Annual Report 2015
In 2000, the 27,000-plus-square-foot Simmons Cancer Center Clinic was established in the Seay Biomedical Building, providing a central location for oncology services and related care.

Dr. James K.V. Willson was named Director in 2004. He launched a five-year plan to develop a “matrix” cancer center, building bridges among disciplines to ensure translation of cancer discoveries to patient care.

### Setting the Stage

In 1988, a $41 million gift from Dallas businessman Harold Simmons and his wife, Annette, provided seminal funds to transform cancer research and care at UT Southwestern. In 1991, the Harold C. Simmons Comprehensive Cancer Center was established.

Pioneering work by Drs. John Minna and Adi Gazdar opened the door in 1996 for Simmons Cancer Center to receive a flagship Specialized Program of Research Excellence grant—a highly competitive award in lung cancer that continues today.

### HAROLD C. SIMMONS COMPREHENSIVE CANCER CENTER

#### Building Momentum

**2005**

The continuing generosity of Mr. and Mrs. Simmons propels the Cancer Center forward, notably through a $50 million commitment to ensure UT Southwestern’s eminence in care and research for all types of cancer.

Extramural funding for Simmons Cancer Research totals $53 million.

The Cancer Center launches its Chemistry and Cancer, Development and Cancer, Cancer Cell Networks, and Molecular Pathogenesis and Therapeutic Targeting of Cancer scientific programs with institutional leadership from Drs. Melanie Ledda, Luis Parada, Steve McKnight, and John Minna to shed new light on factors that cause and promote cancer, and on the disease’s vulnerabilities and potential therapies. Cell biologist Dr. Michael White is named Associate Director for Basic Research.

A $9.8 million grant from NASA fuels research into the effects of radiation on astronauts, to better protect future space travelers and learn more about the risks of radiation exposure on Earth.

The Foundation for the Accreditation of Cellular Therapy (FACT) awards accreditation to UT Southwestern’s adult bone marrow transplant program, and the Myelodysplastic Syndromes Foundation recognizes UT Southwestern as a Center of Excellence in research, diagnosis, and treatment.

The Department of Radiation Oncology begins its residency training program, the first in the Dallas-Fort Worth area.

**2006**

Noted lung cancer specialist Dr. Joan Schiller is appointed Deputy Director to lead the growth of Simmons Cancer Center’s Disease-Oriented Teams (DOT).

A cooperative training program for oncology nursing students from Texas Christian University is created in Simmons Cancer Center Clinics.

The Advanced Imaging Research Center (AIRC) is established within the new Bill and Rita Clements Advanced Medical Imaging Building. The AIRC has become a leader in developing new magnetic resonance and other imaging technologies to shed light on cancer and other diseases.

The newly constructed T. Boone Pickens Biomedical Research Building opens on UT Southwestern’s North Campus, giving Simmons Cancer Center faculty more than 32,000 square feet of laboratory space.

Moncrief Cancer Foundation commits $20 million over 10 years to establish community outreach programs focused on cancer prevention and survivorship. Dr. Keith Agerbright is appointed Medical Director of UT Southwestern’s Moncrief Cancer Resources.

Texas voters approve a $3 billion, 10-year initiative that establishes the Cancer Prevention and Research Institute of Texas, an agency whose mission is to secure the state’s future and attract biotech companies to the region.

**2007**

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The Annette Simmons Stereotactic Treatment Center at Zale Lipshy University Hospital is founded with support from Harold and Annette Simmons through UT Southwestern’s Innovations in Medicine capital campaign.

**2008**

UT Southwestern establishes a new biotech park, called BioCenter at Southwestern Medical District, to develop technologies and attract biotech companies to the region.

UT Southwestern’s bone marrow transplant program is accredited as a joint program with Children’s Medical Center Dallas.

**2009**

Zale Lipshy University Hospital receives the inaugural American College of Surgeons Commission on Cancer Outstanding Achievement Award. Fewer than 1 in 5 evaluated hospitals earn the award.

UT Southwestern’s Cancer Biology Graduate Program receives approval from the Texas Higher Education Coordinating Board; within five years, the program will have grown to include about 50 faculty members and 20 departments.

UT Southwestern is named a pilot center for the National Cancer Institute’s Cancer Target Discovery and Development Network, an initiative designed to translate masses of genomic data about cancers into strategies for treating patients.

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The state agency devoted to fighting cancer, the Cancer Prevention and Research Institute of Texas, funds its first research grants. By late 2015, the agency will have awarded more than $1.47 billion in grants, including $316 million to UT Southwestern, the most of any institution.

The Breast Screening and Patient Navigation program at Simmons Cancer Center, designed to help patients, family members, and others get answers to general questions about cancer and to better navigate care—makes its debut. In its first year, the Answer Line responds to more than 2,000 queries from the public.

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Breast cancer screening, as a tool to combat the disease throughout a woman’s lifetime, is a basic tenet of modern medicine. This year, UT Southwestern is launching a new, comprehensive program to make screening easier for women of all ages.

The new, 522 million, 60,000-square-foot Moncrief Cancer Institute in Fort Worth is dedicated, offering the latest in clinical care and access to clinical trials to residents of Tarrant and 10 other counties.

Three-Year with Commendation at the Gold Level. The American College of Surgeons Commission on Cancer awards this recognition as one of the nation’s top cancer hospitals by U.S. News and World Report magazine, offering the latest in clinical care and access to clinical trials.

A 54.8 million Cancer Prevention and Research Institute of Texas award to Moncrief Cancer Institute, the largest preventive grant the agency has awarded, funds the Complementary Screening and Patient Navigation program. The program provides free colon cancer screening and assistance with follow-up care for patients in Tarrant and 20 surrounding rural counties.

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DIRECTOR’S MESSAGE

FROM FOUNDATIONS TO FULFILLMENT

For cancer care in North Texas, 2005-2015 has been a defining decade. Ten years ago, Simmons Comprehensive Cancer Center set the loftiest of goals—to meet the community’s many and varied cancer-related needs through 1) outstanding achievement in biomedical research; 2) exceptional patient care; 3) a rich training environment for the physicians and scientists of tomorrow; and 4) aggressive outreach to provide more North Texans with lifesaving prevention and early detection.

In just five years, Simmons Cancer Center earned National Cancer Institute (NCI) designation recognizing achievement in those areas, a milestone that also has opened some of the most advanced national clinical trials to local cancer patients. And now, after just another five years, Simmons has been awarded “comprehensive” designation from the NCI, becoming one of only three such top-tier institutions in the state and the only one in North Texas. The designation recognizes superior cancer care and prevention programs, along with pacesetting science and technology.

Those strides testify to the commitment of the Cancer Center’s 173 members—the people behind the ideas, inspiration, industry, and innovation that have propelled a decade of progress in the lab, the clinic, and the community. And this decade of achievement would not have been possible without a vanguard of visionaries who set in place the cornerstones upon which today’s Cancer Center has been built.

A VISION TAKES SHAPE

The center itself—designed with the goal of transforming cancer care and research at UT Southwestern—was established in 1991 through the generosity of local philanthropists Harold and Annette Simmons and shepherded with the commitment of UT Southwestern leadership. Around that time, Dr. John Minna began building a research framework focused on conveying basic-science discoveries to patients’ bedside care. And his work with longtime collaborator Dr. Adi Gazdar, probing the biology of lung cancer, brought the Cancer Center its flagship and long-running multi-investigator grant, a Specialized Program of Research Excellence (SPORE) award.

By the middle of the last decade, more support from the Simmonses, a five-year plan to build a “matrix” cancer center to foster scientific teamwork, and institutional dedication of resources and talent propelled the dynamic era that continues today. Scientific leadership by Drs. Steve McKnight, Melanie Cobb, Luis Parada, and Dr. Minna bridged departments and disciplines, bringing together investigators with a wide range of technical and medical expertise. These collaborations coalesced into scientific programs designed to tackle cancer’s complicated challenges and to deliver impactful science to patients and the public. Then, the Cancer Prevention and Research Institute of Texas (CPRIT), an agency set in motion by a 2007 statewide referendum, began fueling new discovery with its first research grants in 2010.

Since then, a new cadre of scientific leaders at the Cancer Center—such as Drs. Celette Sugg Skinner, David Boothman, Mike White, and Deputy Director Joan Schiller—has helped build novel translational research interactions. At the same time, a critical mass of UT Southwestern clinical leaders focused on cancer—including Drs. Hak Choy, David Johnson, Michael Choti, Stephen Skapek, and Jim Malter—are helping to create multidisciplinary patient-care teams that are bringing broad expertise to bedside care. These efforts not only promise to benefit patients and others at risk but are attracting scientific recognition, including an NCI National Clinical Trials Network Lead Academic Participating Site award, designed to promote large, leading-edge cancer clinical trials.

EXPLOSIVE GROWTH

Numbers also tell the story of the Cancer Center’s journey to NCI comprehensive status. For instance:

• Since 2005, the center’s peer-reviewed funding has more than doubled, and the number of multi-investigator projects has leapt from just three to 23;
• UT Southwestern has been awarded more research dollars from CPRIT—$316 million in total—than any other institution in Texas;
• The Cancer Center fills more than seven times the physical space it did 10 years ago, and has a budget more than 14 times the size.

New facilities such as the cyclotron and the Cell and Nanoparticle GMP facility, and fresh talent—including 36 CPRIT Scholars recruited over the last half-decade—infuse extra energy into an already fast-moving engine of discovery. Meanwhile, in the past decade, the Cancer Biology Ph.D.-granting program has accelerated from zero to nearly 60. Under the leadership of Dr. Jerry Shay, the doctoral program, approved in 2009, has grown to include 58 full-time students as well as about 50 faculty trainers. Moreover, by traversing interdisciplinary bridges within the Cancer Center, the program provides a broad knowledge base upon which the next generation of cancer scientists can build their own careers and discoveries.
Patient care programs also are flourishing. Multidisciplinary clinics and conferences are bringing together disease specialists to individualize patients' treatment and compare notes on their care. Advanced molecular testing is helping to ensure patients are more likely to receive the most effective therapies. A growing portfolio of clinical trials is available at all stages of disease, and since 2005, the number of patients enrolled in the Cancer Center's therapeutic clinical trials has increased an estimated twelvefold. Cutting-edge care and clinical trial access is available at the new William P. Clements Jr. University Hospital, in state-of-the-art Simmons Cancer Center facilities at Moncrief Cancer Institute in Fort Worth, and at UT Southwestern's partner sites, including Parkland and Children's Medical Center.

Over the past decade, the Cancer Center's patient care has earned important national recognition. The Foundation for the Accreditation of Cellular Therapy has accredited the adult bone marrow transplant program and, jointly with Children's, the pediatric bone marrow transplant program. Last year, University Hospitals received the highest level of accreditation, Three-Year with Commendation at the Gold Level, from the American College of Surgeons' Commission on Cancer. The hospitals were also among only about 15 percent of cancer programs reviewed nationwide to earn the commission's Outstanding Achievement Award.

Simmons is also breaking new ground in community outreach with novel, evidence-based programs aimed at cancer prevention and early detection among North Texans who lack easy access to medical care. Leading the way is the NCI-funded Parkland-UT Southwestern PROSPR Center, which is tapping the talents of a team of population science and health services researchers to ensure more efficient and effective screening for colon and cervical cancers.

The latest NCI recognition is an occasion to celebrate these and many more accomplishments of the past decade. It also represents a moment to look ahead. While important new achievements can be seen on the horizon—and other breakthroughs are yet to be conceived—the Cancer Center's objective remains the same: to generate innovative and impactful science, translated to ensure ever-better patient care, and disseminated to benefit all patients at risk.

**THE DECADE AHEAD**

Important advances over the next decade will help Simmons Cancer Center realize the power and promise of precision medicine for North Texas cancer patients. These key areas of progress include:

**Delivery of Radiation Therapy.** A full spectrum of radiation treatment technology will soon be consolidated under one roof in a new, three-story radiation oncology facility. And UT Southwestern researchers are leading an effort funded by the National Cancer Institute and state of Texas to plan research projects for the nation's first hospital-based Heavy Ion Radiation Therapy and Research Center.

**Clinical Trials Leadership.** In its role as a National Clinical Trials Network Lead Academic Participating Site (LAPS), the Cancer Center is using cutting-edge genetic techniques to screen large numbers of cancer patients in clinical trials to identify whose tumors have distinct molecular vulnerabilities targeted by specific therapies being investigated. This far-reaching strategy accords with a changing paradigm of cancer, in which emphasis is shifting from disease site to molecular traits of individual tumors.

**Cross-Disciplinary Collaboration.** Research at Simmons is moving out of departmental silos, enlisting a range of relevant disciplines to spark novel and clinically meaningful discoveries rooted in medicine's evolving understanding of cancer biology.

**Drug Development.** Expert biologists and medicinal chemists are engaged in a robust program to identify and improve lead compounds for new targeted treatments. Already, identification and characterization of the target HR. 

**Innovative Discovery.** A novel technique called FISHON (Functional Signature-OncoNomics) developed in an initiative led by Drs. Michael White and John MacMillan, is using cell-based screening and computational analysis to comprehensively identify both promising cancer-fighting chemicals derived from natural marine products and the proteins or cancer-fighting chemicals derived from natural marine products and the proteins or biological processes they act on in cells. The technique uses libraries of small interfering RNAs and synthetic microRNAs, whose targets in cells are known, as a Rosetta stone, allowing researchers to match gene expression patterns from the library molecules with those of the marine-derived chemicals. From that, the scientists can infer whether and how promising chemicals exert anti-cancer effects.

**Bioinformatics.** Data management and integration capabilities are set to mushroom with establishment of the new Linda Hill Department of Bioinformatics, along with a recent award of nearly $5.6 million from the Cancer Prevention and Research Institute of Texas (CPRIT). Dr. Guangyou Duan, principal investigator for the CPRIT grant and a CPRIT Established Investigator Scholar, heads the new department. Meanwhile, Dr. Yang Xie, Director of the Cancer Center's Bioinformatics Shared Resource, is building bioinformatics and data integration expertise to facilitate cutting-edge cancer research.

**UT Southwestern Genomic Panel.** University pathologists are developing this test-generation sequencing tool capable of identifying dozens of disease-specific biomarkers that are relevant to cancer patients' care or are of interest otherwise to cancer researchers.

**Liver and Kidney Cancer Initiatives.** The renal and liver cancer programs are building on fundamental discoveries to pursue even more breakthrough science in the tradition of the highly successful lung cancer program, whose flagship Specialized Program of Research Excellence (SPORE) grant has fueled progress for nearly two decades. Rates of both kidney and liver cancer are high in the region the Cancer Center serves, with incidence of hepatocellular carcinoma growing the fastest among all cancers in Texas.

**Recruitment.** Support through the CPRIT Scholars program so far has attracted five Established and two Missing Link investigators, three Young Scientist, and 25 First-Time, Tenure-Track Faculty Members. Combined with the new Frenkel Program for Endowed Scholars in Clinical Oncology and other recruitment efforts, the Cancer Center's research and patient-care capabilities are being strategically broadened.

**Clinical Capacity.** Patient volume will con- tinue to grow on the shoulders of Simmons' expanding multidisciplinary care teams, as patient setting facilities, including the new Clements University and Parkland hospitals, herald a new era of care.

**Clinical Trials Growth.** North Texas patients will gain greater access to novel therapies than ever before, through extension of the clinical trials program to Moncrief Cancer Institute in Fort Worth and with the Cancer Center's Phase I Clinical Trial Unit and LAPS designation.

**Early Detection.** The third generation of the Breast Screening and Patient Navigation (BSPAN) program is expanding its reach to 21 counties and more than 180,000 medically underserved women, while the colonoscopy Screening and Patient Navigation (CSPAN) program will encompass 20 counties and 165,000 people. Meanwhile, efforts at Parkland will continue to maximize delivery of prevention and early-detection services, such as HPV vaccination and liver cancer surveillance, to diverse and underserved populations of patients.

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**James Wilson**

James K.Y. Wilson, M.D., Director

The Luks K. Simmons Distinguished Chair in Comprehensive Oncology

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UT Southwestern Simmons Comprehensive Cancer Center (Dallas)

UT MD Anderson Cancer Center (Houston)

UT Southwestern Medical Center (Dallas)

Baylor College of Medicine (Houston)

UT Health San Antonio (San Antonio)
Dallas’ Medical District, about two miles west of downtown, is home to UT Southwestern Medical Center, including its Simmons Comprehensive Cancer Center and a number of facilities that support the Cancer Center’s mission, as well as several key partners in community cancer care.

Parkland Memorial Hospital, a new 862-bed facility, is the primary teaching institution for UT Southwestern. Parkland Health & Hospital System is a vital partner in assessing health needs in a diverse community, investigating how best to deliver services and reaching out to improve cancer care and prevention throughout Dallas County.

Children’s Medical Center, the primary pediatric teaching facility for UT Southwestern, recently opened new inpatient and outpatient cancer facilities and is the only academic medical center in North Texas that offers stem cell transplantation to children.

University of Texas School of Public Health Dallas Regional Campus broadens the reach of UT Southwestern’s research laboratories. Bioinformatics Resources, and many faculty and staff.

Bioinformatics Resources, and many faculty and staff.

Moncrief Cancer Institute

Parkland Memorial Hospital

UTSW North Campus

Children’s Medical Center

UT Southwestern’s South Campus houses Cancer Center facilities such as Medicinal Chemistry and Mass Spectrometry, Proteomics Core, a Cell and Nanoparticle GMP Facility, and High Throughput Screening, Tissue Management, and Small Animal Imaging Shared Resources, as well as the Health Promotion Intervention Shared Resource and other Population Science and Cancer Control Research space.

Daon Lipshy University Hospital, a 15.2-bed facility, is known as a premier referral center for neurological care, including the treatment of brain and spinal malignancies. The hospital houses the Annette Simmons Stereotactic Treatment Center.

BioCenter at Southwestern Medical District, a 15.5-acre biotech park, was established by UT Southwestern to develop university technologies and to attract biotech companies to North Texas.

The Radiation Oncology Center, a 63,000-square-foot facility now under construction, will consolidate current programs and house the latest generation of cancer-fighting technology. The integrated complex will bring together many different modalities for the benefit of cancer patients and to further research. With seven treatment rooms, the center will be the largest radiation facility in North Texas.

UT Southwestern’s North Campus is home to the Simmons Cancer Center Clinics, Cancer Center administrative offices, the Children’s Medical Center Research Institute, the Advanced Imaging Research Center, the Clinical Research Office, the Live Cell Imaging Resource, Biostatistics and Bioinformatics Resources, and many faculty research laboratories.

UT Southwestern Moncrief Cancer Institute, a 60,000-square-foot facility located in the Fort Worth Medical District, provides early cancer detection and survivorship services in Tarrant and surrounding rural counties. Moncrief also houses the brand-new, 20,000-plus-square-foot UT Southwestern Simmons Cancer Center – Fort Worth, which provides services including chemotherapy, cancer imaging, and access to clinical trials.

2005–2015: GROWTH BY THE NUMBERS

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<th>2005</th>
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<td>Total multi-investigator awards</td>
<td>3</td>
<td>8</td>
<td>23</td>
</tr>
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</table>

| Number of Cancer Center members participating in one or more multi-investigator awards | 13 | 21 | 46 |
| Percent of intra-programmatic collaborative publications | 0% | 23% | 27% |
| Percent of inter-programmatic collaborative publications | 0% | 14% | 18% |

<table>
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<th>Administrative</th>
<th>2005</th>
<th>2010</th>
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<td>Square feet of space assigned to the Cancer Center</td>
<td>208,593</td>
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<td>Total operating budget</td>
<td>$18.1M</td>
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**FACILITIES**
Cancer Center chemists discover and develop a new approach that holds promise in treating kidney tumors.

Under normal conditions, hypoxia-inducible factors, or HIFs, allow the body’s cells to thrive in low-oxygen environments, such as high altitudes. By responding to changes in oxygen levels, HIFs serve as master regulators, determining whether multiple genes that help healthy cells survive and reproduce are activated downstream. But this mechanism also promotes growth and survival of cancer cells.

HIFs accumulate and drive these other genes when the von Hippel-Lindau (VHL) gene—normally a tumor suppressor that breaks HIFs down—is inactivated. This loss of VHL leads to the most common type of kidney cancer, renal clear cell carcinoma.

At UT Southwestern, fundamental studies into one type of HIF, called HIF-2, have blossomed into a promising potential treatment.
1997

UT Southwestern biochemist Dr. Steven Mc倾斜gh and molecular geneticist Dr. David Russell lead research discovering and describing the protein encoded by the EPAS-1 gene, also known as HIF-2a. Additional research at UT Southwestern sheds more light on the workings of the HIF family and related molecules, especially HIF-2α.

2000–2009

Over the course of a decade, the laboratories of Drs. Richard Bruick and Kevin Gardner trace apart the structure of HIF-2. Biochemical analysis reveals how HIF-2α docks with another protein to assemble into a functional HIF-2 complex, and how mutations that disrupt this binding halt HIF-2 activity. Finding drug-like disrupters, learning more about how they work and refining the most promising of these compounds to increase their potency and improve their safety profile.

2007–2008

After gaining insights from earlier, more focused screens, scientists deploying the Cancer Center’s High-Throughput Screening Shared Resource systematically test more than 200,000 drug-like molecules, one at a time, to see which ones might interfere with HIF-2. The effort identifies a slate of successful compounds.

2008–2013

Medicinal chemists at Simmons Cancer Center study the HIF-2 disrupters, learning more about how they work and refining the most promising of these compounds to increase their potency and improve their safety profile.

2013

UT Southwestern scientists including Drs. Bruick, Gardner, John MacMillan, and Uttam Tambar detail how chemicals bind with the "sweet spot" cavity to disrupt HIF-2 function. The findings indicate that small molecules can feasibly regulate HIF-2α, a type of molecule previously considered "undruggable."

2013

Research shows that the newly discovered and refined compounds can block the assembly of the HIF-2 complex and disrupt its function in living cells originating from actual human tumors—rendering HIF-2α unable to turn on other cancer-related genes.

2014

The first HIF-2 inhibitor in clinical development, an oral drug known as PT2395, enters a phase I clinical trial for safety and dosing in patients with advanced or metastatic renal clear cell carcinoma. Dr. Kevin Courtney heads the trial at UT Southwestern, one of several sites across the U.S. testing the drug.

THE IMPACT

2011

The most promising compounds are licensed to Peloton Therapeutics, a biotech firm co-founded by Dr. McKnight and based in new-state-of-the-art facilities on UT Southwestern’s BioCenter campus.

2014

A mouse model of human renal clear cell carcinomas, developed and validated by UT Southwestern kidney cancer specialist Dr. James Brugarolas and colleagues, may provide insights into which patients are most likely to benefit from treatment with HIF-2 inhibitors. HIF-2 also appears significant in other types of cancer, including deadly brain cancers called glioblastomas and non-small cell lung cancer, the most common type of lung malignancy.

SIGNIFICANT PUBLICATIONS


THE FUTURE

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SIGNIFICANT PUBLICATIONS


CLINICAL CARE

Four-dimensional radiation treatment planning, using a CT scanner that simulates tumor dimensions, location, and movement for each patient, ensuring extreme accuracy.

Vision RT video monitoring to help protect the heart during whole-breast radiation to the left breast; and

Pediatric care, including an anesthesiologist to help treat very young patients.

EXCEPTIONAL FACILITIES

Clements University Hospital. In their own individual rooms, patients at Clements University Hospital can:

• Control the lights, temperature, and window shades, and even order a snack, from their bed;
• Access Wi-Fi;
• Review with their cancer-care providers personal test results and scans on a large-screen TV monitor or watch an educational video with loved ones; and
• Rest and recover quietly, away from the clamor of high-traffic locations in the hospital.

Family members can:

• Stay overnight in custom sleeper sofas;
• Discuss patient care in private conference rooms; and
• Learn more about medical conditions and clinical trials on a staffed, interactive Patient and Family Resource Center.

Moncrief Cancer Institute. At UT Southwest in Dallas, the latest imaging technologies;

• The latest imaging technologies;
• On-site laboratory and pharmacy services;
• Preventive care and cancer screening; and
• Secure telemedicine consultation with specialists at UT Southwestern in Dallas.

Blood and Marrow Transplantation (BMT). Patients undergoing blood or marrow transplantation are cared for in Clements University Hospital’s state-of-the-art, 32-bed BMT unit. The nationally accredited program is recognized as a Center of Excellence by major insurance carriers, and it:

• Offers the latest therapies, some of which are not available in every hospital’s program;
• Leads in North Texas for one-year survival rates in transplants involving donor cells; and
• Provides blood or marrow transplants for children at a 12-bed pediatric unit at Children’s Medical Center.

Radiation Therapy. Patients undergoing radiation therapy at the Cancer Center have access to specialists providing therapies not widely offered elsewhere. Care includes:

• Stereotactic ablative radiotherapy, in which tumors are bombarded by radiation from multiple directions—concentrating the radiation on the tumor, minimizing dose to surrounding tissue, and adjusting for motion such as breathing in the body (see page 20);
• Stereotactic radiosurgery/stereotactic radiotherapy for brain tumors, which similarly applies high doses of radiation to the cancer while minimizing dose to adjacent tissue; and
• Brachytherapy, or placement of a radiation source in direct contact with a tumor or treatment area;
• Intensity-modulated radiation therapy, which “sculpts” the radiation field so it conforms to a tumor’s shape.

Canc3r Care: the Patient Experience

Comprehensive Cancer Care: the Patient Experience

Surgery. Cancer patients requiring surgery benefit from Simmons Cancer Center’s:

• Highly skilled surgical oncologists who specialize in treating cancers in specific locations in the body;
• Broad and deep expertise in minimally invasive procedures; and
• Access to leading-edge technology in advanced surgical suites in the new Clements University Hospital.

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Cutting-Edge

Richard, diagnosed with kidney cancer at age 40 in 2008, was running out of treatment options. After enrolling in a clinical trial at Simmons Comprehensive Cancer Center, he was the first patient in Texas to receive a new, promising medication that he credits with saving his life. “I truly believe that if I had not come to UT Southwestern, I would not be here.”

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Children’s Health. Children and teens with cancer are treated by UT Southwestern physicians at the Gill Center for Cancer and Blood Disorders at Children’s Medical Center, which:

• Treats the full range of pediatric cancers, including leukemia and lymphoma, brain and other nervous system tumors, Wilms tumor, musculoskeletal tumors, and sarcoma;
• Provides long-term monitoring for children, adolescents, and young adult survivors of childhood cancer through its ACE (After the Cancer Experience) program;
• Offers early-phase clinical trials, bringing promising new treatment options to fight some of the most challenging childhood cancers; and
• Treats one in five children in Texas diagnosed with cancer.

Parkland Health & Hospital System. Cancer patients at Parkland Health & Hospital System, Dallas County’s safety net system for patients who cannot easily access health care, likewise receive care from Simmons Cancer Center experts and other UT Southwestern physicians.

Simmons Cancer Center. Throughout the Cancer Center, patients have the benefit of:

• Expert physicians and other providers who treat each patient’s disease and coordinate other aspects of care;
• Clinical trials providing access to the latest therapies—and new possibilities for patients who have exhausted standard treatment options;
• Advanced genetics screening and counseling based on personal and family history of cancer;
• Support from psychologists, chaplains, social workers, dietitians, and others;
• An electronic medical record that encompasses all care patients have received at UT Southwestern, giving physicians instant access to patient information and test results across hospitals, clinics, and disciplines—and allowing patients to view test results and communicate with care providers through the university’s MyChart portal; and
• Excellence in research, prevention, and patient care that is the hallmark of a National Cancer Institute-designated Comprehensive Cancer Center.

In patient rooms at Clements University Hospital, large-screen TV monitors allow videoconferencing with loved ones or with health care providers.

Dr. Thomas Freishbach, Medical Director of the Simmons Cancer Center’s cancer clinic.
Compassionate

Eight-year-old Shadiamond told her mother she was having “painful, painful headaches” that led to the discovery of her brain cancer in 2014. After treatment, she’s looking forward to growing up and becoming a lawyer. One aspect of her medical care that she found very important was “just to know you always have somebody near you.”

CLINICAL TRIALS

With partner health systems in Dallas and Fort Worth, Simmons Comprehensive Cancer Center is able to offer North Texas cancer patients access to many of the latest therapies available in clinical trials. Simmons Cancer Center has a thriving and nationally recognized clinical trials program with achievements including:

- The launch of a new Phase I Clinical Trials Unit, which helps speed the translation of scientific discoveries made at UT Southwestern for potential patient benefit;
- Recognition as a Lead Academic Participating Site for the National Cancer Institute’s National Clinical Trials Network, which means Cancer Center patients have access to the most cutting-edge drugs that are undergoing testing;
- More than twice the number of patients than a decade ago enrolling in trials to test new cancer therapies, with participants including a substantial representation of racial and ethnic minorities; and
- More than 200 patients a year participating in national cooperative group trials.

CLINICAL RESEARCH OFFICE

Simmons Cancer Center’s Clinical Research Office provides research infrastructure for cancer-related clinical trials at UT Southwestern. Besides managing numerous details related to each trial and its patients, the office coordinates with partner facilities including Parkland, other participating institutions, and cooperative groups.

The office’s research nurses, coordinators, and other staff collaborate with the Cancer Center’s disease-oriented teams to provide specialized care and expertise based on the site or sites of cancers that are targeted in each study. The office has a staff of more than 80, nearly 30 percent of whom speak another language in addition to English—including Spanish, Mandarin, Vietnamese, French, Italian, Arabic, Urdu, Romanian, Russian, Ukrainian, Yoruba, Punjabi, Tamil, Malayalam, Hindi, Japanese, and Korean.

Clinical research coordinator Jenny Chang and Kidney Cancer Program leader Dr. James Brugarolas work with patient Diane Greckel in a clinical trial of an experimental therapy for renal cell carcinoma. The phase I trial, led at UT Southwestern by genitourinary cancer specialist Dr. Kevin Courtney, tests a drug called PT2385, which was developed after groundbreaking research by Simmons Cancer Center biochemists (see page 12).
Stereotactic radiotherapy, originally piloted for treating tumors situated in important functional parts of the brain, operates on a converging-beam principle in which dozens of highly focused yet relatively weak radiation beams from different directions travel through normal tissues on their way to a tumor target deep within the body. The intentionally weak beams cause little entry damage, but at the point of convergence, they add up to deliver a very potent tumor treatment.

For decades, its use was confined to the cranium. Precise but also extremely powerful, stereotactic radiotherapy was not possible elsewhere in the body, where breathing and other functions could cause the target to move, potentially resulting in disastrous side effects.

However, recognition that new image-guidance technology could address that challenge has fueled development of stereotactic body radiation therapy (SBRT), also known as stereotactic ablative radiotherapy (SABR). For the past decade, UT Southwestern has been on the leading edge of SABR innovations.
THE FOUNDATIONS

2003
Dr. Hak Choy is named Chairman of Radiation Oncology at UT Southwestern, with the goal of developing a department that deploys the most promising technologies against cancer.

2004
At a national meeting of radiation oncologists, Dr. Robert Timmerman, then a faculty member at Indiana University and a renowned expert in stereotactic radiosurgery, is met with skepticism when he presents early results of a clinical trial indicating that SABR appears effective in patients with early-stage, non-small cell lung cancer (NSCLC).

2011
UT Southwestern becomes the first North American institution to install Vero SBRT, an advanced system for imaging tumors and delivering treatment. Vero joins Simmons Cancer Center’s formidable arsenal of stereotactic radiotherapy technology, including cutting-edge Gamma Knife, CyberKnife, Agility, and TrueBeam technology.

2012
Cancer Center scientists receive a $4.1 million multi-investigator research award from CPRIT to explore in lung cancer how best to exploit the radiobiological effects of SABR, whose cancer-killing properties at the cellular level appear different than standard radiation. Dr. Timmerman heads the project, which also involves Cancer Center members Drs. Ralph Mason, Rolf Breken, Chul Ahn, Debu Saha, and others, along with the work of Dr. Phil Thorpe.

THE TRANSLATION

2010
In a study of 55 early-stage lung cancer patients too frail to withstand traditional surgery, Drs. Timmerman, Choy, and colleagues report SABR has achieved control of 98 percent of the primary tumors, a rate comparable with surgical resection. Previously, for early-stage patients unable to withstand surgery, standard radiation had achieved only a 30 to 40 percent rate of tumor control. The publication changes the standard of care for so-called medically inoperable patients.

2011
A $3.5 million grant from the Cancer Prevention and Research Institute of Texas (CPRIT) funds a five-year multi-institution effort to develop advanced radiotherapy technology for lung cancer with the aim of also reducing toxicity. The program is led by Dr. Choy and includes Cancer Center members Drs. Timmerman, Dr. Chul Ahn, and Dr. Puneeth Iyengar.

2014
Cancer Center researchers led by Drs. Timmerman and Choy potentially extend the use of SABR to patients with stage 4 limited metastatic NSCLC. In a phase II multi-institution trial combining lowered doses of SABR with the drug erlotinib, the treatment is well-tolerated and patients markedly surpass the time periods they otherwise would be expected to survive without disease progression. Tissue analysis suggests the SABR is primarily responsible for the benefit.

2015
Investigation of SABR continues at UT Southwestern for cancers in sites including the prostate, breast, and larynx, and a range of clinical trials of the therapy is open at Simmons Cancer Center.

THE IMPACT

2008–2015
As stereotactic radiotherapy research flourishes, new studies indicate its effectiveness in various cancers that have spread to a limited number of sites within organs such as the liver and lungs. SABR also appears promising in classically “radio-resistant” tumors such as renal cancer and melanoma.

2009
UT Southwestern’s Department of Radiation Oncology begins hosting quarterly, hands-on courses to train peers interested in SBRT. To date, more than 300 practitioners from all over the world have been trained through the initiative.

2014
A team led by Dr. Timmerman reports on five-year follow-up results among the patients, too frail for surgery, who received SABR for early-stage lung cancer. The rate of recurrence at primary tumor sites is low, and the powerful therapy is not associated with any surge of late II effects—demonstrating SABR’s long-term efficacy and safety in early lung cancer.

Dr. Robert Timmerman
SABR plan for a lung cancer

SIGNIFICANT PUBLICATIONS


Current Department of Radiation Oncology facilities include the 30,000-square-foot W.A. Monty & Tex Moncrief Radiation Oncology Building housing technologies such as the Vero SBRT (1) and CyberKnife (2) for cranial and extracranial stereotactic radiosurgery; and the newly added 16,000-square-foot Radiation Oncology Building housing technologies such as the Vero SBRT (3).
Simmons Comprehensive Cancer Center serves urban, suburban, and rural populations throughout the 12 counties that make up the nearly 7 million resident Dallas/Fort Worth metropolitan area. As partner sites, the Dallas County and Tarrant County public hospital systems, Parkland and JPS Health Network, are invaluable proving grounds for new, more impactful ways of delivering cancer services, especially to people who lack financial resources for care.

In a region in which nearly one in five people are uninsured and where urban centers quickly transition to rural communities, the Cancer Center’s outreach programs target populations that have greater financial, geographical, or other challenges in accessing care. These programs focus on prevention, screening, and early detection (along with health care navigation), genetics, patient and family education, and cancer survivorship.

UT Southwestern’s Moncrief Cancer Institute in Fort Worth is an essential link to Tarrant County’s JPS network, as well as the hub for the Cancer Center’s rural network in western counties outside the metropolitan area. Through telemedicine, a mobile clinic, and extensive collaborations with local health care providers, Simmons Comprehensive Cancer and Moncrief deliver services to a wide swath of rural counties across North Texas.

**CANCER PREVENTION**

Cervical Cancer. UT Southwestern cancer researchers at Parkland Health & Hospital System clinics are improving delivery of vaccination for HPV, the virus that causes cervical cancer.

Lung Cancer. Research by Cancer Center members is addressing challenges that make it hard for homeless individuals to quit smoking, including inadequate no-smoking areas at shelters and difficulty accessing nicotine-replacement therapy.

**SCREENING & EARLY DETECTION**

Breast Cancer. Simmons Cancer Center’s Breast Screening and Patient Navigation (BSPAN3) program, based at Moncrief, strengthens community care resources and connects low-income and uninsured women in rural and underserved counties to local health care providers for screening, diagnostic, and follow-up services. The program, now in 17 counties, will expand to 21, reaching more than 180,000 women who are eligible for screening and connecting about 14,000 with services.

Cancer Prevention. Simmons Cancer Center investigators have been building a coordinated, evidence-based strategy to increase colon cancer screening rates in the Parkland and JPS Health systems (see page 40). The center’s research on multiple aspects of colorectal screening resulted in establishment of the Parkland-UT Southwestern Population-Based Research Optimizing Screening through Personalized Regimens (PRISPR) Center, to expand the research and help expert lessons learned in order to benefit patients across the U.S., especially those who are medically underserved. (The center’s mission has since been expanded to include cervical cancer.)

Liver Cancer. Cancer Center scientists, focusing their efforts at Parkland, are testing ways to overcome systemic obstacles that prevent patients at highest risk of hepatocellular carcinoma, the most common type of liver cancer, from receiving ongoing monitoring to catch the disease early.

**GENETICS/PATIENT & FAMILY EDUCATION**

Hereditary Cancer Risk. Working at UT Southwestern, Moncrief, and 15 sites throughout the Dallas-Fort Worth area, nine certified genetic counselors advise individuals about their personal risk of breast, colon, and other cancers; discuss the role of lifestyle and other risk factors in the disease; and guide patients through any recommended testing for genes that could increase their cancer vulnerability. Patients who test positive for a genetic predisposition to cancer work with their genetic counselor and physicians to obtain follow-up care, and counselors empower the patients to reach out to their family members who might likewise be at risk. The Cancer Center’s genetics team serves patients in rural areas by providing counseling at satellite sites and through telemedicine.

**CANCER SURVIVORSHIP**

Moncrief Cancer Institute. Moncrief offers a robust range of services for cancer survivors, including exercise instruction, nutritional guidance, smoking cessation, genetics counseling, planning and coordination of follow-up care, emotional support and stress management, and assistance with accessing community resources.

On-The-Road Outreach. Moncrief’s Mobile Cancer Survivor Center, a custom-designed 18-wheeler, travels twice a month to locations in nine North Texas counties, where more than half the population is considered medically underserved and where one-third of cancer survivors are at risk of not receiving adequate follow-up care due to factors such as lack of facilities or transportation. The mobile clinic provides bilingual services including mammography and colon cancer screening in addition to physical and psychosocial assessments, one-on-one exercise training, nutrition education, and telemedicine links to experts at Moncrief and Simmons Cancer Center.

**POPLATION OVERVIEW**

CAUCASIANS 75.4% of DFW population*

CAUCASIANS

HISPANICS 28% of DFW population*

HISPANICS

AFRICAN-AMERICANS 15.7% of DFW population*

AFRICAN-AMERICANS

ALL OTHERS 8.9% of DFW population*

ALL OTHERS

*2012 data for DFW Metropolitan Statistical Area (MSA), U.S. Census Bureau; **2011 data for DFW MSA, Texas Cancer Registry; ***2012 data for DFW Metropolitan Statistical Area (MSA), U.S. Census Bureau.

The Cancer Center’s research on multiple aspects of colorectal screening resulted in establishment of the Parkland-UT Southwestern Population-Based Research Optimizing Screening through Personalized Regimens (PRISPR) Center, to expand the research and help expert lessons learned in order to benefit patients across the U.S., especially those who are medically underserved. (The center’s mission has since been expanded to include cervical cancer.)

Like the BSPAN3 breast cancer program, the Cancer Center’s Colorectal Screening and Patient Navigation (CSPAN) initiative, also based at Moncrief, develops and fosters local partnerships across North Texas to improve screening rates among uninsured, underinsured patients and to help guide them to needed care. Building on previous Cancer Center research, CSPAN targets 20 local counties and 165,000 individuals due for screening, using test kits mailed to patients.

Liver Cancer. Cancer Center scientists, focusing their efforts at Parkland, are testing ways to overcome systemic obstacles that prevent patients at highest risk of hepatocellular carcinoma, the most common type of liver cancer, from receiving ongoing monitoring to catch the disease early.

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Nearly one-third of brain tumors are gliomas. These tumors can lie dormant for months or years, then suddenly start growing rapidly in a deadly form called glioblastoma. Gliomas traditionally have been diagnosed via surgical biopsy, an invasive procedure that is especially risky when tumors are near sensitive sites in the brain. Detecting precisely when gliomas become glioblastomas is a challenge, and the transformation requires aggressive treatment. Doctors would also like more information about how tumors respond to treatment and which treatments best target traits specific to individual tumors.

Building on fundamental imaging and metabolism research at UT Southwestern, Cancer Center scientists and physicians have developed innovative approaches to address these challenges.

Imaging innovations developed by UT Southwestern scientists are being deployed to improve brain cancer care.
The Foundations

1980s
Ongoing work at UT Southwestern, spearheaded by Drs. Dean Sherry and Craig Malloy, focused on development of tracer molecules that can be used with magnetic resonance (MR) technology to measure changes in metabolism that occur with disease.

2007
The two researchers hone the use of carbon-13 (13C), a stable natural isotope, in a hyperpolarized state—activating its nucleus so they create a signal powerful enough to track in the body. Enriching substrates such as glucose with 13C allows the researchers to better detect details of the substances’ metabolism than does current technology.

The Translation

2009
Research elsewhere links cancer-associated mutations in the gene IDH1 to high levels of a metabolite called 2-hydroxyglutarate (2HG) and finds elevated 2HG in surgical samples of malignant gliomas. UT Southwestern physicists Dr. Changho Choi and neuro-oncologist Dr. Elizabeth Maher, already working on MR spectroscopy of glioblastoma to find tumor biomarkers, focus their work on developing an approach to noninvasively detect 2HG.

2010–2012
UT Southwestern researchers, including Dr. Ralph DeBerardinis, Dr. Maher, Dr. Malloy, Dr. Robert Bachoo, and neurosurgeon Dr. Bruce Willey, pioneer the presurgical infusion of 13C-labeled glucose to directly study metabolic flux in patients with brain tumors. Once the tumors are removed, researchers use MR spectroscopy to provide a “snapshot” of the tumor cells’ metabolic processing of the glucose. The team finds that glioma cells—and metastatic lung and breast cancer cells in the brain—metabolize glucose much more rapidly than does the rest of the brain, using the energy to survive and to help perpetuate growth of new tumor cells.

2012
A team led by Drs. Choi and Maher finds 2HG is detectable with MR technology using a technique called point-resolved spectroscopy, or PRESS. Accumulation of 2HG is associated with mutations in IDH1 and 2, a hallmark of about 70 percent of gliomas. Thus, 2HG can be used as a biomarker to identify gliomas without need for surgical biopsy; the biomarker also can provide information on patient prognosis and has the potential to help track tumor progression and drug response.

2014
Infusing mouse models of human gliomas with 13C-labeled glucose and 13C-labeled acetate, a team led by Dr. Bachoo demonstrates that cancer cells can use acetate to fuel growth. The study, along with research led by Cancer Center biochemist, Jonathan A.C. Soglio, on an enzyme that metabolizes acetate, is a potential treatment target.

2014–2015
Researchers launch a prospective phase I/II clinical trial, led by Dr. Maher and conducted at Clements University Hospital, testing the 13C2H2 inhibitor AG-221 (Agios Pharmaceuticals), the first drug of its type, in patients with tumors including gliomas. Researchers deploy their approach to noninvasively measure levels of 2HG (the metabolite associated with the IDH1/2 mutation) in gliomas, providing a way to monitor drug penetration into the tumor and ability to inhibit the target.

The Future

Building on the finding that acetate can fuel cancer growth, Cancer Center scientists are revealing more about the role of ASS2, which is expressed in a variety of human tumors, as a potential vulnerability that may be exploited therapeutically.

Based on the insights made in studying tumor metabolism in brain cancer patients at the time of surgery, several other areas of focus have emerged. Dr. DeBerardinis and colleagues are pursuing similar studies in lung cancer, and Drs. Maher and Bachoo are studying early-stage breast cancer in collaboration with Dr. Rashed Mousa. They are also working with pediatric neurosurgery and neuro-oncology teams to address many of the same metabolic questions in childhood brain cancers.

Dr. Choi and colleagues are working to bring their MR technique for measuring 2HG in the brain—developed in research scanners at a magnetic field strength of 3 Tesla—to 3T clinical scanners, as well as to achieve 2HG detection using lower-powered (1.5 T) scanners.

Dr. DeBerardinis, Malloy, Sherry, and others are working to develop imaging of hyperpolarized pyruvate and acetate to study metabolism of cancers in the body. One important goal is to understand energy production in cancers, which identifies possible vulnerabilities and the opportunity for drug targeting.

A new hyperpolarizing technology called 13C15N15H15—funded through an award from the National Institutes of Health, along with support from UT Southwestern—will enable metabolic analyses at the cellular level in patients. By improving sensitivity of nuclear MRI by a factor of 10,000 or more, hyperpolarization could help physicians determine cancer severity, identify recurrence or metastasis, gauge the impact of treatment, and better predict disease outcomes. The technique might also help guide novel therapy choices for patients, based on their tumors’ individual metabolism.

Significant Publications


**SIGNIFICANT PUBLICATIONS**


CANCER CELL NETWORKS

MISSION
To promote research that will contribute to an understanding of the mechanisms by which aberrant cell regulatory networks support cancer initiation and growth.

OVERVIEW
The Cancer Cell Networks Program facilitates investigations that shed light on the mechanisms by which aberrant cell regulation contributes to the transformation of normal cells to cancer cells; and to engage translational and clinical scientists in investigating whether external and internal regulatory cues at the cell-autonomous level; to determine how aberrant cell regulatory networks support the initiation of cancers.

Key goals of the program are to define signaling pathways that integrate external and internal regulatory cues at the cell-autonomous level; to determine how aberrant cell regulation contributes to the transformation of normal cells to cancer cells; and to engage translational and clinical scientists in investigating whether external and internal regulatory cues at the cell-autonomous level; to determine how aberrant cell regulatory networks support the transformation of normal cells to cancer cells; and to engage translational and clinical scientists in investigating whether aberrant cell regulation contributes to the transformation of normal cells to cancer cells; and to engage translational and clinical scientists in investigating whether aberrant cell regulatory networks support the initiation of cancers.

LEADERSHIP
Melissa Cobb, Ph.D., Professor, Pharmacology
Par Paola Signorini, M.D., Associate Professor, Internal Medicine

PEER-REVIEWED FUNDING
2015 total – $37.2 million

SIGNIFICANT PUBLICATIONS


OF NOTE
Supported by new CPRIT funding of more than $889,000, Dr. Zhijian “James” Chen and colleagues are shedding light on innate immune responses to DNA and RNA. The researchers previously discovered a new enzyme, cyclic GMP-AMP synthase (cGAS), that acts as a sensor of innate immunity. The work also has described a novel cell signaling pathway: When cGAS detects foreign DNA or even host DNA that is in the cell’s cytoplasm, the enzyme binds to the DNA, catalyzing formation of a chemical called cyclic GMP-AMP, or cGAMP. Then cGAMP binds to the protein STING, activating a signaling cascade that produces interferons and pro-inflammatory cytokines. The work also has revealed a potential new avenue for enhancing anti-tumor immunity and developing cancer vaccines.
The Chemistry and Cancer Program combines the expertise of synthetic and medicinal chemists, molecular biologists, biochemists, structural biologists, and clinical scientists to discover, design, and optimize drug-like small molecules that regulate biological pathways deregulated in cancer. The program engages 19 members drawn from six departments on campus.

The program’s discovery process takes one of two approaches. For a chemistry-to-biology approach, discovery starts by identifying natural or unnatural small molecules that are selectively lethal to human cancer cell lines, then determining exactly how the small molecules have their effect. In a biology-to-chemistry approach, hypotheses regarding the “drugability” and cancer relevance of specific biological pathways investigated by Cancer Center scientists can be tested with drug-like chemicals.

**THEMES**
- Molecular targets of cancer cell-specific small molecule toxins
- Novel, cancer cell-specific pathways
- Proof-of-concept preclinical development of cancer cell-specific small molecule toxins
- The hypoxia response pathway

**SIGNIFICANT PUBLICATIONS**
OVERVIEW

The Experimental Therapeutics Program supports development of novel therapeutic strategies for cancer. The program provides a science-based infrastructure for translating discoveries from the Cancer Center’s scientific programs to preclinical models and then to evaluation through investigator-initiated clinical trials.

Program leaders and members interact extensively with the Cancer Center’s disease-oriented teams to focus specific therapeutics on select cancers based on laboratory research that indicates optimal targets and relevant biomarkers.

The program represents key oncology disciplines and has 64 members, comprising 12 basic science investigators and 32 clinical investigators from 15 departments or centers. It is also home to the Cancer Center’s Specialized Program of Research Excellence (SPRE) in lung cancer.

MISSION

To identify and validate novel targets, pathways, and therapies for selective tumor targeting; to establish biomarkers that can predict tumor response; and to test the efficacy of resulting potential medicines in clinical trials.

PEER-REVIEWED FUNDING

2015 total—$27 million

LEADERSHIP

John Minna, M.D.
Professor, Internal Medicine and Pharmacology
David Boothman, Ph.D.
Professor, Simmons Cancer Center
David Gerber, M.D.
Associate Professor, Internal Medicine

OF NOTE

Research by the lab of Dr. David A. Boothman on the anti-cancer effects of the natural substance beta-lapachone has led to two multidisciplinary projects—funded through PanCAN and totaling $1.3 million—testing the substance against pancreatic ductal adenocarcinoma (PDA) and non-small cell lung cancer (NSCLC). The first project is pursuing lab studies and a phase IB clinical trial involving chemotherapy plus a formulation of beta-lapachone called ARQ761 (from the biotechnology firms NQ Oncology and ArQule). The other project is exploring the efficacy of combining ARQ761 with PARP inhibitors to treat PDA, NSCLC, and other NQO1 over-expressed malignancies.

The combination has proved effective against pancreatic, breast, and non-small cell lung cancer cells in vitro, and NSCLC in mouse xenografts.

SIGNIFICANT PUBLICATIONS


OVERVIEW

Drawing from the large and diverse population that Simmons Cancer Center serves, the Population Science and Cancer Control Program has a special focus on uninsured residents served by local public health systems. Studies are centered on cancer disparities among subpopulations of individuals who traditionally are medically underserved.

Research focuses on processes of care with the goal of translating findings into improved cancer care in local health systems. The 25 members of the Population Science Program are based in five departments and at the University of Texas School of Public Health’s Dallas campus.

THEMES

- Cancer prevention (including the study of biomarkers for colon and liver cancers and risk prevention behaviors)
- Screening for early detection of colon, liver, and esophageal cancers
- Cancer survivorship

OF NOTE

A thriving research effort is evaluating strategies to improve screening effectiveness and ensure that more people at high risk for hepatocellular carcinoma (HCC), the most common form of liver cancer, receive appropriate testing so tumors can be detected earlier and treated more effectively. Population Science program members are key investigators for the multi-institution Texas HCC Consortium, a $9.7 million initiative funded by the Cancer Prevention and Research Institute of Texas. Consortium projects include characterizing factors that predict liver cancer in a diverse group of patients with cirrhosis, evaluating novel biomarkers to increase sensitivity for early tumor detection, and a trial comparing interventions to boost screening rates in at-risk patients.

PEER-REVIEWED FUNDING

2015 total = $6.1 million

LEADERSHIP

Ethan Netin, M.D., M.P.H.
Professor, Internal Medicine

Jasmin Tiro, Ph.D., M.P.H.
Associate Professor, Clinical Sciences

SIGNIFICANT PUBLICATIONS

The Cancer Center tackles the complex challenge of boosting colon cancer screening among minorities and underserved populations.

BACKGROUND

Colorectal cancer screening—generally advised for people age 50 and older—saves lives. Yet only about 15 percent of those who lack insurance receive screening, research has indicated, compared with 50 percent of insured people. And rates for African-Americans and Hispanics lag substantially behind those for whites. Thus a key challenge in reducing colon cancer deaths is delivery of early detection and follow-up services to people who are inadequately insured and to minorities. Partnering with the community and local health systems, Simmons Cancer Center researchers are addressing that challenge and are setting an agenda nationally for colorectal cancer detection in the neediest of populations.
2011
A five-year, $6.3 million National Cancer Institute grant led by Drs. Skinner and Ethan Willson establishes the Parkland-UT Southwestern PROSPR Center to more efficiently target and deliver screening for colorectal cancer. (PROSPR stands for Population-based Research Optimizing Screening through Personalized Regimens.) The center is one of just three nationwide focused on colorectal screening, and the only one targeting a population that lacks health care resources. The PROSPR Center begins studying all aspects of colon cancer screening among a racially and ethnically diverse group of some 70,000 Parkland primary-care patients to identify opportunities to improve screening rates, follow-up, and other care.

2014
Led by Dr. Sandi Pratt, a statistical analysis of patients in the Tarrant County study who received usual care indicates that factors related not just to patients but to their physicians, neighborhoods, and clinics are relevant in screening decisions. The work highlights potentially important avenues to boost screening rates, such as reminders built into clinic systems or neighborhood campaigns.

THE IMPACT
2011
In a PROSPR project, two Parkland Community-Oriented Primary Care clinics in Dallas begin deploying the Cancer Risk Intake System, a bilingual touch-screen computer application that asks patients about personal risk factors and family history of colon cancer, using responses to generate personalized screening recommendations. As of May 2015, about 2,700 patients had used the program.

2013
The PROSPR Center implements a program, embedded in Parkland’s electronic medical record, that matches colonoscopy findings with follow-up care guidelines for surveillance and rescreening. The program ensures that subsequent care is provided based on the individually determined risk of colon cancer in each patient.

2014
The PROSPR Center’s mission expands to include cervical cancer screening, an effort led by Dr. Jasmin Tiro and Dr. Skinner. Additional funding supports initiatives such as a project to follow some 178,000 screening-eligible women in the Parkland system (24 percent of them African-Americans, and 61 percent Hispanic). Rates of cervical cancer in Hispanic women are about 60 percent higher than in non-Hispanic Caucasian women.

THE FUTURE
Investigators are studying whether higher colorectal cancer screening participation rates found among patients mailed test kits will carry over into repeat screening and follow-up when needed. Also, a large CPET-funded initiative called CPAN (colorectal cancer screening and patient navigation) is partnering with agencies and institutions in 20 local counties to expand the test-kits mailing program to 165,000 underserved suburban and rural residents and to ensure access to needed follow-up care.

Meanwhile, new insights into the genetics of colon cancers may someday better guide screening and follow-up care among African-Americans, who face higher risk of the disease and are more likely to die from it. Work by a team of investigators including Simmons Cancer Center Director Dr. James Willson has identified a set of previously unrecognized mutations in colorectal cancers among African-Americans, shedding light on biological differences in the disease that may help explain that group’s elevated risk.

SIGNIFICANT PUBLICATIONS


Colorectal cancer is a leading cause of cancer deaths. However, screening and care can improve outcomes. The colonoscopy reveals a polyp.
**DEVELOPMENT & CANCER PROGRAM**

**John Abrams, Ph.D.**  
Professor, Cell Biology

**James Amatruda, M.D., Ph.D.**  
Associate Professor, Pediatrics

**Brandeis Family Professor in Pediatric Oncology Research, Marsh Family Scholar in Pediatrics**

**Robert Basho, M.D., Ph.D.**  
Associate Professor, Neurology

**Walter Family Professorship in Neuro-Oncology**

**Xiaying Bai, M.D., Ph.D.**  
Assistant Professor, Green Center for Reproductive Biology Sciences

**Laura Banaszynski, Ph.D.**  
Assistant Professor, Green Center for Reproductive Biology Sciences

**Gary Baron, M.D.**  
Assistant Professor, Neurology

**Michael Buszczak, Ph.D.**  
Associate Professor, Molecular Biology

**E.E. and Greer Garson Fogelson Scholar in Medical Research**

**James Bibb, Ph.D.**  
Professor, Psychiatry

**Michael Castilho, M.D., Ph.D.**  
Associate Professor, Pathology

**Jarrett A. Stemberger, M.D.**  
Distinguished Chair in Pathology

**Ondina Cleaver, Ph.D.**  
Associate Professor, Molecular Biology

**Nicholas Conrad, Ph.D.**  
Associate Professor, Microbiology

**Southwestern Medical Foundation Scholar in Biomedical Research**

**Ralph DeBerardinis, M.D., Ph.D.**  
Associate Professor, Children’s Medical Research Institute, Joel B. Straus, M.D. Chair in Pediatrics, Sowell Family Scholar in Medical Research, Chief, Division of Pediatric Genetics and Metabolism

**Amelia Eisch, Ph.D.**  
Associate Professor, Psychology

**Reza Galindo, M.D., Ph.D.**  
Assistant Professor, Pathology

**Amy Habib, M.D.**  
Associate Professor, Neurology

**Gary Han, Ph.D.**  
Assistant Professor, Green Center for Reproductive Biology Sciences

**Jenny Hoeh, Ph.D.**  
Associate Professor, Molecular Biology

**Tao Hyun Hwang, Ph.D.**  
Assistant Professor, Clinical Sciences

**Jin Jiang, Ph.D.**  
Professor, Molecular Biology

**Eugene McDonald Scholar in Medical Research**

**Jane Johnson, Ph.D., Ph.D.**  
Professor, Neuroscience

**Shirley and William H. McCombs Distinguished Chair in Neuroscience**

**Lu Q. Lu, M.D., Ph.D.**  
Associate Professor, Dermatology

**Thomas L. Sheehy, M.D. Professor in Dermatology**

**Raymond MacDonald, Ph.D.**  
Professor, Molecular Biology

**Elizabeth Maher, M.D., Ph.D.**  
Associate Professor, Internal Medicine–Hematology/Onology

**Theodore W. Strauss Professorship in Neuro-Oncology**

**Joshua Mendell, M.D., Ph.D.**  
Professor, Molecular Biology

**Howard Hughes Medical Institute Investigator**

**Sean Morrison, Ph.D.**  
Professor and Director, Children’s Medical Center Research Institute, Mary McDermott Cook Chair in Pediatric Genetics; Howard Hughes Medical Institute Investigator

**SaiMukhopadhyay, M.D., Ph.D.**  
Assistant Professor, Cell Biology

**Carolyn J. Hoffer, M.D. Scholar in Biomedical Research**

**Kathryn O’Donnell-Mendell, Ph.D.**  
Assistant Professor, Molecular Biology

**Eric Olson, Ph.D.**  
Professor and Chairman, Molecular Biology

**Anne and William Neilson Professorship in Stem Cell Research, Pope Distinguished Chair in Research for Cancer and Development**

**The Robert A. Welch Distinguished Chair in Science**

**Phillip Scherer, Ph.D.**  
Professor, Internal Medicine–Endocrinology

**Garrison D. Taubman and Randolph G. Taubman Distinguished Chair in Diabetes Research**

**Phillip Shaul, M.D.**  
Professor, Pediatrics

**Associate First Capital Corporation Distinguished Chair in Pediatrics**

**Stephen X. Skapek, M.D.**  
Professor, Pediatrics, Director, Division of Pediatric Hematology/Oncology, Children’s Cancer Fund Distinguished Professor in Pediatric Oncology Research

**Yifeng Wang, Ph.D.**  
Associate Professor, Pharmacology

**Virginia Mason McKeown Chair in Pediatric Research**

**Thomas Wilkie, Ph.D.**  
Associate Professor, Pharmacology

**Agnieszka Witkiewicz, M.D.**  
Associate Professor, Biomedical Engineering and Development; UT Translational STARS Award

**Yang Xiu, Ph.D.**  
Associate Professor, Clinical Sciences

**Jian Xu, Ph.D.**  
Assistant Professor, Children’s Medical Center Research Institute

**Chengchong [Alici] Zhang, Ph.D.**  
Associate Professor, Physiology

**Hongtao L. and Merton H. Stusky Professorship in Oncology, Michael J. Roessler Scholar in Medical Research**

**Chun-Li Zhang, Ph.D.**  
Associate Professor, Molecular Biology

**William L. Ackerman, M.D. Scholar in Biomedical Research**

**Hao Zhu, M.D.**  
Assistant Professor, Children’s Medical Center Research Institute

**CANCER CELL NETWORKS PROGRAM**

**Neal Attes, Ph.D.**  
Associate Professor, Microbiology

**Rita C. and William P. Clements Jr. Scholar in Medical Research**

**Bruce Beutler, M.D.**  
Professor and Director, Center for the Genetics of Inflammation, Regental Professor, Raymond and Ellen Willie Distinguished Chair in Cancer Research in Honor of Donald B. Caonard, Ph.D., Howard Hughes Medical Institute Investigator

**James Bruggerolas, M.D., Ph.D.**  
Associate Professor, Internal Medicine–Hematology/Onology

**Virginia Mason McKeown Chair in Pediatric Research**

**Ezra Baranecoff, M.D.**  
Associate Professor, Internal Medicine–Digestive/Liver Diseases

**Stephen Chen, Ph.D.**  
Professor, Radiation Oncology

**Zhijian [James] Chen, Ph.D.**  
Professor, Molecular Biology

**George L. Mackinger Distinguished Chair in Biomedical Science, Howard Hughes Medical Institute Investigator**

**David Chen, Ph.D.**  
Professor, Radiation Oncology

**Yuh Min Cho, Ph.D.**  
Associate Professor, Pharmacology

**Eugene McDonald Scholar in Medical Research**

**Melanie Cobb, Ph.D.**  
Professor, Pharmacology

**Jane and RS Downey Chair in Medical Science**

**David Corey, Ph.D.**  
Professor, Pharmacology, Astyo-Kelly Professorship in Medical Science

**Gaudenz Danuser, Ph.D.**  
Professor and Chairman, Bioinformatics

**Patrick E. Hargreaves Distinguished Chair in Basic Biomedical Science**

**George DeMartino, M.D.**  
Professor, Physiology

**Robert W. Lasky Professorship in Physiology**

**Beatriz Fontoura, Ph.D.**  
Professor, Cell Biology

**Joseph Garcia, M.D., Ph.D.**  
Associate Professor, Internal Medicine

**Elizabeth Goldsmith, Ph.D.**  
Professor, Biochemistry

**Pattie Roffa Brown Professorship in Biochemistry**

**Jun-Shou [Uily] Huang, Ph.D.**  
Associate Professor, Cell Biology

**Bethany Janowski, Ph.D.**  
Associate Professor, Pharmacology

**Howard Hughes Medical Institute Investigator**

**Carole Mendelson, Ph.D.**  
Professor, Pharmacology

**Richard Tyler Miller, M.D.**  
Professor, Internal Medicine–Hematology, John J. Fordham, M.D. Professor in Cancer Research, Internal Medicine Vice Chair, VA North Texas Health Care System

**Yousun Nam, Ph.D.**  
Associate Professor, Green Center for Reproductive Biology Sciences

**Southwestern Medical Foundation Scholar in Biomedical Research**

**Gray Pearson, Ph.D.**  
Assistant Professor, Simmons Cancer Center

**Ryan Potts, Ph.D.**  
Assistant Professor, Physiology

**Michael J. Rosenblum Scholar in Medical Research**

**Mike Rosen, Ph.D.**  
Professor and Chairman, Biochemistry

**W. Robert Salluzzo Chair in Biomedical Research, Howard Hughes Medical Institute Investigator**

**Elliott Ross, Ph.D.**  
Professor, Pharmacology

**Green Center and E.E. Fogelson Distinguished Chair in Reproductive Biology Sciences**

**Lanxi Lin, Ph.D.**  
Associate Professor, Cell Biology

**Mary McDermott Cook Scholar in Medical Research**

**Weibo Lou, Ph.D.**  
Assistant Professor, Pathology

**Dr. Charles T. Ashworth Professorship in Human Growth and Development**

**Nancy B. and Jake L. Hamon Distinguished Chair in Basic Cancer Research, Distinguished Chair in Pediatrics**

**Elliott Ross, Ph.D.**  
Professor, Internal Medicine–Hematology, John J. Fordham, M.D. Professor in Cancer Research, Internal Medicine Vice Chair, VA North Texas Health Care System

**W. Lee Kraus, Ph.D.**  
Professor and Director, Green Center for Reproductive Biology Sciences
CANCER PROGRAM

CHEMISTRY & CANCER PROGRAM

EXPERIMENTAL THERAPEUTICS OF CANCER PROGRAM

Kiyoshi Arizumi, Ph.D.
Professor, Pharmacology

David Boothman, Ph.D.
Professor, Biochemistry

Ralf Brekken, Ph.D.
Professor, Surgery

Sandeepta Burma, Ph.D.
Assistant Professor, Radiology

Benjamin Chen, Ph.D.
Assistant Professor, Radiology

Changbo Choi, Ph.D.
PhD, Advanced Imaging Research Center

Rajiv Chopra, Ph.D.
Assistant Professor, Radiology

Michael Cherf, M.D., Ph.D.
Professor and Chairman, Biochemistry

Korea H. and James S. E. Distinguished Chair in Molecular Pharmacology

Hannah D. and W. J. Stokoe Distinguished Chair in Systems Biology (UT Dallas)

EXPERIMENTAL THERAPEUTICS OF CANCER PROGRAM

Kiyoshi Arizumi, Ph.D.
Professor, Pharmacology

David Boothman, Ph.D.
Professor, Biochemistry

Ralf Brekken, Ph.D.
Professor, Surgery

Sandeepta Burma, Ph.D.
Assistant Professor, Radiology

Benjamin Chen, Ph.D.
Assistant Professor, Radiology

Changbo Choi, Ph.D.
PhD, Advanced Imaging Research Center

Rajiv Chopra, Ph.D.
Assistant Professor, Radiology

Michael Cherf, M.D., Ph.D.
Professor and Chairman, Biochemistry

Korea H. and James S. E. Distinguished Chair in Molecular Pharmacology

Hannah D. and W. J. Stokoe Distinguished Chair in Systems Biology (UT Dallas)
DISEASE-ORIENTED TEAM (DOT) MEMBERS

Ramzi Abdelrahman, M.D. (Hematology/Oncology)  
Associate Professor, Radiation Oncology

Kevin Albuquerque, M.D. (Gynecologic Oncology)  
Associate Professor, Radiation Oncology

Larry Anderson, M.D., Ph.D. (Heme)  
Assistant Professor, Internal Medicine—Hematology/Oncology

Victor Aquino, M.D. (Pediatrics)  
Associate Professor, Pediatrics

Yuli Arriaga, M.D. (Gastroenterology)  
Associate Professor, Internal Medicine

Glen Balch, M.D. (Gastroenterology)  
Associate Professor, Surgery

Muhammad Beg, M.D. (Gastroenterology)  
Assistant Professor, Internal Medicine

Daniel Bowers, M.D. (Pediatrics)  
Associate Professor, Pediatrics

Jeffrey Cadeddu, M.D. (Urology)  
Professor, Urology

Ralph C. Smith, M.D. Distinguished Chair in Minimally Invasive Urologic Surgery

John Mansour, M.D. (Gastroenterology)  
Associate Professor, Internal Medicine—Hematology/Oncology

Mohamed E. El-Sayed, M.D. (Neuro-Oncology)  
Assistant Professor, Radiation Oncology

Edward Pan, M.D. (Neuro-Oncology)  
Assistant Professor, Neurology & Neurotherapeutics

David Pistenmaa, M.D., Ph.D. (Gynecologic Oncology)  
Professor, Radiation Oncology

James Porter, M.D. (Hematology/Oncology)  
Associate Professor, Radiation Oncology

Robert Collins, M.D. (BMT)  
Professor, Internal Medicine

Sydney and J.L. Huffines Distinguished Chair in Comprehensive Oncology

Kevin Courtney, M.D., Ph.D. (GU)  
Associate Professor, Internal Medicine—Hematology/Oncology

Dawn Klemow-Reed, M.D. (Breast)  
Assistant Professor, Internal Medicine

H. Lloyd and Willye V. Skaggs Professorship in Cancer Research in Honor of Eugene Frenkel, M.D.

McKinney Foundation Professorship in Urology, in Honor of A. Marilyn Leitch, M.D.

Elaine Dewey Sammons Distinguished Chair in Cancer Research, in Honor of Eugene Frenkel, M.D.

A. Kenneth Pye Professorship in Cancer Research, Raymond D. and Patricia H. Rusher Distinguished Chair in Cancer Research, in Honor of Eugene Frenkel, M.D.

James Huth, M.D. (Melanoma)  
Associate Professor, Internal Medicine

Ann Spangler, M.D. (Breast)  
Assistant Professor, Internal Medicine

Rohit Sharma, M.D. (Melanoma)  
Professor, Urology

The Dr. Paul Peters Chair in Urology in Memory of Kenneth and Louise Strickland

Venetia Sarode, M.D. (Breast)  
Professor, Pathology

Rahit Sharma, M.D. (Melanoma)  
Assistant Professor, Surgery

Ann Spangler, M.D. (Breast)  
Associate Professor, Radiation Oncology

Masaya Takahashi, Ph.D. (Lung)  
Assistant Professor, Advanced Imaging Research Center

Stan Taylor, M.D. (Melanoma)  
Professor, Dermatology

J.B. Howell Professorship in Melanoma Education and Detection

Udit Verma, M.D. (GI)  
Associate Professor, Internal Medicine

Madhuri Vusirikala, M.D. (Heme)  
Assistant Professor, Internal Medicine

Naomi Winick, M.D. (Pediatrics)  
Assistant Professor, Pediatrics

Lowe Foundation Professorship in Pediatric Neuro-Oncology

Yull Arriaga, M.D. (Gastroenterology)  
Associate Professor, Pediatrics

Jennifer Donaldson, M.D. (GI)  
Assistant Professor, Internal Medicine

S. T. Harris Family Distinguished Chair in Breast Disease; Berta M. and Dr. Cecil O. Patterson Chair in Breast Cancer Research

Amy and Vernon S. Faulconer Distinguished Chair in Medical Science; Dallas Foundation Chair in Gynecologic Oncology

Lucien Nedzi, M.D. (Head & Neck)  
Associate Professor, Radiation Oncology