At the University of Chicago Cancer Research Center, our mission is to understand, cure and prevent each of the scores of diseases we collectively call cancer. We pursue this goal by promoting collaboration among a diverse and dedicated team of outstanding laboratory scientists, caregivers, clinical researchers, and trainees. These partnerships help us develop solutions tailored to the complexity of individual cancers and the unique needs of each patient. Our faculty and staff are dedicated to mentoring and inspiring the investigators of tomorrow while providing superior care to the people of today.

### 2008 - 2009 Annual Report

**RISING TO THE CHALLENGE**

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A Message from the UCCRC Director</td>
</tr>
<tr>
<td>2</td>
<td>Rising to the Challenge</td>
</tr>
<tr>
<td>5</td>
<td>Commitment to our Communities</td>
</tr>
<tr>
<td>9</td>
<td>Early Detection</td>
</tr>
<tr>
<td>9</td>
<td>Hormone Therapy and Cancer Risk</td>
</tr>
<tr>
<td>10</td>
<td>Improved Kidney Cancer Detection</td>
</tr>
<tr>
<td>10</td>
<td>Determining When to Treat Men with Low-Risk Prostate Cancer</td>
</tr>
<tr>
<td>11</td>
<td>Determining Susceptibility to Acute Myeloid Leukemia</td>
</tr>
<tr>
<td>12</td>
<td>Diagnosis and Treatment</td>
</tr>
<tr>
<td>14</td>
<td>Developing a New Treatment Strategy for Leukemia</td>
</tr>
<tr>
<td>15</td>
<td>Using the Immune System to Fight Cancer</td>
</tr>
<tr>
<td>16</td>
<td>The Chicago Center for Systems Biology</td>
</tr>
<tr>
<td>17</td>
<td>Treatment: A Personalized Approach to Cancer Care</td>
</tr>
<tr>
<td>18</td>
<td>Using Nanotechnology to Target Brain Tumors</td>
</tr>
<tr>
<td>18</td>
<td>Neuroblastoma: A Global Evaluation System</td>
</tr>
<tr>
<td>19</td>
<td>Using Radiation to Improve Treatment of Metastatic Disease</td>
</tr>
<tr>
<td>19</td>
<td>Advanced Imaging Technique Combats Tumor Resistance</td>
</tr>
<tr>
<td>20</td>
<td>Understanding How Genetic Variation Influences the Response to Cancer Therapy</td>
</tr>
<tr>
<td>21</td>
<td>Survivorship</td>
</tr>
<tr>
<td>21</td>
<td>Therapy-Related Leukemia</td>
</tr>
<tr>
<td>23</td>
<td>A Community of Seekers</td>
</tr>
<tr>
<td>24</td>
<td>Annual Report of the Cancer Committee</td>
</tr>
<tr>
<td>25</td>
<td>Pancreatic Cancer</td>
</tr>
<tr>
<td>28</td>
<td>Facing Breast Cancer with Attitude and Compassion</td>
</tr>
<tr>
<td>30</td>
<td>The Honor Roll of Donors for Fiscal Year 2008-2009</td>
</tr>
<tr>
<td>37</td>
<td>A Message from the President and the Executive Director of the University of Chicago Cancer Research Foundation</td>
</tr>
<tr>
<td>38</td>
<td>University of Chicago Cancer Research Foundation Boards and Auxiliaries</td>
</tr>
<tr>
<td>40</td>
<td>2008-2009 Financial Report</td>
</tr>
</tbody>
</table>
In last year’s annual report, I expressed my optimism regarding the prospects of the University of Chicago Cancer Research Center (UCCRC) in the 2009 fiscal year, despite the wrenching economic times. I am pleased to say that the actions of UCCRC members, staff, and our many friends and supporters validated my confidence. This has been an exciting year highlighted by the opening of the new Gwen and Jules Knapp Center for Biomedical Discovery (KCBD). As discussed in the opening of this report, the KCBD is a physical manifestation of the growth of the UCCRC, the commitment of our supporters, and the excellence and creativity of our members.

The University of Chicago’s intense focus on enhancing cancer care is evident in the construction of the New Hospital Pavilion (NHP), the largest single health care investment in the history of Chicago’s Southside. Designed to stimulate progress in complex medical care, this innovative facility will strengthen our ability to deliver superior cancer treatment based on the collaboration of our world-renown clinicians, physician scientists, and laboratory researchers.

We see the extraordinary achievements of our members reflected in the numerous grants and awards they received in the past year, as they prevailed on national and international stages. I only have space to mention a few. President Barack Obama awarded the Medal of Freedom, the nation’s highest civilian honor, to Janet Davison Rowley, MD, the Blum-Riese Distinguished Service Professor of Medicine. The Association of American Cancer Institutes (AACI) honored her with its 2009 Distinguished Scientist Award, and the Peter and Patricia Gruber Foundation also presented its 2009 Genetics Prize to Dr. Rowley. The International Society for the Biologic Therapy of Cancer (iSBTC) elected Thomas Gajewski, MD, PhD, its new President, while another noted pathologist, Vinay Kumar, MBBS, MD, FRCPath, received the American Society for Investigative Pathology’s Robbins Distinguished Educator Award for 2009. Dr. Gajewski is a Professor of Pathology, and Leader of the UCCRC Cancer and Immunology Program; Dr. Kumar is Chairman of the Department of Pathology, and Executive Vice Dean of the Biological Sciences Division (BSD). The American Society of Clinical Oncology (ASCO) presented its American Cancer Society Award & Lecture to Olufunmilayo Olopade, MBBS, the Walter L. Palmer Distinguished Service Professor. The National Center for Complementary and Alternative Medicine (NCCAM) awarded $6 million over five years to Chun-Su Yuan, MD, PhD, and his colleagues, to create the Center for Herbal Research on Colorectal Cancer (CHRCC). Dr. Yuan is the Cyrus Tang Professor of Anesthesia and Critical Care. Approximately 100 Medical Center researchers shared $60 million of the $71.5 million awarded to the University of Chicago through the American Recovery and Reinvestment Act of 2009. Three of our members—Richard L. Schilsky, MD, Professor of Medicine, Kevin White, PhD, the James and Karen Frank Family Professor, and Kathleen Millen, PhD, Assistant Professor of Human Genetics, each received grants totaling $800,000 or more. Dr. White and his colleagues also received a grant of $1.8 million to create an encyclopedia of DNA elements, and the University of Chicago was awarded $15 million over five years to support the Chicago Center for Systems Biology, of which Dr. White is the Director.

I also want to congratulate Everett E. Vokes, MD, and Richard L. Schilsky, MD, on their recent appointments. The University of Chicago’s President Robert J. Zimmer, PhD, named Dr. Vokes, the John E. Ultmann Professor, as the interim Dean and CEO of the University of Chicago Medical Center. Dr. Schilsky is the new Chief of the Section of Hematology/Oncology. Both of these men are remarkable administrators and extraordinary scientists and clinicians. Incidentally, both served as Director or Interim Director of the UCCRC.

This is a lengthy list, but it includes only a few of the stars in the galaxy of honors, research breakthroughs, and career advancements achieved by our members this year, and they are only a portion of the many achievements that have made the 2009 fiscal year one of the UCCRC’s greatest. I wish I had the space to delineate all of the major contributions made by our members, our staff, our foundation, and our donors to the UCCRC’s recent successes. Only with their help could we succeed in rising to the challenges of a difficult time.

With heartfelt gratitude,

Michelle M. Le Beau, PhD
Professor of Medicine
Director, University of Chicago Cancer Research Center
In these times of financial crisis, conventional wisdom tells us to play it safe and curb our ambitions; however, a crisis can be a time of decision, definition, and driving forward. At the University of Chicago Cancer Research Center (UCCRC), the economic downturn has not dampened the spirits of our members, lowered their aspirations, or slowed the pace of their research. In the face of economic uncertainty, they have conserved resources, reviewed and reestablished priorities, and responded vigorously to today’s challenges. At the same time, the members of the University of Chicago Cancer Research Foundation (UCCRF) have brought a renewed commitment to their efforts and found innovative ways to support cancer research at the UCCRC. The members and friends of the UCCRC have come together, and are “Rising to the Challenge.” In fact, the past year has in many ways been one of new opportunities.

In this annual report, you will read about progress on all fronts in the battle against cancer. You will see how our members are introducing new technologies and fresh approaches to their work. You will discover how the University of Chicago continues to provide substantial resources to support cancer research and treatment. You will also learn how our members competed successfully for many prestigious grants, enabling the UCCRC to broaden the scope of its research and leverage the latest concepts in the biological and physical sciences.

The University’s intense focus on cancer research and treatment has not wavered. Central to its emphasis on complex care, the Medical Center continues to increase and enhance its resources to wage the war on cancer. This commitment is most evident at the intersection of South Drexel Avenue and East 57th Street in Chicago, where, since 2002, the din of cement trucks, bulldozers, and jackhammers has disturbed the peace. Seven years of effort has produced two new research buildings, and launched the construction of a new hospital facility. When the third facility is completed, the three buildings will encompass the continuum of translational research.

“Seven years of effort has produced two new research buildings, and launched the construction of a new hospital facility.”
First, on the southeast corner is the Ellen and Melvin Gordon Center for Integrative Science (GCIS). The GCIS is home to the Ben May Department for Cancer Research. Opened in 2005, the GCIS swiftly became a powerful center for laboratory research. According to Marsha Rosner, PhD, the Charles B. Huggins Professor, and Chair of the Ben May, many of the researchers here, “focus on fundamental scientific research into the mechanism of cancer progression that continues to lead to outstanding discoveries year after year. Our vision is a future where cancer is either eliminated by a total cure or managed by chronic treatment that enables a high quality of life.”

A pedestrian bridge crossing East 57th Street connects the GCIS with the new Gwen and Jules Knapp Center for Biomedical Discovery (KCBD), which opened in June. The ten-story structure is one of the tallest on campus, rising above neighboring buildings. With an emphasis on clinical research, the KCBD represents the second step in the journey from “bench to bedside.” Key elements of the KCBD’s design reflects its role as a state-of-the-art facility that fosters collaborative, multi-disciplinary research. Much of the research performed in this building relates to cancer. In fact, over 50 percent of the investigators in the new building are UCCRC members.
The KCBD is the new home of the UCCRC and the University of Chicago Cancer Research Foundation Women’s Board Laboratory. Another key tenant is the Ludwig Center for Metastasis Research at the University of Chicago. Led by Co-Directors Geoffrey Greene, PhD, the Virginia and D.K. Ludwig Professor in the Ben May Department for Cancer Research, and Ralph Weichselbaum, MD, the Daniel K. Ludwig Professor and Chair of the Department of Radiation and Cellular Oncology, the Ludwig Center brings together researchers from various areas of expertise, including molecular and cell biology, bioinformatics, chemistry, genetics, imaging and medicine, to dissect the basic mechanisms of metastasis using sophisticated, state-of-the-art approaches. The Center’s researchers are working diligently to expand our understanding of the mechanisms that cause and control cancer’s deadly spread, and to translate concepts developed in the lab into novel therapeutics for treating and preventing metastasis.

The KCBD and GCIS are centers of collaborative research. The pedestrian bridge connecting the two facilities facilitates the sharing of ideas and insights in the search for new approaches to cancer prevention, detection, treatment, and follow-up care. The work accomplished will ultimately benefit the patients, who will occupy the New Hospital Pavilion (NHP), currently under construction.

This emerging structure, directly west of the GCIS, will be devoted to complex care. This facility will provide a home for the Medical Center’s most distinguished clinical programs, including cancer, providing cancer patients with therapies developed on the leading edge of innovation. Designed to accelerate medical progress, the NHP will help clinicians leverage the close collaboration between the University’s world-class physicians and researchers for the benefit of patients. The NHP will contain 240 private inpatient and intensive care beds, 24 state-of-the-art operating rooms, 12 rooms for gastrointestinal and pulmonary procedures, 7 interventional radiology suites, and advanced diagnostic tools, including high-resolution, high-speed magnetic resonance imaging (MRI) and computerized tomography (CT) scanners. On June 5, 2008, the University’s Board of Trustees gave final approval for the building, which will open in 2013.
These enormous investments signify the University’s commitment to Southside Chicago, and promote the economic well-being of the communities surrounding our facilities. The NHP, after all, is the largest single health care investment in the history of the Southside. However, our obligations to our communities do not end at campus boundaries. An office or state-of-the-art lab in the KCBD’s 10th story is in many ways a world away from the streets of a local neighborhood, a quarter mile from the building. Bridging that gap is essential if the UCCRC is to meet its responsibilities to the community, and truly make a difference on the Southside.

The core of these efforts is the Community Engagement Centering on Solutions (CECOS) program, which enhances public awareness of cancer and the increased threat the disease poses to ethnic and racial communities. A program of the UCCRC, CECOS offers an array of services to enhance public awareness of cancer disparities, prevention, detection, control, treatment and genetics. According to Rick Kittles, PhD, Associate Professor of Medicine, and UCCRC Associate Director for Diversity and Community Outreach, one purpose of the program is “to provide for sustained engagement with Chicago’s Southside community to increase local awareness of the latest advances in cancer research, to communicate the benefits of participation in cancer clinical trials and other UCCRC research studies, and to provide information about important cancer-related issues and treatment options.”

The measure of CECOS’s success is its many positive relationships that nurture dialogue between UCCRC researchers and neighborhood leaders and residents. One platform for this dialogue has been an ongoing series of public forums exploring the questions and concerns that are most relevant to the community. Southside residents have embraced this concept, and they have been successful, drawing as many as 550 people to a session. According to Michelle Le Beau, PhD, Professor of Medicine, and UCCRC Director, “People come prepared to learn, interact, and communicate, giving the forums an extraordinary vitality and openness.”
In the past year, CECOS sponsored three forums, including the First Annual Nutrition Knowledge Bowl on December 13, 2008. This Forum used a game-show format to encourage students to learn about the importance of a healthy diet to help prevent cancer and other diseases. The Nutrition Bowl attracted hundreds of cheering, poster-waving high school students, parents, and other supporters to the DuSable Museum of African American History auditorium where six Chicago high schools competed for a first-place trophy, and demonstrated their expertise about nutrition. The Nutrition Bowl is part of an ongoing relationship with Chicago Public Schools and many private high schools.

Good nutrition is vital to good health and an excellent way to fight cancer. A balanced diet can reduce the risk of cancer by as much as 30 to 40 percent. Promoting healthy eating has proven to be a challenge in many parts of Chicago, in part because of the absence of markets selling fresh produce. The abundance of cheap, fast-food outlets, and the high-cost of healthy food is a deterrent for many people. The CECOS team strives to find unique ways to encourage residents to recognize the benefits of making healthy choices. One such activity is the group’s participation in Chicago’s Bronzeville Market. Every Sunday during the summers of 2008 and 2009, CECOS members and high-school students staffed a tent at the market to discuss cancer and nutrition, and to distribute informational material.
CECOS has also developed close links with the City Colleges of Chicago. On Saturday, March 7th, CECOS held a town hall meeting at Kennedy-King College, where residents participated in a lively sharing of ideas and valuable information on cervical cancer and HPV. A collaborative effort with the Kennedy-King College Nursing Program and Biology Department, the town hall included a discussion of a new vaccine that is effective in preventing cervical cancer. The vaccine is effective for the types of viruses that cause 70 percent of cervical cancers and 90 percent of genital warts. Many people in the community have concerns about the vaccine, and the meeting provided a forum for a thoughtful exchange of ideas regarding these issues.

Community involvement is essential to our efforts to address the unequal burden of cancer in our nation. Specific cancers often have greater impact on specific population groups, striking one ethnic group more severely or more often than another. Reducing these health disparities is an excellent way to reduce cancer’s harm to our nation. Researching the biology behind these disparities also provides an avenue into understanding the basic dynamics of cancer to the benefit of the general population.

Many mothers and daughters attended the Forum and listened intently to the speakers.
Andrea King, PhD, Associate Professor of Psychiatry, Director, Substance Abuse Clinic, and Lisa Sanchéz-Johnsen, PhD, Assistant Professor of Psychiatry and Medicine, Director, Multicultural Health Research and Latino Health Research, believe that there is an urgent need for treatments and prevention strategies to overcome the ethnic and cultural barriers that place a heavier burden on underserved minority patients. Their work on a community-based, culturally-tailored smoking cessation program for African Americans living in the Southside has provided initial clues on the utility of culturally-sensitive approaches to increase treatment retention and quit rates. Dr. Sanchéz-Johnsen is also working to reduce cancer risk factors among Latinos. She is developing interventions for overweight Latino women that encourage healthy diets and physical activity, address harmful body image issues, and deter smoking. She also is investigating cultural variables underlying obesity in Puerto Rican and Mexican women.

Blaise Polite, MD, Assistant Professor of Medicine, and his colleagues, have published a study that suggests a plausible link between the genetic, cultural, and bio-behavioral traits of women and their susceptibility to some cancers. They found that African-American women with metastatic breast cancer have a lower survival rate than Caucasian women, even when both groups receive the identical treatment regimen.

A study published recently by Monica Peek, MD, MPH, Assistant Professor of Medicine, and her colleagues found that training physicians and health workers in cultural sensitivity and communication with economically-disadvantaged African-American patients could increase the participation of these patients in breast cancer screening. Dr. Peek discovered that many African-American women believe that health professionals do not treat them respectfully. They also feel that health professionals do not adequately explain the importance of potentially life-saving mammograms. Many of the participants in the study said they had heard rumors about women who had bad experiences with mammograms and received unnecessary or incorrect treatments, including unneeded mastectomies. These impressions discourage women from obtaining adequate care and regular mammograms, increasing the burden of cancer in that population.
The promise of early detection is the identification of cancer in its most curable state, which improves overall survival rates. The chances of surviving cancer are proven to increase significantly when the disease is confined to the site of origin. According to the National Institutes of Health (NIH), the 5-year survival rates for breast and prostate cancer patients with localized, early stage disease are greater than 95 percent. Similarly, early diagnosis and treatment of colorectal cancer leads to a 5-year survival rate of approximately 90 percent. Early cancer detection is also likely to result in less aggressive therapy, faster recovery rates, and decreased costs associated with treatment. The focus of the UCCRC’s early detection research is on increasing the quality of cancer screening tests, particularly in developing more effective tests that are less invasive and focused on cancers that require immediate treatment.

Hormone Therapy and Cancer Risk

In 2002, many women halted their use of hormone replacement therapy in response to findings of the Women’s Health Initiative trial, which demonstrated that hormone supplements increased coronary heart disease and breast cancer risk. Afterwards, the incidence of invasive breast cancer among women in the United States, over the age of 50, declined during 2002 and 2003. UCCRC researchers, however, found that the decrease in breast cancer incidence was not observed among women of African American ancestry in the same age group.

Researchers at the UCCRC, including Dezheng Huo, PhD, Assistant Professor of Epidemiology, and Olufunmilayo Olopade, MBBS, the Walter L. Palmer Distinguished Service Professor, investigated why this trend was not equal across racial groups. Although African Americans showed a similar decrease in the use of hormone therapy, no benefit was observed. The researchers suspected that the observed racial disparity resulted from differences in biology. For example, nearly 80 percent of breast cancers in Caucasian women are estrogen receptor positive, a type of tumor that relies on estrogen for growth, compared to approximately 60 percent and 30 percent among African Americans and Nigerian women, respectively.

In the UCCRC study, researchers examined the incidence of both invasive and in situ (early lesions that have not spread to surrounding tissues) breast cancer in women aged 50 to 69. Data from several large cancer registries, covering approximately one quarter of adult women in the United States, were analyzed. The team concluded that the incidence rate of invasive breast cancer among Caucasian women declined after April of 2002, when many women stopped taking replacement hormones. Although African American women had fewer invasive cancers, the incidence rate did not decline. For early, non-invasive breast cancers, the rates remained steady for all ethnic groups, except for Asian women, whose rates likely increased due to the growing use of screening mammograms in this population. These results suggest that estrogen promotes the growth of invasive breast cancer, and that genetic variations could contribute to how African American women respond differently to hormonal therapy.
Improved Kidney Cancer Detection

A team of University of Chicago researchers led by Kevin White, PhD, James and Karen Frank Family Professor of Human Genetics, has discovered a diagnostic biomarker for human renal cell carcinoma, the most common type of kidney cancer. This biomarker, known as SPOP, is produced by 99 percent of clear cell carcinomas, but not by normal kidney tissue. Physicians could potentially use SPOP levels to confirm or rule out a diagnosis of renal cell carcinoma (RCC). SPOP levels could also help physicians identify the primary tumor in metastatic cancers, which is important for developing an appropriate treatment plan for patients.

Dr. White, also the Director of the Institute for Genomics and Systems Biology at the University of Chicago, and his colleagues study the regulation of entire networks of genes to identify factors that influence the development of human disease. The study was initiated to investigate how two key genes, known as Eve and Ftz, control the early development of flies, beginning shortly after the eggs are laid. Together, these two genes directly regulate the activity of 235 additional genes, of which 150 have human gene equivalents. UCCRC researchers identified the CG9924 gene, also known as Roadkill, as the central player in the development of the nervous system. The human equivalent, SPOP, is approximately 80 percent identical to Roadkill.

The team investigated SPOP more closely and discovered that SPOP plays an important role not only in development, but also in human cancers. By conducting an initial screening of different tumor samples, they found that 85 percent of RCCs produced high amounts of SPOP, whereas normal kidney samples showed no traces of the protein. To confirm this finding, the team examined 300 RCC samples and found that 77 percent tested positive for SPOP, whereas all normal kidney samples were negative. Furthermore, they found that 99 percent of clear cell RCC, which accounts for 75 percent of all RCCs, showed elevated SPOP levels. The SPOP test even revealed that several of the tumors had originally been misdiagnosed as clear cell RCC. When examined more closely, these tumors were reclassified as other types of kidney cancer.

These findings indicate that SPOP could potentially be used as a diagnostic biomarker for clear cell RCC. The use of SPOP as a diagnostic tool may help physicians detect kidney cancer earlier and lead researchers to the development of new drug targets to improve existing therapy.

Determining When to Treat Men with Low-Risk Prostate Cancer

Newly-diagnosed patients with low-risk prostate cancer face a challenging question - whether to undergo immediate treatment, or wait. Treatment, which consists of radiation therapy and/or surgery, is effective but can be associated with serious long-term side effects, including incontinence and erectile dysfunction. Physicians have found that close observation in select patients may maintain quality of life without increasing the chances of the cancer spreading, and that treatment may not necessarily provide added benefit. To date, there are no widely-accepted recommendations as to which patients are appropriate for active surveillance. Scott Eggener, MD, Assistant Professor of Surgery/Urology, and colleagues conducted a multi-center study.
of prostate cancer and found that information obtained from a restaging biopsy is the best method for identifying patients who are ideal candidates for active surveillance.

The study, conducted between 1991 and 2007, involved 262 men diagnosed with prostate cancer from four hospitals in the U.S. and Canada. Patients underwent a restaging biopsy, following their initial diagnostic biopsy, and received no treatment for 6 months following the repeat biopsy. Of the initial participants electing surveillance of their cancer, 43 patients eventually chose treatment or had evidence of disease progression prompting treatment. Following their delayed treatment (radiation or surgery), all but 1 of the patients were cured of their cancer. The remaining 219 patients remained on active surveillance without any evidence of metastasis.

These results demonstrate that patients who are unlikely to be affected by their cancer can be identified and encouraged to actively monitor their condition, saving them the complications of side effects and the cost of unnecessary treatments. This approach encourages patients to be proactive when it comes to monitoring their health – an important initiative when it comes to living with cancer.
Groundbreaking research in cancer diagnosis and treatment is the cornerstone of the UCCRC. Our cancer specialists are committed to solving the mysteries of this disease and are behind some of the most important advances in cancer therapy of our time.

The University of Chicago is widely considered to be the birthplace of chemotherapy. In 1943, Leon Jacobson, MD, used a chemical agent, known as nitrogen mustard, to treat patients with leukemia and lymphoma. This was the first successful cancer treatment using chemotherapy. Dr. Jacobson later discovered the basis of bone marrow transplantation.

In 1966, Charles Huggins, MD, received the Nobel Prize for Physiology and Medicine for his fundamental work in hormonal therapy for prostate cancer. His research offered scientists a new perspective on the behavior of all hormone-responsive cancers, including breast cancer. Dr. Huggins later demonstrated that cancer cells do not emerge spontaneously, but require the stimulus of chemical signals to grow and multiply. He proved that suppression of the signaling process could stop widespread metastasis.
Years later, Janet Rowley, MD, the Blum-Riese Distinguished Service Professor, made several breakthroughs vital to understanding the relationship between genetics and cancer. In 1973, Dr. Rowley identified a chromosomal translocation in patients diagnosed with chronic myelogenous leukemia (CML). Translocations occur when pieces of chromosomes break and are attached to other chromosomes. Her influential discovery, which showed that specific forms of leukemia are genetic diseases, initiated a proliferation of discoveries that led to the discovery of over 70 translocations across different cancers by the early 1990s. Her work has led to the development of more accurate diagnostic techniques and more effective cancer treatments, including Imatinib, the most successful targeted cancer therapies to date. Dr. Rowley is one of our most distinguished scientists, having received the Medal of Freedom, the nation’s highest civilian honor, from President Barack Obama in recognition of her work.

UCCRC members continue to pursue new avenues of research that are leading to innovative discoveries and transforming our understanding of cancer. With a pioneering spirit that spans several decades, we are building on the discoveries of the past and translating our research breakthroughs into advanced diagnoses and cancer therapies to improve patient care.
Developing a New Treatment Strategy for Leukemia

Dorothy Sipkins, MD, PhD, Assistant Professor of Medicine, studies the molecular characteristics of tissue microenvironments, or “niches,” within the bone marrow where normal, healthy bone marrow cells divide and mature. From these niches, stem cells produce several different types of blood cells involved in transporting oxygen from the lungs to the rest of the body, fighting infection, and controlling blood clotting. In patients with leukemia, however, these stem cells lose their ability to function normally because they are crowded out by the rapid proliferation of diseased cells that have taken over certain bone marrow niches.

Dr. Sipkins and her colleagues have shown that the process is far more complicated than simply overcrowding. Using sophisticated microscopy tools, the team developed systems to monitor the movement of leukemia cells and hematopoietic progenitor cells (HPCs), a group of cells that form various types of blood cells. They found that leukemia cells, upon settling into a niche, take over the specialized environment that HPCs require to function normally. Within a few days, the leukemia cells release a chemical signal, called stem cell factor, which attracts normal stem and progenitor cells from tumor free niches to malignant sites. Additional signals released by the leukemic cells interfere with the production of healthy new blood cells.

Dr. Sipkins’ team was able to successfully blunt this effect by blocking the release of stem cell factor from tumor cells. This led to an increase in the number of HPCs and their ability to migrate out of the diseased bone marrow niches. “By preserving the activity of HPCs and potentially boosting the immune system [HPC’s are a source of mature immune cells], the body’s own weapon against leukemia, we support the patient and take away one of the disease’s weapons,” Dr. Sipkins remarks. The success of this approach could also make transplantation an option for more patients, by enabling physicians to collect stem cells from the peripheral blood to restore damaged bone marrow resulting from chemotherapy. The researchers are using these results to develop treatment strategies that protect healthy blood-forming stem cells and improve the outcomes of bone marrow transplantation for leukemia and other types of cancer.
Using the Immune System to Fight Cancer

Solid tumors develop elaborate mechanisms to evade recognition and destruction by our immune system. Many tumors will often discard tumor antigens, found on the cell surface, which act as signals to alert the immune system that these cells are harmful. Without these antigens, white blood cells fail to recognize and kill infected or cancerous cells. As a result, these tumors can grow rapidly and often resist treatment. Tumor antigens can also be present on the stroma, which is the layer of non-malignant cells that surrounds and supports the growth of tumors. Stromal cells are genetically stable and retain the molecules that present tumor antigens, making them an ideal target for immunotherapy. However, although the stroma is considered the ‘root of the tumor’, current therapies that target the stroma are often transient and not cancer-specific.

Hans Schreiber, MD, PhD, Professor of Pathology, along with his colleagues, has uncovered a new approach to treating therapy-resistant cancers by targeting tumor-specific proteins found in the stroma. Dr. Schreiber’s team hypothesized that mutant proteins are released from the tumor into its surroundings and picked up by the stroma, and that these proteins could be used for targeted cancer therapy. The researchers injected T cells into mice with large, established tumors. These T cells were specifically engineered to recognize the tumor antigen. Although they had no direct impact on the cancerous cells, they successfully killed stromal cells, which subsequently reduced the size of the tumor and halted tumor growth for over 80 days. According to Dr. Schreiber, “Such growth arrest in patients would be an admirable achievement for many cancers, and could be used as an adjuvant to other therapies.” The team plans to test this approach for the treatment of melanoma, breast, and colon cancer in mice. They are also studying the effects on human cancers, and early results suggest that this approach may be useful in the clinic.
The Chicago Center for Systems Biology

The University of Chicago was awarded more than $15 million over 5 years from the National Institute of General Medical Sciences (NIGMS) to support the development of The Chicago Center for Systems Biology (CCSB). One of 10 National Centers for Systems Biology, and the only such center in Illinois, the CCSB represents a collaboration between investigators from Chicago-area universities. The Center, through additional support from The Searle Funds at the Chicago Community Trust and the Chicago Biomedical Consortium (CBC), combines experimental and computational tools to study the dynamic behavior of gene networks in cells, tissues, and organisms.

Systems biology is an emerging field that focuses on connections that are found between multiple levels of biological organization, from networks of molecules to whole organisms. By examining and integrating these data in an environmental and evolutionary context, systems biology can potentially explain how biological systems behave as a whole. Studies in this field will help scientists decipher how tissues respond to natural and artificial stimuli and, ultimately, improve our understanding of human disease. Unlike the past 50 years, where traditional biomedical research has focused on isolated genes and proteins, scientists are studying how multiple genes or proteins work together as networks to regulate basic biological processes. The rapid accumulation of data becoming available to researchers, such as the genomes of multiple organisms, makes these studies possible.

The CCSB has brought together more than a dozen experts in genomics, developmental biology, evolutionary biology, stress and physiology, chemistry and physics, with several computational specialists who focus on modeling networks. Investigators are using increasingly complex models, including bacteria, worms, fruit flies, and mice, to study networks that control development, response to environmental stress, and the differentiation of stem cells into specialized cells. The University of Chicago team is led by Kevin White, PhD, James and Karen Frank Family Professor of Human Genetics, Director of the Institute for Genomics & Systems Biology (IGSB), a collaboration between the University of Chicago and Argonne National Laboratory for studying gene networks.
Although several targeted therapies are available for the treatment of a variety of cancers, medical practitioners face the challenge of matching the right therapy with the right patient. Researchers at the UCCRC are continuously striving to develop novel methods to effectively guide treatment choices for people with cancer. Each patient diagnosed with cancer is different – biologically, genetically, and socially – and a uniform approach to treatment is simply not optimal.

Two patients diagnosed with the same cancer may differ significantly in their prognosis and response to certain therapies, factors that could drastically alter the outcome of their treatments.

The focus of the UCCRC has shifted towards personalized medicine. We are entering an era of targeted therapies where treatments are becoming more specialized, more effective, less toxic and specifically targeted against the tumor. Treatments are also being increasingly tailored to the genetic profile of each patient, which enables researchers to assess whether individuals will benefit from a specific treatment option. Richard Schilsky, MD, Professor of Medicine, Chief of the Section of Hematology/Oncology, made personalized medicine the theme of his term as President of the American Society of Clinical Oncology (ASCO). “Patients want to know that we’ve used all of our resources to analyze their cancer. It’s what clinicians want as well—to give patients treatments that are targeted to their particular disease.”

UCCRC members recognize the broad impact of cancer, and consider their first priority to be treating the patient, not the disease. The experience of each individual living with a diagnosis is unique and, therefore, considering all aspects of the disease is a crucial step in effectively devising a personalized treatment plan for each patient. Personalized medicine can guide the selection of drugs or treatments that ensure a more successful treatment outcome. By identifying individuals who have a predisposition to certain cancers, it can enable physicians to monitor patients at risk. It can indicate a predisposition to certain cancers before they manifest, allowing physicians to set forth a plan to monitor and prevent.

The UCCRC program is committed to bringing these advances to clinical practice. Our researchers find opportunities to enhance existing cancer therapies and discover new treatments and technologies to improve patient outcomes. In 2009, UCCRC members are working on a number of initiatives revolutionizing personalized cancer care.
Using Nanotechnology to Target Brain Tumors

Nanotechnology may prove to be a valuable asset in developing targeted therapies that harm only cancer cells and leave normal cells untouched. Scientists from the University of Chicago’s Brain Tumor Center and Argonne National Laboratory are testing a new nano-biology approach using inorganic titanium dioxide nanoparticles bonded to soft biological material. They pair the photo-reactive nanomaterial with an antibody that can recognize and bind specifically to cancer cells. When light is focused on the affected region, the titanium dioxide reacts and creates free oxygen radicals that interact with the mitochondria in the cancer cell, signaling the cancer cells to launch apoptosis (cell suicide). According to Maciej Lesniak, MD, Director of Neurosurgical Oncology and Director of the Brain Tumor Center, the process addresses a challenge in nanomedicine. Since nanoparticles are minuscule, they can travel anywhere in the body. Bonding the nanoparticles to the antibody enables the targeting of specific cell surface receptors.

Neuroblastoma: A Global Evaluation System

Neuroblastoma is the most common solid cancer that occurs outside the cranium during childhood. For some young children, it disappears with minimal treatment. In other children, the cancer can be relentlessly aggressive, with a high likelihood of death. Classifying the behavior of this tumor is crucial to planning appropriate treatment. Researchers in the University of Chicago’s International Neuroblastoma Risk Group (INRG) have developed a classification system to establish a consistent approach for categorizing a patient’s pretreatment risk. This classification system helps to ensure that patients with low- or intermediate-risk cancers will be spared intensive treatment regimens given to patients with more aggressive cancers. The INRG task force is co-chaired by Susan Cohn, MD, Professor of Pediatrics, Director of Clinical Research at the University of Chicago Comer Children’s Hospital. The criteria included in the INRG classification system were based on an analysis of 8,800 children under age 21 who were diagnosed with neuroblastoma between 1990 and 2002. They were primarily from North America, Australia, Europe, and Japan. Among the seven predictors of how neuroblastoma will progress are stage of the cancer, histology, patient’s age, and genetic factors. By taking a global approach to the diagnosis and treatment of this cancer, UCCRC researchers are launching a unified system of clinical trials that will enable quicker identification of more targeted treatments for neuroblastoma.
Using Radiation to Improve Treatment of Metastatic Disease

Metastasis, the spread of cancer from its primary site to distant organs, is responsible for the majority of cancer-related deaths. The best method for treating cancer is to remove the disease by surgery or local radiation before metastasis has occurred. In cases where the cancer has already spread to other organs, chemotherapy is also administered, but often with limited success because of resistance to treatment. Previous investigations have suggested that there exists a subset of patients in which cancer has spread to only a few distant sites. This intermediary state of metastases, referred to as oligometastases, may be successfully treated by local radiation. Recent improvements in precise image-guided radiation therapy have made possible the simultaneous treatment of multiple tumor sites. The delivery of targeted radiation therapy allows for treatment of tumors while sparing adjacent tissues and organs. A team led by University of Chicago Joseph Salama, MD, Instructor of Radiation and Cellular Oncology, is conducting a clinical trial, which is testing whether cancer patients with oligometastasis who had failed standard therapies can be safely treated with targeted radiotherapy.

Sponsored by the University of Chicago Ludwig Center for Metastasis Research, Dr. Salama and colleagues conducted a dose-escalation trial to determine the optimal dosage of radiotherapy applied simultaneously to multiple organs. Patients were eligible for the trial if they had been diagnosed with stage IV cancer with 1 to 5 distant sites of metastasis. Participants received 3 doses of targeted radiation focused on each metastatic tumor over the span of several days. Patients were monitored 1 month following treatment and, subsequently every 3 months.

Although dose-escalation radiotherapy of one organ and standard dosing of two organs have been previously studied, this trial was unique in that radiotherapy was safely used in the treatment of patients with metastasis in multiple organs. The study demonstrates that patients with low-volume metastatic cancer can be treated with precise radiotherapy with few serious side effects, and that response rates are improved with higher doses without increased side effects. Based on these early successful results in controlling the spread of cancer, Dr. Salama and Ralph Weichselbaum, MD, the Daniel K. Ludwig Professor and Chair of the Department of Radiation and Cellular Oncology, and their colleagues suggest that targeted radiotherapy could also be used as a treatment regimen following chemotherapy. By discovering more about how cancer spreads and how metastasis can be targeted, University of Chicago scientists are continuing to find more effective ways to treat and control cancer.

Advanced Imaging Technique Combats Tumor Resistance

Tumor hypoxia, a condition in which tumor cells are deprived of oxygen, is a significant cause of tumor resistance to radiation therapy. For example, resistance to radiotherapy has been strongly associated with low tumor oxygen concentration for head-and-neck cancer, cervical cancer, and sarcoma. Therefore, an accurate measurement of tumor oxygenation status in patients would enable physicians to individualize therapy more effectively. Oxygen imaging in human cancers has been performed using positron emission tomography (PET), and blood oxygen level-dependent magnetic resonance imaging (MRI).

Howard Halpern, MD, PhD, Professor of Radiation and Cellular Oncology, Director, Center for EPR Imaging in Vivo Physiology, and his colleagues have pioneered the use of electron paramagnetic resonance (EPR) spectroscopy imaging to map hypoxia in tumors. Unlike PET and MRI, EPR provides quantitative measures of tissue hypoxia, which allows for the comparison of oxygenation images. Dr. Halpern and his colleagues recently investigated whether EPR oxygen imaging could be used to predict the responsiveness of tumors to radiation treatment. They implanted tumors into the hind legs of mice and measured tumor
Understanding How Genetic Variation Influences the Response to Cancer Therapy

Enormous strides have been made in the field of pharmacogenomics, which examines how genetic variation influences a patient’s response to drug therapy. Patients treated with the same therapeutic agent can display a wide range in responses, including the incidence and severity of side effects. By correlating a patient’s genetic profile with a drug’s effectiveness or toxicity, pharmacogenomic researchers in oncology aim to optimize the chemotherapeutic regimen for cancer patients. This will allow physicians to individually tailor treatment to maximize drug response and minimize side effects.

M. Eileen Dolan, PhD, Professor of Medicine, and Soma Das, PhD, Associate Professor of Human Genetics, along with their colleagues have identified genetic variants that contribute to daunorubicin cytotoxicity. Daunorubicin is a chemotherapeutic agent commonly used to treat cancers, including leukemia and lymphoma. Use of the drug is associated with severe side effects, such as myelosuppression and cardiac toxicity. Using International HapMap cell lines, which are derived from individuals of African and European descent, the investigators identified 53 genetic variants that were associated with daunorubicin-induced toxicity. When validating their findings, they found that two single nucleotide polymorphisms were able to predict 29 percent of variation in daunorubicin-induced toxicity, and that the expression of CYP1B1 (a drug-metabolizing enzyme found in the liver) was associated with drug sensitivity.

The results of these studies will help direct future clinical studies by providing a list of candidate genes to evaluate. These clinical studies will verify whether variations in these genes influence the toxicity of chemotherapeutic drugs in patients. The results will ultimately enable physicians to identify patients who may be at high risk for drug-associated side effects.
Survivorship

Personalized cancer care extends beyond cancer treatment to risk assessment for prevention interventions, and even to cancer survivorship. In the past 30 years, enormous progress has been made in the treatment of cancer, increasing the number of cancer survivors from 3 to nearly 14 million in the United States. Each of these survivors faces new challenges. Child survivors who face cancer may have to deal with these obstacles for the rest of their lives. Different social support systems, susceptibility to other illnesses, financial circumstances, education levels, age, and other factors create diverse needs requiring personalized survivorship plans.

Therapy-Related Leukemia
A particularly deadly challenge to survivors is therapy-related cancers, in particular acute myeloid leukemia (t-AML). These cancers are direct results of mutational events that are induced by chemotherapy or radiotherapy used in the treatment of primary malignancies, such as breast and colon cancer. Approximately 8 to 10 percent of all patients treated for cancer will develop t-AML, an average of 5 years after receiving treatment, and they have a median survival of 8 months. Patients who have received immunosuppressive agents for organ transplantation and the elderly are also at risk for developing t-AML and AML.

A $3 million grant from Cancer Research Foundation (CRF) has enabled the UCCRC to form an interdisciplinary team of scientists to use a comprehensive approach to identify individuals at risk for developing t-AML, identify genetic susceptibility factors that are involved, and design effective prevention and treatment strategies for this disease. (Founded by the late Maurice Goldblatt, and led today by his son, Stanford J. Goldblatt and daughter, Merle Goldblatt Cohen, the CRF has provided over $20 million to the University of Chicago cancer programs since its inception in the 1950s. The CRF and University of Chicago Cancer Research Foundation [UCCRF] are separate entities.)

With the support of the Cancer Research Foundation and its Executive Director Alexandra Nikitas, (bottom right), Michelle Le Beau, PhD, Director, UCCRC, (bottom left) has gathered a top team of world-renowned cancer researchers including (from left to right) Harinder Singh, PhD, John Cunningham, MD, and Kevin White, PhD, to address therapy-related cancers. Nikitas is the granddaughter of Maurice Goldblatt pictured in the photo to the left.

In 1948, Mark A. Brown, Harris Trust and Savings Bank executive vice-president, presents a check for $1,045,999.78 to Chancellor Robert M. Hutchins for the University of Chicago’s Cancer Research Center. Joining in the presentation at the Palmer House are Thomas B. Freeman (campaign chair), and Alexandra Nikitas’s grandfather Maurice Goldblatt (Cancer Research Foundation president).
Dr. Le Beau has gathered an interactive team, which represents the UCCRC and the University of Chicago Institute for Genomics and Systems Biology. The team has extensive research expertise in clinical oncology, hematopathology, genetics, genomics, systems biology, computational modeling of molecular networks, and hematopoiesis. Members include John Cunningham, MD, Professor of Pediatrics, Physiology, and Stem Cell Research, Chief, Section of Pediatric Hematology/Oncology; Dr. Dolan; Lucy Godley, MD, PhD, Assistant Professor of Medicine; Sandeep Gurbuxani, MBBS, PhD, Instructor of Pathology; Rong Huang, PhD, Instructor of Medicine; Dr. Larson; Yves Lussier, MD, Associate Professor of Medicine; Olatoyosi Odenike, MBBS, Associate Professor of Medicine; Dr. Onel; Harinder Singh, PhD, Louis Block, Professor of Molecular Genetics and Cell Biology; Wendy Stock, MD, Professor of Medicine; and Dr. White. Using a systems approach, these investigators will integrate six research projects involving high-throughput screening, stem cell biology, pharmacogenetics, clinical trials, and computation to elucidate the basic biology of t-AML. Taken together, these projects will help researchers identify the molecular basis of the disease and lead to improved therapeutics, earlier detection, and prevention strategies.

The increased focus on survivorship has resulted in a number of survivorship clinics designed to help patients overcome their remaining challenges and improve their quality of life. Susan Hong, MD, MPH, Assistant Professor of Medicine, leads the Breast Cancer Survivorship Program, which helps women deal with the long-term impacts of breast cancer. The University of Chicago’s Program in Integrative Sexual Medicine (PRISM) for Women and Girls with Cancer is designed to identify, prevent and treat sexual health problems in female cancer patients and survivors. PRISM helps cancer patients manage the long-term physical and emotional impacts of their malignancies. PRISM’s leadership includes Stacy Tessler Lindau, MD, MAPP, Assistant Professor of Obstetrics/Gynecology and Medicine-Geriatics, Stacey Sandbo, NP, Obstetrics/Gynecology, and S. Diane Yamada, MD, Associate Professor of Obstetrics/Gynecology, Chief, Section of Gynecologic Oncology. The team provides direct patient care and education to women and girls with cancer, and is expanding services to include women who are partners of men with prostate cancer. The group is expanding its mission to include female partners of prostate cancer patients and females who do not have cancer, but have sexual dysfunction.

The Childhood Cancer Survivors Center (CCSC) is an integrated program for pediatric and adult survivors of childhood cancer aimed at the prevention and treatment of long-term issues associated with cancer therapy. Led by Tara Henderson, MD, MPH, Assistant Professor of Pediatrics, the CCSC team of experts discusses each patient, and develops an individualized set of recommendations for health maintenance and late effects screening. The clinic team educates survivors and their families about the health issues related to cancer survival, and works closely with a patient’s primary care giver and other specialists to ensure that he or she is receiving the best care possible.
On the University of Chicago’s opening day in May of 1892, the original buildings were glorious structures of freshly cut stone. During the opening celebration, Charles O. Whitman, the University’s first Biology Department Chairman, remarked, “The time has now come when we must recognize and live up to the necessity for greater organic unity among kindred sciences.”

The University of Chicago still emphasizes unity in scholarly endeavor. We value and promote interaction, collaboration, and spirited discourse. The bright new buildings at the intersection of South Drexel Avenue and East 57th Street testify to the vitality of that ethos. By bringing researchers, physicians and laboratory scientists together, they foster scholarly interchange, the trading of ideas, and the evaluation of new concepts by tough critics.

This is the ideal environment for cancer research. Collegial camaraderie, disciplined inquiry, and the willingness to accept the criticism of one’s peers create the conditions for discovery by leveraging the powers of multiple perspectives and disciplines. Rigorous debate also helps build a team of researchers who are tested by the best, and inspired by an atmosphere of innovation – researchers who can “Rise to the Challenge.”
The University of Chicago Medical Center (UCMC) Cancer Committee is a multi-disciplinary team of physicians from diagnostic and treatment specialties, researchers, and administrative and support staff (See membership list). Since November 2004, the Committee has been led by surgical oncologist Mark McKee, MD, Associate Professor of Surgery. The Committee has promoted excellence and collaboration among the UCMC’s cancer-related disciplines. With the departure of Dr. McKee at the end of November 2009, Kevin Roggin, MD, Assistant Professor of Surgery, became the new Committee Chairman on December 1, 2009. Seven members of the 25-member Committee represent UCCRC leadership or staff. The Committee monitors and assesses the clinical cancer programs to ensure that the UCMC meets the requirements of accreditation by the American College of Surgeons’ Commission on Cancer (CoC). The Commission is a consortium of professional organizations, including the UCMC, which has met the standards mandated by the College of Surgeons. CoC-accreditation helps patients select programs that provide quality cancer care.

In the past year, UCMC evaluated and treated 3,740 cancer patients, a 4% increase over the previous year. Of those patients, 83% were newly-diagnosed, and 17% were treated for recurrent or progressive disease. The cancers most commonly seen at UCMC were prostate cancer (556 cases), lung cancer (301 cases), breast cancer (252 cases), colorectal cancer (188 cases), and kidney/renal pelvis cancer at the UCMC. The Registry’s employees also respond to requests from physicians, researchers and healthcare administrators for data to be used in research, patient care evaluation, resource allocation, and strategic planning.

The UCCRC, together with the Cancer Committee, directs the Cancer Registry, which coordinates the collection, analysis, and dissemination of patient information vital to cancer care and research. This includes follow-up data on patients treated for
cancer (148 cases). Table 1 presents the distribution of cancers by body site diagnosed at the UCMC. Figure 1 compares the distribution of cancer at the UCMC, the State of Illinois, and the nation.

Each annual report also presents detailed information on a particular cancer site. In this year’s report, pages 26-27 focus on pancreatic cancer, the fourth most common cause of cancer deaths among men and women in the United States. The Committee chose to report on this malignancy, in part, because of the increasing number of cases and the growing percentage of cases at UCMC as compared to Illinois and national estimates. Pancreatic cancer represents 5% of all cancer cases seen at the UCMC, whereas the comparable figures for the State of Illinois and the nation is 3%. Figure 2 illustrates the increase in pancreatic cancer cases seen at the UCMC from 1999 through 2008. The number of pancreatic cases in 2008 (147) is four times the number of cases seen in 1999 (36).

Additional information on pancreatic cancer is available in the next section of this report.

Table 1. 2008 UCMC Cancer Cases by Site and Gender

<table>
<thead>
<tr>
<th>Primary Site</th>
<th>Total</th>
<th>Newly-Diagnosed</th>
<th>Recurrent/Progressive Disease</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Cavity &amp; Pharynx</td>
<td>139 (3.7%)</td>
<td>99</td>
<td>40</td>
<td>100 (4.9%)</td>
<td>39 (2.3%)</td>
</tr>
<tr>
<td>Digestive System</td>
<td>734 (19.6%)</td>
<td>606</td>
<td>128</td>
<td>400 (19.5%)</td>
<td>334 (19.8%)</td>
</tr>
<tr>
<td>Respiratory System (Includes Pleura)</td>
<td>439 (11.7%)</td>
<td>375</td>
<td>64</td>
<td>236 (11.50%)</td>
<td>203 (12.1%)</td>
</tr>
<tr>
<td>Bones &amp; Joints</td>
<td>16 (0.4%)</td>
<td>15</td>
<td>1</td>
<td>10 (0.5%)</td>
<td>6 (0.4%)</td>
</tr>
<tr>
<td>Soft Tissue (Includes Heart)</td>
<td>60 (1.6%)</td>
<td>47</td>
<td>13</td>
<td>26 (1.3%)</td>
<td>34 (2.0%)</td>
</tr>
<tr>
<td>Skin (Excludes Basal &amp; Squamous Cell)</td>
<td>82 (2.2%)</td>
<td>55</td>
<td>27</td>
<td>46 (2.2%)</td>
<td>36 (2.1%)</td>
</tr>
<tr>
<td>Breast</td>
<td>352 (9.4%)</td>
<td>317</td>
<td>35</td>
<td>1 (0.0%)</td>
<td>351 (20.8%)</td>
</tr>
<tr>
<td>Female Genital System</td>
<td>188 (5.0%)</td>
<td>162</td>
<td>26</td>
<td>0 (0.0%)</td>
<td>188 (11.2%)</td>
</tr>
<tr>
<td>Male Genital System</td>
<td>638 (17.1%)</td>
<td>573</td>
<td>65</td>
<td>638 (31.1%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Urinary System</td>
<td>362 (9.7%)</td>
<td>303</td>
<td>59</td>
<td>247 (12.0%)</td>
<td>115 (6.8%)</td>
</tr>
<tr>
<td>Eye &amp; Orbit</td>
<td>2 (0.1%)</td>
<td>2</td>
<td>0</td>
<td>0 (0.0%)</td>
<td>2 (0.1%)</td>
</tr>
<tr>
<td>Brain &amp; Other Nervous System</td>
<td>127 (3.4%)</td>
<td>107</td>
<td>20</td>
<td>56 (2.7%)</td>
<td>71 (4.2%)</td>
</tr>
<tr>
<td>Endocrine System (Includes 18 Benign Pituitary Adenomas)</td>
<td>220 (5.9%)</td>
<td>174</td>
<td>46</td>
<td>74 (3.6%)</td>
<td>146 (8.7%)</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>154 (4.1%)</td>
<td>113</td>
<td>41</td>
<td>88 (4.3%)</td>
<td>66 (3.9%)</td>
</tr>
<tr>
<td>Multiple Myeloma</td>
<td>47 (1.3%)</td>
<td>32</td>
<td>15</td>
<td>29 (1.4%)</td>
<td>18 (1.1%)</td>
</tr>
<tr>
<td>Leukemia</td>
<td>110 (2.9%)</td>
<td>91</td>
<td>19</td>
<td>68 (3.3%)</td>
<td>42 (2.5%)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>70 (1.9%)</td>
<td>50</td>
<td>20</td>
<td>35 (1.7%)</td>
<td>35 (2.0%)</td>
</tr>
<tr>
<td>Total Cases</td>
<td>3,740 (100%)</td>
<td>3,121</td>
<td>619</td>
<td>2,054 (100%)</td>
<td>1,686 (100%)</td>
</tr>
</tbody>
</table>

*Bladder cancer includes "in situ" cancers, which are abnormal cells that have not spread beyond the organ where they first formed.*
can give rise to benign or malignant cysts or neoplasms, but the vast majority of all pancreatic cancers are exocrine adenocarcinomas arising from the cells of the pancreatic ducts. Endocrine carcinomas of the pancreas tend to occur in younger patients and have a better prognosis. At the UCMC, 110 newly-diagnosed patients treated for pancreatic cancer last year had malignant exocrine tumors, and 9 newly-diagnosed patients had endocrine tumors (higher than the national average of 3%).

The University of Chicago Pancreatic Cancer Working Group is a new initiative designed to encourage complementary approaches to pancreatic cancer research. The physician scientists and cancer researchers in the Working Group are capitalizing on cross-departmental collaborations to examine causes of tumor development, growth, and spread in human pancreatic cancer tissue. Work is being performed to identify factors that improve the short-term and long-term recovery of patients after pancreatic surgery, and to establish a repository of clinical, pathological, and genetic information for future research studies.

With an average five-year survival rate of only 4 percent, it is estimated that pancreatic cancer will claim the lives of more than 35,240 people nationwide in 2009. Known as the “silent killer”, pancreatic cancer often does not present any symptoms in its early stages. Consequently, the majority of patients are diagnosed with advanced disease when treatment options are limited. At present, there are no effective screening tests to detect early disease. The UCMC has an active program focused on improving the tools for pancreatic cancer prevention, diagnosis, and treatment of this fatal disease. According to the American Cancer Society, 37,680 new cases of pancreatic cancer were diagnosed in the U.S. in 2008. Among cancer types, pancreatic cancer is ranked tenth in cancer incidence. Figure 2 illustrates the number of pancreatic cancer cases seen at the UCMC between 1999 and 2008. There has been a significant increase in the number of patients diagnosed and treated for pancreatic cancer at the UCMC in the past 10 years (36 in 1999 to 147 in 2008). This may be due, in part, to increased awareness among patients and physicians that the UCMC has pancreatic cancer treatment outcomes that are superior to those in centers where few pancreatic surgeries are performed.

The pancreas is a complex organ with two main cell types, exocrine and endocrine. The exocrine components produce and deliver digestive enzymes and fluids to the small intestine. Endocrine components secrete hormones, such as insulin, into the blood stream. Both components

Figure 2. UCMC Pancreatic Cancer Cases 1999-2008

Effective treatment for pancreatic cancer is based on a number of factors: tumor location, stage, the patient’s age, overall health and their personal preferences. The UCMC utilizes leading-edge imaging technology that provides a high level of detail, improving the ability of specialists to determine if the cancer has spread to nearby organs, nerves or blood vessels. Multidisciplinary team planning combines the expertise of our physicians to create individualized treatment plans. Potentially curative surgery may be performed when diagnostic tests suggest that it is possible to safely remove the entire tumor. Approximately 20 percent of pancreatic cancers can be resected. The three surgeries routinely performed to remove pancreatic tumors are the “Whipple” procedure, known as pancreaticoduodenectomy, a distal pancreatectomy, and a total pancreatectomy. These procedures are technically-challenging, and sometimes require complex care during recovery. Fortunately, with expert treatment, the mortality and complication rates for pancreatic cancer surgery have decreased markedly in the past twenty years.
Chemotherapy or chemotherapy in combination with radiation (chemoradiotherapy) can be given before or after surgery to help reduce the size of the tumor and destroy cancer cells that may have spread beyond the pancreas. If the tumor cannot be surgically removed, chemoradiation also can be used as the primary treatment. Currently, only a few chemotherapeutic agents are known to be effective against pancreatic cancer. UCCRC researchers are actively participating in nearly a dozen clinical trials targeted at pancreatic cancer. Some of these interesting and promising investigations include studies evaluating the efficacy of chemotherapy combinations, using newer investigational agents, administering monoclonal antibodies with other conventional therapy, and altering the coordination of surgery and systemic therapy. (Figure 3 illustrates the distribution of first course treatments used in 2008 at the UCMC.)

In advanced cancer, treatment may be limited to supportive care, palliation and pain control. Coordinated efforts amongst a multidisciplinary group of helpful and compassionate medical staff provide the care needed for the physical and psychosocial issues that affect our cancer patients and their families. Procedures to address pain and other symptoms of pancreatic cancer include intestinal or bile duct bypass surgery, the use of endoscopic stents to open blocked bowel or ducts, and celiac plexus nerve block to treat chronic pain.

With current treatment, the five-year overall survival rate for pancreatic cancer remains low (see Figure 4). Through scientific research, clinical expertise, innovative technology, and a comprehensive approach to treatment, the UCMC and the UCCRC strive to improve pancreatic cancer outcomes for current patients and future generations.
Facing Breast Cancer with Attitude and Compassion

It is difficult to keep up with Suzanne Zaccone. Always in overdrive, the energetic Executive Vice Chairman, former President, and co-owner of Graphic Solutions International, LLC (now called GSI Technologies, LLC) brims with ideas and deftly manages multiple projects. In 1985, Suzanne and her brother Bob opened GSI, which now has 110 employees. She is a powerhouse in the tag-and-label industry, and served as President of its leading business association, the 75-year-old Tag & Label Manufacturers Institute. When Suzanne was diagnosed with breast cancer, she approached her battle against the disease with the same vigor, optimism, and determination that she brings to her occupation. Her intense determination also allowed her to create something valuable from her experience with cancer, and make a difference in the lives of many cancer patients and their friends and families. She also has developed an innovative way to support the University of Chicago Cancer Research Foundation (UCCRF).

Employing the due diligence that she uses to make key business decisions, Suzanne launched an extensive search to find the best breast cancer program to treat her malignancy. She developed a detailed list of questions for her interviews with the principals leading cancer programs in Chicago. Her meticulous evaluation led to her choice of the University of Chicago, and she is convinced that she made the right decision.

“Mark Connolly [MD, Clinical Associate Professor of Surgery] provided me with exceptional care,” said Suzanne. “He also is very upfront about my situation and I trust him implicitly. I insist on honesty, and Mark never hesitated in keeping me fully informed.”

Dr. Connolly and a team of specialists successfully treated her breast cancer with surgery, radiation, and chemotherapy. “My physicians used a combination of therapies,” said Suzanne. “I am fortunate that the University was able to provide me with top physicians, adept at each procedure, and able to provide me with the best possible and most sympathetic care.” Oncologist Rita Nanda, MD, Assistant Professor of Medicine, who administered chemotherapy, is an expert in therapy regimens that improve outcomes for women with breast cancer. Steven Chmura, MD, PhD, Assistant Professor of Radiation and Cellular Oncology, the team’s radiation oncologist, is skilled in radiotherapy and stereotactic radiosurgery (SRS). (SRS is a very precise form of radiation that delivers intensely-focused radiation beams to treat both malignant and benign tumors.) David Song, MD, MBA, Professor and Vice-Chairman of Surgery, and Chief, Section of Plastic and Reconstructive Surgery, performed Suzanne’s reconstruction surgery. Dr. Song is an internationally-recognized expert in plastic surgery and reconstructive microsurgery.

In many ways, a fifth specialist treated Suzanne, herself. She became an expert in handling the emotional aspects of her cancer effectively and productively. She knew that her family and many friends and associates would want to know how she was doing at every stage of her ordeal. “I wanted to keep people informed, but, frankly, I did not want to repeat my story over and over again,” Suzanne remarked. Always practical, she decided to send periodic e-mail reports to the approximately 50 friends and associates who were most concerned about her condition.
Writing the e-mails proved therapeutic for Suzanne, helping her face her cancer directly. They also helped the recipients. Readers found them to be inspiring; many forwarded them on to their friends. Others would contact Suzanne and ask to be included in the mailing. Before long, Suzanne was in contact with hundreds of people in eight countries and 30 states. The e-mails proved so popular that she decided to create a book from them.

A Random Interruption: Surviving Breast Cancer with Laughter, Vodka, Smoothies and an Attitude is a story of survival, a candid detailed account of the experiences of a breast cancer patient, and a practical guide on the realities of a cancer. Dr. Song provides his own perspective as a physician, and the book includes questions a patient should ask when seeking treatment.

“The book is my way of thanking my doctors for their compassionate care and my hope is that it will help other cancer patients find the best possible treatment and understand what they are facing,” said Suzanne. The book is also a gift to the University of Chicago cancer program, since Suzanne is contributing all proceeds from its sales to the University of Chicago Cancer Research Foundation.
We could not rise to the challenge without the strong support of our donors and friends. In our quest to accelerate progress in controlling cancer, we are thankful to our dedicated partners – individuals, corporations, and foundations – who offer unwavering commitment to our programs. Their generous gifts enable us to set a new standard in the fight against malignancy. We thank the following contributors for their support. We simply could not do our work without their assistance.
Every attempt has been made to ensure accuracy and completeness of this list.
The debate over health care reform has brought to light issues that the UCCRC and the UCCRF have been addressing for many years. We have helped the UCCRC enhance cancer care, develop more effective and safer therapies, and promote prevention and screening research. Investment in medical research is one of the best ways to improve the quality of health care, while reducing its cost.

UCCRF funding has enabled creative experimentation that tested unconventional ideas and brought about monumental advances in cancer care. We have supported research that deepened and expanded our understanding of malignancy. As a trusted ally of the UCCRC for over 60 years, we have promoted the value and importance of cancer research in our communities.

Ours is a long-term commitment to cancer research that recognizes the importance of tireless, persistent effort. We cannot succeed if our support rises and falls in parallel with the vagaries of the economy. There is no other option but full speed ahead; so, we have stayed the course and kept the throttle open. When the Women’s, Associates, and Auxiliary Boards made their 2009 allocations to support cancer research at the UCCRC, their contributions equaled or surpassed their contributions in 2008. In fact, the Associates Board increased its allocation by 63 percent this year.

It has been an exciting and rewarding year in cancer research at the University of Chicago and we have played an important role. We can measure our success in 2009 in the hiring of talented researchers, the many electrifying scientific advances, and the growing wealth of resources. We can point to the new Women’s Board laboratory in the Knapp Center for Biomedical Discovery, which is the result of the Board’s outstanding capital campaign. We can include the Board’s major contributions to the Ben May Department for Cancer Research, and the training of promising students in cancer biology. We can add the Associates Board’s support of top scientists studying the human immune system and how best to encourage and enable the body to use its own defenses against cancer. Our tally also should recognize the Auxiliary Board’s contributions to support the research of three outstanding young physician scientists: Drs. Ernst Lengyel, MD, PhD, Associate Professor Obstetrics/Gynecology, Samuel Volchenboum, MD, PhD, MS, Instructor of Pediatrics, and Tara Henderson, MD, MPH, Assistant Professor of Pediatrics, Director, Childhood Cancer Survivors.

These are examples of the many ways the UCCRF members have contributed to the war against cancer, but our list is far from complete. Our members are helping to improve our nation’s health care system, as they invest in the possibility of a future when cancer is no longer the menace that it is today.

With sincere thanks,
The University of Chicago Cancer Research Foundation (UCCRF) is one of our most dedicated and valuable allies. Their passionate commitment to the UCCRC reflects a deep understanding of the importance of research and their faith in a future where we have the measures to control cancer effectively. We are immensely grateful for the indispensable work of the individuals who make up the boards and auxiliaries of the UCCRF. Their generous human spirit inspires us to work more diligently in our efforts to create a healthier future.
The UCCRF Auxiliary Board supports three physician scientists who attended the March 7, 2009 All That Jazz fundraising event. From left to right are Ernst Lengyel, MD, PhD, Associate Professor of Obstetrics/Gynecology, Julie and Samuel Volchenboum, MD, PhD, MS, Instructor of Pediatrics, and Tara Henderson, MD, MPH, Assistant Professor of Pediatrics, Director, Childhood Cancer Survivors Clinic, and her husband M. Todd Henderson, JD.

Children of UCCRF Women's Board members helped raise funds at the 42nd Annual Ball. Ball Co-Chairs, Nalisa Ward (center left) and Shelley Johnstone (center right) posed for a picture with their young helpers.
**2008-2009 Financial Report**

**Beginning Balance** $4,262,936

**July 1, 2008 - June 30, 2009**

**Income**

- UCCRF Contributions $430,688
- UCCRF Capital Campaign $605,000
- Boards/Auxiliaries $1,288,661
- Women’s Board Campaign $157,377
- Endowment Income $69,935

**Total Income** $2,551,661

**Expenses**

**Operating**

- Personnel $280,342
- Services $473,075
- Supplies $4,332

**Total Operating** $757,749

**Allocations**

- Research & Faculty Support $747,671
- Women’s Board $590,000
- Auxiliary Board $129,000
- Associates Board $40,000
- Capital Campaign $1,525,000
- UCCRF Trustees Endowment $35,000

**Total Allocations** $3,066,671

**Operating Expenses**

- UCCRF $236,501
- Women’s Board $431,206
- Associates Board $19,615
- PowerLinks Golf Outing $5,027
- Nutrition Bowl $65,400

**Total Operating Expenses** $757,749

**Ending Balance** $2,990,177
Help Us Continue Care and Research

To learn more about cancer research at the University of Chicago and how you can help our researchers pursue promising avenues of investigation that would otherwise remain unexplored, please contact Mary Ellen Connellan, Executive Director, University of Chicago Cancer Research Foundation, at (773) 834-7490.

A donation to the University of Chicago Cancer Research Foundation is an investment in one of the nation’s leading facilities for scientific inquiry and will help people here at home and around the world.

Donations by check may be made to:
The University of Chicago Cancer Research Foundation
5841 South Maryland Avenue, MC 1140
Chicago, IL 60637

All gifts are tax deductible as provided by law.