Powered by Innovation

2017 Annual Report
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Our mission at the University of Chicago Medicine Comprehensive Cancer Center is to develop innovative and collaborative research to discover the determinants of cancer, to develop cures for cancer, and to prevent cancer.
Letter from the Director

Innovation is defined as the introduction of something new or a new idea, method, or device. It’s applying fresh solutions to difficult problems. In cancer research especially, innovation is the key to making real progress in the name of reducing cancer’s devastating effects.

Innovation is what allows researchers at the University of Chicago Medicine Comprehensive Cancer Center to push the boundaries of discovery and blaze new paths for better care and outcomes for cancer patients. The 2017 annual report highlights some of the ways in which we are using innovation to advance discovery and clinical practice.

The use of new technology and methods has broadened the realm of what is possible in cancer research. From developing novel chemical probes to better monitor and disrupt signaling within cancer cells to launching first-of-its-kind population studies to uncover factors that contribute to the risk of developing cancer, our researchers are better understanding how cancer develops and discovering novel ways to prevent or treat it.

Other new advances, made possible by state-of-the-art equipment, such as the new cyclotron—the only particle accelerator for developing imaging and therapeutic compounds in an academic medical institution in Illinois—and the most cutting-edge gene panels for genetic profiling of tumors, are advancing both research and clinical care.

In this report, we also spotlight new technology- or device-driven treatments that are revolutionizing how aggressive cancers, including those that have spread, are being treated. For example, new approaches to cancer surgery and chemotherapy, such as Heated IntraPEritoneal Chemotherapy, have made a significant impact on patients with mesothelioma or other cancers in the lining of the abdomen.

In addition, innovative partnerships for a new education program aimed at enhancing diversity in the cancer research workforce are furthering our mission of training the next generation of cancer researchers.

Innovation touches every aspect of cancer research and has the power to change healthcare and the lives of those who receive it. The latest innovations at the University of Chicago are changing how cancer research and care take place in the world.

These accomplishments, fueled by innovation, would not be possible without continued investment and philanthropy through the University of Chicago Campaign: Inquiry and Impact Janet D. Rowley Discovery Fund. We are grateful for our supporters who enable us to chart a new path forward for cancer prevention, diagnosis, treatment, and survivorship.

With sincere gratitude,

Michelle M. Le Beau, PhD
Arthur and Marian Edelstein Professor of Medicine
Director, the University of Chicago Medicine Comprehensive Cancer Center
Innovative Research
Innovation at the Interface of Chemistry and Cancer

Bryan Dickinson, PhD, assistant professor of chemistry, is developing small molecule, fluorescent probes to study enzymes in cells responsible for removing a class of protein modifications called palmitoylation. Hundreds of proteins in human cells are tagged by this modification, including some known to play an important role in cancer.

In a recent study, Dickinson and colleagues showed that they could detect these eraser enzymes in live cells, and the activity of the erasers changed in cancer cells depending on their growth state. Dickinson was recently awarded a five-year, $1.25 million grant from the National Institutes of Health to develop similar fluorescent tools to track the activity of another type of eraser protein, one that removes lysine acetylation, in living cells.

Approaches that marry chemistry, biology and physics to study and manipulate biological systems are able to provide resolution in living cells in both space and time.

“Chemical biology can answer questions that genetics can’t,” Dickinson said.

Also employing synthetic chemistry approaches, Raymond Moellering, PhD, assistant professor of chemistry, is developing chemical tools to better understand the proteome—the entire complement of proteins in cells, tissues or an organism—and to manipulate target proteins and pathways for cancer treatment.

For example, his lab has discovered several novel post-translational modifications on proteins that bridge metabolism and cell signaling in cancer cells.

This work, which is supported by a Pathways to Independence Award from the National Cancer Institute, has resulted in the discovery of new signaling pathways and small molecule probes that regulate metabolism in cancer cells. Additionally, the Mary Kay Foundation funded Moellering’s project on developing precision imaging diagnostics to detect and treat the metastatic spread of breast and ovarian cancer.

Finally, to address newly discovered cancer pathways, Moellering’s lab is developing novel protein-based drugs to block the activity of proteins important to tumor cells that have proven challenging to disrupt through more conventional means.

Enhancing Colorectal Cancer Screening through Technology

The Cook County CARES (Colorectal Cancer Alliance to Reinforce and Enhance Screening) team at the University of Chicago Medicine Comprehensive Cancer Center (UCCCC) has developed an innovative and sustainable web-based tool at ILColonCares.org to increase linkage to care for individuals referred for care from local community health clinics. This collaborative tool provides enhanced quality CRC screening by providing community health clinics with access to available colonoscopy appointments at UChicago Medicine.

“We developed this sustainable technology to increase linkage to care for individuals referred to care from local community health clinics,” said Karen Kim, MD, professor of medicine, UCCCC associate director for community engagement and cancer disparities, and director of UChicago’s Center for Asian Health Equity (CAHE).

The ILColonCares.org website was developed with multiple hospital and community-based clinics, including UChicago Medicine, Rush University Medical Center, Swedish Covenant Hospital, Heartland Health Centers, Friend Family Health Centers, and CommunityHealth Centers of Chicago.

The hospital systems donate colonoscopy appointments to partner local health centers. These slots appear on the site instantly, and the health centers can schedule colonoscopies for approved or uninsured patients. Patient navigation will be provided to ensure compliance, utilization, and transfer of results. There is interest in scaling the site for state-wide and/or national use.

“This web-based enterprise focuses on enhancing equitable access to colonoscopy care for uninsured patients,” said Fornessa T. Randal, executive director for CAHE, and lead designer and site director for ILColonCares.org.

Karen Kim, MD, and her team are expanding access to colon cancer screening with a web-based tool.
Tackling Health Disparities through One-of-a-Kind Cohort Studies

In 2016, the National Institutes of Health (NIH) launched the Precision Medicine Initiative (PMI), which will enroll one million or more participants in a national research effort designed to find better ways to prevent and treat disease based on lifestyle, environment and genetics.

A portion of the funds allocated for the PMI are dedicated to the National Cancer Institute’s efforts in cancer genomics, and the University of Chicago Medicine Comprehensive Cancer Center is playing a key role through the All of Us Research Program, a key element of the PMI.

The All of Us leadership hopes to extend precision medicine for prevention and treatment of all diseases by building a diverse national research cohort that will be followed for decades. Cohort studies provide a unique opportunity for scientists to follow a large group of people over an extended period of time to see how exposure—environment, occupation, city of residence, for example—may relate to incidence of chronic diseases such as cancer.

In this effort, the Comprehensive Cancer Center is working alongside Northwestern University, University of Illinois at Chicago, Ann & Robert H. Lurie Children’s Hospital and the Alliance of Chicago Community Health Services LLC as members of the Illinois Precision Medicine Consortium (IPMC), which will help recruit 100,000 All of Us participants.
“We are hoping to leverage our extensive experience engaging diverse research participants in UChicago projects to enhance minority representation in All of Us and boost the ability of the program to make breakthroughs relevant to our patient population,” said Brisa Aschebrook–Kilfoy, PhD, research assistant professor of public health sciences and a key investigator.

Aschebrook–Kilfoy helps run the Comprehensive Cancer Center’s ChicagO Multiethnic Prevention And Surveillance Study (COMPASS), which aims to understand disparities in disease incidence and mortality in Chicago’s population where there are higher rates of cancer and chronic diseases than in other parts of the United States.

Through the efforts of a multidisciplinary team, COMPASS investigators plan to recruit 100,000 Chicago residents to study the lifestyle, environmental and genetic factors that impact health and chronic diseases with an emphasis on cancer. The study was launched in 2013 and thus far close to 4,000 diverse residents have enrolled in the cohort.

COMPASS is led by Habibul Ahsan, MBBS, MMedSc, Louis Block Professor of Public Health Sciences, Medicine, and Human Genetics, who established the University of Chicago Precision and Population Health Initiative (PPHI) by integrating COMPASS and All of Us.

“Once we know and understand what leads to the development of disease and the underlying biological processes, we are in a better position to identify prevention and treatment solutions,” said Ahsan, who also serves as associate director for population research at the Comprehensive Cancer Center.

Join All of Us by visiting www.joinallofus.org and download the free app for both iOS and Android. Learn more about COMPASS by visiting compass.uchicago.edu.
Cyclotron Research Facility Transforms Imaging Research

After nearly two decades, the University of Chicago welcomed the return of a cyclotron research facility, which opened in January 2017, making the University the only academic medical institution in Illinois with an operational cyclotron.

A cyclotron is a type of particle accelerator that uses a magnet and high electrical voltage to accelerate charged particles in a spiral motion. The particles eventually collide with a target, causing a nuclear reaction to produce radioactive isotopes.

These isotopes are combined with chemical compounds to create injectable radioactive molecules, or tracers, which are used in Positron Emission Tomography (PET) scans. In a PET scan, a radioactive tracer is injected into the patient. Radiologists then use imaging techniques to follow the “glowing” tracer as the patient’s body processes the molecule. This process helps doctors and researchers diagnose disease, predict outcomes, and assess the effects of drugs.

“Now that we have the new cyclotron, we can really fuel the engine to empower our molecular imaging research,” said Chin-Tu Chen, PhD, associate professor of radiology, who was a member of the original radiochemistry research team that worked with UChicago’s first cyclotron, which was installed in 1968 and decommissioned in 1997.

Chen is collaborating with other Comprehensive Cancer Center members including Chien-Min Kao, PhD, associate professor of radiology, Raymond Moellering, PhD, assistant professor of chemistry, and William Green, PhD, professor of neurobiology.

For example, Green and Chen are developing PET probes to image proteins in the brain that respond to nicotine, which will allow them to study the effects of smoking cessation therapy.

Funding for the $8.4 million cyclotron project came in part from the William F. O’Connor Foundation, the Duchossois Family Foundation, Ludwig Cancer Research, and the University of Chicago Cancer Research Foundation Women’s Board.

“Now that we have the new cyclotron, we can really fuel the engine to empower our molecular imaging research.”

— Chin-Tu Chen, PhD
Making the Cyclotron Facility a Reality

In honor of the foundation’s gift, the University’s imaging program will be renamed the William F. O’Connor Molecular Imaging Program. The addition of the cyclotron would no doubt have pleased William O’Connor, who was a patient at the medical center.

Former chairman of the Chicago Board of Trade, O’Connor died in 1999 from pancreatic cancer. Before his death, he established the William F. O’Connor Foundation to help support cancer research in Illinois. Since 2000, the foundation has given more than $3 million to the University toward cancer research.

Adds Mary Jo McGuire, who was a personal friend of O’Connor’s and also serves on the foundation’s board, “We all knew him very well, and we just try to envision what he would have wanted us to do. We never disagree about that,” McGuire says.
Nucleic acids, which include DNA and RNA (the DNA “message” transmitter), carry the genetic information that encodes the building blocks of cells and tissues. Chuan He, PhD, the John T. Wilson Distinguished Service Professor of Chemistry and Howard Hughes Investigator, and colleagues study how specific modifications, such as methylation, to RNA can lead to changes in how genes are expressed and, ultimately, result in disease. This field is referred to as epitranscriptomics.

He is truly a pioneer of the field. In 2011, his laboratory discovered the first RNA demethylase, an “eraser” enzyme that removes methylation modifications, and went on to show for the first time that it is possible to reverse RNA modifications. His team has also identified “reader” proteins that specifically bind and affect methylated RNA in mammalian cells and “writers” that are responsible for methylating RNA.

At the center of much of this research is innovative technology—new methodologies to map and capture DNA and RNA modifications using sophisticated chemistry approaches. For example, He recognized that the lack of techniques to distinguish one DNA modification (5-hydroxymethylcytosine) from another (5-methylcytosine) limited scientists’ ability to understand the role of these modifications in cancer and other diseases.

Therefore, his team developed the first chemical labeling approach to isolate 5-hmc–enriched DNA, and subsequently improved the resolution (i.e., the amount of detail detectable) to single DNA bases. More recently, He’s laboratory developed a highly sensitive and selective chemical labeling and capture approach for genome-wide profiling of 5hmC with a very small sample size (approximately 1,000 cells).

These new tools have allowed He and his collaborators to generate detailed epigenetic footprints that were not possible previously. He’s team is characterizing such modifications in a wide array of...
He’s team is in the process of establishing RNA modifications as a main, fundamental mechanism of gene expression regulation, and also hope to develop technologies that can directly benefit patients and clinical practices.

Chuan He, PhD, was awarded the 2017 Paul Marks Prize for his work in DNA and RNA epigenetics.

“...This research laid down the mechanistic pathways for our current understanding of how these modifications impact biological outcomes, including those related to cancer,” He says. “Cancer and other diseases can hijack aberrant RNA methylation to gain a survival advantage, allowing cells to proliferate and grow out of control.”

He was recently recognized for his groundbreaking work with the 2017 Paul Marks Prize for Cancer Research, a prestigious recognition of promising investigators aged 45 or younger for their efforts in advancing cancer research.

tumor types, including hematological (blood) cancers, colorectal cancer, endometrial cancer, breast cancer, and glioblastoma. They are in the process of establishing RNA modifications as a main, fundamental mechanism of gene expression regulation, and also hope to develop technologies that can directly benefit patients and clinical practices.

Additionally, multiple Comprehensive Cancer Center investigators are currently working with He on biomarker cancer discoveries using the new 5-hmC DNA modification detection technology.
Gene Panels Aid Decision-Making for Hereditary MDS/AL Patients

Myelodysplastic syndrome (MDS) and acute leukemia (AL) are both caused by blood cell abnormalities in the bone marrow. Inherited forms of these hematological malignancies, or blood cancers, have become more prevalent in recent years. Identifying patients with hereditary predisposition is important for stem cell transplantation, particularly during the donor selection process.

The University of Chicago Medicine has the first laboratory to provide comprehensive clinical testing to evaluate genetic predisposition to MDS/AL. In a study led by Zejuan Li, MD, PhD, assistant professor of human genetics, and including Jane Churpek, MD, assistant professor of medicine, and Lucy Godley, MD, PhD, professor of medicine, the researchers analyzed the prevalence of genetic variants in 197 adult and pediatric patients using a gene panel between October 2014 and June 2016.

The study allowed researchers to identify the most common genetic mutations linked to hereditary MDS/AL, while demonstrating the important role genetic testing can play in the development of treatment plans. For example, one patient’s testing revealed a mutation that led to a diagnosis of Fanconi anemia. This revelation prompted significant changes to the patient’s chemotherapy regimen. In another instance, a patient’s sister was ruled out as a potential bone marrow donor when it was revealed that she too carried the same disease-causing genetic variant as her sibling.

In addition, 44 percent of patients had negative testing results, suggesting that a considerable portion of genetic abnormalities in patients with a history of MDS/AL predisposition have yet to be identified.

Godley received funding from the Janet D. Rowley Discovery Fund, and Churpek’s research will be supported by the University of Chicago Cancer Research Foundation Auxiliary Board in Spring 2018. Churpek also received developmental funds from the UChicago Cancer Center Support Grant.
Chicago’s First Ultrasound Treatment for Prostate Cancer

In September, a University of Chicago Medicine surgical team, led by Arieh Shalhav, MD, professor of surgery and director of the Robotic Surgery Program, used the Ablatherm® Robotic HIFU device to perform the first high-intensity focused ultrasound (HIFU) procedure in the city of Chicago for a patient with prostate cancer.

During the procedure, HIFU directs high-frequency sound waves that heat up and burn off targeted prostate tissue where the small tumors are located. This has little effect on nearby tissue containing healthy cells and can be focused to treat only the area that contains the cancer. The process minimizes side effects such as impotence or incontinence that are associated with radical prostate surgery.

“As surgeons, we strive to find effective treatment options that are less disruptive to the human body and life, and set the stage for better and gentler ways of curing disease,” Shalhav said. “Focal HIFU fills a significant void between active surveillance—a watch and wait approach, which can be stressful—and radical treatments like whole gland removal, radiation or ablation. It bridges this gap and allows patients to maintain their quality of life.”

This clinical achievement complements the Comprehensive Cancer Center’s strong research program in HIFU. Radiologist Aytekin Oto, MD, professor of radiology and surgery, is a pioneer in developing HIFU techniques for prostate cancer treatment. Innovative clinical trials using HIFU led by Oto and Scott Eggener, MD, professor of surgery and radiology, were made possible by the installation of a new Philips Ingenia 3.0T Magnetic Resonance (MR) scanner in the University of Chicago MRI Research Center. This work has received philanthropic support from the Forefront Fund and the University of Chicago Cancer Research Foundation Women’s Board.

Charlie Barriball was UChicago Medicine’s first HIFU patient.
Breakthrough CAR T-Cell Therapy for Blood Cancer

The University of Chicago Medicine is the first site in Chicago and Illinois to be certified by both Kite Pharma Inc. and Novartis to offer chimeric antigen receptor T-cell, or CAR T-cell, therapy for adult patients with relapsed or refractory diffuse large B-cell lymphoma, a form of non-Hodgkin lymphoma.

UChicago Medicine is also among the first sites in the Midwest certified to offer the therapy for pediatric acute lymphoblastic leukemia (ALL).

Used to supplement forms of cancer treatment like chemotherapy, radiation, and stem cell transplants, CAR T-cell therapy uses modified versions of a patient’s own blood cells to target and destroy cancer cells.

To create CAR T cells, scientists remove some of each patient’s T cells, the workhorses of the immune system. Then they modify the cells to detect both normal and diseased B cells. They grow millions of these modified T cells in the lab and then return the re-programmed T cells to the patient, through a simple intravenous drip. Within a few days, these CAR T cells multiply in the body, then search for diseased B cells and destroy them.

Patients with diffuse large B-cell lymphoma often relapse after standard treatments, but those treated with CAR T-cell therapy have doubled the long-term survival rate. Now, about 50 percent of those patients appear to have lasting complete remissions.

Michael Bishop, MD, professor of medicine, leads the Hematopoietic Stem Cell Transplantation Program for adults and John Cunningham, MD, George M. Eisenberg Professor of Pediatrics, leads the program for pediatrics.

What If Our Immune System Could Treat Cancer Cells Like They Were Just Germs?

1. T cells (the workhorse of the immune system) are collected from the patient’s blood.

2. Scientists insert instructions that enable those T cells to find specific cancer cells.

3. While the T cells multiply in the lab, the patient receives chemotherapy to reduce the number of cancer cells.

4. The engineered T cells are returned to the patient’s bloodstream, where they seek out and kill remaining cancer cells.
Patients with diffuse large B-cell lymphoma often relapse after standard treatments, but those treated with CAR T-cell therapy have doubled the long-term survival rate.

New CAR T-Cell Therapy Gives Patient Hope

While driving the 500 miles from a client in Tennessee to his home in Michigan, Andy Parker, 59, a tool and die engineer, noticed that his lower leg was sore and swollen. He thought it might just be how he was sitting. But, an ultrasound scan revealed three blood clots in that leg and a lethal disease—acute lymphoblastic leukemia (ALL).

Parker immediately began chemotherapy. After one round of treatment: no change. Second round: no change. After unsuccessful treatment at a second institution, Parker was referred to UChicago Medicine and Michael Bishop, MD, professor of medicine and an expert in CAR T-cell therapy, a type of cancer treatment that works by modifying a patient’s own immune system to kill cancer cells.

After CAR T-cell therapy, Parker’s tests showed no leukemia. One month later, a second test confirmed: no cancer. He was back to work after two months and by three months, enjoying what Bishop called “a continuous complete remission.”

Learn more about CAR T-cell therapy at UChicago Medicine by visiting: https://uchicagomedicine.org/defeat-cancer
Pioneering Treatment Option for Abdominal Cancers

Once a cancer has metastasized, or spread, it becomes more difficult to treat. Several cancers, such as colon, ovarian, gastric, and appendix cancer and mesothelioma, spread to the lining of the abdominal cavity called the peritoneum and were historically considered fatal. Not anymore.

“Think about peritoneal metastases as spots of cancer like specks of paint on the walls of a room,” said Kiran Turaga, MD, associate professor of surgery. “These cancers are difficult to see on modern tests including CT scans, MRIs, and PET scans. Often patients are told they are cancer-free, when the cancer is growing inside untreated.”

Turaga has developed expertise in performing a specialized treatment technique called HIPEC (or Heated IntraPeritoneal Chemotherapy), which has also been modified to be delivered laparoscopically in some cases. In a HIPEC procedure, the surgeons first remove any visible cancerous spots from the abdominal cavity. Then, they insert tubes through small incisions and flow about three liters of chemotherapy—about one liter per minute, heated to about 42 degrees centigrade (108° Fahrenheit)—through the abdomen.

“HIPEC is now standard of care for appendix cancer and for mesothelioma,” Turaga said. “The European Society of Medical Oncology considers it standard for patients with colorectal cancer or peritoneal

— Kiran Turaga, MD

(continued on page 18)
A Practice in Compassion

A lifelong Chicagoan, John Cooney says he was well aware of the impact the University of Chicago has had in the city, country, and even the world when he joined the University of Chicago Medical Center Board of Trustees in July 2016. As a plaintiffs’ attorney specializing in mesothelioma litigation, Cooney sees his trusteeship as an intersection between his life’s work and the aspirations he has for his clients, whose experiences have made him an advocate for medical research and funding.

In his mesothelioma practice, Cooney scores wins in the courtroom on behalf of his clients, but he knows that many will ultimately lose their fight with the disease. With current treatment, 90 percent of mesothelioma patients succumb to the disease within one year. Where Cooney gains a sense of optimism for his clients and would-be clients is at the University of Chicago Medicine. His firm, Cooney & Conway, has given $1 million to support the work of Comprehensive Cancer Center researchers including Hedy Lee Kindler, MD, professor of medicine; Kiran Turaga, MD, associate professor of surgery; Thomas Gajewski, MD, PhD, AbbVie Foundation Professor of Cancer Immunotherapy; and Jane Churpek, MD, assistant professor of medicine, who are tackling mesothelioma from different angles. The University of Chicago has one of the largest mesothelioma research and treatment programs in the U.S., drawing patients from throughout the country.

“I’m a lawyer who works for people who have very desperate outcomes and some of the best hope they’ve ever gotten is from this institution,” says Cooney. “Why wouldn’t I help this institution, which is helping my clients—people I’ve come to know, people I’ve come to love in some cases? This is the only break they have.”
carcinomatosis. Next, we need to confirm that for gastric cancer.”

“The synergy between all of us interested in oligometastases [when tumor cells spread to other parts of the body and create new tumors] and specifically peritoneal disease at the University of Chicago is incredible,” Turaga said. “Thought leaders in medical oncology, gynecological oncology, radiation oncology and radiology, amongst other groups, are working together, uniquely blended in with the translational research at the University to forge progress in this disease state.”

Learn more about HIPEC by visiting https://www.uchicagomedicine.org/hipec.

Gaining Hope and Healing After Cancer

Throughout her busy career, Jessica Blackford-Cleeton has provided training on public education and reporting systems to fire departments, fire services organizations, and emergency management groups in Illinois and across the country.

Still, nothing could prepare the 32-year-old for her own crisis. In 2015, following recurring fatigue and abdominal pain, Blackford-Cleeton was diagnosed with mesothelioma, a rare and aggressive cancer that develops in the linings of organs—most often the lungs, where it is linked to asbestos exposure. Blackford-Cleeton’s cancer was in the lining of her abdomen (peritoneal mesothelioma).

With the support and guidance of her care team at UChicago Medicine, she was able to understand and successfully navigate her treatment options. Her treatment included surgery to remove the cancer, followed by HIPEC.

UChicago Medicine is one of the few hospitals that offers HIPEC for both adult and pediatric patients, and Kiran Turaga, MD, is an expert in the specialized procedure. Oncologist Hedy Lee Kindler, MD, the founder and director of UChicago Medicine’s mesothelioma program, led the care team.

Blackford-Cleeton was most concerned about how the extensive surgery might affect her ability to have children. She understood that tumors were in many of her organs and they would have to be removed. Prior to surgery, she gave Turaga a wish list of what she hoped could be spared.

“Dr. Turaga came through—he saved my ovary and even the belly button,” she said. “Everyone was extremely supportive of my goal to start a family.” One year after surgery, she was cleared to begin in vitro fertilization. In August 2017, Jessica and her husband were thrilled to welcome their son, Avery.
A surgical team from the University of Chicago Medicine led by Raymon Grogan, MD, assistant professor of surgery, and Zhen Gooi, MD, assistant professor of surgery, was the first in the Midwest and the fourth in the United States to remove diseased thyroid or parathyroid glands—located at the front of the neck, an inch or two below the chin—using an approach that leaves no visible scar.

The standard thyroid operation has long been performed through a two-inch or longer opening in the neck, known as a transverse-collar incision. This leaves a permanent, obvious scar. The new trans-oral approach, developed by a surgeon in Bangkok, Thailand, was designed to hide the scar. Instead, surgeons make the incision inside the mouth, at the crease between the gums and the lower lip.

“No one but your dentist will see this, and most dentists will not notice,” said Grogran, who directs the endocrine surgery research program at the University of Chicago. “Once the incisions have healed, patients cannot see them.”

The surgeon makes three small incisions in the space where the inside of the lower lip meets the gums. The biggest is 10 millimeters long (less than half an inch), to accommodate a light and a miniature video camera. They then tunnel beneath the skin until they reach the thyroid.

“No one but your dentist will see this, and most dentists will not notice. Once the incisions have healed, patients cannot see them.”
— Raymon Grogan, MD

“From that point on, this is the same anatomy that you see during an open thyroid operation,” Grogan said. “It allows for excellent visualization, maybe better than the open approach, and provides a lot of mobility for the instruments.”
Radiosurgery: Becoming the Treatment of Choice for Spinal Metastases

More than 90 percent of spine tumors are metastatic. They begin somewhere else. Then a small number of cells break loose from the original tumor, enter the bloodstream and travel to the spine.

“Spine mets require aggressive management,” said Sean P. Pitroda, MD, assistant professor of radiation and cellular oncology and a researcher in the University of Chicago’s Ludwig Center for Metastasis Research. “Radiosurgery is currently the best way to treat this, to deliver a very high dose to a really small area.”

Radiosurgery uses high doses of radiation with the precision of microsurgery—but no incision. The process begins with an injection of dye into the thecal sac, a tube that encases the spinal cord. This enables the team to map out the precise location of the spinal cord as it passes through the affected vertebra and, thus, avoid exposing the sensitive, easily damaged cord to radiation.

During therapy, the radiation beam is modulated by 120 tiny collimators, thin metal leaves that are programmed to guide the radiation beams, each a few millimeters wide. They move “like little fingers, in and out to shape the beam in a complex way that leads to maximum tumor-cell kill,” Pitroda said. “That, and lots of planning, is how we administer high doses to the tumor while preventing the beams from hitting healthy structures, such as the spinal cord.”

Smaller doses target tumor cells, primarily damaging their DNA. The larger doses can have the same effect, but they are also thought to damage the blood vessels that feed the tumor and activate an immune response to fight off tumor cells.

“Spine mets require aggressive management. Radiosurgery is currently the best way to treat this, to deliver a very high dose to a really small area.”

— Sean P. Pitroda, MD
Breast Cancer Patient Finds Pain Relief with Radiosurgery

Theresa Barrett was diagnosed with breast cancer in 2009. Her disease at that time was stage one. She and her doctors, at another hospital, were aggressive. They chose to remove both breasts, followed by chemotherapy and five years of estrogen-blocking treatment.

In 2010, she transferred her care to the University of Chicago Medicine. In 2013, her doctors found a new lump under her right arm. Two weeks later, she felt a new pain, this time in her back. Her cancer had metastasized, moved from her breast to one of the bones of her spine—the fourth thoracic vertebra (T4). Surgery wasn’t an option.

Instead, she went through radiation, plus additional chemo, followed by more hormone therapy. She was then introduced to Dr. Pitroda, who recommended radiosurgery.

“Dr. Pitroda told me I was a text-book candidate, that I would respond well and that we should give it a go, just to get rid of the pain.”

Barrett completed all three radiosurgery treatments in December, 2016. Then she had to wait three months for the swelling to go away. “I chose not to get excited,” she recalled. “It’s just another procedure.”

But, in March, a PET scan, and then an MRI, showed no evidence of metastatic disease on T4. This was “a turning point,” Barrett said, “the first time that I’ve had such great news. With this disease, it’s rare to smile when you get results.”

Barrett still has metastatic disease. Tumors on thoracic vertebrae 7 and 8 continue to grow and new ones could emerge at any time. But, the worst of her pain is gone. Barrett has been spending time with her family and can once again take Jack, her neglected Labrador retriever, out for short walks.
Improving Immunotherapy with Nanomedicine

Innovation comes in all shapes and sizes. Wenbin Lin, PhD, James Franck Professor of Chemistry, thinks big when it comes to innovation, but his approach is small—nanomedicine. Lin has teamed up with Ralph Weichselbaum, MD, Daniel K. Ludwig Distinguished Service Professor of Radiation and Cellular Oncology, to improve cancer immunotherapy (mobilizing a person’s immune system to fight cancer) using nanotechnology.

Immunotherapy has recently revolutionized how many cancers are treated, and scientists at the University of Chicago Medicine Comprehensive Cancer Center are leaders in the field from basic immunology research to immunotherapy clinical trials. However, it is not perfect. Many patients do not respond to immunotherapy from the get-go, or they stop responding.

To enhance its effectiveness, Lin and Weichselbaum combined immunotherapy with a type of nanotechnology the Lin laboratory pioneered using metal organic frameworks (MOFs) nanoparticles for photodynamic therapy. The MOFs are loaded with immunotherapy drugs (such as a small molecule inhibitor of indoleamine 2,3-dioxygenase or IDO) and light is used to activate a chain of reactions to destroy the cancer cells and initiate an immune response. In preclinical cancer models, the combination treatment is more potent, and far-reaching, than each are individually.

The team has broadened the scope of their research efforts, observing similar effects by combining photodynamic therapy using nanoscale coordination polymers nanoparticles (rather than MOFs) with checkpoint inhibitor immunotherapies. Next steps also include additional preclinical testing in a range of cancer types and planned early-stage clinical trials.

Nanomedicine is the application of nanotechnology—engineering of functional systems at the molecular scale—to the prevention and treatment of disease.
Helping Researchers Take Cancer Immunotherapy to the Next Level

Family has been a major influence in Elliott Sigal’s life. His father, who worked at Eli Lilly, always encouraged his son to pursue his interests at the highest level, which is how Sigal came to earn a PhD in industrial engineering at Purdue University. “My mother’s struggle with cancer caused me to reflect on where my career would go next,” he said. He entered the Pritzker School of Medicine determined to pursue interdisciplinary research that might someday be life-changing for other families.

Sigal put his training to work in research and development in the pharmaceutical field, ultimately serving as executive vice president and chief scientific officer at Bristol-Myers Squibb from 2004 to 2013. Under his leadership, more than 12 new medicines were brought to market. Among these was the first checkpoint inhibitor for cancer immunotherapy.

“Even though it’s profound when it works, immunotherapy works on fewer patients than we would like to see,” said Elliott Sigal, whose parents both died from cancer at young ages. “I dedicated my post-Bristol-Myers Squibb career to helping researchers take this to the next level.”

To that end, the Sigals endowed UChicago’s first fellowship in cancer immunotherapy this year. The inaugural Elliott Sigal Fellow is Jonathan Trujillo, MD, PhD, whose research seeks to identify tumor-intrinsic oncogene pathways that mediate cancer immune evasion and resistance to immunotherapies. Trujillo is a member of the UChicago laboratory of Thomas Gajewski, MD, PhD, AbbVie Foundation Professor of Cancer Immunotherapy and Pathology, a pioneer in the field of cancer immunotherapy. The Sigals also established the Elliott Sigal Immunology Lectureship.

“The University of Chicago is at the forefront of cancer immunotherapy. ... [They have] made major contributions to this area in the past and we should expect great things in the future.”

— Elliott Sigal
Training Tomorrow’s Scientists through Inventive Initiatives

The South Side of Chicago faces some big challenges—including being hit hard by cancer. One way that the University of Chicago Medicine Comprehensive Cancer Center is addressing this challenge is by inspiring Chicago youth, especially those from population groups underrepresented in the biomedical sciences, to pursue careers in cancer research and medicine.

The Comprehensive Cancer Center was recently awarded a $1.9 million grant from the National Cancer Institute to launch the Chicago EYES (Educators and Youth Enjoy Science) on Cancer program. Key new components of the program include a partnership with the Museum of Science and Industry Chicago and the addition of teachers as program participants who will develop curriculum for their classrooms based on their research experience.

“We believe it’s important for our Cancer Center, located on the South Side, to impact our surrounding community and reach students who might not have an opportunity to learn about cancer research, medicine and biological sciences,” said Eileen Dolan, PhD.

Undergraduate Kelly Perez conducted research in a chemistry laboratory over the summer.

“We believe it’s important for our Cancer Center, located on the South Side, to impact our surrounding community and reach students who might not have an opportunity to learn about cancer research, medicine and biological sciences.”

— Eileen Dolan, PhD
PhD, Professor of Medicine and Associate Director for Cancer Education. “That’s the part that’s so rewarding for us. Once you work with these kids, you see how they get so motivated by the experience. Their excitement is contagious.”

To learn more about the program, visit: http://cancer.uchicago.edu/education

The Center’s research training programs have been supported by Debra and Ira Cohen, Susan and Milo Barrera, Kim Duchossois, the UCCRF Women’s Board, and an anonymous donor.

The 2017 class of high school and undergraduate students participating in the Comprehensive Cancer Center’s programs.

“Once you work with these kids, you see how they get so motivated by the experience. Their excitement is contagious.”

— Eileen Dolan, PhD

High school students Celeste Sanchez, Mahie Gopalka, Alexis James, and Henry Deap participate in the end-of-summer research symposium.
Identifying New Ways to Treat Pediatric Cancer

A diagnosis of cancer can be devastating for a child and his or her family. But there is cause for hope. Advances by specialists at the University of Chicago Medicine Comer Children’s Hospital and other pediatric hospitals have greatly improved outcomes over the years. Fifty years ago, less than 10 percent of childhood cancer patients could be cured. Today, nearly 80 percent of children diagnosed with cancer become long-term survivors, and the majority of them are considered cured.

Our researchers are looking to improve those numbers even further. The stories that follow outline several initiatives that are propelling research discoveries or improving outcomes for kids and teens with cancer.
More than 15,000 children under the age of 20 are diagnosed with cancer each year in the United States, according to the American Cancer Society. Though cancer remains the leading cause of death among children past infancy, childhood cancers account for less than one percent of all cancers diagnosed each year. In comparison, more than 1.6 million adults receive cancer diagnoses annually.

The paucity of pediatric cancer cases has created barriers for researchers. Fewer cases mean fewer technological advancements in treatment driven by synthesizing "big data." And, the pediatric data that do exist are often hard for scientists to access and analyze.

But, University of Chicago researchers are hoping to shift this paradigm by creating a comprehensive Pediatric Cancer Data Commons (PCDC) that centralizes data and makes it easily accessible to the entire research community. "We’ve always had the problem in pediatric cancer, that there are just not enough data to study," said Sam Volchenboum, MD, PhD, associate professor of pediatrics and director of the University of Chicago Center for Research Informatics (CRI).

Many advances in pediatric cancers, Volchenboum added, have relied on data from large consortium clinical trials, such as those out of the Children’s Oncology Group (COG). The COG is supported by the National Cancer Institute (NCI), and is the world’s largest organization devoted exclusively to childhood and adolescent cancer research. "It is a way to collect all these patients together," Volchenboum said. "But, the data still remain sequestered in Excel spreadsheets or in peoples’ computers."

In 2004, recognizing a need for centralized data, researchers from North America, Europe, Australia and Japan formed the International Neuroblastoma Risk Group (INRG) Task Force, co-chaired by Susan Cohn, MD, professor of pediatrics. This task force gathered and standardized data from 8,800 patients with neuroblastoma—a cancer that starts in the nerve cells of developing embryos—and continued to add data during the following decade.

But, despite their efforts, the data still remained in a large spreadsheet that required a lengthy approval process to access. Furthermore, the clinical data were not linked to patient genomic data, leaving researchers with an incomplete picture. And, researchers could not easily determine the availability of patient biospecimens housed at the COG biorepository in Columbus, Ohio.

In 2012, Volchenboum and Cohn set out to overcome these limitations by using philanthropic funding from The William Guy Forbeck Research Foundation to take the INRG neuroblastoma data and turn it into a “living” database housed on a searchable website. This allowed researchers to easily search for the information they needed, including biospecimen availability.

"The INRG data are available to investigators from around the world for research studies. Many of these studies evaluated small patient cohorts and the analysis would not have been possible without the large numbers of patients included in the INRG Data Commons.”

— Susan Cohn, MD
A Super Start for Pediatric Cancer ‘Game Changer’

Plans to build at the University of Chicago a Pediatric Cancer Data Commons (PCDC), a globe-spanning database focused exclusively on pediatric cancers, recently got a boost from Sammy’s Superheroes Foundation. The Columbus, NE-based foundation committed $400,000 over four years to the database project, which is overseen by Susan Cohn, MD, and Samuel Volchenboum, MD, PhD.

The nonprofit, tax-exempt foundation sprang from grassroots support for Sammy Nahorny, who in 2012 was diagnosed with neuroblastoma at the age of four. Two years later, when Sammy didn’t respond to surgery, chemotherapy, and a stem cell transplant, his family brought him to University of Chicago Medicine Comer Children’s Hospital to receive an innovative treatment. He was isolated in a lead-lined room while a team led by Cohn administered intensive MIBG therapy, which destroys tumor cells while leaving healthy tissue intact.

Today, Sammy is a healthy, well-adjusted 9-year-old whose mother, Erin, says shows no signs of the journey he went through on his way to recovery.

Erin notes that the gift to PCDC fits perfectly with the mission of Sammy’s Superheroes to raise awareness and much needed funding for research of all types of childhood cancer. “This project is just so exciting because of the implication it has on any child with cancer,” she adds. “There’s a big picture here. Connecting doctors and researchers across the country and world to a common database...brings together everyone with a shared voice.”

— Erin Nahorny
National Center for Biotechnology Information’s Gene Expression Omnibus. This provided a link between available genomic data with the INRG database’s de-identified clinical patient information, such as basic demographics, tumor profile, and treatment regimen. The searchable database now houses data from more than 19,000 neuroblastoma patients from around the world.

“Gradually, we were starting to see the power of what we could do here,” Volchenboum said.

Soon, he was being approached by pediatric researchers who hoped to create similar databases in other cancer types, demonstrating the need for a more comprehensive data commons for all pediatric cancers.

“Most of the commons for genomic data are not going to be undertaking the difficult task of harmonizing the clinical elements, and I think that’s where this PCDC is going to be really valuable,” he said. “This is the only way we’re going to be able to collect and share data between international groups.”

With the appropriate funding, Volchenboum believes the team could get the PCDC up and running in 2–3 years. He hopes it
will encourage more data sharing among researchers and help inform the design of future clinical trials. “Once this is built, I think it’s actually going to drive the research,” he said.

The PCDC team has already received philanthropic support from Sammy’s Superheroes Foundation, which committed $400,000 over four years to the project (see story on pg. 29). And, they have also received funding from the Rally Foundation.

“The PCDC has the promise of leveraging the success of the INRG to other pediatric cancers, accelerating research and hopefully improving survival,” Cohn said. “As the genomic data gets more rich, additional studies will be able to be conducted that we hope will lead to a better understanding of the genomic factors that drive clinically aggressive tumor growth.”

While they work to develop the PCDC, Volchenboum and Grossman will also lend their expertise to a new five-year, $14.8 million effort by the National Institutes of Health (contingent upon available funding) to improve the understanding of inherited diseases.

The project, known as the Gabriella Miller Kids First pediatric data resource center, will be a multi-centered effort led by investigators at the Center for Data Driven Discovery in Biomedicine at the Children’s Hospital of Philadelphia (CHOP).

Teams led by Grossman and Volchenboum will design and operate the cloud-based, open-source software needed to establish the data coordination center within the Kids First data resource center. Volchenboum hopes the PCDC at the University of Chicago will help provide valuable clinical data to this new genomic commons for pediatric cancer.

“The PCDC has the promise of leveraging the success of the INRG to other pediatric cancers, accelerating research and hopefully improving survival.”

— Susan Cohn, MD

Pediatric Treatment Regimens Benefit Adolescents and Young Adults

Each year, about 70,000 patients aged 15–39 in the U.S. are diagnosed with cancer, according to the National Cancer Institute, with blood cancers making up 20 percent of those cases.

In 2012, Wendy Stock, MD, Anjuli Seth Nayak, Professor in Leukemia, and Jennifer McNeer, MD, assistant professor of pediatrics, collaborated on the development of the Adolescent and Young Adult (AYA) Oncology Program to address the unique challenges that this population faces during treatment.
The program was the first of its kind in the Midwest, and was established based on research conducted by Stock, Richard Larson, MD, professor of medicine, and the late James Nachman, MD. Their research found that AYA patients newly diagnosed with acute lymphoblastic leukemia (ALL) were more successfully treated using pediatric treatment protocols rather than adult treatment regimens.

“We were seeing that young adult patients aged 21–30 with ALL didn’t do as well as younger patients aged 16–20 who were treated by pediatricians,” Stock said. “The difference in survival rate was 30 percent. It became a focus of my clinical work to explore this disparity. It showed that the whole environment, not just the treatment, all has an impact on patient outcomes.”

Based on their research, the team modified the University of Chicago’s AYA program to bring medical oncology and pediatric oncology together, using a multidisciplinary, team approach. The two programs, including their physicians, nurses, and staff, collaborate on each patient case to determine the best course of care for each individual patient.

AYA patients often don’t have the support necessary to cope with cancer diagnosis, treatment, and survivorship, and it can be a challenge to ensure that AYA patients follow through with their treatment. “Our use of pediatric treatment models allow for more time spent with patients, in terms of financial, psychological and educational support,” Stock said.

Recently, Tara Henderson, MD, associate professor of pediatrics, led the first large retrospective analysis1 of AYAs with Hodgkin lymphoma who were treated on recent North American clinical trials. The study compared failure-free and overall survival rates between patients treated on the Eastern Cooperative Oncology Group-American College of Radiology Imaging Network Intergroup adult E2496 study and patients treated on the pediatric Children’s Oncology Group (COG) AHOD0031 study. Her team found that younger AYA patients with Hodgkin lymphoma appear to have better outcomes when treated on a pediatric clinical trial than patients of similar age on an adult clinical trial.

Dr. Henderson is currently leading a newly activated COG high-risk neuroblastoma survivorship trial.

1 Henderson et al., Cancer, 2017 [Epub ahead of print]
CAR T-Cell Therapy for Pediatric ALL

The University of Chicago Medicine is among the first sites in the Midwest certified to offer chimeric antigen receptor T-cell, or CAR T-cell, therapy for pediatric acute lymphoblastic leukemia (ALL), which was approved in August by the U.S. Food and Drug Administration.

Used to supplement forms of cancer treatment like chemotherapy, radiation and stem cell transplants, CAR T-cell therapy works by using modified versions of a patient’s own blood cells to target and destroy cancer cells.

“CAR T-cell therapy has revolutionized the treatment of acute lymphoblastic leukemia,” according to cancer specialist John Cunningham, MD, chair of pediatrics at the University of Chicago and physician-in-chief at Comer Children’s Hospital. “I came to the United States 30 years ago with the intent to work on therapies such as this. We need focused treatments like this that can eradicate particular types of cancer.”

Pediatric ALL is a rapidly progressive leukemia that primarily affects children and young adults, from age 3 to 25. Nearly 3,100 patients under 21 years old in the U.S. will be diagnosed with ALL this year. Ninety percent (20 out of 22) of pediatric patients with ALL enrolled in early CAR T-cell clinical trials throughout the country went into lasting remission.

Read more on page 14.
Center of Innovation
By The Numbers

The Cancer Registry reports on patients who were newly diagnosed and/or received their first course of treatment for cancer progression or recurrent disease at the University of Chicago Medicine. The total number of patients seen with cancer, including all consult visits, is higher.

### Cancer Incidence by Type

#### 2016 Cancer Cases by Site

<table>
<thead>
<tr>
<th>Primary Site</th>
<th>Newly Diagnosed</th>
<th>Recurrent/Progressive Disease</th>
<th>Total</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digestive System</td>
<td>657</td>
<td>120</td>
<td>777</td>
<td>17.4%</td>
</tr>
<tr>
<td>Male Genital System</td>
<td>559</td>
<td>102</td>
<td>661</td>
<td>14.8%</td>
</tr>
<tr>
<td>Breast</td>
<td>499</td>
<td>70</td>
<td>569</td>
<td>12.7%</td>
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<tr>
<td>Urinary System</td>
<td>344</td>
<td>83</td>
<td>427</td>
<td>9.5%</td>
</tr>
<tr>
<td>Respiratory System</td>
<td>330</td>
<td>84</td>
<td>414</td>
<td>9.2%</td>
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<tr>
<td>Female Genital System</td>
<td>251</td>
<td>69</td>
<td>320</td>
<td>7.1%</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>177</td>
<td>43</td>
<td>220</td>
<td>4.9%</td>
</tr>
<tr>
<td>Oral Cavity, Larynx and Pharynx</td>
<td>173</td>
<td>24</td>
<td>197</td>
<td>4.4%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>160</td>
<td>32</td>
<td>192</td>
<td>4.3%</td>
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<tr>
<td>Endocrine System*</td>
<td>156</td>
<td>19</td>
<td>175</td>
<td>3.9%</td>
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<tr>
<td>Brain and Other Nervous System**</td>
<td>104</td>
<td>21</td>
<td>125</td>
<td>2.7%</td>
</tr>
<tr>
<td>Skin (Excluding Basal and Squamous)</td>
<td>72</td>
<td>28</td>
<td>100</td>
<td>2.2%</td>
</tr>
<tr>
<td>Myeloma</td>
<td>71</td>
<td>23</td>
<td>94</td>
<td>2.1%</td>
</tr>
<tr>
<td>Miscellaneous***</td>
<td>67</td>
<td>11</td>
<td>78</td>
<td>1.7%</td>
</tr>
<tr>
<td>Mesothelioma</td>
<td>29</td>
<td>26</td>
<td>55</td>
<td>1.2%</td>
</tr>
<tr>
<td>Soft Tissue</td>
<td>36</td>
<td>5</td>
<td>41</td>
<td>1.1%</td>
</tr>
<tr>
<td>Bones and Joints</td>
<td>11</td>
<td>4</td>
<td>15</td>
<td>0.9%</td>
</tr>
<tr>
<td>Eye and Orbit</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

**Total** | 3,697 | 768 | 4,465 | 100%**

* includes benign pituitary adenomas
** includes benign neoplasms
*** includes blood dyscrasias, myelodysplastic/myeloproliferative disorders and cancers with other histology/primary site designations
**Patient Demographics**

2016 Cancer Cases by Race/Ethnicity

- **4,465** Patients
  - 1,127 African American
  - 290 Hispanic
  - 13 Asian
  - 12 Asian Pacific Islander
  - 7 American Indian
  - 197 Unknown Race

- **2,819** White

**Patient Geographics**

2016 Patient Residence at Diagnosis

- **3,464** Illinois Patients
  - 1,003 Out-of-state Patients
  - 7 Out-of-country Patients

**Number of Patients Enrolled in Therapeutic Clinical Trials in 2016**

<table>
<thead>
<tr>
<th>Disease Category</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>66</td>
</tr>
<tr>
<td>Colorectal</td>
<td>21</td>
</tr>
<tr>
<td>Kidney, Bladder, Urinary Tract</td>
<td>42</td>
</tr>
<tr>
<td>Stomach, Esophagus, Pancreas and Liver</td>
<td>38</td>
</tr>
<tr>
<td>Skin</td>
<td>12</td>
</tr>
<tr>
<td>Lymphoma, Mesioblastoma</td>
<td>56</td>
</tr>
<tr>
<td>Advanced Solid Tumor</td>
<td>226</td>
</tr>
<tr>
<td>Head and Neck</td>
<td>47</td>
</tr>
<tr>
<td>Cervix, Ovarian, Uterus, Fallopian</td>
<td>59</td>
</tr>
<tr>
<td>Leukemia, Lymphoma, Multiple Myeloma</td>
<td>43</td>
</tr>
<tr>
<td>Prostate</td>
<td>0</td>
</tr>
<tr>
<td>Thyroid</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>
Moving Cancer Care Forward

2016
Ingalls Health System and UChicago Medicine merge
New outpatient facility opens in Orland Park
Installation of the cyclotron research facility

2017
UChicago Medicine certified to offer breakthrough CAR T-cell therapy
Center for Supportive Oncology opens in the Duchossois Center for Advanced Medicine
Renovation of the chemotherapy infusion suite
Teen Lounge opens in the Adolescent and Young Adult Clinic at Comer Children’s Hospital

2018–2022
Renovation of Bernard A. Mitchell Hospital to become a dedicated cancer hospital

Peer-Reviewed Cancer Research Grants
Awarded to Members (as of September 1, 2017)

$41,164,391 Total of peer-reviewed project direct costs

$19,467,920 Other NIH peer-reviewed projects

$18,561,353 NCI peer-reviewed projects

$3,358,333 Other peer-reviewed projects

$45K
New Comprehensive Cancer Center Members

We added 15 cancer researchers to our team

Peter Angelos, MD, PhD
Professor of Surgery
Research interests: thyroid and endocrine oncology and surgery, medical ethics

Mark Applebaum, MD
Assistant Professor of Pediatrics
Research interests: neuroblastoma and sarcomas, tumor genomics

Kenneth Bader, PhD
Assistant Professor of Radiology
Research interests: radiology, tissue ablation

Talia Baker, MD
Associate Professor of Surgery
Research interests: liver transplant, organ donation

Nicolas Chevrier, PhD
Assistant Professor of Molecular Engineering
Research interests: bioengineering, immune response, vaccination

Emily Curran, MD
Clinical Instructor of Medicine
Research interests: immune resistance in leukemia

Ami Desai, MD
Assistant Professor of Pediatrics
Research interests: neuroblastoma and sarcomas, drug development and toxicities

Michaela Gack, PhD
Associate Professor of Microbiology
Research interests: virology, immune function and defense
Chih-Yi Liao, MD
Assistant Professor of Medicine
Research interests: thyroid and gastrointestinal oncology, clinical trials

Gokhan Mutlu, MD
Professor of Medicine
Research interests: lung injury and disease, air pollution

Anjana Pillai, MD
Associate Professor of Medicine
Research interests: transplant hepatology, viral hepatitis, and hepatocellular carcinoma

Sean Pitroda, MD
Assistant Professor of Radiation and Cellular Oncology
Research interests: brain and spine oncology, radiosurgery

Christina Son, MD
Assistant Professor of Radiation and Cellular Oncology
Research interests: lung, gynecologic, and breast oncology, molecular basis for treatment

Randy Sweis, MD
Instructor of Medicine
Research interests: genitourinary oncology, immunotherapy

Lixing Yang, PhD
Assistant Professor, Ben May Department for Cancer Research
Research interests: computational data sets, new drug targets
Cancer Center Members

**Molecular Mechanisms of Cancer**

**Program Leaders**
Suzanne Conzen, MD, and Kay Macleod, PhD

Nishant Agrawal, MD
Lev Becker, PhD
Eric Beyer, MD, PhD
Suzanne Conzen, MD
Bryan Dickinson, PhD
Wei Du, PhD
Nickolai Dulin, PhD
Geoffrey Greene, PhD
Tong-Chuan He, MD, PhD
Yu Ying He, PhD
Akira Imamoto, PhD

Jessica Kandel, MD
Stephen Kron, MD, PhD
Bruce Lahn, PhD
Deborah Lang, PhD*
Ernst Lengyel, MD, PhD
Anning Lin, PhD
Hue Luu, MD
Kay Macleod, PhD
Raymond Moellerling, PhD
Gokhan Mutlu, MD
Marcelo Nobrega, MD, PhD
Tao Pan, PhD
Sean Pitroda, MD
Glenn Randall, PhD
Ilaria Rebay, PhD
Carrie Rinker-Schaeffer, PhD
Bernard Roizman, ScD
Marsha Rosner, PhD
Benoit Roux, PhD
Alex Ruthenburg, PhD
Michael Spiotto, MD, PhD
Wei-Jen Tang, PhD
Donald Vander Griend, PhD
Samuel Volchenboum, MD, PhD
Kevin White, PhD
Chung-I Wu, PhD
Xiaoyang Wu, PhD
Lixing Yang, PhD
Yingming Zhao, PhD

**Hematopoiesis and Hematological Malignancies**

**Program Leaders**
Wendy Stock, MD, and Lucy Godley, MD, PhD

Farah Abdulla, MD
John Anastasi, MD
Andrew Artz, MD
Beverly Baron, MD
Michael Bishop, MD
Jason Cheng, MD, PhD
Jane Churpek, MD
Kenneth Cohen, MD
Jill de Jong, MD, PhD
Lucy Godley, MD, PhD

Fotini Gounari, PhD, DSc
Sandeep Gurbuxani, MBBS, PhD
Elizabeth Hyjek, MD, PhD
Andrzej Jakubowiak, MD, PhD
Barbara Kee, PhD
Richard Larson, MD
Michelle Le Beau, PhD
Zejuan Li, MD, PhD
Hongtao Liu, MD, PhD
Susana Marino, MD, PhD
Jennifer McNeer, MD
Megan McNerney, MD, PhD
Olatoyosi Odenike, MD
Sonali Smith, MD
Wendy Stock, MD
Michael Thirman, MD
Girish Venkatakraman, MD
James Vardiman, MD (emeritus)*
Y. Lynn Wang, MD, PhD
Amittha Wickrema, PhD
Todd Zimmerman, MD*

**Immunology and Cancer**

**Program Leaders**
Thomas Gajewski, MD, PhD, and Peter Savage, PhD

Erin Adams, PhD
Maria-Luisa Alegre, MD, PhD
Albert Bendelac, MD, PhD
Nicolas Chevrier, PhD
Anita Chong, PhD
Marcus Clark, MD
Emily Curran, MD
Michaela Gack, PhD
Thomas Gajewski, MD, PhD
Tatyana Golovkina, PhD
Jun Huang, PhD
Seungmin Hwang, PhD
Bana Jabri, MD, PhD
Justin Kline, MD
James LaBelle, MD, PhD
Peter Savage, PhD
Hans Schreiber, MD, PhD
Anne Sperling, PhD
Melody Swartz, PhD
Patrick Wilson, PhD
Clinical and Experimental Therapeutics

Program Leaders
Walter Stadler, MD, and M. Eileen Dolan, PhD
Mark Applebaum, MD
Talia Baker, MD
Douglas Bishop, PhD
Elizabeth Blair, MD
Daniel Catenacci, MD
David Chang, MD
Steven Chmura, MD, PhD
Susan Cohn, MD
Philip Connell, MD
Ami Desai, MD
M. Eileen Dolan, PhD
Scott Eggener, MD
Mark Ferguson, MD
Gini Fleming, MD
Olwen Hahn, MD
Daniel Haraf, MD
John Hart, MD
Rex Haydon, MD, PhD
Chuan He, PhD
Philip Hoffman, MD
R. Stephanie Huang, PhD*
Edwin Kaplan, MD
Theodore Karrison, PhD
Hedy Kindler, MD
Chih-Yi Liao, MD
Wenbin Lin, PhD
Marcy List, PhD
Jason Luke, MD
Yusuke Nakamura, MD, PhD
Rita Nanda, MD
Peter O’Donnell, MD
Jyoti Patel, MD
Akash Patnaik, MD, PhD
Anjana Pillai, MD
Louis Portugal, MD
Mitchell Posner, MD
Mark Ratain, MD
Kevin Roggin, MD
Jeremy Segal, MD, PhD
Tanguy Seiwert, MD
Arieh Shalhav, MDw
Manish Sharma, MD
Christina Son, MD
David Song, MD*
Walter Stadler, MD
Gary Steinberg, MD
Randy Sweis, MD
Russell Szumulewitz, MD
Kiran Turaga, MD
Everett Vokes, MD
Ralph Weichselbaum, MD
S. Diane Yamada, MD
Bakhtiar Yamini, MD
Chun-Su Yuan, MD, PhD

Advanced Imaging

Program Leaders
Greg Karczmar, PhD, and Aytekin Oto, MD
Hiroyuki Abe, MD
Hania Al-Hallaq, PhD
Daniel Appelbaum, MD
Samuel Armato, PhD
Issam Awad, MD
Bulent Aydogan, PhD
Kenneth Bader, PhD
Chin-Tu Chen, PhD
Abraham Dachman, MD
Maryellen Giger, PhD
Howard Halpern, MD, PhD
Yulei Jiang, PhD
Chien-Min Kao, PhD
Gregory Karczmar, PhD
Anthony Kossiakoff, PhD
Patrick La Riviere, PhD
Stanley Liuw, MD
Heber MacMahon, MB, BCh
Aytekin Oto, MD
Xiaochun Pan, PhD
Charles Pelizzari, PhD*
Yonglin Pu, MD, PhD
Steffen Sammet, MD, PhD

Cancer Prevention and Control

Program Leaders
Habibul Ahsan, MBBS, MMedSc, and Andrew King, PhD
Habibul Ahsan, MBBS, MMedSc
Peter Angelos, MD, PhD
Marc Bissonnette, MD
Eugene Chang, MD
Brian Chiu, PhD
Rena Conti, PhD
William Dale, MD, PhD*
Christopher Daugherty, MD
Jonas de Souza, MD*

Harriet de Wit, PhD
Anna Di Rienzo, PhD
James Dignam, PhD
David Grdina, PhD
William Green, PhD
Raymon Grogan, MD
Yasmin Hasan, MD
Donald Hedeker, PhD
Tara Henderson, MD
Susan Hong, MD*
Dezheng Huo, MD, PhD
Neil Hyman, MD
Yuan Ji, PhD
Nora Jaskowiak, MD
Yuan Ji, PhD
Karen Kim, MD
Andrea King, PhD
Sonia Kupfer, MD
Nita Lee, MD, MPH
Yan Chun Li, PhD
Stacy Tessler Lindau, MD
Mark Lingen, DDS, PhD
Martha McClintock, PhD
Daniel McGeehee, PhD
David Meltzer, MD, PhD
Olufunmilayo Olopade, MBBS
Aasim Padela, MD, MSc
Joel Pekow, MD
Brandon Pierce, PhD
Blase Polite, MD
Iris Romero, MD
David Rubin, MD
Fabrice Smieliauskas, PhD
Irving Waxman, MD

Not Aligned
John Cunningham, MBCh, MSc
Yoav Gilad, PhD
Benjamin Glick, PhD
Robert Grossman, PhD
Julian Solway, MD

*members during some of the reporting period but have since retired, left, are leaving by end of the year or have a change in research focus
Member Honors

Chuan He, PhD, John T. Wilson Distinguished Service Professor, was awarded the Paul Marks Prize for Cancer Research, which recognizes a new generation of leaders in cancer research, who are making significant contributions to the field.

Thomas Gajewski, MD, PhD, professor of pathology and medicine, received the 2017 William B. Coley Award for Distinguished Research in Tumor Immunology.

Bernard Roizman, ScD, Joseph Regenstein Distinguished Service Professor of Virology, was awarded the 2017 Selman A. Waksman Award in Microbiology from the National Academy of Sciences.

Olufunmilayo I. Olopade, MBBS, FACP, Walter L. Palmer Distinguished Service Professor of Medicine, received the American Society of Clinical Oncology’s 2017 Humanitarian Award at the ASCO Annual Meeting. She was also named as a Komen Scholar.

Nishant Agrawal, MD, professor of surgery, is a member of the 2017 International Liquid Biopsy Initiative Team, which received the American Association for Cancer Research’s 2017 Team Science Award.

Endowed Professorships

Robert Grossman, PhD, professor of medicine, director of the Center for Data Intensive Science, and Co-PI of the NCI Genomic Data Commons, has been named the Frederick H. Rawson Professor.

Sonali Smith, MD, professor of medicine, was named the Elwood V. Jensen Chair, Department of Medicine.

John Cunningham, MD, Donald N. Pritzker Professor of Pediatrics, has been named the George M. Eisenberg Professor in Pediatrics and the College.

Thomas Gajewski, MD, PhD, professor of pathology and medicine, was named the Abbvie Foundation Professor of Cancer Immunotherapy.

Rex Haydon, MD, PhD, professor of orthopedic surgery, has been named the Simon and Kalt Families Professor in Orthopaedic Surgery.

Faculty Appointments

Nishant Agrawal, MD, professor of surgery, was appointed Chief of the Section of Otolaryngology-Head and Neck Surgery.

Karen Kim, MD, professor of medicine, was appointed Associate Director for Community Engagement and Cancer Disparities for the Comprehensive Cancer Center.

Anne Sperling, PhD, was appointed as Associate Vice Chair for Research for the Department of Medicine.

Daniel McGehee PhD, associate professor of anesthesia and critical care, was appointed as Chair of the Committee on Neurobiology.
The University of Chicago Cancer Research Foundation

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As the UCCRF’s governing body, the Board of Trustees builds a strong culture of philanthropy and supports all modalities of fundraising to ensure that the cancer faculty and researchers achieve their aspirations. The UCCRF Board of Trustees is made up of the presidents of the subsidiary boards, representatives of other foundations, and distinguished philanthropists. This wealth of experience and knowledge provides counsel, guidance, and support for the UCCRF.

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The UCCRF Auxiliary Board comprises 30 women who actively work toward raising funds for selected research doctors. Each doctor receives funds for three years. Currently, the Auxiliary Board is serving a commitment to support the research of Mark Applebaum, MD, assistant professor of pediatrics, Jane Churpek, MD, assistant professor of medicine, and Nita Lee, MD, PhD, assistant professor of obstetrics/gynecology. Since its inception, the Auxiliary Board has raised almost $3 million for cancer research.

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The Auxiliary Board has raised almost $3M for selected research doctors—with each doctor receiving funds for three years.
The Women’s Board allocated a record-breaking $1.7M to support innovative experimentation that would otherwise remain unexplored.

Women’s Board

The UCCRF Women’s Board was established in 1947 and has allocated more than $17.5 million in funding for cancer research at UChicago. The Women’s Board invests in innovative experimentation, enabling UChicago scientists to pursue promising avenues of investigation that would otherwise remain unexplored. In 2017, the Board allocated a record-breaking $1.7 million to support the following efforts:

- The Microbiome and Cancer
- The Cancer Epitranscriptome
- Team Science
- Ben May Department for Cancer Research
- Janet D. Rowley Discovery Fund
- Spotlight: Prostate Cancer
- Spotlight: Women’s Cancer
- Spotlight: Pediatric Cancer
- Human Tissue Resource Center
- Committee on Cancer Biology
- Personalized Cancer Treatments

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The Associates Board has provided more than $475K in funding to underwrite mesothelioma and immunology research.
Janet D. Rowley had great ideas—transformative ideas. She identified the genetic basis for leukemia, confirming that cancer is a genetic disease. The powerful impact of her work is still felt decades later.

Sadly, many of today’s most promising ideas in cancer research are never pursued due to a lack of resources. Without funding, visionary researchers like Janet D. Rowley are unable to conduct the innovative science that can change the way we diagnose and treat cancer.

That’s where you come in.

Your gift to the Janet D. Rowley Discovery Fund will support great ideas and the researchers who are devoted to tackling cancer from every angle.

To make your gift, visit donatetocancer.uchicago.edu.

Providing the gift of venture investing in the name of a legend. For more information and to learn about becoming a Janet D. Rowley Discovery Fund Visionary, please contact us at 773-772-6565 or RowleyFund@bsd.uchicago.edu.
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