



Achieving the
Remarkable

2015 Annual Report

The past year was a period of remarkable achievements.



Across University of Iowa Health Care, 2015 will be remembered as a time of unique opportunities and extraordinary accomplishments in medical education, research, and patient care.

From the UI Health Care Leadership

The past year truly was a period of remarkable achievements. At UI Hospitals and Clinics, we experienced all-time highs in the number of patients treated in our inpatient units and outpatient clinics while continuously striving to maintain the highest levels of quality, safety, and service for our patients and employees.

Our research enterprise remains robust, with faculty and staff in the UI Carver College of Medicine leading and participating in basic science studies that provide greater understanding of human systems at the cellular level as well as clinical trials that test the safety and effectiveness of new drugs and medical devices.

We continue to lead by example in the area of medical education—teaching students, medical residents, and fellows the intricacies of medical science and patient-centered care as well as the importance of interdisciplinary collaboration and humanism in every interaction with colleagues, peers, patients, and families.

In *Achieving the Remarkable*, the 2015 University of Iowa Health Care annual report, we share stories and examples that demonstrate our commitment—and our value—to Iowa, the nation, and the world. In one sense, this publication is a tribute to the individuals across our organization—more than 12,000 faculty, staff members, students, residents and fellows, and volunteers—who display their skills, resources, expertise, commitment, and experience each and every day of the year.

Ultimately, it is about making a difference in the lives of people—how they understand health, disease, treatment, and recovery; how they take care of themselves and their families; and how they value their health care team. It's about helping people live better and live longer.

That's the “remarkable” we are always aiming to achieve.



Jean E. Robillard, MD
Vice President for Medical Affairs
University of Iowa



Debra A. Schwinn, MD
Dean, UI Roy J. and Lucille A. Carver
College of Medicine



Kenneth P. Kates, MD
CEO, UI Hospitals and Clinics
Associate Vice President, UI Health Care

University of Iowa Health Care is Iowa's comprehensive academic medical center, comprised of the UI Roy J. and Lucille A. Carver College of Medicine, UI Hospitals and Clinics, and UI Physicians, the state's largest multispecialty group practice.

Through its commitment to innovation, interdisciplinary collaboration, quality and safety, and service, UI Health Care:

- Educates and trains future generations of physicians and health care providers
- Provides world-class medical care and expertise to patients, families, and communities
- Maintains partnerships with doctors, hospitals, and health systems across Iowa and the region
- Seeks knowledge and discoveries that advance biomedical science, leading to improved treatments and therapies

ONE OF AMERICA'S BEST

Forbes ranks UI Health Care highest among health care employers

Ask our employees, and they'll tell you: It feels great at the top.

In March 2015, *Forbes* magazine released its 2015 listing of "America's Best Employers" and University of Iowa Hospitals and Clinics ranked No. 12 out of 500 of the nation's largest employers—and No. 1 in the health care industry.

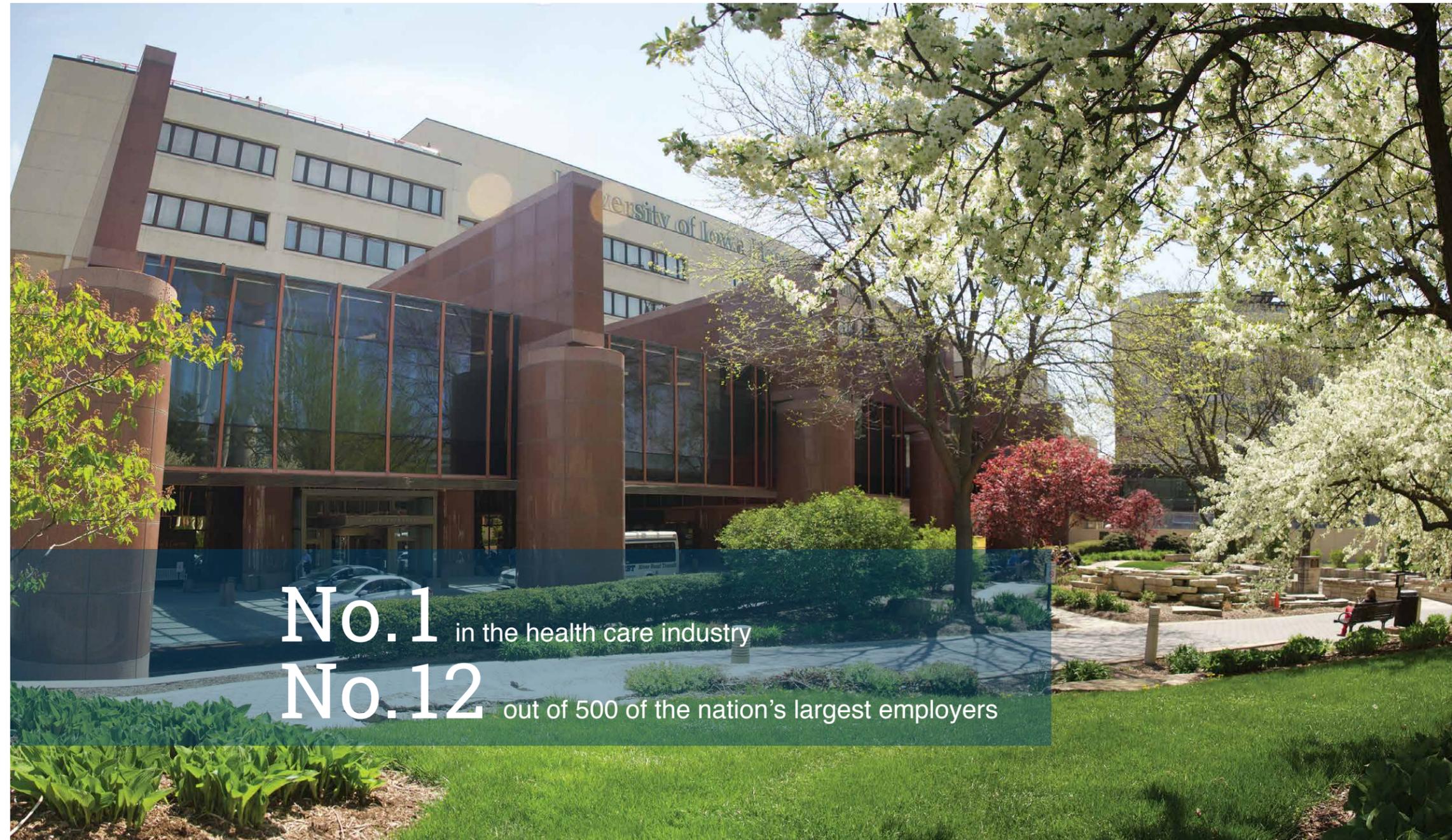
In partnership with Statista.com, *Forbes* surveyed more than 20,000 U.S. workers at large (at least 2,500 employees) American companies, nonprofit organizations, government agencies, and U.S. divisions of international corporations.

The ranked employers represent 25 industries—retail, automotive, biotechnology, banking, and others. UI Hospitals and Clinics was not only the highest-ranked health care employer but also the highest-ranked employer associated with a university.

The *Forbes* honor is national recognition from two highly valued sources: our employees and our peers in health care. The ranking reinforces our belief that by empowering and engaging people, an organization can foster innovation, growth, and teamwork—and achieve remarkable results for which we all can be proud.

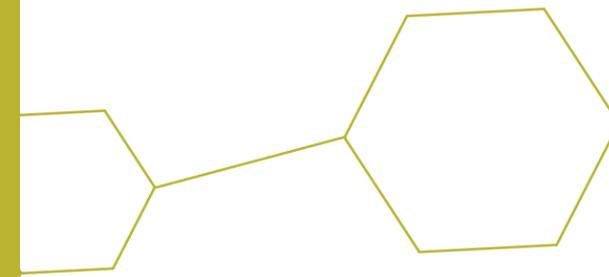
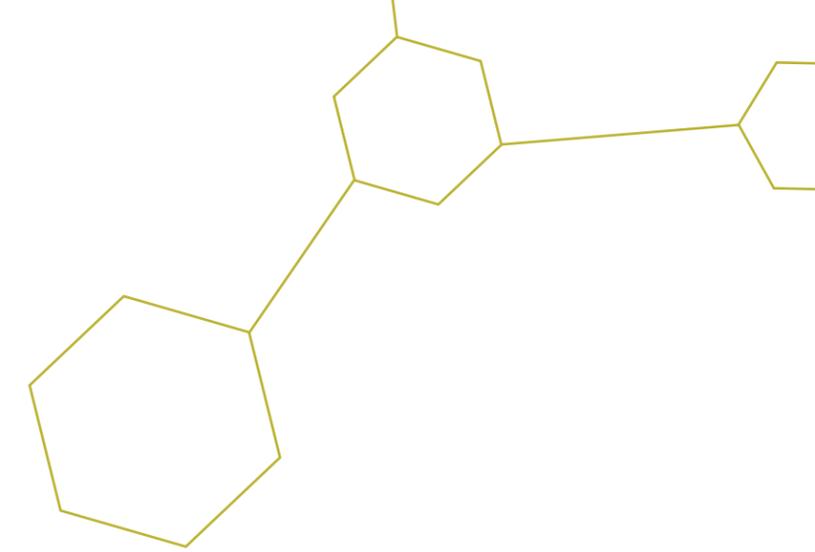
THE SURVEY ASKED TWO QUESTIONS:

1. On a scale of 0 to 10, how likely would you recommend your employer to someone else?
2. How about other employers in your industry?





Providing remarkable medicine
and expertise to patients,
families, and communities.



University of Iowa President Sally Mason announces her retirement, effective Aug. 1. In February, the Board of Regents, State of Iowa, selects UI Vice President for Medical Affairs Jean E. Robillard, MD, to chair the presidential search committee. In April, the board appoints Robillard as interim president of the UI.

Legendary Jazz musician **Wycliffe Gordon** gives the 2015 Martin Luther King Jr. Distinguished Lecture and a live performance during UI Health Care Human Rights Week 2015: A Celebration of Diversity and Inclusion.

John W. Cromwell, MD, is named director of Surgical Quality and Safety.



FINDING the WHY



UI Cardiovascular Genetics Program serves families with inherited heart problems

Terri Essary and her daughter, Sheri Garmoe, are part of an extended family with a long history of serious heart trouble. Terri and Sheri, who live in Brighton, Iowa, each have left ventricular non-compaction (LVNC), a condition that weakens their hearts' ability to pump blood efficiently. It's a genetic disease caused by a mutation in one of the genes that controls the heart's structural development.

Barry London, MD, PhD, a UI Heart and Vascular Center cardiologist who specializes in cardiovascular genetic disorders, provided the care. With London's encouragement, Terri and Sheri also enrolled their family in a cardiovascular genetics family study. Staff from the UI Cardiovascular Genetics Program obtained medical records and blood samples from 20 of Terri and Sheri's adult family members and also conducted various heart scans. From these records and tests, eight members of the family were found to have LVNC. As a result, a total of 47 family members are now enrolled in the study.

"Now we have a 'why,'" Terri says. "Before, we didn't know why members of our family had heart disease or why members of our family who seemed completely normal were suddenly falling over dead."

The UI Cardiovascular Genetics Program, led by Ferhaan Ahmad, MD, PhD, is the only integrated consultative service of its kind in the region and one of only a few in the United States that provide clinical evaluation, genetic counseling and testing, and management recommendations for patients and families with inherited heart disorders.

The University of Iowa Institute of Human Genetics (IIHG) now offers a new test that will ensure that patients who may require specific pain medications, or need blood-thinning drugs to prevent heart attack or stroke, will receive medicine that is safe and effective, based on the patient's own genetic makeup.



Precision MEDICINE

Drug metabolism test is based on patients' own genetic makeup

Variations in a person's DNA can alter the way they metabolize certain drugs. These changes in metabolism can cause drugs to be less effective than expected or even raise the risk of dangerous side effects.

The new drug metabolism test offered by IIHG will analyze patients' DNA from their blood samples and help providers decide whether certain opioid drugs or the blood-thinner clopidogrel (Plavix) will work based on each patient's DNA variants.

The test—developed in collaboration with the UI Hospitals and Clinics Department of Pharmaceutical Care, the UI College of Pharmacy, and Integrated DNA Technologies—can be ordered by health care providers. It's one of several tests the IIHG and UI Hospitals and Clinics are implementing to bring precision medicine to Iowans.

Precision medicine uses information about a patient's medical and family history, genetic makeup, and lifestyle to tailor treatments and improve health.

"The pharmacogenetic tests developed and offered by the IIHG are designed to inform dosing, predict efficacy, and minimize the possibility of adverse events with therapeutic agents to optimize therapy for our patients," says Richard Smith, MD, director of the IIHG. "We anticipate that health care providers will find these tests valuable in the care of their patients and that UI Health Care will continue to be at the forefront in offering this type of precision medicine to patients."

FOLLOWING HER HEART.♥

Math professor counts on UI for innovative cardiac procedure

Roseanne Wolf is well-schooled on how the heart works. The 31-year-old math professor's doctoral research at the University of Iowa focused on mathematical modeling of cardiac muscle cells.

Despite her academic knowledge, Roseanne couldn't have guessed that heart function would one day affect her on a much more personal level.

In fall 2013, Roseanne suddenly lost consciousness at her home in Dubuque, Iowa. An electrocardiogram (EKG) test came back normal, but "I knew something wasn't right," she says.

She called a cardiologist she knew from her research at Iowa, and headed to UI Hospitals and Clinics for additional testing. UI doctors determined that Roseanne had neurocardiogenic syncope, which is a sudden drop in heart rate and blood pressure that can cause the heart to stop beating.

In late December 2014, Roseanne collapsed at her parents' home. After a trip to the local ER, she requested a transfer to UI Hospitals and Clinics. Three months after

Roseanne received an implanted cardiac monitor—a device that continuously records a heart's rhythm—UI electrophysiologist Michael Giudici, MD, suggested a pacemaker, given the uncertainty and possible danger of Roseanne losing consciousness again.

To hide the incision and scar from the pacemaker procedure, Giudici used a unique submammary approach. It involves two small incisions to place the device between the chest muscle and ribs. Giudici is one of the few electrophysiologists in the United States to perform this innovative technique.

Since receiving her pacemaker, Roseanne feels great. She's even completed her first 5K run.

"There are no restrictions to what I can do now whatsoever," she says.





Naturally caring

UI team offers specialized breast reconstruction procedure

For Denise Brown of Robins, Iowa, the diagnosis she received from her Cedar Rapids doctors was clear: multifocal ductal carcinoma in situ (DCIS), a common type of breast cancer.

Since Denise’s cancer was in multiple locations, her risk of developing invasive cancer later was high.

“Although DCIS is considered pre-invasive cancer, if you want to remove it all and it is in multiple spots throughout the breast, you can’t really take it out with a lumpectomy,” says University of Iowa breast surgeon Ingrid Lizarraga, MBBS. “You have to remove the whole breast to take [the cancer cells] out.”

In addition to a skin-sparing mastectomy—removing all breast tissue while leaving as much skin as possible—Denise wanted a DIEP (deep inferior epigastric perforator) flap reconstruction. With the DIEP approach, tissue is taken from the patient’s

abdomen to form a new breast. Whereas a standard procedure requires taking some abdominal muscle and its blood supply, a DIEP flap reconstruction means carefully separating the vessels supplying blood to the skin and fat in the abdomen and connecting them to the blood vessels in the chest, thereby eliminating the need to remove abdominal muscle.

To get the surgical expertise she wanted, Denise was referred to UI Hospitals and Clinics, where surgeons have performed the highest number of DIEP flap procedures in the state.

Denise’s mastectomy, led by Lizarraga, and DIEP flap reconstruction, performed by UI plastic surgeon Jerrod Keith, MD, went smoothly.

“The team approach meant a lot to me,” Denise says. “I would tell anyone, ‘Go there and get on their team.’”

“I have tried living life with a more positive outlook due to this experience,” Tacia says. “It wasn’t my time. And there were tons of people praying for me.”

Quick thinking

Vascular surgery saves woman with rare, life-threatening condition

When Tacia Justus arrived at the emergency department at University of Iowa Hospitals and Clinics in March 2015, she could neither feel nor move her left leg, which had become badly swollen earlier that morning. She was bleeding internally, and her blood pressure was dangerously low.

Tacia was taken to the hospital’s hybrid suite, a state-of-the-art operating room where endovascular (catheter-based), surgical, and advanced imaging procedures can be performed simultaneously. Four teams of specialists—in anesthesia, emergency general surgery, interventional radiology, and vascular surgery—went to work.

Tacia had an uncommon condition called May-Thurner syndrome, in which the left iliac vein in the leg is compressed, leading to severe deep vein thrombosis (blood clotting). Tacia’s case was rare in that she also had a tear in her left iliac vein.

“What was really critical was that we had the technology and expertise to make that diagnosis in a timely fashion,” says UI vascular surgeon Neelima Katragunta, MD. “She was in a critical, life-threatening condition, and without the excellent work of everyone involved, it is difficult to say if she would be alive today.”

UI specialists treated the obstruction with a large stent and removed the clot that had formed in Tacia’s left leg caused by lack of blood flow upstream. The sev-



en-hour procedure went well. Tacia spent nine days in the hospital; several weeks later, she was back to work full time. Her long-term prognosis is good.

“I have tried living life with a more positive outlook due to this experience,” Tacia says. “It wasn’t my time. And there were tons of people praying for me.”

Debra Schwinn, MD, dean of the UI Carver College of Medicine, is named an area "Woman of Influence" by the *Corridor Business Journal*.

Barry London, MD, PhD, is named director of the Francois M. Abboud Cardiovascular Research Center. Peter Gruber, MD, PhD, is named co-director.

Jack Stapleton, MD, comments for National Public Radio on the GB Virus-C (GBV-C), which is found in patients who survived Ebola and might have had a protective effect in those infected with Ebola.

New Pediatric Brain Tumor Clinic brings together specialists

Collaboration and CONVENIENCE

Nine-year-old Brady Jorgensen of Council Bluffs has lived with a brain tumor most of his life. When he was only 9 months old, his mother noticed his left eye twitching. Less than two weeks later, his parents learned Brady had a rare tumor known as a Pilocyctic astrocytoma.

Neurosurgeons in Omaha removed 70 percent of the mass, but within weeks, most of it came back. Brady underwent 18 months of chemotherapy beginning when he was only 10 months old.

In June 2010, Brady's tumor began to grow again, and he underwent more chemotherapy. In July 2013, doctors discovered that the tumor was growing again. When scans done the following year showed the tumor had not diminished, his mother contacted pediatric cancer specialists at University of Iowa Children's Hospital, who were in the process of launching a new clinic.

The Pediatric Brain Tumor Clinic at UI Children's Hospital is the first of its kind in Iowa. The multidisciplinary clinic brings together specialists from several

disciplines, including neurosurgery, neuro-oncology, endocrinology, and ophthalmology, allowing patients to see multiple specialists in one day at one location.

When Brady arrived at the clinic in January 2015, the team had already reviewed his medical records. Soon he began a six-week course of fractionated stereotactic radiotherapy, which involves administering narrow beams of radiation from multiple angles. This process targets the tumor with precision while sparing surrounding tissue.

At a follow-up appointment, the tumor appeared to be well-controlled. For Brady, his experience at UI Children's Hospital has meant one thing. "Just hope," he says. "That's all I do is hope."



"Just hope," he says. "That's all I do is hope."



3,000+

names and messages adorn the beam

Continued >



the **BEAM**

Raising

Ceremonies celebrate milestone in construction of new children's hospital

In April 2015, University of Iowa Children's Hospital celebrated a significant construction milestone with "raising the beam" ceremonies. Patients, employees, donors, and community members gathered to watch as a crane hoisted the final steel beam into place, celebrating completion of the new building's core structure.



Before the beam was raised, patients and family members, faculty, staff, construction workers, donors, and community members signed the beam during events held in front of Kinnick Stadium. In addition, 1,005 virtual signatures were collected online from people in 13 states and Germany and added to the beam. In total, more than 3,000 names and messages adorn the beam.

At events on April 24 and 25, patients, family members, and hospital leaders talked about what the new building means for them, for the community, and for Iowa.

Stacy Van Gorp is a mother of twins with cystic fibrosis. "Cystic fibrosis is a heavy burden," she said. "But we don't carry that burden alone. We have the support

of University of Iowa Children's Hospital. And like the beam that's being raised, University of Iowa Children's Hospital supports our family. It helps us withstand the weight of cystic fibrosis."

The construction team also took a smaller beam to inpatient floors for pediatric patients to sign. When this beam was raised to the top of the new building, pediatric patients watched from a hospital skywalk. Fittingly, the crew waved their hard hats to the children.



In 2015,
the UI Organ Transplant Center
performed its 5,000th solid
organ transplant

5,000 generous donors
5,000 grateful recipients
5,000 transformed lives



University of Iowa
Roy J. and Lucille A. Carver
College of Medicine

“Not many people get things
written about them in a
medical journal. Because of
my pioneering care at Iowa,
doctors may be saving
other people’s lives.”

—Hailey Steimel, a heart recipient from
Cedar Rapids, who will pursue a health
care career in college



Transplant firsts for the state of Iowa,
all performed at UI Hospitals and
Clinics, include the following:

- Kidney – 1969
- Pancreas – 1979
- Kidney and Pancreas – 1979
- Heart – 1983
- Liver – 1984
- Lung – 1988
- Heart and Lung – 1988

Transplant number 5,000 involved a
liver, which is the second most com-
mon transplant performed at
UI Hospitals and Clinics.

- Kidney – 66.4 %
- Liver – 15.5 %
- Heart – 6.7 %
- Lung – 2.7 %
- Pancreas – 1.4 %
- Multi-organ transplants – 7.3 %
(including kidney/pancreas; kidney/
liver; heart/kidney; and heart/lung)

5,000

Transplant Milestone

Organ Transplant Center performs its 5,000th procedure

In April 2015, leaders of the University of Iowa Hospitals and Clinics Organ Transplant Center announced that the program had performed its 5000th solid organ transplant. The milestone was reached in March when a patient received a new liver.

The UI Organ Transplant Center, which also serves the Iowa City Veterans Affairs Health Care System, performed its first transplant—a kidney—in 1969. It was the state’s first transplant program and remains the only multi-organ, comprehensive transplant program in Iowa serving both adult and pediatric patients.

“We are both humbled and honored to be part of this historic milestone for Iowa’s transplant program and patients,” says Alan Reed, MD (pictured left), professor of surgery and director of the UI Organ Transplant Center. “The advancements we’re making today in transplant care are founded on the pioneering efforts, both at Iowa and elsewhere, over the past near half century of men and women dedicated to extending lives through organ transplantation.”



Joan Wuest likes to keep moving. For the spry 83-year-old from Iowa City, a three-mile walk is an important part of her daily routine.

Or at least it was until severe pain in her left hip limited Joan's ability to stay active. Sixteen years earlier, she underwent surgery at University of Iowa Hospitals and Clinics to repair her right hip. This time, she again chose the orthopedic expertise available at the UI and opted for a procedure known as anterior approach total hip replacement surgery.

A minimally invasive technique that involves a small incision, the anterior approach means entering the front of the thigh—instead of the back side as with the traditional posterior approach—to reach the hip. This allows an orthopedic surgeon to work between, rather than spreading, the muscles that hold the hip joint with its “ball and socket” in place.

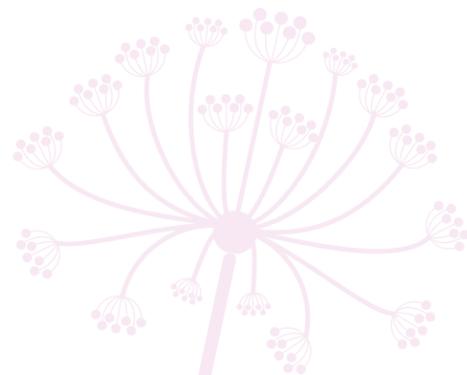
With the anterior approach, patients experience less

pain after the procedure, which often results in a shorter hospital stay and a quicker recovery.

“The anterior approach has been around for decades, but relatively recent advances in technology, equipment, and training have made it a much more efficient and effective option for certain patients,” says UI orthopedic surgeon Charles Clark, MD, who uses the anterior approach for the majority of total hip replacement procedures he performs.

Joan had her procedure in February 2015 and soon was walking up to a mile and a half every day. She insists she couldn't have asked for better care.

“From the surgery to the physical therapy to the nursing care, it was all great,” Joan says.



WALKING THE WALK

Anterior approach hip surgery means less pain, quicker recovery



The UI honorees

Paula Forest, advanced registered nurse practitioner, Palliative Care Consult Service

Amy Leitch, advanced registered nurse practitioner, Anemia Management Clinic

Lisa Maske, nurse clinician specialist, Transitions of Care team, ICTS administration

Deena McAndrew, staff nurse, Pediatric Catheterization/Electrophysiology Lab

Christine Mentz, assistant nurse manager, Pediatric Catheterization/Electrophysiology Lab

Julie Neuzil, staff nurse, obstetrics services, Women's Health Center

Roger Roeder, staff nurse, Pediatric Sedation Team

Christina Woline, advanced nursing practice coordinator, Nursing Clinical Education Center

Courage, competence, commitment

Eight individuals named to 2015 list of '100 Great Iowa Nurses'

Eight nurses at University of Iowa Hospitals and Clinics were named to the 2015 listing of “100 Great Iowa Nurses,” an award that recognizes nurses who have made meaningful, lasting contributions to their patients, colleagues, and profession.

The 100 honorees were selected from a pool of more than 350 individuals and nominated by colleagues, patients, doctors, friends, and family members. The field of nominees was narrowed to 100 by a panel of reviewers, including nursing professionals and previous honorees, as well as representatives from the UI College of Nursing, the Iowa Nurses Association, the Iowa Nurses Foundation, and the Iowa Hospital Association.

Nurses in the Intermediate Medical-Surgical Unit at UI Hospitals and Clinics receive the Gold Beacon Award of Excellence from the American Association of Critical-Care Nurses.

TraumaHawk mobile app created by UI researchers enables Iowa State Troopers to send photos and information from automobile accidents to trauma doctors before a patient arrives in the emergency department, helping physicians prepare for injuries they will treat.

March

Pediatricians from **UI Children's Hospital** begin seeing patients and families at a new location in North Liberty, Iowa.



Alumni Jerre and Mary Joy Stead began giving to the UI more than 30 years ago; their cumulative support totals \$53.9 million.

UI Children's Hospital to be named for Stead Family

University of Iowa Children's Hospital will be named University of Iowa Stead Family Children's Hospital in honor of Jerre and Mary Joy Stead. The new name will take effect in November 2016 with the dedication of the new UI Children's Hospital building.

The Steads, natives of Maquoketa, Iowa, and residents of Scottsdale, Arizona, have committed \$25 million to children's medicine at the UI. The Steads' support will help complete the new UI Children's Hospital facility and support faculty, staff, and researchers who are making discoveries that enhance the understanding, awareness, and treatment of pediatric diseases.

In 2013, the UI announced the naming of the Stead Family Department of Pediatrics in honor of the couple's generous gifts to children's medicine. They have supported other areas of the UI, too, including the Henry B. Tippie College of Business, of which Jerre is a 1965 graduate.

"We believe the people of UI Health Care set Iowa apart in children's medicine," Jerre Stead says. "With the new UI Children's Hospital building, the doctors, nurses, staff, and researchers at UI Health Care will be able to continue to deliver the highest level of teaching, care, and research."

The Steads serve as co-chairs for UI Health Care in *For Iowa. Forever More: The Campaign for the University of Iowa*, the UI's \$1.7 billion fundraising campaign.



“The Holden family’s landmark support has helped assure that we are able to lead the way in cancer research; offer state-of-the-art, compassionate treatment for our patients; and train the next generation of cancer researchers and clinicians.”

Jean Robillard, MD, UI Vice President for Medical Affairs



U.S. News & World Report lists four UI Carver College of Medicine programs in its 2016 edition of “Best Graduate Schools.”

Richard M. Hoffman, MD, MPH, becomes director of the Division of General Internal Medicine.

Marcy Rosenbaum, PhD, professor of family medicine, is selected as one of four recipients of the 2015 UI President and Provost Award for Teaching Excellence. Her teaching activities reach students, residents, fellows, and faculty.

Stuart Weinstein, MD, and Lori Dolan, PhD, win the 2015 Orthopaedic Research and Education Foundation Clinical Research Award for a paper summarizing decades of research that followed patients with adolescent idiopathic scoliosis throughout childhood, adolescence, and adulthood.



Giving for a cure

Holden support for cancer research and care remains strong

When Roland Holden—who founded Holden Foundation Seeds Inc., a seed corn research and genetics company—died in 1995 after battling leukemia, the Holden family of Williamsburg, Iowa, became committed to celebrating his legacy by advancing research and treatment that may eventually cure the disease that took his life.

That commitment to honor Roland Holden led the family to make transformational gifts to support cancer research and care at the University of Iowa. In honor of the family’s remarkable gifts, the UI established the Holden Comprehensive Cancer Center in 2000.

The excellent care Roland Holden and his wife, Ruby, received at UI Hospitals and Clinics—and the transformative, first-rate care Holden Comprehensive Cancer Center at the UI provides to all

patients and families—is why the Holden family continues to make a difference for so many others affected by cancer.

The Roland and Ruby Holden Foundation committed an additional \$5 million to Holden Comprehensive Cancer Center at the UI, a National Cancer Institute-designated center. The gift will support faculty, research, clinical trials, and nursing education.

“The Holden family’s landmark support has helped assure that we are able to lead the way in cancer research; offer state-of-the-art, compassionate treatment for our patients; and train the next generation of cancer researchers and clinicians,” says UI Vice President for Medical Affairs Jean E. Robillard, MD. “This gift from the Holdens will help future generations of patients and their families.”

Hope comes true

Family grateful for UI Center for Advanced Reproductive Care

For years, Corinne and Bill Otting of Peosta, Iowa, had tried to get pregnant. Corinne had undergone numerous tests and procedures at other medical centers, but none of these efforts proved successful.

“We never lost hope that we’d start a family someday,” Corinne says, “but there were times where we wondered if it really would happen.”

In March 2011, the Ottings met with University of Iowa obstetrician Eyup Duran, MD, at the UI Center for Advanced Reproductive Care, home to Iowa’s premier in vitro fertilization (IVF) program. They learned about the IVF process and timeframe and took part in preliminary tests and evaluations.

Corinne also learned she had polycystic ovarian syndrome (PCOS), which is a hormone imbalance that interferes with a woman’s ability to ovulate regularly.

“Polycystic ovarian syndrome is a common cause of infertility, and many women don’t

know they have PCOS until they try getting pregnant,” Duran says. “The good news is that with the right treatment, women with PCOS can indeed get pregnant.”

The UI team prescribed medications to help stimulate ovulation so that Corinne could produce mature eggs for the IVF process. She returned to the UI for follow-up care, and in May 2011, the Ottings received news that Corinne’s pregnancy test was positive. In early January 2012, their son, Easton, was born.

In May 2013, the Ottings welcomed Eli, another baby boy, who was born via frozen embryo transfer, a process that uses a preserved embryo from a previous fresh IVF cycle.

Today, Corinne and Bill have two healthy, growing boys, and they’re grateful for the care they received.

“We knew we were in good hands,” Corinne says.



PROACTIVE DUTY

Clinical trials play an important part in cancer care at Holden Comprehensive Cancer Center

When Stephen Cockrell began treatment at Holden Comprehensive Cancer Center at the University of Iowa for a cancerous tumor behind his tongue, he was confident he'd receive the best cancer care available.

He also was given the opportunity to give something back.

Stephen's cancer required chemotherapy and radiation. In addition to his treatment regimen, he was invited to participate in a clinical trial to test a drug that aims to reduce a negative side effect of radiation therapy.

Radiation is commonly used to attack cancer cells in patients with head and neck tumors, but this sometimes can damage healthy tissue around the cancer cells. Potential side effects—pain, swelling, and blisters in the throat and mouth—can limit a patient's ability to complete treatment on schedule.

Like many patients at Holden Comprehensive Cancer Center, Stephen participates in, and recognizes the value of, clinical trials that test new treatments or therapies not yet available to the public. He hoped the study drug would improve the quality of his care. He also knew his participation could help future cancer patients.

The study drug, administered intravenously, is given to patients before each radiation session. Clinical researchers are hoping to demonstrate that the drug will counteract radiation's impact on surrounding healthy tissue.

Stephen participated in the clinical trial throughout his 47-day treatment period, with minimal side effects from the radiation.

"It's been a very positive experience," Stephen says. "I'm 100 percent supportive (of clinical trials)."





Brain TRUST

Breakthrough procedure allows patients to go home the same day

In January 2015, shortly after arriving for work in West Des Moines, Iowa, LaDel Hoyle began feeling disoriented and experiencing memory lapses.

An MRI at a local hospital showed that LaDel had an unruptured cerebral aneurysm—a thin spot on a blood vessel in the brain that bulges and fills with blood.

LaDel's doctor referred her to University of Iowa Hospitals and Clinics, where she met neurosurgeon David Hasan, MD, who suggested a new, minimally invasive procedure using the Pipeline Embolization Device.

Standard treatment for cerebral aneurysms typically meant surgery to remove part of the skull to access the brain. With the Pipeline procedure, a catheter is inserted into an artery in the groin and threaded into the carotid artery, which supplies blood to the brain. A wire mesh tube at the tip of the catheter is positioned across the neck of the aneurysm. The blood remaining in the blocked aneurysm forms a clot that reduces the likelihood of the aneurysm rupturing or enlarging. Over time, the aneurysm shrinks on its own.

Remarkably, Hasan and his neurosurgery team have perfected the Pipeline technique so that patients are able to leave the hospital the same day. A few hours after her aneurysm procedure, LaDel was cleared to go home.

“The doctors and nurses were with me the whole way. I couldn't have asked for a better team,” LaDel says.

The Pipeline approach “really is a breakthrough in aneurysm treatment,” Hasan says. “The ability to take it from a very complex surgery to a much simpler outpatient procedure is very comforting for patients and their referring providers.”





For Steven Clegg, walking had become almost unbearable due to pain in his lower back that extended down to his right calf.

Back on track

Spine surgery provides relief for professor in pain

“I’d be hobbling by the time I got from my lab to my car at the end of the day,” says Steven, a professor of microbiology at the University of Iowa.

Steven’s primary care doctor referred him to Cassim Igram, MD, a spine care specialist in the UI Department of Orthopedics and Rehabilitation.

An MRI showed that Steven had a synovial cyst, a non-cancerous, fluid-filled sac that had formed in the area between two vertebrae in his lumbar spine. A synovial cyst that grows too large can put pressure on the spinal nerves.

“This often leads to pain that starts in the lower back and radiates down one or both legs,” Igram says. “For many of these patients, standing or walking for extended periods can become very difficult.”

To treat the condition, a surgical procedure known as a laminectomy is performed. This involves removing a small piece of the vertebra (lamina) in order to locate and safely remove the cyst, thereby relieving pressure on the nerves.

Steven had his surgery in June 2015. The procedure was a success, and he was back home the following day. Six weeks later, Steven returned to work. Most important, his back and leg pain was gone, thanks to Igram and his surgical team.

“Obviously his surgical skills are very good, but what struck me about Dr. Igram was that he sat down and told me everything I needed to know,” Steven says. “I really couldn’t be more pleased with the results.”

Ahead of the curve

New technology reduces surgery for young scoliosis patients

For four years, Will Imbus, an energetic boy from East Dubuque, Illinois, hasn’t been able to play baseball or run around with friends. Will has early-onset scoliosis (EOS), an abnormal, side-to-side curvature of the spine.

EOS occurs in children younger than 5 years old; Will was diagnosed at just 9 months old. Left untreated, the curve can impede lung growth and development. Traditional treatment requires titanium rods be surgically implanted into the back across the spinal curvature. Every six months, surgeons reopen the incision site and lengthen the rods to keep up with the child’s growth. As a result, Will has undergone seven major surgeries since he was 5.

Fortunately, repeat surgeries for Will and other EOS patients are becoming a thing of the past. In January 2015, Universi-



ty of Iowa Children’s Hospital became the only hospital in Iowa to offer the MAGEC (MAGnetic Expansion Control) Spinal Growing Rod. Developed by Ellipse Technologies Inc., MAGEC is an adjustable rod that uses innovative magnet technology and remote control, allowing the device to be lengthened non-invasively.

Will had MAGEC rods surgically implanted in March 2015. Stuart Weinstein, MD, UI professor of orthopedics and pediatrics, led the surgical team. After wearing a temporary brace for three months to protect his incision site, Will had his first outpatient lengthening procedure in June. He will continue to return every three or four months for lengthenings, but he no longer needs surgery twice a year. Eliminating the pain, expense and recovery time of many surgeries seems like magic to Will and other EOS patients.

UI researchers discover that mice lacking a gene linked to eating disorders in humans show behavioral abnormalities resembling those in people with anorexia nervosa. The study, published in *Cell Reports*, may point to neural circuits as targets to treat abnormal behaviors associated with eating disorders.

Researchers with the multinational **Human Brain Research Laboratory**, whose members include UI investigators, learn that tinnitus—phantom ringing in the ears—involves activity throughout the brain. The findings, in *Current Biology*, may help to inform treatments such as neurofeedback, electromagnetic brain stimulation, or pharmacological approaches.

Iowa City Heart Center, P.C., which has served eastern Iowa patients and families since 1987, joins UI Health Care.

Robert G. Robinson, MD, receives the 2015 Gary J. Tucker Award for Lifetime Achievement in Neuropsychiatry from the American Neuropsychiatric Association and the Jack Weinberg Memorial Award for Geriatric Psychiatry from the American Psychiatric Association.

UI Health Care launches UleCare.com, which offers 24/7 access to providers for anyone in Iowa with a computer, tablet, or smartphone.



In the RIGHT SPOT

Innovative stroke treatment brings results

Mailis Toop felt pain in her neck when she arrived at her community college campus in Iowa City in April 2015. That discomfort soon gave way to a nightmare scenario: The 29-year-old exchange student from Estonia had a stroke in the classroom.

Mailis' teacher, classmates, and host family acted quickly. Before the day was through, her life was saved—by a groundbreaking treatment called thrombectomy—at University of Iowa Hospitals and Clinics, the only facility in Iowa that offers the procedure.

“When she arrived, she was starting to deteriorate,” says neuro-interventionalist Santiago Ortega, MD, one of two doctors on staff who could perform a thrombectomy. “We rushed her into the OR and started the thrombectomy immediately.”

In a thrombectomy, a catheter is inserted into an artery. Guided by X-rays, doctors locate the brain clot, navigate the catheter to it, and introduce a wire cage called a stent-retriever. The device expands inside the artery to grab the clot and pull it out, restoring blood flow to the brain.

“We were able to open the artery in 34 minutes,” Ortega says. “We definitely felt like we saved a life.”

As home to a nationally designated Comprehensive Stroke Center, UI Hos-

pitals and Clinics has the infrastructure and personnel to offer thrombectomy to patients 24/7 as needed. In the time since the therapy was endorsed last year, four more doctors with expertise in the procedure have been recruited to join the staff.

Mailis was out of the hospital in four days and back in class within weeks.

“I feel fine, like it never happened,” she says. “I’m really lucky. I keep telling that to everybody.”





BACK on the JOB

Work injury center helps patients, employers, and insurers

When Richard Swenson of Cedar Rapids injured his shoulder while at work, his employer referred him not to an emergency room but the University of Iowa Work Injury Recovery Center (WIRC), based in the UI Department of Orthopedics and Rehabilitation.

WIRC provides specialized care for foot, ankle, knee, hip, spine, hand, elbow, and shoulder injuries that happen on the job.

“If the clinician knows your area of injury backwards and forwards, they can quickly assess what’s going on and decide whether you can get back in the game or not,” says UI orthopedic surgeon and WIRC physician James Nepola, MD.

In addition to providing comprehensive orthopedic services, WIRC also distributes diagnosis, treatment, and progress communications to the patient, employer, insurance company, and claims adjusters involved.

“They directly communicated everything to me right away,” Richard says. “It was a relief knowing everybody was on the same page.”

“The employers need to know what their staffing situation is going to be,” adds Nepola. “Employers are counting on their employees. They’re not just replaceable parts.”

WIRC has also recently expanded its efforts to provide expert care in the Des Moines area by opening a new center in Clive, Iowa.

Over several months, Richard worked with WIRC orthopedic specialists to improve his shoulder. After trying physical therapy and medication, he underwent shoulder surgery.

“I can’t thank the UI enough for what they did,” says Swenson. “I wouldn’t be where I’m at if it hadn’t been for them.”



Expertise at heart

New mitral valve procedure provides alternative to open-heart surgery

In fall 2015, specialists with University of Iowa Heart and Vascular Center became the first in eastern Iowa to perform mitral heart valve repair procedures without traditional surgery.

The Abbott MitraClip System is a first-of-its-kind device that provides improvement of both symptoms and quality of life for people with severe degenerative mitral regurgitation who are not candidates for surgery.

On the left side of the heart, the mitral valve controls blood flow from the upper chamber (left atrium) into the lower chamber (left ventricle). With mitral regurgitation, the flaps of the mitral valve don’t close properly, causing blood to leak into the atrium. Severe mitral regurgitation can cause heart muscle damage and lead to heart rhythm problems and stroke.

Traditional open-heart surgery has been the standard treatment option for mitral regurgitation, but not for patients at high risk for surgery. For these patients, the MitraClip System provides an alternative to invasive surgery. The device is delivered to the heart via a catheter that is threaded through the femoral artery in the leg. Once in place, it allows the blood to flow normally between the chambers of the heart.

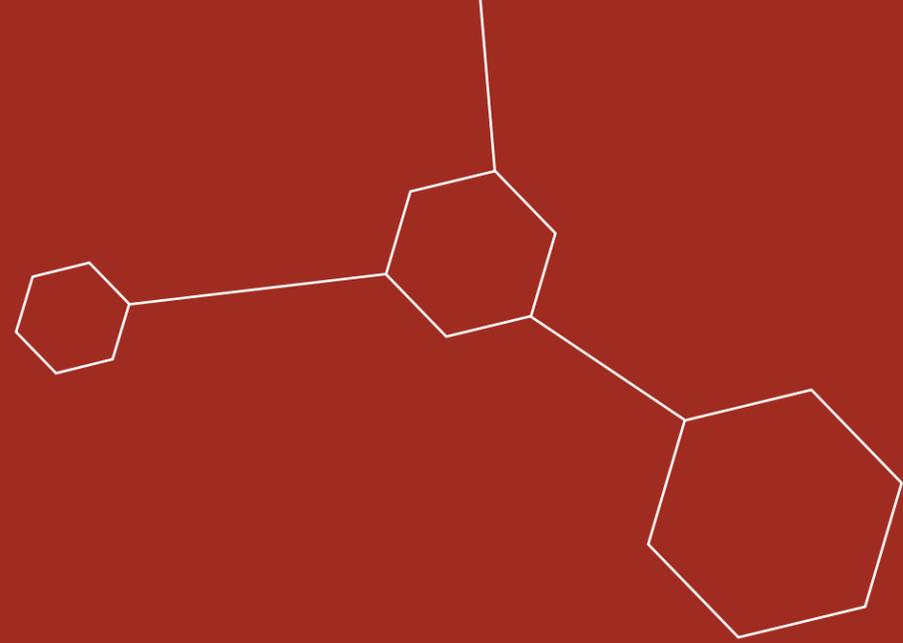
The MitraClip procedure is part of UI Heart and Vascular Center’s Structural Heart Disease Program, which specializes in the complex repair of heart disease structures. As the only dedicated program in Iowa, the UI Structural Heart Disease Program includes interventional cardiologists, imaging experts, and cardiac surgeons working together to provide the best treatment approach for each patient.

Eric Taylor, PhD, biochemistry faculty member and a member of the Fraternal Order of Eagles Diabetes Research Center, receives a five-year, \$1.87 million grant from the National Institutes of Health to study biological mechanisms used by the liver to make glucose.

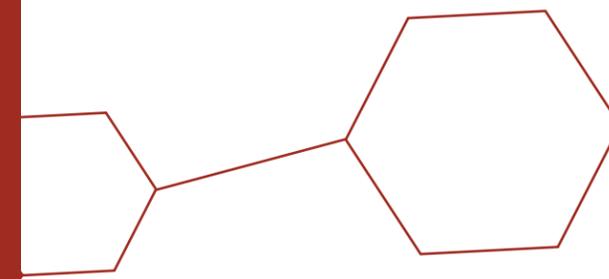
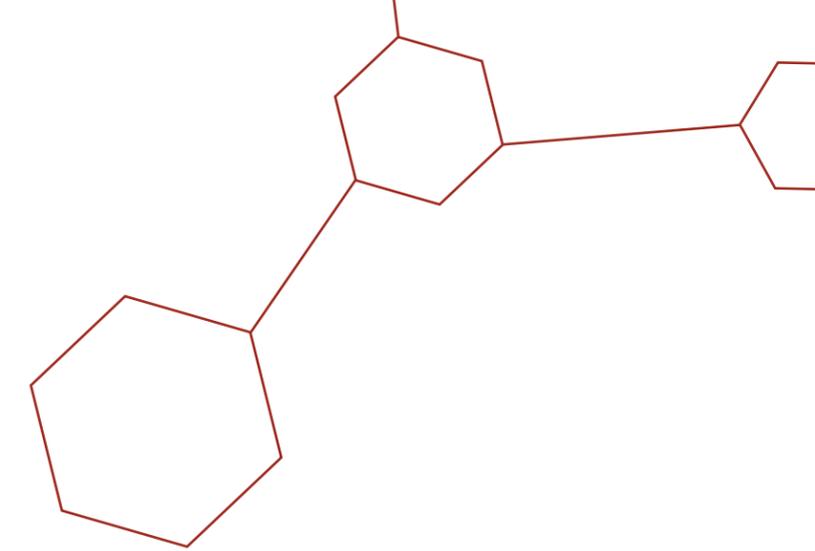
The UI Heart and Vascular Center **Pulmonary Hypertension Program** earns the Center of Comprehensive Care designation by the Pulmonary Hypertension Association. The program, under the direction of Linda Cadaret, MD, is the only treatment center of its kind in Iowa.

June

Nine pediatric specialties are included in *U.S. News & World Report’s* rankings of “Best Children’s Hospitals.”



Teaching the remarkable intricacies of medical science and patient-centered care.



UI Hospitals and Clinics is the first hospital in Iowa to achieve NICHE Exemplar status for nurse-driven care that improves the quality of care for older adult patients.

Michael Brownlee, PharmD, is named a fellow of the American Society of Health-System Pharmacists.

July

The UI Hospitals and Clinics EEG lab earns accreditation by American Board of Electroencephalographic and Evoked Potential Technologists.

The Spanish-language service UleSalud.com joins UI Health Care's 24-hour urgent care service available online at UleCare.com.

TRADITIONS OF excellence

Physician assistant, physical therapy programs among the nation's best

While the University of Iowa Carver College of Medicine is understandably recognized for excellence in its Doctor of Medicine (MD) program, two other programs in the college have long maintained traditions of excellence.

The Physician Assistant (PA) Studies and Services program offers a curriculum that is integrated into the college's medical degree curriculum, which allows PA students to complete didactic coursework with the college's medical students.

It's a curricular model unlike any other PA program in the nation, one that provides a broad-based, interdisciplinary experience for students leading to a Masters of Physician Assistant Studies (MPAS) degree. It's one reason why the 28-month program receives more than 800 applications every year for 25 spots in each new class of students.

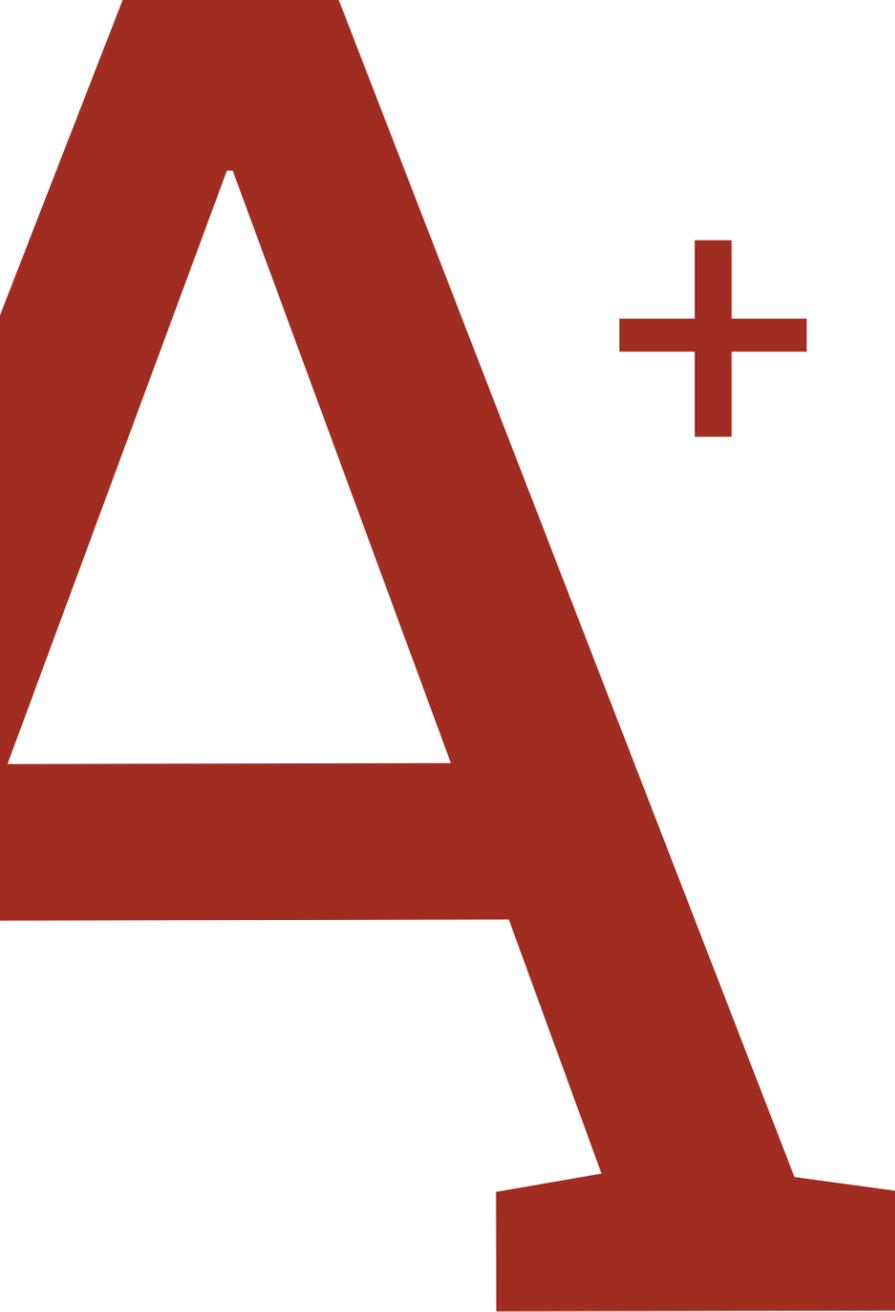
Among the more than 150 PA programs in the United States, the UI program is truly elite—No. 2 in the nation,

according to *U.S. News & World Report*. In fact, the program has been ranked No. 1 or 2 by the magazine for more than a decade.

The Department of Physical Therapy (PT) and Rehabilitation Science program is also one of America's best programs of its kind, consistently ranking in the top 5 nationally according to *U.S. News*. The department enjoys a rich tradition, having offered entry-level education in physical therapy since 1942.

The Doctor of Physical Therapy (DPT) program enrolls 120 students (40 each year) over a three-year curriculum. A research-intensive Master of Arts (MA) and a PhD degree in rehabilitation science also are offered.

Inter-professional education, extended clinical internships, and innovative instructional methods are hallmarks of the PT students' experiences. PT faculty members conduct research in diverse areas such as molecular biology, pain perception, and health care outcomes.



STARTING EARLY

Program aims to reach students underrepresented in medical school

Nurturing a high school student's interests can go a long way toward unlocking his or her career potential.

A new "pipeline" program between City High School in Iowa City, the University of Iowa Carver College of Medicine, and the UI Center for Diversity and Enrichment is doing just that. Introduced during the fall 2015 semester, the City High Pre-Health Society gives interested City High freshmen and sophomores early exposure to health-related career choices and the preparation necessary to succeed in medical (or other health sciences) schools.

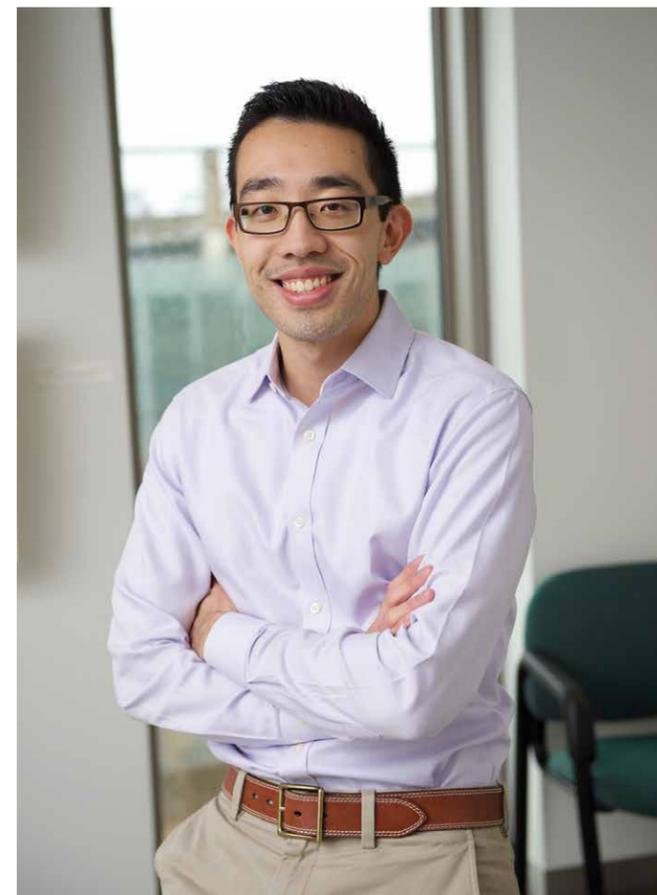
The program was developed for students who typically are underrepresented in medical or health sciences educational programs—African American, Latino, Native American, and Pacific Islander students, for example, as well as students from

low-income backgrounds or those who potentially would be a first-generation college student.

"Our goal is to provide these students the tools and foundation to be successful," says Denise Martinez, MD, assistant dean for cultural affairs and diversity initiatives in the UI Carver College of Medicine and clinical assistant professor of family medicine. "They get to interact with current health sciences students and faculty and learn firsthand what it takes. Most of all, they see that a career as a health professional is a real option and full of opportunities if they're interested."

The program is one component of a strategic diversity "roadmap" developed by the UI Carver College of Medicine Office of Cultural Affairs and Diversity, which works to foster an environment where all UI Health Care students, employees, and volunteers feel welcome.

BRIDGING ^{the} gap



Student-run Free Mental Health Clinic serves community's needs

Tim Ando considers himself fortunate. It's an outlook that helps him succeed as a medical student at the University of Iowa. It also helps him—along with other UI Carver College of Medicine students—serve the Iowa City community.

"As medical students, we are really lucky to be here," says Ando, a third-year medical student. "I think it's our duty as physicians and physicians-in-training to do what we can to give back to the community."

Ando does this through the Free Mental Health Clinic in Iowa City, a student-led partnership between the Carver College of Medicine, the Community Mental Health Center for Mid-Eastern Iowa, and the UI Department of Psychiatry.

The clinic—held every other Saturday at the Community Mental Health Center in downtown Iowa City—helps bridge gaps in existing mental health care for area individuals who have limited resources

or otherwise would need to wait months for mental health services. Working with an attending physician, the students help provide diagnostic and follow-up care, which includes medication management for common psychiatric disorders, referral assistance for long-term mental health care, and related services.

Ando's experience—he's been involved in the Free Mental Health Clinic for more than two years—has spurred his interest in psychiatric medicine. It's also enhanced his ability to communicate with patients.

"Counseling your patients, getting to know them, building trust—all those things are done with words," Ando says. "And doing psychiatric interviews is a great way to practice that skill. Every time I go, I learn something new."



MATCH made in Medicine

*UI Carver College of Medicine graduates
learn their residency destinations*

Friday, March 20, was Match Day 2015—the day when most medical school graduates around the world learned where they will enter residency programs to receive advanced specialty training. In the months prior to Match Day, students apply and interview at hospitals and medical centers where they would like to do their residency training. They rank their preferences with the National Residency Matching Program (NRMP).

Directors of residency programs at institutions around the globe create a similar list—theirs ranking the candidates according to the program's preference. The lists of both the candidates and the programs are entered into a computer, and an algorithm creates a “match,” placing candidates with programs.

Students learn a few days before Match Day whether they'd matched at all, and

those who haven't matched are given the week to find a program. On Match Day, participating medical schools around the globe distribute eagerly awaited details at the exact same time.

Among the University of Iowa Carver College of Medicine's 2015 graduating class of 154 students, 49 percent (76 students) chose primary care specialties, which include family medicine, internal medicine, obstetrics and gynecology, and pediatrics. There were 20 matches in family medicine programs, 26 in internal medicine, nine in obstetrics and gynecology, and 21 in pediatrics.

Among this year's graduates, 50 will remain in Iowa for their first year of postgraduate training, and 33 of these 50 students will train at UI Hospitals and Clinics.

THE MATCH
NATIONAL RESIDENCY MATCHING PROGRAM
2121 K Street NW, Suite 100, Washington, DC 20007
www.nrmp.org | E-mail: support@nrmp.org
Toll Free: 800-433-1434 | Phone: (202) 462-2223

2015 MATCH RESULTS
March 20, 2015

Applicant Name: Heidi Ahmed
NRMP ID:
AAMC ID:

Congratulations, you have matched!

Institution Name: U Iowa Hosps and Clinics
Program Name: Obstetrics-Gynecology
Program Code: 120222000

THE MATCH
NATIONAL RESIDENCY MATCHING PROGRAM
2121 K Street NW, Suite 100, Washington, DC 20007
www.nrmp.org | E-mail: support@nrmp.org
Toll Free: 800-433-1434 | Phone: (202) 462-2223

2015 MATCH RESULTS
March 20, 2015

Applicant Name: Courtney A Keresztes
NRMP ID:
AAMC ID:

Congratulations, you have matched!

Institution Name: U Iowa Hosps and Clinics
Program Name: Obstetrics-Gynecology
Program Code: 120222000

THE MATCH
NATIONAL RESIDENCY MATCHING PROGRAM
2121 K Street NW, Suite 100, Washington, DC 20007
www.nrmp.org | E-mail: support@nrmp.org
Toll Free: 800-433-1434 | Phone: (202) 462-2223

2015 MATCH RESULTS
March 20, 2015

Applicant Name: Hana Hashim Khidir
NRMP ID:
AAMC ID:

Congratulations, you have matched!

Institution Name: Jackson Memorial Hosp-FL
Program Name: Medicine-Residation

Teaching Caring

Learning by sharing

Mentoring, community-based learning help guide the student experience

Roger Sur wants to be sure he's taking full advantage of the sharing experiences that are so crucial to a well-rounded education.

During the summer after his first year in the University of Iowa Carver College of Medicine, Sur was a mentee, working at Jones Regional Medical Center in Anamosa as part of the college's Medical Education in Community Orientation (MECO) program. MECO offers students the opportunity to spend up to 12 weeks at an Iowa community hospital following the completion of their first year of studies. The students observe and work alongside experienced physicians in various specialties and real-world situations.

But Sur is also focused on giving back. Reflecting on his own education, he sees what a difference mentoring can make. So he's not just a mentee; he's also reaching

out whenever possible "to share what I've learned and give any advice I can," he says.

During one of the college's Mini Medical School community outreach programs, Sur volunteered to teach middle school students about medical technology. And he has some ongoing mentoring relationships—one with a first-year medical student in his home state of California, and another with an undergraduate student who is considering a career in medicine.

Looking back on his education, "I wish I'd had that," Sur says. "I had some mentors along the way, but in the beginning it was me learning by trial and error."



Ready for rotations

Students gain clinical experience early into New Horizons curriculum

Second-year medical student Anna Mark and the other members of the University of Iowa Carver College of Medicine Class of 2018 are a pioneering group.

They're the first students to experience, from the start of classes, the college's New Horizons curriculum—where students quickly move beyond lectures and labs and into the live clinical environment. Within weeks of starting their first semester, students interview patients under the guidance of a physician-mentor and observe a variety of providers in action.

These early clinical activities are critical for the students' clinical clerkships that start after just three semesters of preclinical instruction—a semester earlier than what students experience at other medical schools.

As students progress through the curriculum, they'll learn more about the connections between health and disease,

people and their environment, and their health care providers.

Mark spent part of summer 2015—before the start of her second year—participating in the college's Medical Education in Community Orientation program. For this experience, she returned home to Decorah, Iowa, where her father, Kevin Locke, MD, is on staff at Winneshiek Medical Center. There, Mark helped deliver a baby, scrubbed in on a cesarean section, practiced suturing, and did a punch biopsy. She also practiced her interviewing skills and worked on presenting patients' cases to the center's doctors.

"The experience made me remember why I wanted to go into medicine in the first place," Mark says. "Now I'm much more excited for the clinical years."

UI Hospitals and Clinics is recognized by the 2015 "Health Care's Most Wired" survey from the American Hospital Association Health Forum and the College of Healthcare Information Management Executives.

Kimberly Leslie, MD, chair and departmental executive officer of obstetrics and gynecology, is elected to the National Institutes of Health Council of Councils, which advises the NIH director.

In the *U.S. News & World Report* rankings of "America's Best Hospitals," UI Hospitals and Clinics places seven specialties in the top five; five other specialties rank as "high performing." UI Hospitals and Clinics also ranks as the No. 1 hospital in Iowa.

Justin Grobe, PhD, assistant professor of pharmacology, is named the recipient of the 2015 Harry Goldblatt New Investigator Award by the American Heart Association.

Where he belongs

A former Navy pilot returns to medicine and finds his niche



As a young man, Brad Egbers had an interest in medicine. During high school, he worked for a retina specialist and spent some time volunteering in an emergency department. Although his path took him in a different direction for several years, today he is a second-year student in the University of Iowa Carver College of Medicine.

Following a sense of duty to his country, Egbers had enlisted in the U.S. Navy after high school. He earned a degree in electrical engineering at the Naval Academy, and for five years he served as a Navy aviator before retiring to return to school.

After his first year in medical school, Egbers' technical experience helped him find summer work in the lab of Michael Abramoff, MD, PhD, UI professor of ophthalmology and visual sciences, biomedical engineering,

and electrical and computer engineering. Egbers helped the Abramoff team design algorithms used in automated retinal image analysis, applying his non-medical technical experience to create solutions that will assist in screening patients for diabetic retinopathy, macular degeneration, and glaucoma.

Academics has undergone some changes since Egbers was last in college. Online quizzes, digitized versions of textbooks, and lectures available as downloadable podcasts give students flexibility in managing their time.

"At the Naval Academy, attendance was mandatory, and I couldn't break that habit initially in medical school," Egbers says. "But now I can watch lectures at one-and-a-half times speed, so that saves 10 minutes, plus transit time to campus. If you objectively evaluate it, you realize it's more efficient to watch lectures on the computer."

Searching for solutions

MD-PhD program prepares students for careers as physician-scientists



An art student as an undergraduate, Lauren Boland also worked as an AmeriCorps volunteer, doing art therapy with people with disabilities. From these experiences she realized that she had a yearning to make a difference by providing health care.

Boland enrolled in the University of Iowa Carver College of Medicine's dual-degree Medical Scientist Training Program (MSTP), which emphasizes the connections between science and innovative medicine. MSTP aims to provide students with the ability to engage in critical and creative thinking about the science behind the medicine they will provide as physicians.

"Intense" is how Boland describes her second year as a medical student.

"We're dealing with both basic science and how to apply it in the clinic," she says.

Most second-year Carver College of Medicine students the entire spring

semester in core clinical clerkships, but as an MSTP student, Boland will serve 12 weeks. Then she will devote four weeks to studying for Step 1 of the U.S. Medical Licensing Exam. Boland will return to the MD curriculum after three to four years of graduate coursework and research.

For the research component, she chose to work in the lab of James Ankrum, PhD, assistant professor of biomedical engineering. Ankrum studies mesenchymal stem cells and their potential to help patients with diabetes.

"This lab is focused on creating solutions," Boland says. "I'm excited by the questions being asked here."



“The experience made me remember why I wanted to go into medicine in the first place. Now I’m much more excited for the clinical years.” Anna Mark, M2



EQUALITY CARE

Helping providers understand—and meet—LGBTQ health needs

The LGBTQ Clinic, established in 2012, provides instruction on LGBTQ care to internal medicine physicians in residency training.

With the 2015 Supreme Court ruling legalizing same-sex marriage in all states, and national media coverage of transgender individuals such as Caitlyn Jenner, issues related to sexual orientation and gender identity are increasingly finding their way into doctor-patient conversations.

In 2014, the Association of American Medical Colleges released guidelines to help medical schools teach future physicians to care for patients who are LGBTQ (lesbian, gay, bisexual, transgender, queer, or questioning), gender nonconforming, or born with differences of sex development.

But even before the AAMC weighed in, University of Iowa Carver College of Medicine faculty members Katie Imborek, MD (pictured left), and Nicole Nisly, MD, were working to level the learning curve for current and future providers.

In core curriculum lectures on LGBTQ health, Imborek discusses definitions and disparities with first-year medical

students. With second-year students, she covers topics such as preventive medicine or medication regimens for transgender patients. The UI medical curriculum also addresses LGBTQ health issues when students practice taking sexual histories with standardized patient-actors, as well as when they do their internal medicine clerkships.

Nisly, who with Imborek established the LGBTQ Clinic in 2012, provides instruction on LGBTQ care to internal medicine physicians in residency training. Resident physicians in pediatrics and family medicine also rotate through the LGBTQ Clinic after completing the UI Safe Zone Project, where participants learn to model support, affirmation, and inclusion of LGBTQ individuals.

The LGBTQ Clinic itself employs a multidisciplinary approach, with a dedicated pharmacist and mental health experts from the UI College of Education's Couple and Family Therapy Program serving as key members of the clinic's team.

For the **KIDS**

UI Dance Marathon allocation supports UI Children's Hospital

The University of Iowa Dance Marathon Allocations Committee announced in November 2015 the approval of a new, significant funding request put forth by UI Children's Hospital leadership: \$2.2 million over three years to establish the UI Dance Marathon Pediatric Oncology Targeted Therapy Program.

This program and associated funding allows UI Children's Hospital to assemble a targeted therapies infrastructure and begin hosting Phase I and Phase II clinical trials for pediatric cancer patients. With this support, UI Children's Hospital will be able to treat children whose cancer has not responded to

standard therapies. The approval of this request places UI Children's Hospital among an elite group of hospitals across the United States performing these pediatric trials.

UI Dance Marathon is a student-run philanthropy that creates and sustains special projects to provide emotional and financial support for pediatric oncology and bone marrow transplant patients and their families treated at UI Children's Hospital. It is one of the few dance marathon events in the nation that have student representatives on the committee to vote on where the dollars they personally raise are allocated.

\$2.2 Million

The new gift will help support:

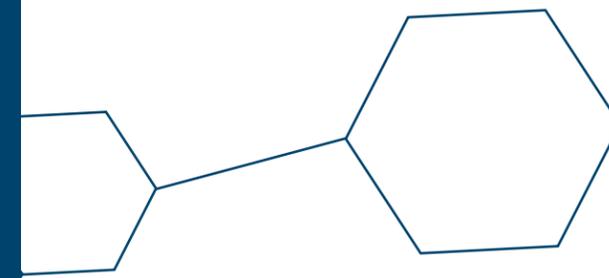
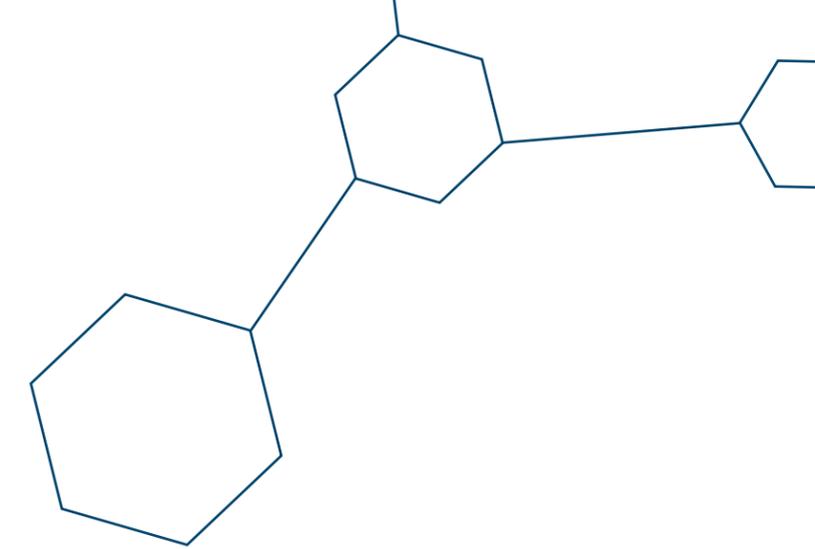
- Aspects of inpatient care not covered by insurance
- Inpatient and outpatient requirements of clinical studies, including lab work and tumor profiling
- 24-hour clinical research nursing care
- A pediatric cancer research pharmacist
- A research data manager

It is one of the few dance marathon events in the nation that have student representatives on the committee to vote on where the dollars they personally raise are allocated.



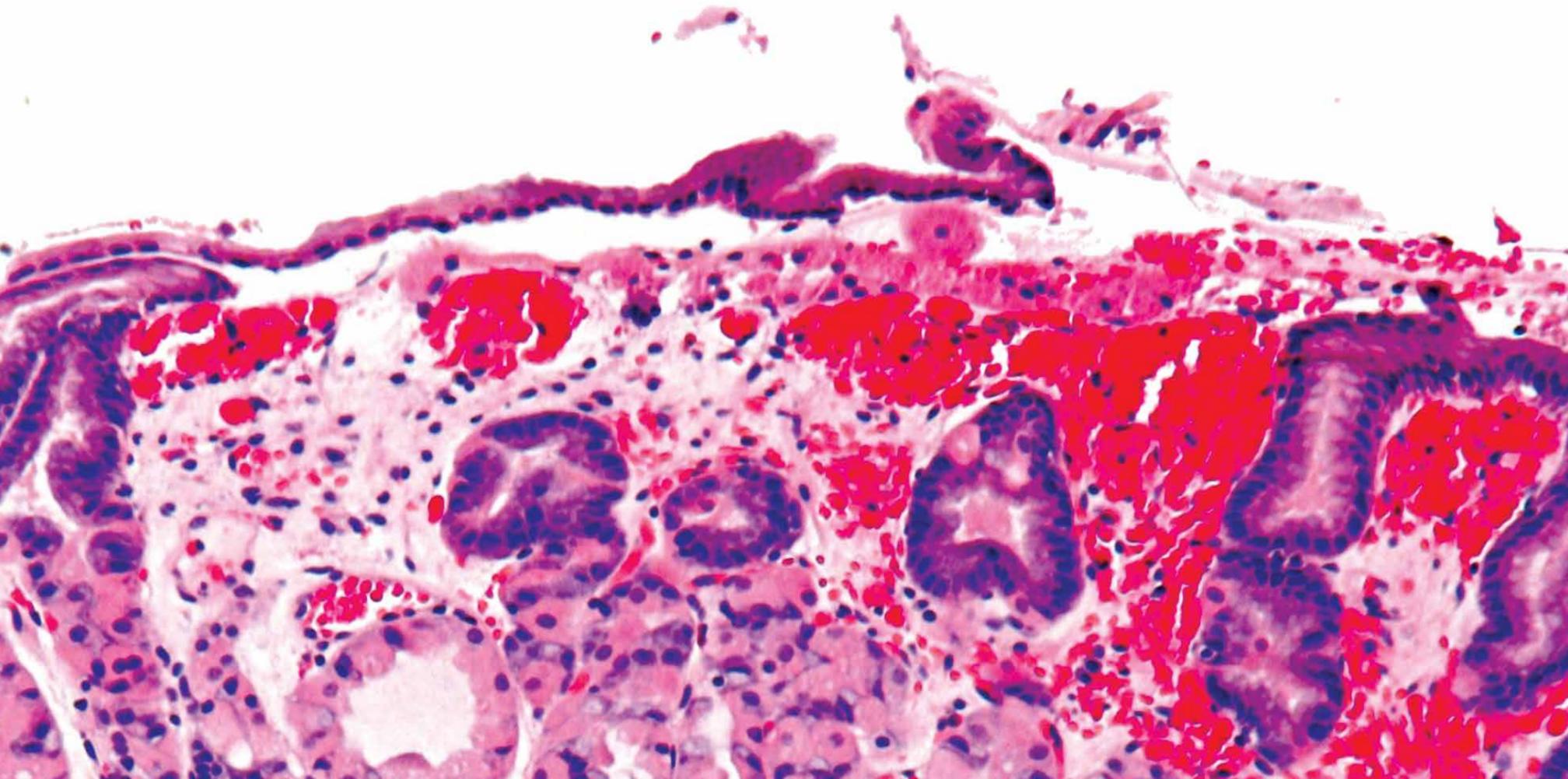


Directing and collaborating in remarkable studies that lead to better treatments for patients today and tomorrow.



SPORE 'SCORE'

First-in-the-nation grant focuses on neuroendocrine tumors



M. Sue O'Dorisio, MD, PhD, professor in the Stead Family Department of Pediatrics, leads the investigation of neuroendocrine tumors with the SPORE grant funding.

Researchers at Holden Comprehensive Cancer Center at the University of Iowa have received the first-ever Specialized Programs of Research Excellence (SPORE) grant to study neuroendocrine tumors.

The five-year, \$10.67 million grant from the National Cancer Institute is the only SPORE grant funding research on neuroendocrine tumors, which are slow-growing cancers that occur in both adults and children. Neuroendocrine tumors are most commonly found in the small intestine, lungs, and pancreas and are related to medulloblastomas and neuroblastomas commonly diagnosed in children. These tumors also will be studied as part of the SPORE.

“The incidence of neuroendocrine tumors has increased five-fold over the last three decades, and many patients are not diagnosed until the tumors have metastasized,” says principal investigator M. Sue O’Dorisio, MD, PhD, professor in the UI Stead Family Department of Pediatrics and a specialist in pediatric hematology-oncology at UI Children’s Hospital.

“Further understanding of the tumors’ molecular biology holds the promise for earlier diagnosis and curative therapy.”

The four major projects of the SPORE focus on the genetics of these tumors, their molecular makeup, and how this information can be used to develop new approaches to diagnosis and treatment. Researchers at Holden Comprehensive Cancer Center at the UI have significant roles in this multidisciplinary, collaborative effort and come from the departments of pediatrics, internal medicine, surgery, radiology, pharmacology, pathology, radiation oncology, epidemiology, biostatistics, chemistry, and biomedical engineering.

“Treatment of these rare, life-threatening malignant diseases represents a major breakthrough in both pediatric and adult cancer medicine,” notes Yatin M. Vyas, MD, director of pediatric hematology-oncology at UI Children’s Hospital. “Holden Comprehensive Cancer Center and UI Children’s Hospital have become the only referral centers in the country where patients with these diagnoses are eligible to obtain this innovative tumor-targeted treatment.”

August

New medical students in the UI Carver College of Medicine recite the Oath of Hippocrates and are ceremonially “cloaked” during the college’s annual White Coat Ceremony.

K. Todd Woods, radiation sciences educator and sonographer with UI Health Care, becomes the first person in Iowa—one of only 173 in the world—to be certified in pediatric sonography by the American Registry of Diagnostic Medical Sonographers.

Maia Hightower, MD, is named chief medical information officer for UI Health Care.

Collaborative LEADER

Abel adds internal medicine role to research, administrative duties

You could say 2015 was a milestone year for E. Dale Abel, MD, PhD.

As director of the University of Iowa's Fraternal Order of Eagles Diabetes Research Center, Abel provides administrative leadership for research programs aimed at better understanding diabetes and its complications.

In March, he was awarded a four-year, \$2.4 million grant from the National Institutes of Health to study how high levels of insulin in Type 2 diabetes may contribute to heart failure.

In October, Abel joined the prestigious National Academy of Medicine, an organization that elects no more than 70 regular members and 10 international members each year.

And in December, Abel was appointed chair and departmental executive officer of the UI Carver College of Medicine Department of Internal Medicine. During his tenure as chair, Abel will hold the François M. Abboud Chair in Internal Medicine and the John B. Stokes III

Chair in Diabetes Research. He succeeds Gary Rosenthal, MD, whose 18-month role as interim chair was invaluable in advancing the department's missions of research, education, and patient care.

"I'm very motivated by talent and by people's willingness to push boundaries and push the envelope," Abel says. "One of my roles is cheerleader-in-chief. When members of my lab or colleagues within the diabetes center tell me what they have discovered or are just about to discover, or they sit down with me to plan a strategy for applying for grants or publishing their research in a journal, those encounters are very energizing because they represent the multiple elements that ultimately will feed into our success."

As our years add up, strength and muscle mass decline.

In 2015, University of Iowa scientists discovered a protein that causes muscle weakness and loss during aging. The protein, ATF4, is a transcription factor that alters gene expression in skeletal muscle, reducing muscle protein synthesis, strength, and mass.

The UI study also identifies two natural compounds—ursolic acid from apples and tomatidine from green tomatoes—that reduce ATF4 activity in aged skeletal muscle. The findings were

published online Sept. 3, 2015, in the *Journal of Biological Chemistry*.

In the study, mice with age-related muscle weakness and atrophy were fed diets lacking or containing either 0.27 percent ursolic acid, or 0.05 percent tomatidine, for two months. The scientists found that both compounds turn off genes that are turned on by the transcription factor ATF4. This action increased muscle mass by 10 percent; more important, it increased muscle quality, or strength, by 30 percent.

These results led researchers to

engineer and study a new strain of mice that lack ATF4 in skeletal muscle. Like old muscles that were treated with ursolic acid and tomatidine, old muscles lacking ATF4 were resistant to the effects of aging.

Emmyon Inc., a company founded by senior study author Christopher Adams, MD, PhD, UI professor of internal medicine, is working to translate ursolic acid and tomatidine into foods, supplements, and pharmaceuticals that can help preserve or recover strength and muscle mass as people grow older.

PROTEIN OUT, MUSCLE IN

UI study suggests natural compounds could revive older muscles

10 percent muscle mass increase

30 percent increased muscle strength

Christopher Adams, MD, PhD,
UI professor of internal medicine



Stage **IV** **SURVIVAL**

Surgery may benefit some women with advanced breast cancer

A University of Iowa study that included more than 21,000 women with stage IV breast cancer found that survival has improved over the past 25 years and is increasingly of prolonged duration—particularly for some women undergoing initial breast surgery. The findings were published online Dec. 2, 2015, in the journal *JAMA Surgery*.

Spurred by the observation that a small but growing number of her patients with stage IV breast cancer were living a long time without disease progression, Alexandra Thomas, MD, professor and co-leader of Holden Comprehensive Cancer Center's Breast Molecular Oncology Group, led a team to investigate whether receiving surgery to remove primary tumors is associated with improved survival.

The researchers analyzed data from 21,372 female patients diagnosed with stage IV breast cancer between 1988 and 2011 who underwent surgery but

did not receive radiation therapy as part of their first course of treatment.

The team found that median survival increased from 20 months (in 1988 to 1991) to 26 months (in 2007 to 2011). Although the rate of surgery declined from 1988 to 2011, the study showed that receiving surgery to remove the primary tumor was associated with improved survival. For women diagnosed as having cancer before 2002 (7,504 of the women in the study), survival of at least 10 years was seen in 9.6 percent of those who did receive surgery, compared with 2.9 percent of those who did not.

"Our study in this observational data set doesn't suggest that every patient with stage IV breast cancer should undergo surgery, but we showed that for some patients, surgery was associated with prolonged survival," Thomas says.



Alumni, friends, and colleagues join faculty and staff to celebrate the 100th anniversary of the UI Department of Urology.

Thirteen current and former UI Children's Hospital patients are selected as **Kid Captains** for the 2015 Iowa Hawkeye football season.

UI QuickCare–North Dodge opens in Iowa City, located just off Interstate 80 at the North Dodge Street exit.

New cells may help treat diabetes

UI group creates insulin-producing cells that normalize blood-sugar levels



“This raises the possibility that we could treat patients with diabetes with their own cells.” *Nicholas Zavazava, MD, PhD*

Starting from human skin cells, University of Iowa researchers have created human insulin-producing cells that respond to glucose and correct blood-sugar levels in diabetic mice.

The finding is potentially a first step toward developing patient-specific cell

replacement therapy for Type 1 diabetes. In a study published Jan. 28, 2015, in the journal *PLOS ONE*, the UI team led by Nicholas Zavazava, MD, PhD, professor of internal medicine, reprogrammed human skin cells to create induced pluripotent stem (iPS) cells, which were then coaxed into forming insulin-

producing cells. When these cells were transplanted into diabetic mice, the cells secreted insulin and reduced the blood sugar levels of the mice to normal or near-normal levels

“This raises the possibility that we could treat patients with diabetes with their own cells,” says Zavazava, who also is a member of the Fraternal Order of Eagles Diabetes Research Center at the UI and a staff physician with the Iowa City Veterans Affairs Health Care System. “That would be a major advance.”

Zavazava’s team is among several groups aiming to create an alternative source of insulin-producing pancreatic cells that can be transplanted into patients with Type 1 diabetes. However, the UI study is the first to use human iPS cells to create the insulin-producing cells.

Creating these cells from a patient’s own cells would not only eliminate the need to wait for a donor pancreas, but would also mean patients could receive transplants without needing to take immunosuppressive drugs.

Muscular dystrophy research, training

UI Wellstone Center awarded NIH grant renewal



In October 2015, the University of Iowa Paul D. Wellstone Muscular Dystrophy Cooperative Research Center (MDCRC) received a five-year, \$7.4 million grant renewal from the National Institute of Neurological Disorders and Stroke to advance its work on finding treatments for muscular dystrophies.

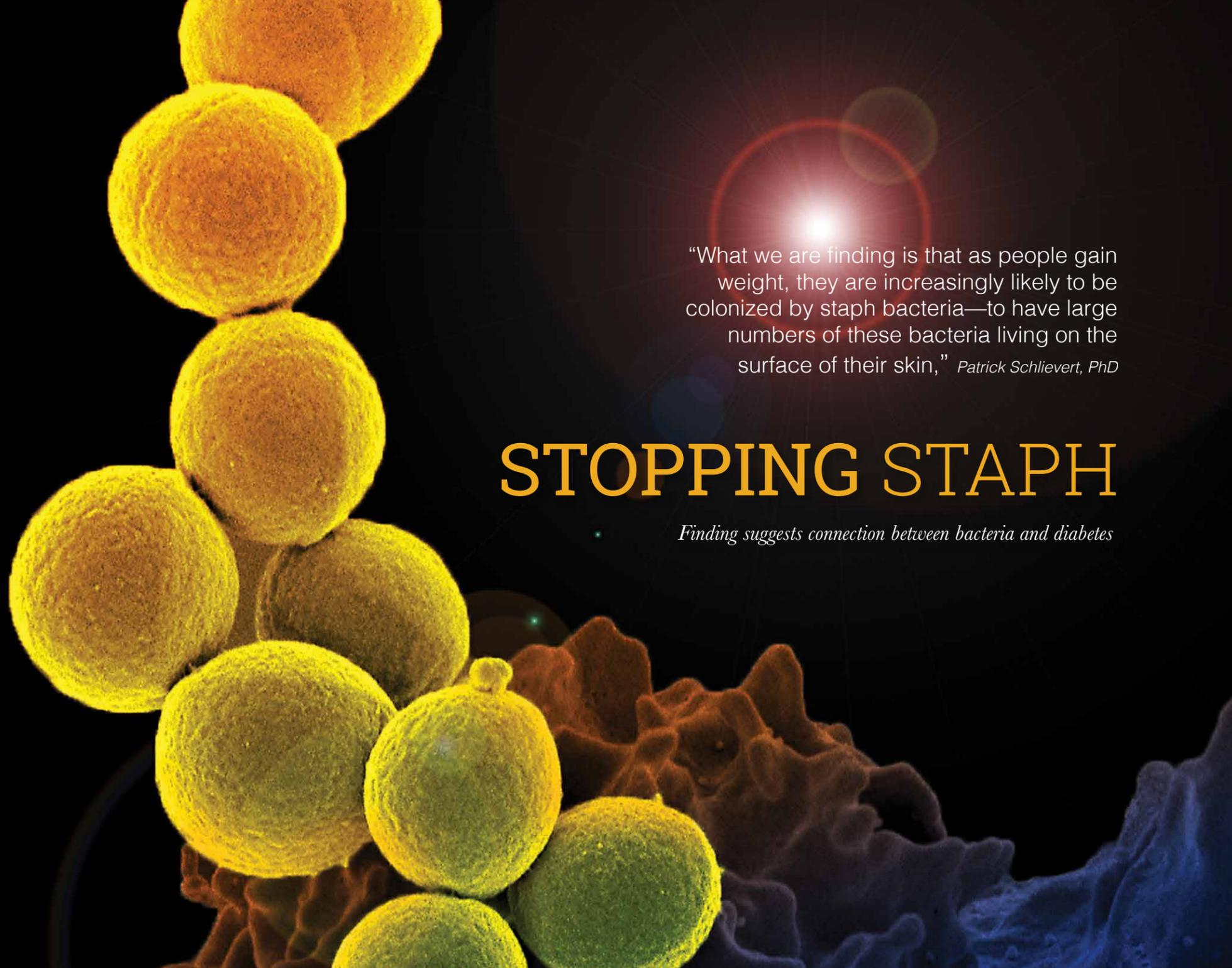
Established in 2005, the center brings together UI researchers and clinicians to translate laboratory discoveries into improved diagnoses and therapies for a group of congenital and limb girdle muscular dystrophies caused by abnormalities in a protein called dystroglycan.

Kevin Campbell, PhD, professor and departmental executive officer of molecular physiology and biophysics in the UI Carver College of Medicine, directs the center and leads the group’s basic science research; Steven Moore, MD, PhD, UI professor of pathology, is co-director of the center and oversees a national shared resource muscle biopsy and cell

culture repository; and Katherine Mathews, MD, UI professor and director of the division of pediatric neurology at UI Children’s Hospital, serves as the principal investigator for the clinical research component of the MDCRC.

Campbell, Mathews, and Moore also share responsibility for research training and education of the next generation of muscular dystrophy specialists, which is a primary focus of the center.

“In addition to providing critical support for our basic research and clinical advances, this grant also supports yearlong fellowships for medical students, postdoctoral trainees, postbaccalaureate students, and undergraduate students,” says Campbell, who also is professor of internal medicine and neurology and a Howard Hughes Medical Institute investigator. “These efforts are vital to train future basic scientists and clinicians who can partner to develop and test muscular dystrophy therapies.”



“What we are finding is that as people gain weight, they are increasingly likely to be colonized by staph bacteria—to have large numbers of these bacteria living on the surface of their skin,” *Patrick Schlievert, PhD*

STOPPING STAPH

Finding suggests connection between bacteria and diabetes

Colin P. Derdeyn, MD, is named chair and departmental executive officer of the UI Department of Radiology.

The Burn Treatment Center at UI Hospitals and Clinics earns re-verification from the American Burn Association and the American College of Surgeons Committee on Trauma.

Lane Strathearn, MBBS, is named physician director of the UI Center for Disabilities and Development and director of the developmental and behavioral pediatrics division in the UI Stead Family Department of Pediatrics.



Bacteria and viruses have an obvious role in causing infectious diseases, but a new study by University of Iowa researchers suggests that bacteria may even be a cause of Type 2 diabetes.

The UI research team, led by Patrick Schlievert, PhD, professor and departmental executive officer of microbiology in the UI Carver College of Medicine, found that prolonged exposure to a toxin produced by *Staphylococcus aureus* bacteria causes rabbits to develop the hallmark symptoms of Type 2 diabetes—insulin resistance, glucose intolerance, and systemic inflammation.

Obesity is a known risk factor for developing Type 2 diabetes, but obesity also alters a person’s microbiome—the ecosystem of bacteria that colonize our bodies and affect our health.

“What we are finding is that as people gain weight, they are increasingly likely to be colonized by staph bacteria—to have large numbers of these bacteria living on the surface of their skin,” Schlievert says. “People who are colonized by staph bacteria are being chronically exposed to the superantigens the bacteria are producing.”

Schlievert’s research has previously shown that superantigens—toxins produced by all strains of staph bacteria—disrupt the immune system and are responsible for the deadly effects of various staph infections, such as toxic shock syndrome, sepsis, and endocarditis.

The team’s latest study, published in the May/June 2015 issue of the journal *mBio*, shows that superantigens interact with fat cells and the immune system to cause chronic systemic inflammation, which leads to insulin resistance and other symptoms characteristic of Type 2 diabetes.



A multi-center study led by infection control experts with University of Iowa Health Care finds that implementing a series of simple interventions before surgery can reduce the rate of surgical-site infections (SSIs) by up to 40 percent.

SIMPLE STEPS

Eliminating staph before surgery can reduce post-surgery infections

The study, published in the June 2, 2015, issue of *JAMA*, tested the effectiveness of a “bundle” of evidence-based interventions for lowering SSIs caused by *Staphylococcus aureus* bacteria in patients undergoing heart surgery or hip or knee replacement procedures.

The interventions included screening patients for the presence of staph bacteria in their noses; having patients who tested positive apply an antibiotic ointment in their noses and bathe with an antimicrobial wash for up to five days before the surgery; and giving all patients appropriately targeted antibiotics just before surgery.

Approximately one in three people have staph bacteria inside their noses. This colonization is generally harmless, but if these bacteria get into a surgical incision they can cause a severe infection. In addition to causing potentially life-threatening health complications, an SSI can add tens of thousands of dollars to health care costs.

“Patients undergoing total hip or knee replacements and cardiac operations should be tested to see if they carry the staph bacteria in their noses. If they do carry the staph bacteria, the protocol we describe in the paper can lower their risk of a serious staph infection by about 40 percent,” says Loreen Herwaldt, MD, UI professor of internal medicine and senior author on the study.



PREVENTION EPICENTER

CDC adds UI to its pathogen-prevention network

In October 2015, the University of Iowa became one of six new U.S. health care centers to be designated Prevention Epicenters by the U.S. Centers for Disease Control and Prevention (CDC).

The UI team, led by Eli Perencevich, MD, professor of internal medicine, will receive \$2.2 million over three years from CDC to develop and test interventions aimed at preventing dangerous pathogens like Ebola, MRSA, and *Clostridium difficile* from spreading in hospitals.

UI researchers from the Carver College of Medicine, College of Liberal Arts and Sciences, College of Engineering, and the College of Public Health, as well as the Iowa City Veterans Affairs Health Care System, will tackle four specific projects.

The teams will test a variety of approaches to prevent the spread of infectious germs in patient care settings; track health

care workers’ compliance with wearing personal protective equipment (PPE); and improve protocols for putting on and taking off complicated PPE of the type required to care for Ebola patients. One group also will generate a more quantitative picture of the true benefits of PPE, as well as evidence of any harms associated with the equipment.

“There are many significant pathogens that can harm our patients and spread among health care workers,” Perencevich says. “To make the health care system safer for both patients and health care workers we need to continue to invest in research to identify ways to prevent harmful pathogens from spreading in our hospitals.

“This funding really extends the work we are already doing at the UI and Iowa City VA to help make hospital environments safer for everyone who enters our facilities,” Perencevich adds.

UI researchers, led by Eric Taylor, PhD, report that a protein called Mitochondrial Pyruvate Carrier is critical for controlling glucose production in the liver and could be a new target for drugs to treat diabetes. The UI study is published in *Cell Metabolism*.

The Comprehensive Stroke Center at UI Hospitals and Clinics is awarded Gold Plus Target: Stroke Elite Plus recognition from the American Heart Association.

Kamal Rahmouni, PhD, receives the 2015 Mid-Career Award for Research Excellence from the American Heart Association Council on Hypertension.

Collaborative vision

UI part of study identifying gene that controls macular development

“This new finding will help us learn how nature builds a macula so that scientists in the future can reconstruct an injured macula using the patient’s own cells.”

Edwin Stone, MD, PhD



Scientists at the University of Iowa Stephen A. Wynn Institute for Vision Research were part of a multi-center research team that reported the discovery of a gene that controls the development of the human macula.

The macula is the central portion of the retina needed for normal reading and driving vision. The discovery was electronically published in October 2015 in the journal *Ophthalmology*.

Kent Small, MD, a retina specialist affiliated with Cedars-Sinai Board of Governors Regenerative Medicine Institute in Los Angeles and the study’s lead author, first mapped the gene causing North Carolina macular dystrophy to chromosome 6 in 1992. It ultimately required an international team of 20 investigators using data from the Human Genome Project and an elaborate computer analysis to identify the actual mutations in intergenic DNA near the PDRM13 gene.

Understanding how this gene works may help vision specialists treat macular diseases more effectively in the future.

“Scientists already know how to create new retinal cells from a patient’s skin,” said Edwin Stone, MD, PhD, director of the Wynn Institute for Vision Research at the UI and a co-author of the study. “This new finding will help us learn how nature builds a macula so that scientists in the future can reconstruct an injured macula using the patient’s own cells.”

The study was funded in part by a \$25 million gift from Stephen A. Wynn, chairman and chief executive officer of Wynn Resorts, Ltd. The gift, announced in August 2013, helps accelerate progress toward cures for inherited retinal diseases.

October

Cynthia Wong, MD, is named chair and departmental executive officer of the UI Department of Anesthesia.

A UI study led by **Barcy Levy, MD, PhD**, finds that more than 80 percent of homes tested in the northwest Iowa community of Akron showed radon levels higher than Environmental Protection Agency recommendations.

J. Lawrence Marsh, MD, chair and departmental executive officer of orthopedics and rehabilitation, is named president of the American Board of Orthopaedic Surgery.

In a study that seems to defy conventional dietary wisdom, University of Iowa scientists have found that adding high salt to a high-fat diet actually prevents weight gain in mice.

The UI team—led by pharmacologist Justin Grobe, PhD, and psychiatrist Michael Lutter, MD, PhD—began with the hypothesis that fat and salt, both being tasty to humans, would act together to increase food consumption and promote weight gain. They tested the idea by feeding groups of mice different diets: normal chow or high-fat chow with varying levels of salt.

To their surprise, the mice on the high-fat diet with the lowest salt gained the most weight, while the animals on the high-fat, highest-salt diet had low weight gain similar to the normal chow-fed mice.

All the mice ate the same amount of calories regardless of the salt in their diets. Also, there was no

difference in resting metabolism or physical activity between the mice on different diets. Varying the levels of salt, however, appeared to have an effect on digestive efficiency, or the amount of fat from the diet that is absorbed by the body.

As exciting as the study's implications may seem to fast food lovers, the researchers caution that very high levels of dietary salt are associated with increased risk for cardiovascular disease in humans. Rather than suggest that a high-salt diet is suddenly a good thing, the researchers say these findings really point to the profound effect non-caloric dietary nutrients can have on energy balance and weight gain. The study was published in the June 11, 2015, edition of the journal *Scientific Reports*.

Busting the 'French fry hypothesis'

High salt prevents weight gain in mice on a high-fat diet





\$11 Million five-year grant

CF funding renewal

Long-standing program focuses on gene therapy for cystic fibrosis

In September 2015, researchers in the University of Iowa Pappajohn Biomedical Institute received a five-year, \$11 million grant from the National Heart, Lung, and Blood Institute to continue advancing gene therapy to treat and prevent cystic fibrosis, a life-shortening, lethal lung disease.

Cystic fibrosis is an inherited disease caused by a faulty gene (known as the CFTR gene) that normally creates a protein that moves salt and water out of a cell. If the CFTR gene is defective, it results in a buildup of thick, sticky mucus in the body. This leads to numerous problems, including lung infection and inflammation, the major causes of disease and death in cystic fibrosis.

Led by Paul McCray, MD, professor of pediatrics in the UI Carver College of Medicine and an allergy and pulmonology specialist with UI Children's Hospital, the Iowa team will use novel viruses to replace the defective CFTR gene in the airway cells and develop new animal models to address questions regarding the specific cell types that must be corrected to prevent disease.

The grant, "Gene Therapy for Cystic Fibrosis Lung Disease," has been continuously funded since 1993.



Project: preeclampsia

UI named one of four centers in national research network

University of Iowa researchers' expertise in preeclampsia and hypertension has earned the UI a spot—and a four-year, \$3.7 million grant, announced in April 2015—in a four-center Strategically Focused Network on Hypertension created by the American Heart Association (AHA).

Each of the four centers—the UI, University of Alabama at Birmingham (UAB), Cincinnati Children's Hospital, and Medical College of Wisconsin—have been identified as leaders in four areas of hypertension research.

Preeclampsia is a cardiovascular disorder generally occurring late in pregnancy that causes high blood pressure and protein in the urine. It often results in an early delivery, creating immediate and potentially lifelong risks to both mother and baby.

In 2014, UI scientists reported their discovery of a biomarker that may help predict whether a pregnant woman will develop

preeclampsia. The UI team will use the new funding to develop a reliable, early predictor of preeclampsia to help doctors in areas with lower levels of obstetric care identify the highest-risk patients as early as the sixth week of pregnancy.

The research "will provide novel opportunities for the prediction, prevention, and potential cure for this universally impactful and devastating disease which has been grossly understudied," says UI maternal-fetal medicine specialist and researcher Mark Santillan, MD.

"The whole concept of this network is that we will be collaborating with the other three centers, so it is very likely that this will drive us to continue our focus not only on preeclampsia but on other areas of hypertension, which we are already doing," notes Curt Sigmund, PhD, professor and departmental executive officer of pharmacology and director of the UI Center for Hypertension Research.

November

The Pappajohn Biomedical Discovery Building project earns Leadership in Energy and Environmental Design (LEED) Gold certification.

The Iowa Institute of Human Genetics launches KidneySeq, a new genetic testing panel that looks for DNA changes in over 170 different genes that can cause more than 75 renal diseases.

Darren Casey, PhD, assistant professor of physical therapy and rehabilitation science, receives the American Diabetes Association Innovative Clinical or Translational Science Award.

Epilepsy insight

Research marks first time amygdala is stimulated and breathing loss reported

Sudden unexpected death in epilepsy (SUDEP) is a devastating medical problem in which impaired breathing is thought to play a critical role. Researchers believe breathing may be impaired during and after epileptic seizures, without the patient's knowledge.

By using electrical stimulation to activate the amygdala, University of Iowa researchers have identified areas of the brain in which breathing is controlled and, in some cases, impaired, providing an important insight into SUDEP.

The study—which marks the first time researchers have stimulated the amygdala in humans and reported loss of

that can't be well controlled with two or more medications—whose brain was already being monitored to map the focus of seizures, researchers found that when seizures spread to the amygdala, the patient stopped breathing. That effect could be reproduced by electrically stimulating the amygdala. Amazingly, the patient was not aware that his breathing had stopped, even though he was awake at the time. This finding was reproduced in two other study participants.

The finding may help explain why SUDEP occurs after seizures because patients would stop breathing yet remain unaware that their blood oxygen

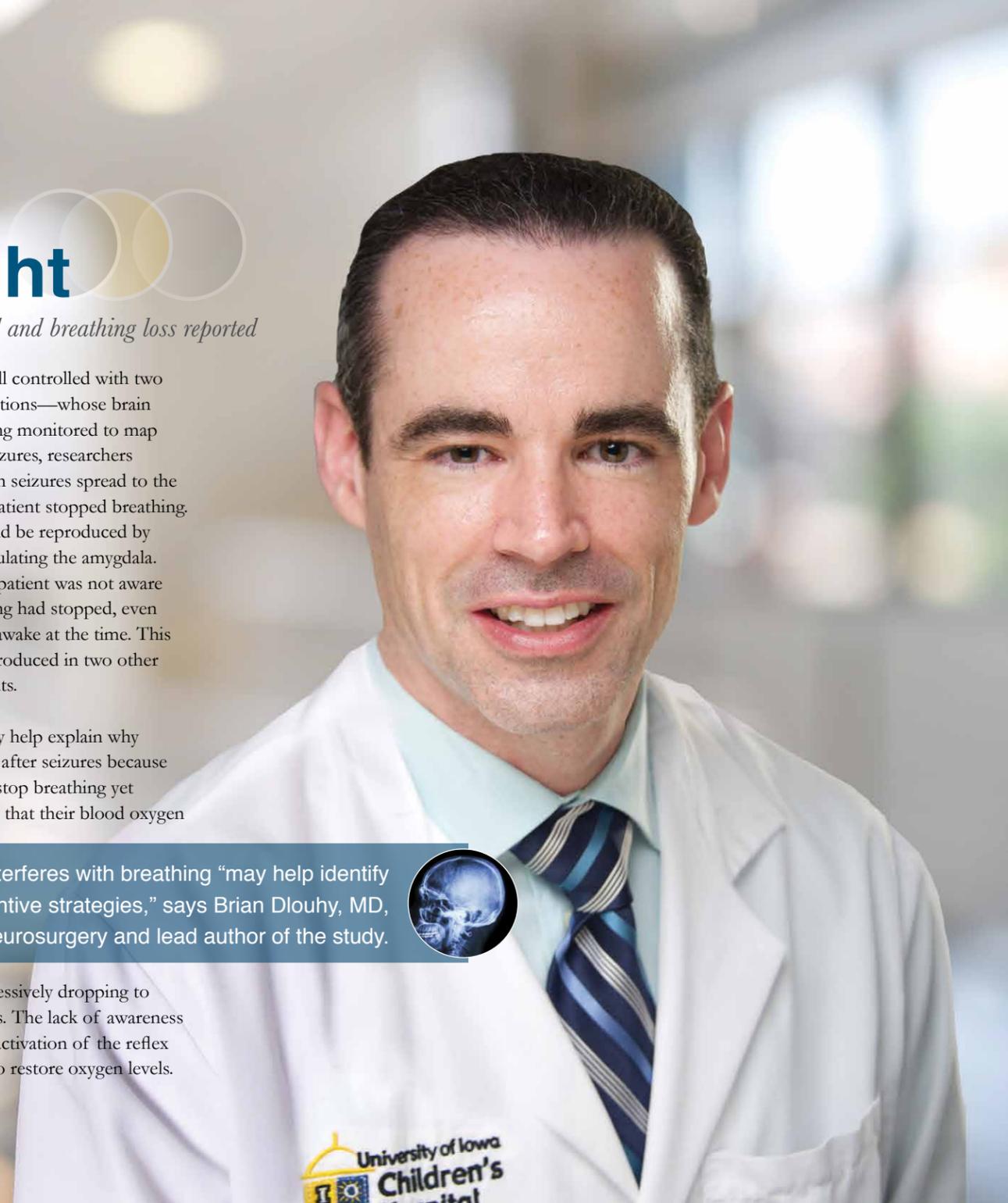
Identifying brain areas where seizure spread interferes with breathing “may help identify patients at risk for SUDEP and lead to preventive strategies,” says Brian Dlouhy, MD, UI assistant professor of neurosurgery and lead author of the study.



breathing—was published in the July 15, 2015, issue of the *Journal of Neuroscience*.

Using a research participant with medically intractable epilepsy—epilepsy

levels are progressively dropping to fatally low levels. The lack of awareness would prevent activation of the reflex that is needed to restore oxygen levels.



Sometimes, a new way of looking at something can bring to light an entirely new perspective.

Using a different type of MRI imaging, University of Iowa researchers discovered previously unrecognized differences in the brains of patients with bipolar disorder.

The UI study, published Jan. 6, 2015, in *Molecular Psychiatry*, revealed differences in the white matter of patients' brains and in the cerebellum, an area of the brain not previously linked with the disorder. Interestingly, the cerebellar differences were not present in patients taking lithium, the most commonly used treatment for bipolar disorder.

“This imaging technique appears to be sensitive to things that just have not been imaged effectively before. So it's really providing a new picture and new insight into the composition and function of the brain [in bipolar disease],” says John Wemmie, MD, PhD, professor of psychiatry in the UI Carver College of Medicine and the study's senior author.

Bipolar disorder affects about 1 percent of the population. Despite being relatively common, scientists do not have a good understanding of what causes this psychiatric condition, which is characterized by sudden mood shifts from normal to depressed or to an abnormally elevated or “manic” mood state.

The UI team imaged the participants' brains using an MRI approach known as quantitative high-resolution T1 rho mapping, which is sensitive to certain byproducts of cell metabolism. The study is the first time this MRI technique has been used to investigate a psychiatric disease.

NEW picture insight

UI study reveals brain differences in bipolar disorder





Investing in research

UI Health Care increases research support by \$100 million

In an effort to leverage more funding from the National Institutes of Health (NIH) and recruit new faculty, University of Iowa Health Care is investing an additional \$100 million in its research enterprise over the next five years.

“Our goal is to build on our strong historic foundation of excellence by investing in growth and development, effectively establishing the ‘next generation’ of world-class researchers here within UI Health Care, leading the way to groundbreaking discoveries in the years to come,” UI Vice President for Medical Affairs Jean Robillard, MD, announced in June 2015.

UI Health Care leaders are especially interested in attracting new faculty with existing NIH funding who conceivably would have a dual appointment in the UI Carver College of Medicine and another UI college. Particularly attractive would be recruits whose research interests and expertise falls within emerging fields of study and major interdisciplinary programs of research in the Carver College of Medicine.

Also eligible for the new funds are current medicine faculty involved in “leading-edge, high-risk, high-reward research,” who need additional resources to secure NIH grants.

A group of faculty leaders in basic science and clinical departments will recommend candidates to Robillard and Debra Schwinn, MD, dean of the UI Carver College of Medicine.

\$100 Million

Treatment in sight

UI researcher contributes to vision-improving gene therapy trial

Stephen R. Russell, MD, service director of vitreoretinal diseases and surgery and the Dina J. Schrage Professor of Macular Degeneration Research in the Stephen A. Wynn Institute for Vision Research at the University of Iowa, worked with colleagues from Children’s Hospital of Philadelphia and representatives from Spark Therapeutics Inc. in creating a gene therapy that treats certain rare, inherited eye disorders that cause blindness.

Patients involved in the clinical trial have maintained improved vision for more than a year. The study marks the first successful completion of a randomly controlled Phase III clinical trial of any gene therapy in the world.

In the study, 29 patients between the ages of 4 and 44—none of whom could see well enough to walk unassisted in a regularly lit room—were given gene therapy developed by Spark Therapeutics and tested in a room set up as a kind of obstacle course.

The treatment, SPK-RPE65, is injected directly into the eye. In the final stage of the trial, patients were directed by arrows



through a mobility course in seven different light levels. The course changed with each change of light level. The lowest level of light was that of a moonless summer night; the brightest was that of a well-lit office.

“These are kids who could not walk through a room in normal light and who were absolutely paralyzed in dim light,” says Russell, who presented findings from the trial at the Retina Society’s annual scientific meeting in October 2015. “Now they’re walking around markedly better.”

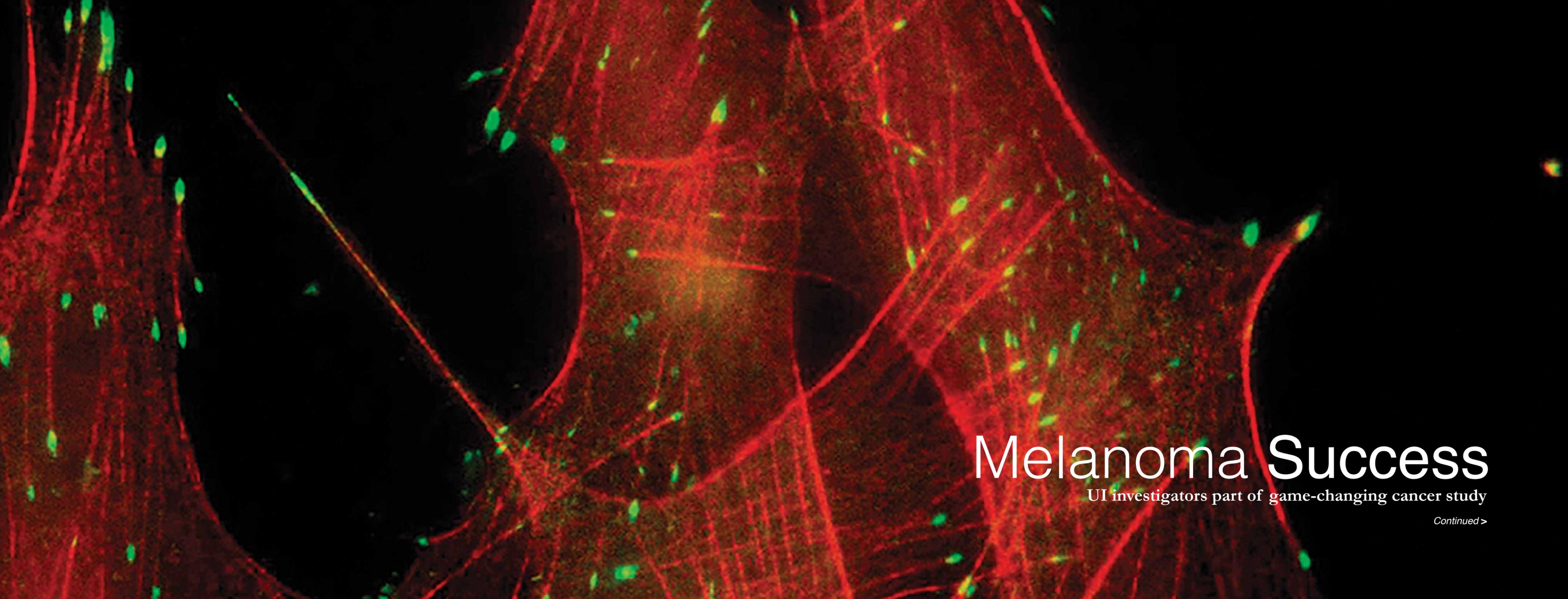
After a year, patients treated in both eyes improved by 1.9 light levels, and visual acuity improved by eight letters—roughly one and a half lines on an eye chart, Russell says.

Theresa Hegmann, MPAS, clinical professor of physician assistant studies and services, is named the recipient of the 2015 Research Achievement Award from the Physician Assistant Education Association.

Pamela Geyer, PhD, professor of biochemistry and obstetrics and gynecology, is named a fellow of the American Association for the Advancement of Science.

December

UI QuickCare–East opens in the Iowa City Marketplace at Sycamore Mall. The new clinic site replaces an existing UI QuickCare location just across the mall parking lot.



Melanoma Success

UI investigators part of game-changing cancer study

Continued >



Melanoma Success

UI investigators part of game-changing cancer study

Clinicians and researchers with Holden Comprehensive Cancer Center at the University of Iowa played a key role in a major clinical trial that has led to a new treatment for melanoma, a cancer that starts in a certain type of skin cell.

In a study published May 26, 2015, in the *Journal of Clinical Oncology*, researchers involved in a multi-center study reported that an altered form of the herpes virus was successfully used to treat melanoma in a Phase III clinical trial.

UI oncologist and cancer researcher Mohammed Milhem, MBBS, was a co-author on the journal article. And in fact, the UI enrolled the most patients out of the 436 individuals who participated in the study.

The modified form of the herpes simplex virus type-1, called T-VEC, was injected directly into a melanoma, killing the cancer cells and rallying

the immune system against them. Patients in the trial who had inoperable stage III and stage IV melanomas lived almost twice as long (41 months on average) when injected with T-VEC therapy compared to earlier-stage melanoma patients using more traditional treatments (21.5 months on average).

Researchers have studied cancer immunotherapy—using agents to bolster the body’s immune system against a tumor—for years. The T-VEC study was the first to successfully carry out the treatment using a virus. In October 2015, the Food and Drug Administration gave approval for the treatment.

Milhem and colleagues have now started a new clinical study of T-VEC in patients with advanced soft tissue sarcoma, a type of cancer that develops from tissues like bone or muscle.

Welsh leads Pappajohn Biomedical Institute

For more than three decades, Michael Welsh, MD, has fostered a culture of inquiry, collaboration, and entrepreneurial spirit at the University of Iowa medical campus.

As a UI faculty member since 1981 and a Howard Hughes Medical Institute investigator since 1989, Welsh’s research in cystic fibrosis (CF)—including early discoveries about the function of the CFTR protein mutated in CF—has advanced understanding of the disease and laid the foundation for new studies and potentially new therapeutic and preventive strategies.

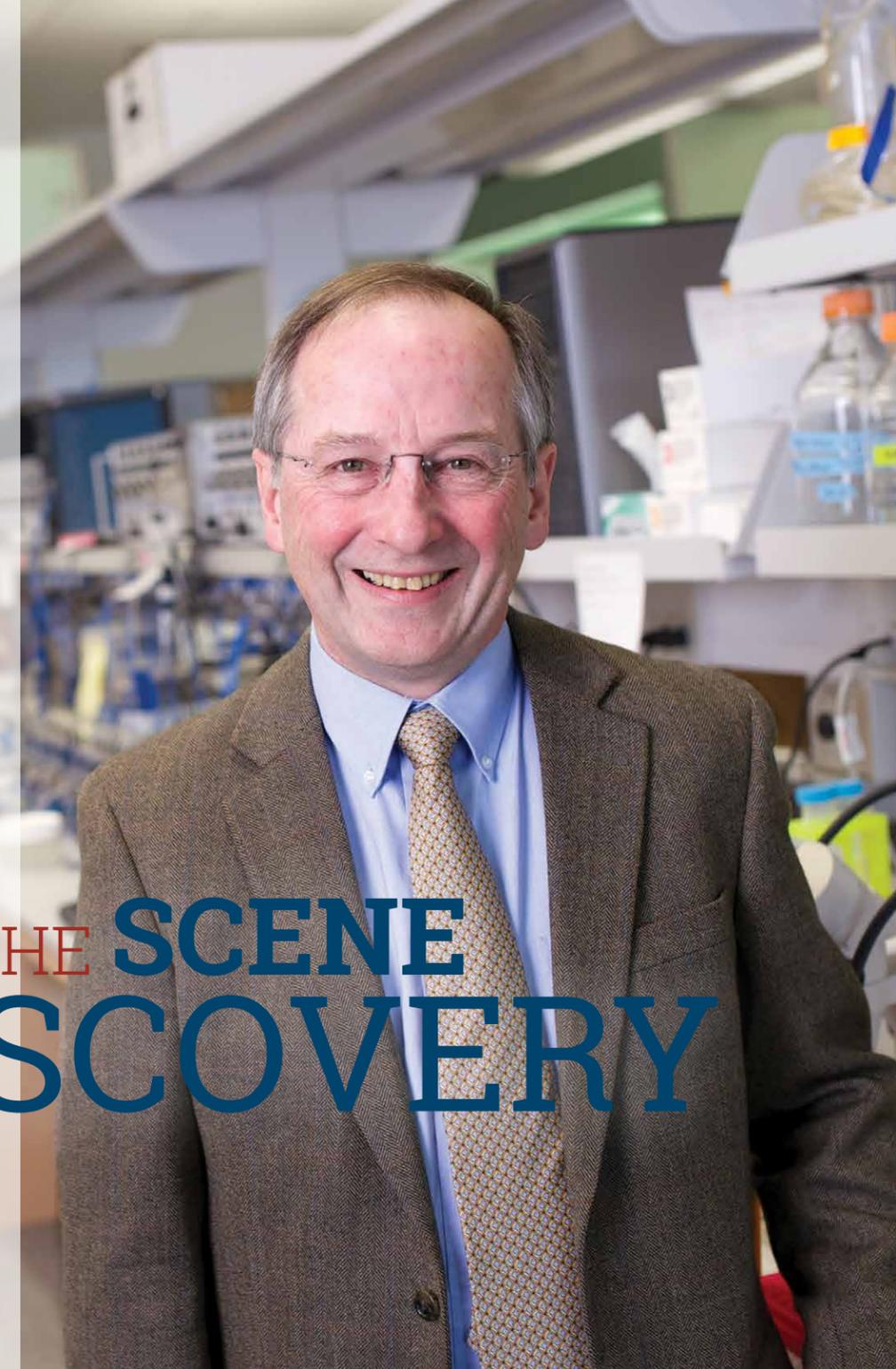
And as director of the Pappajohn Biomedical Institute—the UI’s scientific community that draws together researchers from multiple disciplines to pursue high-risk, high-reward research—Welsh is committed to UI researchers tackling some of medicine’s most perplexing questions.

One of Welsh’s goals is to help realize the vision for the institute, which is housed in the six-story, 256,000-square-foot Pappajohn Biomedical Discovery Building that opened in 2014. This includes accelerated bench-to-bedside studies; greater mentoring opportunities for physician-scientists in training; and continued emphasis on technology transfer and industry partnerships.

Throughout his distinguished career, Welsh has led by example.

“I’ve been incredibly fortunate. There are so many people at Iowa who have helped me, and I’ve had freedom to chase important problems,” Welsh says. “I have superb colleagues in an environment where we like to see each other succeed. I get to interact with young people who are full of idealism, ideas, and energy. And importantly, our work improves the lives of human beings. I have the best job in the world.”

SETTING THE SCENE
FOR DISCOVERY





In the 1970s, vitamin C was thought to be a potential killer of cancer cells. Clinical studies at the time proved otherwise, however, and for years that appeared to be the final word among many in the scientific community.

Vitamin C REVIVAL

Once-dismissed cancer therapy earns a second chance

However, a group of University of Iowa researchers is part of a growing reconsideration of vitamin C's potential as a cancer therapy. In general terms, the idea is to use ascorbate (vitamin C) to exploit fundamental flaws in cancer cell metabolism, making the cells more vulnerable to chemotherapy and radiation.

Over the past decade and a half, Garry Buettner, PhD, UI professor of radiation oncology and an expert in the chemistry of vitamin C, has collaborated on studies in human cancer cells and animal models demonstrating that high doses of vitamin C can selectively kill cancer cells but leave normal cells unharmed.

In 2009, Buettner and Joseph Cullen, MD, UI professor of surgery, initiated a Phase I clinical trial to test the safety and tolerability of high-dose,

intravenously delivered vitamin C combined with standard chemotherapy in patients with stage IV pancreatic cancer.

The results showed that intravenous (IV) vitamin C is safe and well tolerated, and of nine patients who received two cycles of the treatment, overall survival was 14 months compared to an average of six months commonly seen for patients with this late-stage, aggressive cancer.

The trial's success has led to a surge in interest and follow-up studies. Currently at the UI, three Phase I clinical trials involving high-dose, intravenously administered vitamin C as a treatment for pancreatic cancer, glioblastoma (a type of brain cancer), and lung cancer are underway. UI investigators are about to being a Phase II trial for glioblastoma, as well.





PREEMIES and OUTCOMES

UI study finds preterm babies born at 22 weeks might survive, if treated

University of Iowa researchers have discovered that a small number of very preterm infants can survive if they receive potentially lifesaving treatment, but not all academic medical centers provide such care.

Mathew Rysavy, a 2015 UI Carver College of Medicine graduate, and Edward Bell, MD, professor of pediatrics in the Stead Family Department of Pediatrics, studied the cases of nearly 5,000 infants born before 27 weeks of gestation. All were born between 2006 and 2011 at 24 academic hospitals participating in the Neonatal Research Network, part of the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

The study's results, published in the May 7, 2015, issue of the *New England Journal of Medicine*, found that much of the difference in outcomes could be explained by whether centers tried to save the lives of the infants after birth.

At most centers, active care was not provided for infants born before 22 weeks. Almost all centers provided active care for infants born at or after 25 weeks. For infants born at 22, 23, or 24 weeks, however, there was a substantial difference in whether they were actively treated or provided comfort care.

The UI Children's Hospital Neonatal Intensive Care Unit (NICU) is Iowa's only Level 4 NICU, the highest level recognized by the American Academy of Pediatrics. UI Children's Hospital survival rates for extremely premature babies are among the highest in the nation: 71 percent at 23 weeks, 86 percent at 24 weeks, and 90 percent at 25 weeks.



What does the heart say to fat? It's not a schoolyard riddle, but a basic science question that poses unique research challenges for Chad Grueter, PhD, assistant professor of internal medicine in the University of Iowa Carver College of Medicine.

Grueter studies transcription factors—proteins that are crucial to the regulation and expression of different genes and play an important role in cell development and cell signaling. Mutations in these proteins have been linked to diabetes and other diseases.

As a postdoctoral research fellow at University of Texas Southwestern Medical Center before coming to Iowa in 2013, Grueter was part of a team that found that manipulating the expression of a transcription co-factor called MED13 prevents obesity and guards against increased blood-sugar levels associated with Type 2 diabetes. Increasing levels of MED13 in mouse hearts caused the animals to remain lean despite a high-fat diet.

Having a **HEART-to-FAT** talk *Researcher examines protein's obesity-protection capabilities*

“Basically, it's the heart saying ‘burn more fat,’” Grueter says.

That the heart is capable of regulating whole-body metabolism was a major discovery, one that never before had been shown. Now at the UI, Grueter is studying MED13 and other proteins to better understand its obesity-protection capabilities. Grueter also is interested in what happens when MED13 is increased in the context of hypertension, heart attack, or myocardial infarction.

Could his research suggest a treatment that helps prevent obesity, which affects one in three American adults and is a major risk factor for diabetes and heart disease?

“That's a good long-term question,” Grueter says. “First, we've still got a lot of work to do.”

UI Hospitals and Clinics **Parking Ramp 2** opens for patients and visitors. The new four-level, underground facility holds 651 parking spaces. The original Ramp 2 was demolished in 2013 as part of the new UI Children's Hospital construction project.

Brian Dlouhy, MD, assistant professor of neurosurgery, is named the first Getch Scholar by the National Institute of Neurological Disorders and Stroke and the Congress of Neurosurgeons.

Becker's Hospital Review names UI Hospitals and Clinics to its 2015 list of 100 hospitals with outstanding **neurosurgery and spine programs**.



287 faculty, staff, and students devoted more than 1,300 hours to UI Health Care STEM (science, technology, engineering, and mathematics) programs

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atoms

DNA bases

0.1 nm

1 nm

bacteria

nucleus



693,000 people

STEM education success

Activities promote interest in science, technology, engineering, and math

During the 2014-2015 academic year, 287 faculty, staff, and students devoted more than 1,300 hours to UI Health Care STEM (science, technology, engineering, and mathematics) programs through partnerships with K-12 educators, administrators, and community education leaders.

More than 16,000 students—from more than 110 schools and community educational organizations in 49 counties

across Iowa—participated in UI Health Care STEM education programs over the course of the school year. Activities included tours of research laboratories and health care facilities, classroom presentations, and hands-on demonstrations and exhibits.

The programs serve a dual purpose: to pique students' curiosity about careers in health care and inspire them to take an active role in their own health.

Point of pride

UI Health Care serves Iowans and their communities

University of Iowa Health Care provided more than \$235 million in community benefits—programs, services, and activities that provide treatment or promote health as a response to identified community needs—to more than 693,000 people across the state of Iowa, according to the most recent annual assessment of community benefits reported to the Iowa Hospital Association (IHA).

Community benefit data is submitted to IHA as part of a larger effort to report services that exceed mission-driven patient care activities and provide a measurable increase in health care access and the availability of health care resources. All 118 of Iowa's hospitals contribute annually to the IHA report.

Community Health Improvement Services	\$9,480,342
Health Professions Education	\$10,106,035
Subsidized Health Services	\$602,458
Research	\$55,436,263
Financial and In-Kind Contributions	\$251,007
Community Building Activities	\$186,216
Community Benefit Operations	\$36,010
Financial Assistance	\$18,744,088
Government-Sponsored Health Care	\$43,015,414
Unpaid Cost of Medicare	\$97,367,872
TOTAL Community Benefits Contribution	\$235,225,705



Service Record

Bed and Clinic Complements

Inpatient Beds	
Intensive Care	166
Acute Care	566
Total	732

Human Resources

Staff Physicians and Dentists	883
Resident Physicians and Dentists	554
Fellow Physicians	216
Professional Nurses	1,972
Other Professional Staff	2,227
Other Hospital Staff	2,770
Total Staff	8,622

Education Programs

University Health Sciences College	
Students in Training	
Medical Students	680
Dental Students	81
Nursing Students	219
Pharmacy Students	530
Resident and Fellow Physicians and Dentists in Training	770
Other Iowa Health Profession Students in Training	1,439
Total in Health Education at UI Hospitals and Clinics	3,719

Patient Services

Acute Adult and Children Admissions	31,748
Newborn Nursery	1,734
Total Acute Admissions	33,482

Acute Adult & Children Patient Days of Care	206,153
Newborn Nursery	3,846
Total Acute Patient Days of Care	209,999

Births	2,143
Clinic Visits (UIHC, Outreach, & UICMS)	
UI Hospitals and Clinics Clinic Visits	762,463
Outreach and UICMS Clinic Visits	173,277
Total Clinic Visits	935,740

Emergency-Trauma Center Visits	57,293
Major Surgical Operations	29,958
Cardiac Operations	618
Organ and Tissue Transplants	
Bone Marrow	188
Cornea	188
Heart	12
Kidney	76
Liver	27
Lung	18
Pancreas	15
Total Transplants	524

Minor Surgical Procedures	119,947
Digestive Disease Procedures	14,665

Cochlear Implants	127
In Vitro Fertilization/Related Procedures	1,008
Fetal Diagnosis and Therapy Procedures	194
Cardiac Catheterization Procedures	
Adult	3,042
Child	1,161
Total	4,203

Cardiac Electrophysiology Studies	1,827
Units of Blood Products Transfused	21,459
Days of Ventilator Care	27,561
Pulmonary Diagnostic Procedures	12,162
Hyperbaric Oxygen Treatments	3,043
Radiographic Examinations and Treatments	
Diagnostic	225,910
PET Scans	3,713
Head and Whole Body Scans	53,135
Magnetic Resonance Imaging	26,984
Nuclear Medicine	7,732
Total	317,474

Radiation Oncology Treatments	41,499
Electrocardiograms (EKG)	61,487
Echocardiograms (ECHO)	26,934
Electroencephalograms (EEG)	4,627
Electromyograms (EMG)	2,294
Laboratory Tests	5,061,675

Pharmacy Orders	2,140,000
Social Service Consultations	174,963
Volunteer Service Hours	131,232
Renal Dialysis Treatments	27,197

Meals Served	2,390,191
Pounds of Laundry Processed	5,697,593

Patients Transported by:	
Air and Mobile Critical Care Services	1,162
Helicopter Service	815
Mobile Ground Unit	347

Financial Statements

Consolidated and net revenue expenses for the 2015 fiscal year

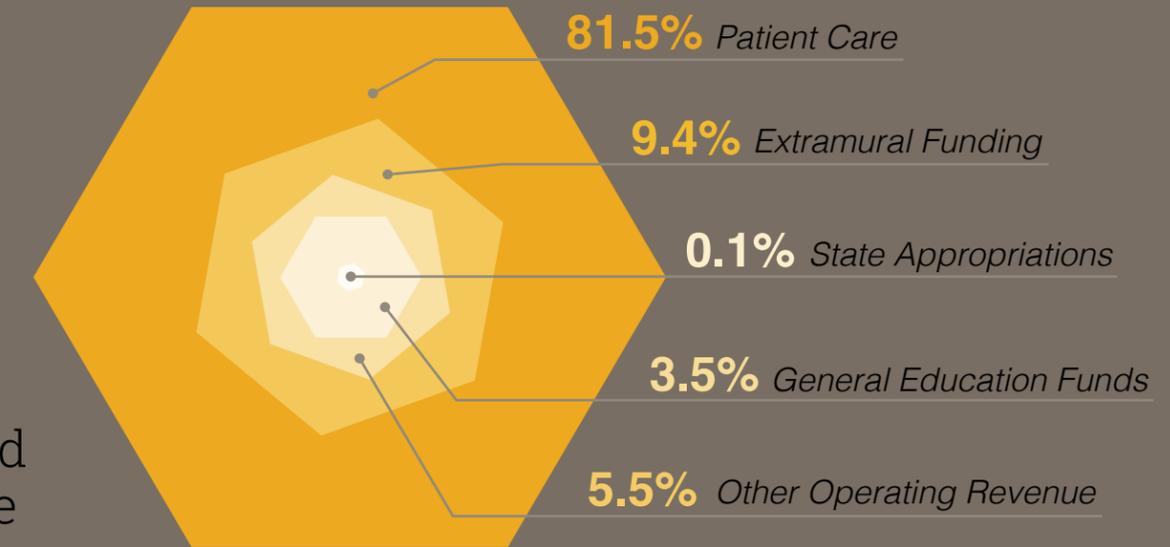
Revenue

Patient care	\$1,557,469,472	81.5%
Extramural funding	\$178,983,191	9.4%
Other operating revenue	\$105,559,713	5.5%
General education funds	\$67,095,960	3.5%
State appropriations	\$2,437,195	0.1%
Total	\$1,911,545,531	100%

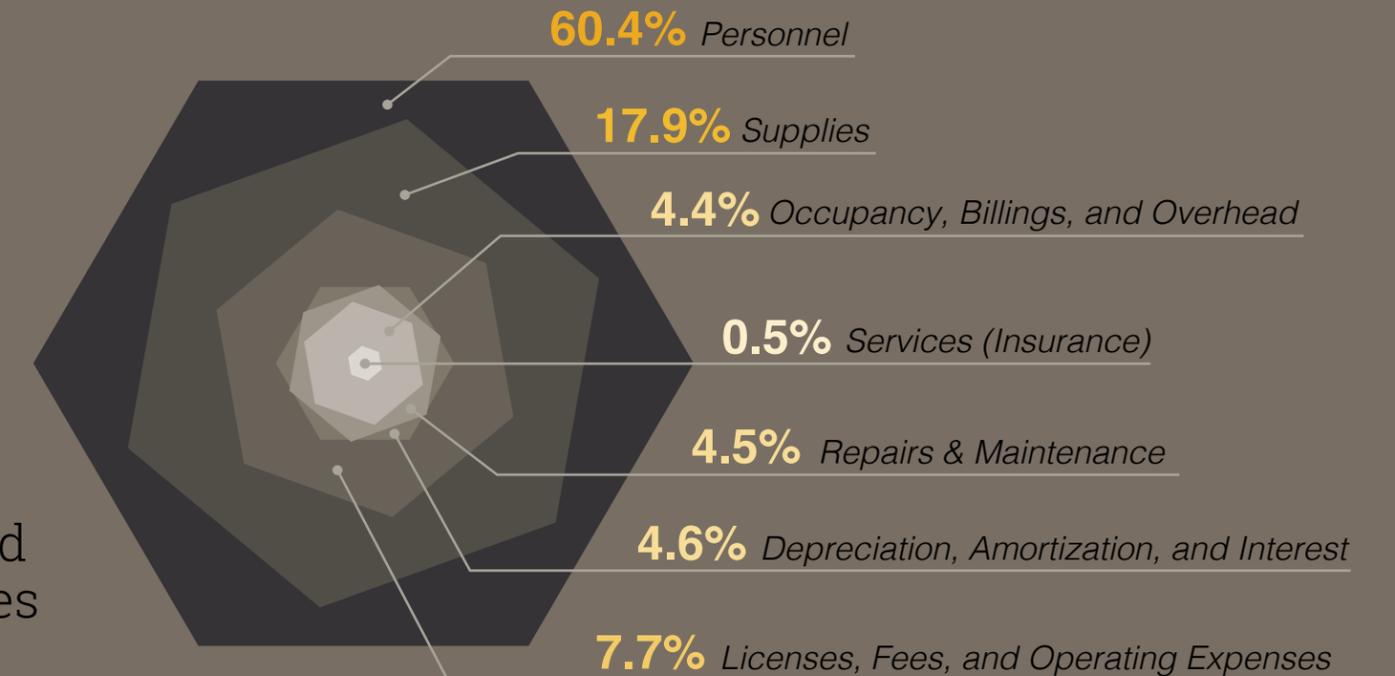
Expenses

UI Health Care Human Resources	\$1,083,297,623	60.4%
Faculty	\$303,931,412	28.1%
SEIU	\$260,662,363	24.1%
Professional and Scientific staff	\$264,069,744	24.4%
Merit staff	\$169,316,929	15.6%
Residents/fellows	\$61,011,766	5.6%
Other	\$24,305,409	2.2%
Supplies	\$321,330,879	17.9%
Licenses, fees, and operating expenses	\$137,760,349	7.7%
Depreciation, amortization, and interest	\$81,586,150	4.6%
Repairs and maintenance	\$81,476,951	4.5%
Services (Insurance)	\$9,185,707	0.5%
Occupancy, billings, and overhead	\$78,853,235	4.4%
Total	\$1,793,490,894	100%

UI Health Care Consolidated Net Revenue



UI Health Care Consolidated Net Expenses



UI Health Care 2015 Annual Report

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Marketing and Communications
University of Iowa Health Care
W319 GH
200 Hawkins Drive
Iowa City, Iowa 52242
319-356-1009

Editor: David Pedersen

Contributors: Barbara Barrows, Jennifer Brown, Tony Craine, Dawn Goodlove, Katherine House, Catie Malooly, Steve Maravetz, Jerilyn McCarty, Tom Moore, Kristine Roggentien, Molly Rossiter, Tom Walljasper, Jackie Kleppe

Design: Lindsey Bliss, Andrew Kiley, Nancy Zear

Photography: Susan McClellan, Kris DeMali, Tim Schoon, National Institute of Allergy and Infectious Diseases, Envisage Studios, Thinkstock, iStock, Abbott, Robyn Hepker

Contact us: Please send comments or questions to the address above or call 319-356-1009.

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Making a difference in the lives of people—that’s the “remarkable” we are always aiming to achieve.



*UI Health Care
200 Hawkins Drive, W319 GH
Iowa City, Iowa 52242*

Changing Medicine. Changing Lives.®