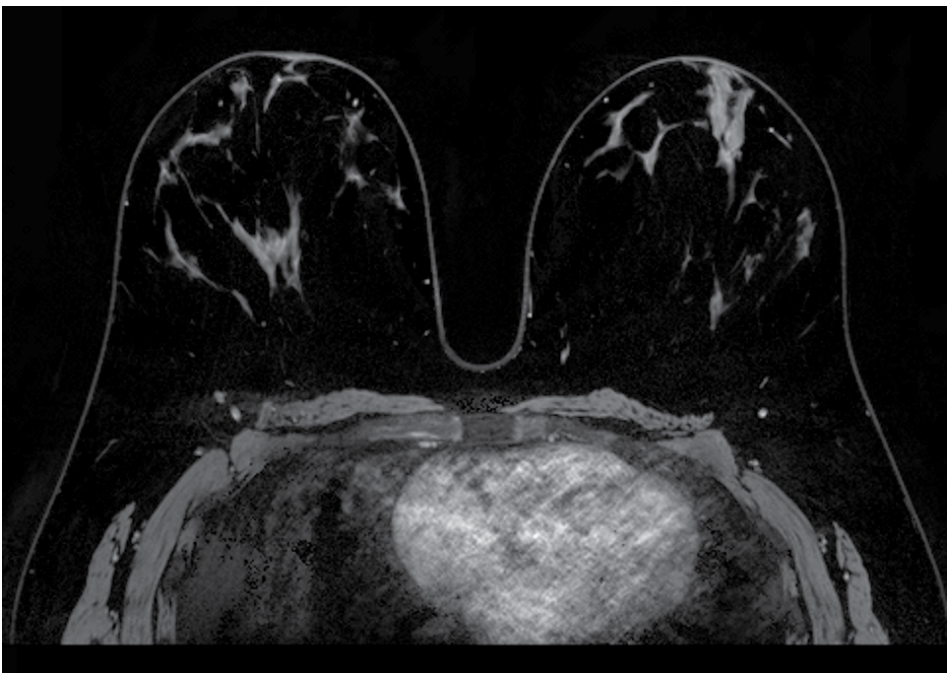
# New MRI Technique to Measure Breast Density May Help Assess Cancer Risk

**B**REAST DENSITY, or the amount of tissue in the breast, is one of the strongest known risk factors for breast cancer. Imaging experts at the University of Chicago Medicine Comprehensive Cancer Center (UCCCC) have developed an innovative approach to measure breast density using high-resolution magnetic resonance imaging (MRI). This imaging tool may allow physicians to assess breast cancer risk more accurately.

### Measuring Breast Density

Mammogram X-rays do not penetrate dense tissues as effectively as fat tissue. Fat tissue appears as a dark area on a mammogram, whereas breast tissue appears as a solid white area. Cancer appears as white, too, making it very difficult to interpret mammograms and detect tumors in women with dense breasts.

Because of its high sensitivity, MRI has been increasingly relied upon as an alternative breast imaging tool. Gregory Karczmar, PhD, professor of radiology and medical physics, and director of the Florsheim Magnetic Resonance Imaging Spectroscopy Laboratory, and Gillian Newstead, MD, professor emerita of radiology, are leading a study<sup>1</sup> to test whether a spectroscopic method of MRI developed at the UCCCC, called high spectral and spatial resolution (HiSS) MRI, can more accurately measure breast density.



A high spectral and spatial resolution (HiSS) MRI image of the breasts of a screening subject at high risk for breast cancer. Researchers are studying whether or not HiSS MRI can improve the measurement of breast fat and tissue to assess breast cancer risk.

HiSS MRI provides more precise measurements of the volume of water and fat in tissues than conventional MRI. The researchers plan to use HiSS MRI to measure breast density, as well as changes in density due to tamoxifen therapy, a drug used to prevent and treat breast cancer. The research is an extension of the work initi-

ated as part of the University of Chicago Specialized Program of Research Excellence (SPORE) in Breast Cancer.

### Future Applications

The new technique will be compared to conventional imaging methods. Once validated, the technique could potentially be

used to evaluate a woman's risk for breast cancer and guide the management of both risk and preventive treatment. HiSS MRI could also be used, instead of mammography, to follow high-risk patients and reduce repeated exposure to radiation.

"It's much easier to take care of cancer before it even begins to develop, as opposed to later on when it's more serious," Dr. Karczmar said. "The easiest way to do that is to measure risk accurately."

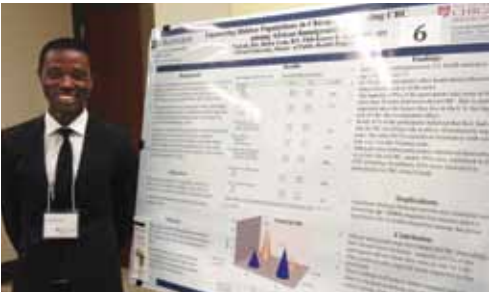
He also pointed out that screening and diagnostic tools need to be both sensitive and specific. The more reliable the method, the less likely false-positive results will occur. "We have to make sure we know which breast abnormalities are dangerous, and which are not," said Dr. Karczmar.

HiSS MRI also holds potential for facilitating more efficient and economical clinical trials for testing new therapeutic agents. Researchers are hopeful that the technique could one day predict an individual patient's response to therapy, allowing for more personalized treatment.

<sup>1</sup>This project is being supported by research grant CA167785 from the National Cancer Institute of the National Institutes of Health, and was supported in its initial stages by the University of Chicago Specialized Program of Research Excellence in Breast Cancer grant CA125183.

## OCECD MENTOR Scholars Deliver Cancer Presentations to Community

The UCCCC Office of Community Engagement and Cancer Disparities (OCECD), under the direction of Professor of Medicine Karen E. Kim, MD, MS, initiated the Mentored Education Now Taking on Research (MENTOR) program to help minority graduate, undergraduate, and high school students gain hands-on experience in health disparities research among racial and ethnic populations. Three MENTOR scholars have recently carried out their mentored research projects in the Hispanic, Asian, and African communities. Tonya Roberson, a Master's of Public Health student at DePaul University, instituted a health and nutrition component to an existing physical activity program at the Vietnamese Association of Illinois. For 6 weeks, she taught a group of high school students how to read food labels and make healthy nutritional choices. Yaw Boateng, a Master's of Public Health degree candidate at DePaul University, focused on colorectal cancer risk and risk perception among Chicago's African immigrant communities. His research showed that over 40% of study participants did not believe they were at risk for colorectal cancer and that over 64% of individuals are interested in participating in research focused on colorectal cancer. Catherine Castro, an undergraduate student at the University of Chicago, presented an educational intervention on breast cancer for Hispanic/Latina women. After her presentation, several women expressed interest in receiving screening services.



At DePaul University, Yaw Boateng presents a poster summarizing his mentored research project on colorectal cancer risk and risk perception among Chicago's African immigrant communities.



Tonya Roberson presents her poster on a health and nutrition educational program that she instituted for high schoolers in the Vietnamese community.



Catherine Castro (third from left) stands with some of the Hispanic women who participated in her educational session about breast cancer risk.



## Open Cancer Clinical Trials

Patient enrollment is under way for more than 350 clinical trials at the University of Chicago Medicine Comprehensive Cancer Center. A few of our newly launched clinical trials include:

- Phase II evaluation of MR-guided laser-induced interstitial thermal therapy for **prostate cancer**—Aytekin Oto, MD, principal investigator.
- A biomarker-driven Phase II study of the pan-class I PI3K inhibitor NVP-BKM120 in combination with cetuximab in patients with recurrent/metastatic **head and neck cancer**—Tanguy Seiwert, MD, principal investigator.
- A randomized Phase II study of IV Topotecan versus CRLX101 in the second-line treatment of recurrent small cell **lung cancer**—Ravi Salgia, MD, PhD, principal investigator.
- Pilot study of prophylactic dose-escalation donor lymphocyte infusion after T cell-depleted allogeneic stem cell transplant in high-risk patients with **hematologic malignancies**—Hongtao Liu, MD, principal investigator.

To learn more about these or any other UCCCC clinical trial, call toll-free 1-855-702-8222 for adult clinical trials or 1-773-702-6808 for pediatric clinical trials, or go to [cancer.uchicago.edu](http://cancer.uchicago.edu) and click on Search Clinical Trials in the blue box.



SPECIAL  
SERIES

# Personalized Medicine

*The UCCCC is transforming the future of medicine by using genetic, social, and environmental factors to predict cancer risk and customize prevention and treatment strategies for our patients. In this installment of a special series on personalized medicine, we take a closer look at how the exciting field of pharmacogenomics is leading to safer and more effective cancer care.*

## Pharmacogenomics Employs Genetic Information to Individualize Cancer Therapy

**W**HY DRUGS ARE EFFECTIVE for some individuals but not others is still largely a medical mystery, but genetics are believed to play an important role. In the 1970s, scientists began to analyze variations in one or a few genes to predict drug sensitivity. Following the explosion of genomic technology in the early 2000s, scientists expanded their search to the entire genome, opening up countless new possibilities.

This study of how a patient's genetic makeup influences drug response, known as pharmacogenomics, is a pillar of personalized medicine.

"Looking at the whole genome allows us to determine which genetic signals are influencing drug response, as well as predict which patients will experience a severe side effect," said R. Stephanie Huang, PhD, assistant professor of medicine. "Instead of the one-size-fits-all approach, we can use genetic information to optimize the timing of treatment and maximize the value of therapy."

The University of Chicago Medicine Comprehensive Cancer Center (UCCCC) leads the emerging field of pharmacogenomics research, serving as the host institution for the National Institutes of Health-funded Pharmacogenomics of Anticancer Agents Research (PAAR) Group since 2000.

Principal investigators include M. Eileen Dolan, PhD, professor of medicine, Nancy Cox, PhD, professor of medicine, and Mark Ratain, MD, the Leon O. Jacobson Professor of Medicine and UCCCC associate direc-

tor for clinical sciences. The research group brings together multi-disciplinary expertise in pharmacology, genetics, and hematology/oncology to discover how genetic differences impact the response to anticancer agents.

"Our program is strong because it runs the gamut from early discovery work to clinical implementation," said Dr. Dolan. "Not many groups can do that."

To study the genetic interactions caused by many commonly used chemotherapy drugs, Dr. Dolan's laboratory created cell-based models. Using cells from related individuals in 34 different families, they were able to show that some families are more sensitive to chemotherapies than others. This model system allows researchers to determine what percent of the variation in drug sensitivity is due to genetics.

In another study, Drs. Huang, Dolan and colleagues used a similar method to identify genetic markers that predict treatment outcomes in patients with ovarian cancer. They discovered a genetic variant in the NRG3 gene associated with a 17-month difference in survival outcomes for ovarian cancer patients treated with carboplatin, a



The University of Chicago hosted a scientific and steering committee meeting of the Pharmacogenomics Research Network (PGRN) in April. The PGRN is a nationwide collaborative partnership of scientists who study how a person's genes affect his or her response to medicine. Investigators at the UCCCC are leading a subcomponent of PGRN, the Pharmacogenomics of Anticancer Agents Research (PAAR) Group, to focus on drugs used in cancer treatment.

commonly used chemotherapy. The NRG3 gene had not been previously associated with cancer nor with drug response.

Although such studies are generating many publications in the medical literature, more work is needed to incorporate this new information into clinical practice. The University of Chicago Center for Personalized Therapeutics is undertaking this task through its 1,200 Patients Project. Led by Peter O'Donnell, MD, assistant professor of medicine, the study is incorporating genetic information into routine clinical practice to help physicians prescribe the most effective medications with the fewest side effects.

Dr. Dolan said, "Oncologists need to be

able to determine up-front if patients are responders or non-responders because it's really important to switch their treatment early to avoid wasting time with an ineffective therapy that could have dangerous side effects."

The UCCCC incorporates pharmacogenomics into more clinical trials than any other Cancer Center and already uses genetics to guide clinical practice. These unique strengths in pharmacogenomics research position the UCCCC as a leader in personalized medicine.

## UCCRF Women's Board Hosts Annual Dinner

The University of Chicago Cancer Research Foundation Women's Board came together for its annual dinner May 29 at Del Frisco's Double Eagle Steak House Chicago. Del Frisco's was a great supporter of last year's Grand Auction, donating a dinner for 20 and a trip for 2 to Napa Valley. The topic of discussion at the dinner was "Marketing, Cancer, and the Medical Center" from guest speaker Kathleen DeVries, vice president for marketing and communications at the University of Chicago Medicine and Biological Sciences.



(from left to right) Women's Board President Jill Pollock with members Joan Crouch and Jean Atchison



(from left to right) Women's Board members Stephanie Harrold, Becky Davidson, and Jody Krug-Schulte



(from left to right) Nancy Stevens, Grand Auction co-chair; Troy Smith, general manager of Del Frisco's Chicago; Women's Board President Jill Pollock; and Janie Song, Grand Auction co-chair



## Research Reveals Five Subgroups of Head and Neck Cancer

**R**ESearchers AT the University of Chicago Medicine Comprehensive Cancer Center (UCCCC) have classified head and neck cancers into five subgroups, each with unique characteristics that may help personalize treatment decisions for patients.

Head and neck cancer comprises cancers of the mouth, tonsils, nose, sinuses, throat, and upper esophagus. It is the 6th most common cancer worldwide. Risk factors include human papilloma virus (HPV) infection, similar to cervical cancer, as well as tobacco and alcohol use.

“We are in the middle of an epidemic of HPV-associated tumors,” said Tanguy Seiwert, MD, assistant professor of medicine. “Usually those cancers have a better prognosis, but there is a subgroup of patients who do very poorly and, unfortunately, we have no reliable means of identifying them.”

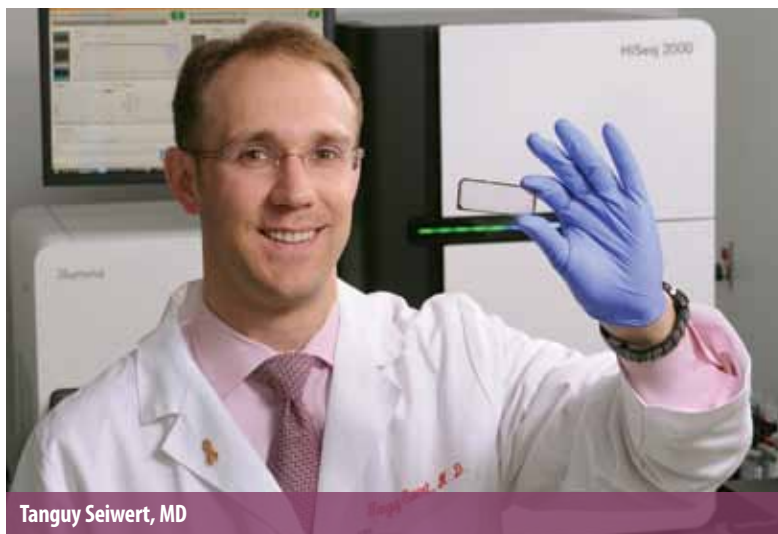
Dr. Seiwert and colleagues set out to understand why some head and neck cancers responded favorably to treatment and why others fared worse. They used advanced genomic and bioinformatics analysis tools to determine the genetic profiles of 134 head and neck tumors. These tumors had all been previously treated with standard therapy so that now the researchers could compare “genetic fingerprints” with the outcomes.

Based on their study, they were able to classify head and neck cancer into 5 different subgroups. Three types—hypoxic, basal, and classical—were not associated with HPV, had a poor prognosis, and showed unique features that may be useful to guide therapy in the future. For example, Dr. Seiwert said that some features, such as lack of oxygen supply (hypoxia), strongly correlated with subtypes and may explain why some patients respond favorably to radiation or epidermal growth factor receptor (EGFR) inhibitors.

Out of the other two types, which were both HPV-associated, the researchers found that type A was associated with a better outcome than type B.

“It was really striking that the HPV-positive tumors, which were previously believed to be one entity, were actually two different subtypes,” Dr. Seiwert said. “Our study brings us one step closer to predicting which patients will need more intensive treatment, and which patients may safely undergo a better tolerated treatment with fewer side effects.”

He said that because these tumors often occur in young patients, it would be particularly helpful to know which patients



Tanguy Seiwert, MD

can be safely and effectively treated with less intense therapy to avoid long-term side effects.

Dr. Seiwert’s group submitted their findings for publication. In addition, Dr. Seiwert delivered a presentation about the genetic make-up of these tumors at the recent annual meeting of the American Society of Clinical Oncology in Chicago. “The mutational spectrum of every tumor is different, but certain patterns are emerging that classify tumors and may guide our understanding of individual tumors,” he said. Interestingly, these patterns may cross tumor types; in other words, certain head and neck tumors show features similar to aggressive breast cancers or bladder cancers, potentially enabling treatments that are based on shared biology in multiple cancers. The clear goal is to develop new or intelligently re-use existing therapies to target the specific mutations. “It’s a process that will take years to complete, but promises a more rational and personalized approach to cancer care,” said Dr. Seiwert.

The UCCCC head and neck cancer team, led by Everett Vokes, John E. Ulmann Professor of Medicine and Radiation Oncology, is leading the field with outstanding treatment outcomes. “Not only do we want to be known as a center of excellence for treatment, but also as leaders in precision medicine for head and neck cancer,” Dr. Vokes said. “It seems that this classification system could potentially be a valuable tool to personalize the treatment for our patients.”

### A CONVERSATION WITH...

#### Tanguy Seiwert, MD

Assistant Professor of Medicine

**If you were not a physician, what would your profession be?**

In another time, I would have wanted to be a software/technology innovator; it’s part of my curious nature. I enjoy looking at things from another perspective.

**What is the most rewarding part of your job?**

The opportunity to think outside of the box and work with talented, creative young students and scientists from around the world.

**Is there a professional goal that you have not yet accomplished?**

To help enable the adoption of more personalized treatment approaches for patients with head and neck cancer by running a genetic “fingerprint” for every patient.

**Where have you been that you feel everyone should go?**

The Museum of Science and Industry. An afternoon walk around the different exhibits provides inspiring examples of what human beings are capable of creating.

**If you had one piece of advice for someone considering your field, what would it be?**

Believe in your dreams, work hard toward it, and be patient.

**Who inspires you?**

My patients. Each and every one pushes me to work harder every day.

**What was the last book you read?**

I read *The Cloud Spinner* by Michael Catchpool to my sons. It is a tale about the beauty and fragility of our natural world, and the wisdom and courage needed to protect it.

## UChicago Discoveries Paved the Way for Modern Breast Cancer Treatment

**A**SERIES OF SCIENTIFIC FINDINGS made at the University of Chicago in the 1950s through 1980s transformed the way breast cancer is treated. The initial discovery of the estrogen receptor, made by a chemist named Elwood V. Jensen, PhD, in 1958, led to a test that is still used today to determine the best therapy for patients with breast cancer.

In the 1950s, removal of a patient’s ovaries worked for the treatment of some breast cancers, but little was known about the role of the hormone estradiol (also known as estrogen) in tumor growth. Dr. Jensen, then assistant professor of surgery, had been closely collaborating with Charles Huggins, MD, who received the Nobel Prize for Physiology and Medicine for his fundamental work in hormonal therapy for prostate cancer. Dr. Jensen decided to focus his work on identifying the role of estradiol in the growth and development of breast cancer. He devised a method to tag estradiol with a radioactive compound, enabling him to follow the events that occurred when the hormone interacted with tissues in rats. Estradiol appeared to bind specifically to a protein in cells of the reproductive tract.

Dr. Jensen discovered that this protein, called the estrogen receptor, is activated by estrogen and shifts to the cell’s nucleus. Once in the nucleus, the estrogen receptor binds to DNA and changes the expression profile of various genes and proteins that promote tumor growth. Until Dr. Jensen’s



In a snapshot from 2003, Geoffrey Greene, PhD, (standing) is pictured with his mentor, Elwood V. Jensen, PhD, and Elwood’s wife, Peggy.

discovery, hormones were thought to act via metabolic pathways. “His discovery profoundly changed the thinking of the field,” said Geoffrey Greene, PhD, Virginia and D. K. Ludwig Professor, chair of the Ben May Department for Cancer Research, and associate director for basic sciences at the University of Chicago Medicine Comprehensive Cancer Center.

Next, Dr. Jensen developed a test to detect estrogen receptors in breast

cancer cells. As a result, Dr. Jensen and his colleagues discovered that about two-thirds of breast cancers express the estrogen receptor, of which half depend on estrogen for growth. Although the test was effective, it was complicated and laborious, Dr. Greene said. Other researchers in the field soon recognized the importance of the test and began devising simpler methods.

Dr. Greene joined the laboratory in 1974, and together with Dr. Jensen and

colleagues, used an emerging technology to develop monoclonal antibodies directed against the estrogen receptor. The technology enabled them to quickly and accurately detect and count estrogen receptors in breast and other tumors. By 1980, this test was incorporated into the standard of care for patients with breast cancer.

“Now, every breast cancer in the Western world and in many other parts of the world is routinely analyzed for the expression of the estrogen receptor,” said Dr. Greene. By determining which tumors have estrogen receptors, doctors can identify who will be responsive to anti-estrogen therapy and who should begin chemotherapy or radiation.

Dr. Jensen is considered the father of the field of nuclear hormone receptors, which play an integral role in the development and progression of hormone-responsive cancers, including breast and prostate cancers. He received the prestigious Albert Lasker Award for Basic Medical Research in 2004 and died in December 2012 at the age of 92.

“Out of all the tumor biomarkers that are around today, the estrogen receptor still stands out as one that is used routinely—even after more than 30 years,” said Dr. Greene. “It has withstood the test of time, and it is still considered valuable as a therapeutic and prognostic marker.”



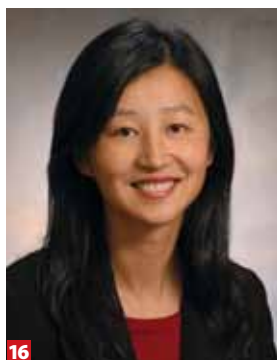
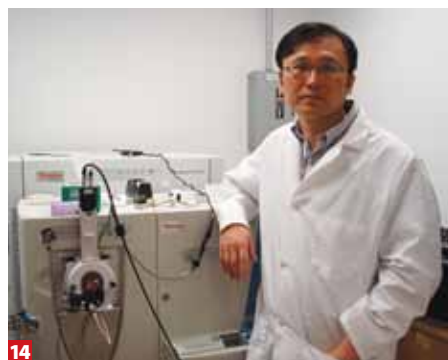
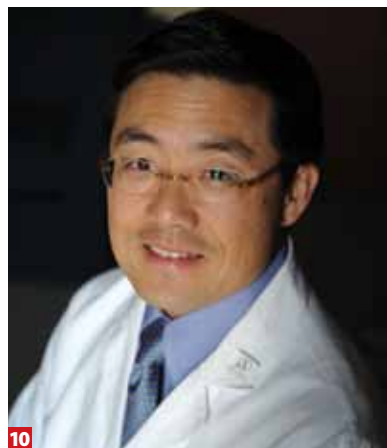
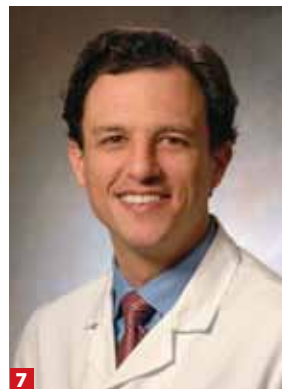
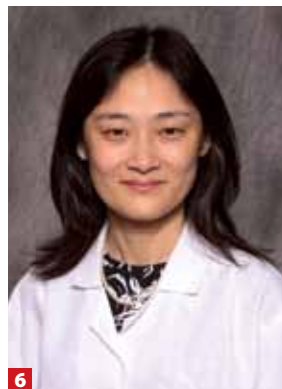
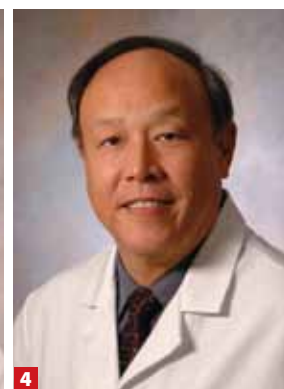
# MEMBER NEWS & UPDATES

**1 Janet Davison Rowley, MD**, Blum-Riese Distinguished Service Professor of Medicine, Molecular Genetics & Cell Biology and Human Genetics, received the Albany Medical Center Prize in Medicine and Biomedical Research, a prestigious award for medicine and scientific discoveries. During a ceremony on May 17, Dr. Rowley shared the prize with Peter C. Nowell, MD, Harnwell Professor Emeritus, Department of Pathology and Laboratory Medicine, Perelman School of Medicine, University of Pennsylvania; and Brian J. Druker, MD, Director of the Knight Cancer Institute and Associate Dean for Oncology, Oregon Health and Science University. They were honored for their groundbreaking research that led to the development of a new generation of targeted cancer drugs, starting with imatinib (Gleevec).

**2 UCCCC Director Michelle M. Le Beau, PhD**, Arthur and Marian Edelstein Professor of Medicine, delivered the keynote address at Stony Brook University School of Medicine's 39th Convocation Ceremony, where 130 medical students graduated—its largest class to date.

**3 Thomas Gajewski, MD, PhD**, professor of medicine and pathology, **4 Eugene Chang, MD**, Martin Boyer Professor of Medicine, **5 Kenan Onel, MD, PhD**, associate professor of pediatrics, and **6 Ping Yu, MD**, assistant professor of medicine, received a Team Science Award from the Melanoma Research Alliance. The research team, led by Dr. Gajewski, will focus on the molecular mechanisms of T cell-inflamed melanoma to identify new therapeutic targets.

**7 Scott Eggner, MD**, associate professor of surgery, **8 Nora Jaskowiak, MD**, associate professor of surgery, **9 Sonali Smith, MD**, associate professor of medicine, and **10 David Song, MD**, Cynthia Chow Professor of Surgery, were among the 12 newly appointed Bucksbaum Senior Scholars for 2013-2014 by the Bucksbaum Institute for Clinical Excellence, which was established in 2011 to improve doctor-patient relationships. They were selected based on their abilities as outstanding clinicians, teachers, and mentors, and they will provide guidance to Bucksbaum Institute junior faculty scholars and students. The Bucksbaum Institute also named new UCCCC member **11 Michael Bishop, MD**, professor of medicine, as a master clinician. For the next 3 years, he will serve as a mentor for faculty and student scholars to enhance doctor-patient communication skills.



Blum-Riese Distinguished Service Professor of Medicine, Molecular Genetics & Cell Biology and Human Genetics, was selected for her revolutionary discovery of recurring chromosomal abnormalities in leukemias and lymphomas.

**14 Yingming Zhao, PhD**, professor in the Ben May Department for Cancer Research, has been re-elected to the Board of Directors for US HUPO (Human Proteome Organization), the main organization in the U.S. that engages in scientific and educational activities to encourage research in proteomics, the large-scale study of proteins.

**15 Issam A. Awad, MD, MS**, director of Neurovascular Surgery, has been named the John Harper Seeley Professor of Surgery. An internationally recognized scholar and educator, Dr. Awad has expertise in the use of MRI to study angiogenesis in brain tumors, particularly cerebral cavernous angiomas, an important model for angiogenesis.

**16 R. Stephanie Huang, PhD**, assistant professor of medicine, has been named the recipient of the 2013 Outstanding Young Investigator Award by the Central Society for Clinical and Translational Research (CSCTR) for her abstract entitled, "Micro RNA-Based Approach Expands on Genome-Wide Association Studies and Identifies Single-Nucleotide Polymorphisms Important for Response to Glucocorticoids in Asthma Patients." Dr. Huang's research focuses on the pharmacogenomics of anticancer agents. She received this award at the 2013 Combined Annual Meeting of CSCTR and Midwestern Section of the American Federation for Medical Research.

The American Cancer Society (ACS) appointed **12 John Cunningham, MD**, professor of pediatrics and chief of the Section of Pediatric Hematology/Oncology, as a member of its Council for Extramural Grants. The main duties of the council include setting the payline for various committees and providing guidance to the ACS on research policy issues and health professional training.

Two UCCCC members were named to the first class of fellows of the American Association for Cancer Research Academy, which was created to recognize and

honor distinguished scientists whose contributions have made a significant impact on cancer research. **13 Olufunmilayo I. Olopade, MD**, Walter L. Palmer Distinguished Service Professor of Medicine and Human Genetics, associate dean for global health, and director of the Center for Clinical Cancer Genetics, was chosen for her work on the interactions between genetics and environment in the onset of breast cancer in young women of African ancestry and research on the prevention and early detection of breast and ovarian cancer in women at high risk. **Janet Davison Rowley, MD**,

## UChicago Medicine Supports Team for American Cancer Society Walk & Roll

The University of Chicago (UChicago) Medicine participated in the American Cancer Society's 2013 Walk & Roll in April at Soldier Field. The UChicago Medicine team raised money to support the American Cancer Society's lifesaving work in research, education, advocacy, and patient services.



Thousands of people walked, biked, or skated along Chicago's lakefront.



# RESEARCH HIGHLIGHTS

The following represent some of the research accomplishments of UCCCC members published February–May 2013.

## Smoking Linked to Other Lifestyle Behaviors Involved in Head and Neck Cancer

Cigarette smoking is associated with engagement of other lifestyle behaviors that increase the risk of head and neck cancer.

**Andrea King, PhD**, professor of psychiatry, and colleagues including **Ezra Cohen, MD**, associate professor of medicine, conducted a health survey, and collected saliva samples, on 102 patients treated for head and neck cancer. They found that, compared to their non-smoking counterparts, participants who currently smoked were less educated, less likely to be married or living with a current partner, and heavier drinkers. In addition, cotinine analysis indicated that approximately 25% of patients who denied tobacco use misrepresented their true smoking status.

Study findings highlight the fact that patients who continue to smoke after diagnosis and treatment are also more likely to engage in other high-risk behaviors, such as alcohol use. Furthermore, self-report of smoking status may not be accurate, underscoring the need for careful assessment to identify at-risk patients. Targeted interventions for tobacco and alcohol cessation for this patient population are clearly needed. (Sivasithamparam et al., *Cancer* 119:2419-26, 2013)

This work was supported by the National Institutes of Health grant number R01 AA013746 and a UCCCC Pilot Grant P30 CA014599.

## Dietary Protein May Provide Clue to Cancer Mortality

The amount of protein consumed as part of a diet may be a risk factor for cancer deaths in developing countries, according to a new study.

**Habibul Ahsan, MBBS, MMedSc**, Louis Block Professor of Health Studies, Medicine, and Human Genetics, and UCCCC associate director for population research, and colleagues prospectively assessed the diets among a very large rural population in Bangladesh and found that those individuals with higher animal

proteins in their diets were at increased risk of death from cancer, especially cancers of the digestive organs.

These findings suggest that protein is somehow involved as a risk factor for cancer mortality and warrant further studies to explore possible causes. (Argos et al., *Int J Cancer* published online ahead of print, May 2013)

This work was supported by grant numbers R01 CA107431 and P42 ES10349 from the National Institutes of Health.

## Soy May Impede Colon Cancer Growth

Soy has been previously associated with anti-cancer properties for breast and prostate cancer, but new research identifies its role in the prevention of colon cancer.

**Chun-Su Yuan, MD, PhD**, Cyrus Tang Professor of Anesthesia and Critical Care, **Wei Du, PhD**, professor of the Ben May Department for Cancer Research, and **Tong-Chuan He, MD, PhD**, associate professor of orthopedic surgery, evaluated the growth inhibitory effect of genistein, one of the most active flavonoids in soybeans, on human colon cancer cells. Their study showed that genistein not only inhibited the growth of colon cancer cells, but also promoted apoptosis, the process of programmed cell death.

These findings provide new insights into the anticancer effects of soy in colon cancer. (Zhang et al., *Int J Oncol* 43:289-96, 2013)

This work was supported in part by grant P01 AT004418 by the National Institutes of Health and the National Center for Complementary and Alternative Medicine.

## Genomic Study Reveals Molecular Features and Functions of Glucocorticoid Receptors

Glucocorticoids, which are hormones that mediate the immune system’s response to stress, are widely used to treat immune diseases and certain types of cancers. However, their mechanism of action remains unclear.

**Anna Di Rienzo, PhD**, professor of human genetics, and colleagues combined several genomic approaches to characterize molecular aspects of glucocorticoid action,

especially the regulatory mechanisms mediated by binding of the glucocorticoid receptor to the chromatin (genetic material that forms chromosomes). They found that the timing and direction of the transcriptional response to glucocorticoid may depend on the presence of a group of interacting transcription factors in addition to the glucocorticoid receptor.

The researchers said their results establish the first genome-wide evidence for the functional importance of genetic variants in glucocorticoid receptor binding sites. Future studies are likely to provide greater insights into the role of these genetic variations. (Luca et al., *PLoS One* 8: e61654, 2013)

This work was supported by National Institutes of Health grant R01 DK056670 and R01 DK056670-S1.

## Expression of IL-15 in Tumor Microenvironment Causes T Cells to Reject Tumors

Researchers found that interleukin 15 (IL-15), a regulatory protein that induces natural killer (NK) cells in the immune system, enables T cells to eliminate cancer cells.

The critical problem encountered in curing solid tumor cancers is the relapse of tumors due to their incapacity to induce a robust and adapted immune response. Based on previous observations, **Bana Jabri, MD, PhD**, professor of medicine, and colleagues including **Hans Schreiber, MD, PhD**, professor of pathology, transferred T cells into mice bearing tumors expressing IL-15, and control tumors lacking IL-15 expression, and monitored tumor growth activity. IL-15 elicited a powerful immune response against the tumor and helped T cells prevent the tumor from developing resistance and relapsing.

These findings have important implications for the design of immunotherapy therapy trials, in particular, IL-15 immunotherapy. (Liu et al., *Proc Natl Acad Sci USA* 110:8158-63, 2013)

This work was supported by National Institutes of Health Grants P01 CA97296, R01 CA22677, R01 CA37156, R01 DK067180-06, and University of Chicago Digestive Disease Research Core Center (DK42086) and Committee on Immunology Training Grant T32 AI 0709.

## Tobacco Use Increases Some Side Effects from Prostate Cancer Treatment

Among men treated for prostate cancer with external beam radiotherapy (EBRT),

those with a smoking history had higher rates of toxicity to the genitourinary (GU) system.

**Stanley Liauw, MD**, associate professor of radiation and cellular oncology, and a colleague evaluated the effects of tobacco use on disease control and long-term side effects in men undergoing EBRT for prostate cancer. They found that, compared to never smokers, current and prior smokers were at increased risk of GU toxicity, including urinary frequency and cystitis. The authors wrote that their findings could help identify tobacco users as a group at risk for late GU toxicity and better guide clinicians weighing the risks and benefits of EBRT in men with a smoking history. (Liauw and Solanki, *Cancer* published online ahead of print, April 2013)

## Surgery Technique Identifies Cancer in the Fallopian Tube

Cancer originating in the fallopian tube may be more common than expected, according to a recently published study.

Previous studies showed that serial sectioning of the fallopian tube in women undergoing risk reducing surgery revealed hidden cancers among BRCA1/BRCA2 mutation carriers. **Ernst Lengyel, MD, PhD**, professor of obstetrics and gynecology, and colleagues including **Anthony Montag, MD**, professor of pathology, reviewed surgical cases for patients with suspected ovarian or peritoneal cancers and found that serial sectioning of the fallopian tube identified more cases where the cancer originated in the fallopian tube. They also found that patient outcomes were similar despite the primary cancer site, so they did not suggest changing the clinical management of these patients.

The researchers said the study shows that fallopian tube cancer may be more common than previously believed, but more studies are needed to identify how it differs biologically and clinically from ovarian and peritoneal cancers. (Lengyel et al., *Gynecol Oncol* 129:120-3, 2013)

This work was supported by grant R01 CA111882 from the National Cancer Institute of the National Institutes of Health and a grant from the Burroughs Wellcome Fund.

# Lectureship Shares Insights in Molecular and Cellular Oncology

In March, the University of Chicago Medicine Comprehensive Cancer Center (UCCCC) hosted the inaugural Dr. Melvin L. and Dr. Sylvia F. Griem Lecture in Molecular and Cellular Oncology. The lectureship brings leaders in the productive field of molecular and cellular oncology to the University of Chicago campus to share their insights with students, faculty, and colleagues. Elaine Fuchs, PhD, Rebecca C. Lancefield Professor of The Laboratory of Mammalian Cell Biology and Development at The Rockefeller University in New York, presented her talk on skin stem cells in homeostasis, wound-repair, and cancer. She is also a Howard Hughes Medical Institute investigator.



The lectureship was endowed by (from left) Anthony G. Montag, MD, professor of pathology, and his wife Katherine Griem, MD. They are pictured with guest speaker Elaine Fuchs, PhD, Rebecca C. Lancefield Professor of The Laboratory of Mammalian Cell Biology and Development at The Rockefeller University, and UCCCC Director Michelle M. Le Beau, PhD, Arthur and Marian Edelstein Professor of Medicine.



Faculty, students, and scientists attend the inaugural Dr. Melvin L. and Dr. Sylvia F. Griem Lecture in Molecular and Cellular Oncology.



# Head and Neck Cancer Experts at the UCCCC Successfully Treat Oral Cancer without Surgery

**A**BOUT A YEAR AGO, a persistent sore throat and earache led Vince Draa of Libertyville to see his family practitioner, who then referred him to an ear, nose, and throat specialist. A scope examination revealed a tumor at the base of his tongue, and a biopsy confirmed that Vince had squamous cell carcinoma that had partially spread to the lymph nodes. The 56-year-old father of two teenagers knew that he needed to act immediately and find the best place for treatment. “This decision was a matter of life or death,” said Ana, Vince’s wife. “We knew we had to cast a national net.”

After seeking opinions at Mayo Clinic and M. D. Anderson, the Draas decided to entrust Vince’s care to experts at the University of Chicago Medicine Comprehensive Cancer Center (UCCCC). The UCCCC head and neck cancer team is renowned for its highly effective approach to treatment involving chemotherapy and intensity-modulated radiation therapy, often sparing patients from surgery.

His team included nationally recognized experts Kerstin Stenson, MD, professor of

surgery and director of the Department of Surgery’s Head and Neck Program; Ezra Cohen, MD, associate professor of medicine and UCCCC associate director for education; and Daniel Haraf, MD, MS, professor of radiation and cellular oncology and medical director of radiation oncology.

Vince underwent six weeks of induction chemotherapy, followed by 10 weeks of combined chemoradiation therapy in the hospital. Ana stayed by his side, encouraging him to eat even when painful sores developed in his mouth. Friends and neighbors pitched in by cooking meals for the family. Vince also drew strength from oral cancer survivors who related their experiences.

Then, the week before Christmas, a positron emission tomography scan showed suspicious activity in Vince’s lymph nodes. Ana recalled that Vince’s doctors “moved heaven and earth” to schedule a biopsy so that the family would not spend Christmas with Vince’s fate unknown. To their relief, the lymph nodes were inflamed due to a condition called sarcoidosis, which usually resolves on its own. Subsequent scans and tests have shown no sign of the cancer.



Kerstin Stenson, MD, professor of surgery and director of the University of Chicago Department of Surgery’s Head and Neck Program, checks in with Vince Draa (right), a patient who underwent chemoradiation for tongue cancer. Vince’s doctors, who are experts in head and neck cancers, were able to treat his cancer without surgery.

Ana remarked that everyone involved in Vince’s care came together as a team to help him pull through. “Coming to the UCCCC, I expected the technical expertise, but what I didn’t expect was how much everyone cared,” Vince said. “They went above and beyond.” For example, Dr. Cohen penned a letter of support for the Draas’ college-bound son.

“We believed that the UCCCC is where Vince’s chances of surviving this were

highest, and looking at him today, I know we made a good decision,” said Ana. Next, the couple plans to participate in the Oral Cancer Foundation’s Walk for Awareness—Northern Illinois in the fall.

As for now, Vince only returns to the UCCCC for follow-up visits. Looking back on his journey, he is amazed. “I didn’t think I would be this well off a year ago.”

**FOCUS ON:  
CORE FACILITIES**

## Biostatisticians Work with Cancer Researchers to Optimize Study Design

AT THE University of Chicago Medicine Comprehensive Cancer Center (UCCCC), investigators have access to a shared resource, the Biostatistics Core Facility, which provides advice on research design, data analysis, and statistical analysis.

“Biostatistics is a key part of the collaborative science involved in cancer research,” said Ronald Thisted, PhD, professor of health studies and scientific director of the Biostatistics Core Facility. “We help design state-of-the-art studies that extract the maximum amount of information possible.”

The types of studies that benefit from statistical support include investigator-initiated Phase I, II, and III clinical trials; observational and population-based studies; basic science research projects; animal experiments; and correlative/translational studies.

Designing any study requires careful planning. “The more we can understand what investigators need, the better we are able to help them carry out a successful investigation,” Dr. Thisted said. “It’s a back and forth discussion of asking ‘why’ and ‘how.’”

He added that studies are more successful when researchers involve the Biostatistics Core Facility in the early stages of formulating their study protocol or grant proposal. For example, when planning a Phase II clinical trial, which is intended to evaluate a treatment’s effectiveness, investigators need to ascertain and decide upon many factors, including how many patients to include, the study design (for example, single arm vs. randomized), and which endpoints to use. The Facility also helps researchers write protocols, which may be adopted by multiple physicians in affiliated hospitals who participate in the Phase II Oncology Trials Network.

The Facility plays an essential role in helping investigators to analyze research data, which is shared with the oncology community at national meetings and in scientific journals. The Facility’s Technical Director and Research Associate (Associate Professor) of Health Studies Theodore Karrison, PhD, said, “We believe in evidence-based medicine, so if a new therapy needs to be evaluated, we help



Directors and staff of the Biostatistics Core Facility

investigators design the studies and analyze the data to produce evidence about the treatment’s safety and efficacy.”

The Facility interacts closely with the UCCCC Cancer Clinical Trials Office to ensure the accuracy, timeliness, and quality of research data. The Facility also works with the newly developed Bioinformatics Core Facility to provide comprehensive design and analytical services to investigators working on experiments that generate large

sets of molecular data, e.g., microarray and high-throughput DNA sequencing data.

“Biostatistics is a very collaborative enterprise,” said Dr. Thisted. “Ultimately, the goal of statistics is to make the results clearer. We have a really great team of experts who can do this.”

## UCCRF Auxiliary Board Hosts Spring Luncheon

On May 31, the University of Chicago Cancer Research Foundation Auxiliary Board (UCCRFAB) held its annual luncheon at the Michigan Shores Club in Wilmette. The event featured lunch, raffle prizes, and presentations. Guest lecturer Susan Hong, MD, MPH, associate professor of medicine, spoke to the group about “Comprehensive Care in the Era of Personalized Medicine.” Members of the Auxiliary Board also visited the University of Chicago Medicine campus on June 6 to tour the facilities and present checks to the three UCCCC oncologists whose research they have supported. Jill de Jong, MD, PhD, assistant professor of pediatrics; Michael Spiotto, MD, PhD, assistant professor of radiation and cellular oncology; and Peter O’Donnell, MD, assistant professor of medicine, provided updates about their work in childhood blood cancers; head and neck cancers; and bladder, kidney, prostate, and testicular cancers, respectively.



(from left to right) UCCRFAB President Annette Hickman; Peter O’Donnell, MD, assistant professor of medicine; Michael Spiotto, MD, PhD, assistant professor of radiation and cellular oncology; Jill de Jong, MD, PhD, assistant professor of pediatrics; and UCCRF Executive Director Mary Ellen Connellan



Nancy Gupta, UCCRFAB member; Susan Hong, MD, MPH, associate professor of medicine, and Kathy McCarthy, UCCRFAB member



Debbie Madlener and Laurie Baker Foster, UCCRFAB members



# UCCRF Auxiliary Board Invests in Innovation by Raising Critical Start-up Funds

*The University of Chicago Cancer Research Foundation Auxiliary Board (UCCRFAB) call themselves “investors in innovation” and have been working to raise funds for the University of Chicago Cancer Research Foundation for over 60 years.*

**F**OUNDED IN 1951 by North Shore resident Stephanie Howell, the Board was incorporated as an official auxiliary of the UCCRF in 1959. With scores of members at the active, honorary and sustaining level, this group – whose membership comes from the North Shore and surrounding areas – has continued to grow in the past year.

The Board’s mission is to provide funds to enable research programs at the UCCCC that work toward the prevention, early detection, and treatment of cancer. Every three years, they choose three promising researchers to support. For the past 2 years, the Board has funded the work of Jill de Jong, MD, PhD, assistant professor of pediatrics, Peter O’Donnell, MD, assistant professor of medicine, and Michael Spiotto, MD, PhD, instructor of radiation and cellular oncology. Dr. de Jong treats children with cancer and blood diseases, Dr. O’Donnell specializes in genitourinary malignancies, and Dr. Spiotto focuses his work on head and neck cancers.

“One hundred percent of the funds we raise goes to these researchers,” said Annette Hickman, who has served as the Board’s president for the past 2 years. “Without philanthropic support, cancer researchers would not get the start-up funds they need to apply for larger government funding.”

To raise funds, the Board organizes several events throughout the year. Its largest event is an annual benefit that features dinner, dancing, and a live and silent auction. This year, the Board raised \$160,000, the highest amount raised in the event’s history. The “Light the Way to a Cure”

gala was held in February at the Michigan Shores Club in Wilmette and was attended by more than 200 people.

The Board also generated approximately \$48,000 through their “Leap of Faith” campaign, in which they wrote letters to potential donors to emphasize the importance of an extra day for UCCCC researchers to positively impact the lives of patients with cancer.

Smaller events are frequently held to draw awareness to the UCCRF’s cause and to attract new membership for the Auxiliary Board. Hickman said much of their success is propelled by the enthusiasm of new members.

“We have some really dedicated, strong-willed women who are passionate about our mission to support cancer research,” said Hickman, who lost both parents to cancer. Her own involvement began 12 years ago when she moved to Wilmette and met a Board member at a cocktail party.

“The strength of our members, both new and existing, will allow us to continue to help current and future physicians,” she said. “I’m thrilled with where we are today, and it has been an honor to work with this amazing group of women.”



UCCRFAB President Annette Hickman  
Photo: Sheridan Road Magazine

## SAVE THE DATES!

The University of Chicago Cancer Research Foundation (UCCRF) presents a list of upcoming fundraising events:

### WOMEN’S BOARD

#### Chicago Hunter Derby

Sunday, September 8, 2013  
Annali Farm, Antioch

### UCCCC AND UCCRF

#### Shubitz Prize Recognition Dinner

Monday, October 7, 2013  
The University of Chicago Gleacher Center

### WOMEN’S BOARD

#### Grand Auction

Saturday, November 9, 2013  
Four Seasons Hotel

For more information, please contact [kcoady@bsd.uchicago.edu](mailto:kcoady@bsd.uchicago.edu).

## Pathways to DISCOVERY

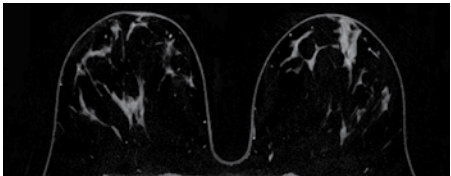
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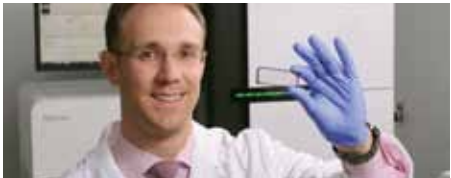
**1** The latest statistics show national cancer death rates are dropping.



**2** Imaging experts develop a tool that may help assess breast cancer risk.



**3** The UCCCC leads the nation in pharmacogenomics, the study of how genetics influence drug response.



**4** Scientists classify head and neck cancers into five subgroups that may help personalize care.



**4** Discovery of the estrogen receptor paved the way for modern breast cancer treatment.



**7** Nationally renowned UCCCC experts help a man overcome oral cancer without surgery.

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