



RESEARCH AND CREATIVE ACTIVITIES PROFILE

FALL 2017



Southern Illinois University System
ONE SYSTEM | MANY LOCATIONS | STATEWIDE IMPACT



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SIU MEDICINE

SIUe

SIU
Southern
Illinois
University
CARBONDALE

As the moon prepared to pass before the sun during the total solar eclipse this summer, all of southern Illinois were struck by the significance of what they were witnessing. The entire event was a celebration of science and discovery – with people from every spectrum of the world coming to our region to experience this spectacular scientific phenomenon– knowing that global-impacting events occur right here in southern Illinois. It impressed me then, and it still excites me thinking of the influence the eclipse will have on people to enter the fields of science and innovation. Across the SIU System, we have top-ranked research faculty that spend countless hours exploring while graduate and undergraduate students collaborate with them – learning about the art of invention. Most impressive, though, is that SIU conducts “research that matters.” From advances in dentistry and rural medicine to leading breakthroughs in plant yields and transportation, the outcomes extend not only to communities and residents throughout southern Illinois, but is far reaching to many parts of the globe. In sum, SIU research activities start local and culminate with an impact that spreads internationally. This newsletter provides just a small look at the many different types of research that SIU faculty and students conduct on a regular basis. On behalf of students, faculty, staff and alumni throughout the SIU System, thank you for your support.

A handwritten signature in black ink that reads "Brad Colwell".

Brad Colwell, Ph.D., J.D.
Vice President for Student & Academic Affairs
Southern Illinois University System

SUICIDE AND PREVENTION: CREATING AWARENESS, RECOGNITION & EDUCATION

More than 1,000 college students commit suicide annually. A \$300,000 grant from the Substance Abuse and Mental Health Services Administration to the SIUE Schools of Pharmacy and Nursing and SIUE Counseling Services was received to fund “initiatives to Create Awareness, Recognition and Education” (iCARE) about suicide and prevention.

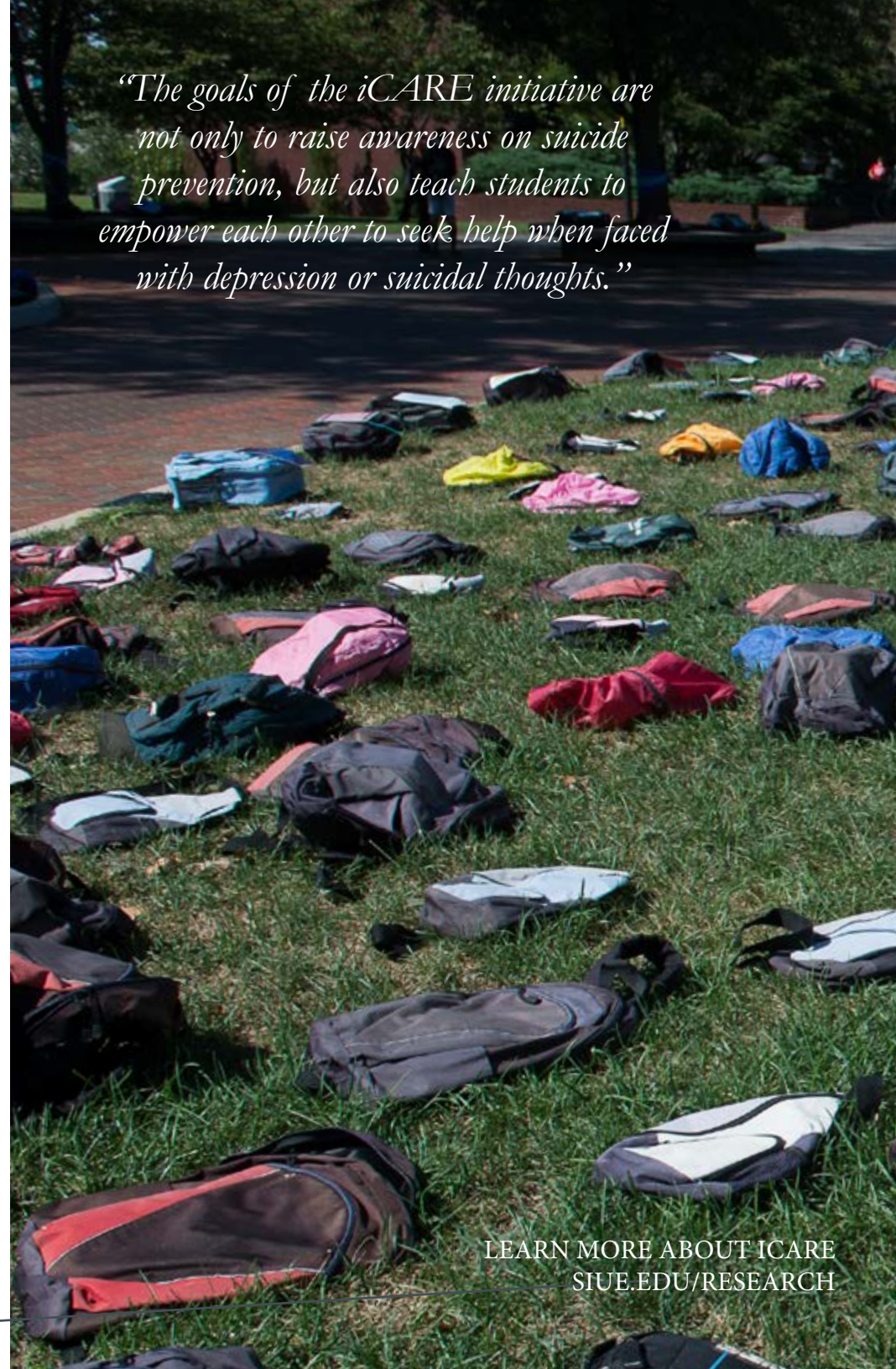
“Suicidality, while not always present with depression, is a serious symptom that may go unnoticed if a student feels uncomfortable talking about mental health struggles or is not aware of their treatment options,” said Kelly Gable, PharmD, associate professor of pharmacy practice. “The goals of the iCARE initiative are not only to raise awareness on suicide prevention, but also teach students to empower each other to seek help when faced with depression or suicidal thoughts.”

iCARE has a strong presence in the campus community. Events throughout the year include:

- An awareness video (siue.edu/icare-video) launched to initiate dialogue around the topic.
- Documentarian Lisa Klein visited SIUE for a showing of her documentary, “The S Word” (theswordmovie.com). The film aims to reduce the stigma and expand the conversation about suicide.
- SIUE’s Stratton Quad was blanketed with 1,100 backpacks that displayed personal stories in memory of loved ones impacted by suicide, creating an emotional representation of the number of college students who die by suicide each year.
- The “Out of Darkness Walk” in The Gardens at SIUE encouraged participants to walk in support of suicide prevention and mental illness awareness.
- An online role play simulation exercise, “At-Risk for College Students”, teaches students how to recognize someone who is struggling with psychological issues.

To sustain the prevention initiatives, the grant’s executive council, comprised of faculty from the Psychology Department and the Schools of Pharmacy and Nursing, Counseling Services, SIUE Police, students and community partners, will become a standing committee.

“The goals of the iCARE initiative are not only to raise awareness on suicide prevention, but also teach students to empower each other to seek help when faced with depression or suicidal thoughts.”



LEARN MORE ABOUT ICARE
SIUE.EDU/RESEARCH

NIH GRANT FUNDS RESEARCH ON OPIOID USE IN SOUTHERN ILLINOIS - SIU SCHOOL OF MEDICINE AND UCHICAGO MEDICINE TEAM UP TO COMBAT INFECTIOUS DISEASES LINKED TO INJECTION DRUG USE

Opioids have killed nearly 11,000 people in the state since 2008, including almost 1,900 people last year, according to statistics from the Illinois Department of Public Health. State officials unveiled the Illinois Opioid Action Plan last month, which includes a goal of reducing opioid deaths by 33 percent in three years.

Southern Illinois University School of Medicine and the University of Chicago Medicine are taking steps to help that effort, thanks to a \$1.13 million, federal grant to study the opioid epidemic affecting the state's 16 southernmost counties, known as the Illinois Delta Region.

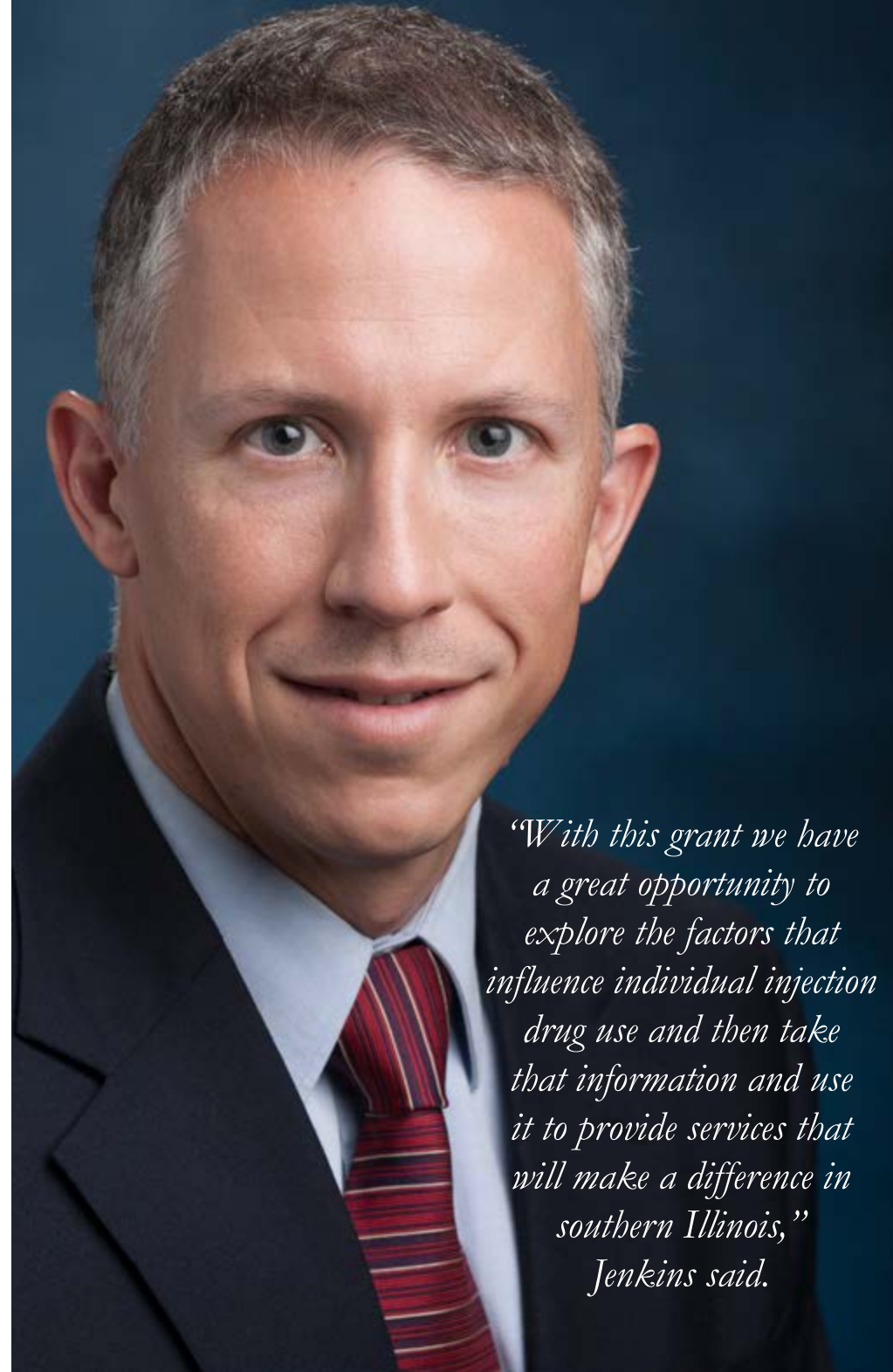
The joint effort will initially focus on learning how and why people use opioids such as heroin, fentanyl and prescription painkillers for non-medical reasons and examine the impact on health. People with opioid use disorder, particularly those who inject the drugs, are more vulnerable to outbreaks of HIV, hepatitis and other infections.

The researchers hope their work sheds light on the region's non-medical opioid use, which will then help create more effective interventions, treatment and recovery programs.

Wiley D. Jenkins, PhD, MPH, science director of the Office of Population Science and Policy and associate professor of family and community medicine at SIU School of Medicine, is the co-principal investigator of the grant with UChicago Medicine's Mai Tuyet Pho, MD, MPH, an infectious disease expert and assistant professor of medicine.

Epidemiologists note that the Delta Region sees particularly high rates of hepatitis C and opioid overdoses, especially among people aged 25 to 44. In addition, the region has unusually high rates of neonatal abstinence syndrome, which affects newborns who were exposed to the drug while their mothers were pregnant.

The two-year grant, which includes an option for a three-year extension to implement targeted interventions, was one of eight awarded by the National Institute on Drug Abuse in cooperation with the Appalachian Regional Commission, the Centers for Diseases Control and Prevention and the Substance Abuse and Mental Health Services Administration.



“With this grant we have a great opportunity to explore the factors that influence individual injection drug use and then take that information and use it to provide services that will make a difference in southern Illinois,”
Jenkins said.



THE MCLAFFERTY ANNEX AT SIUC IS PROVIDING A HOME FOR RESEARCH AND COLLABORATION AMONG FACULTY AND STUDENTS, AND POTENTIAL FOR COMMUNITY EDUCATION AND INTERACTION.

The 65,000 square-foot building, along with its 5,000-square foot basement, houses several research facilities, high-tech equipment and common areas aimed at facilitating interdisciplinary research and creativity.

“Our hope is that it fosters interdisciplinary and creative work among our faculty and students for decades to come,” said James Garvey, interim vice chancellor for research.

Originally built in 2005 as a repository for library materials during the massive renovation of Morris Library, university leaders decided in 2012 to retrofit the empty space, turning it into a state-of-the-art research facility.

Now largely complete, the McLafferty Annex is also home to SIUC’s new Fermentation Science Institute, as well as its Aquatic Research Laboratory, which may someday be home to a massive aquarium that will serve both science and the community.

Researchers such as Sean Moran, assistant professor of chemistry and biochemistry, have found McLafferty to be invaluable in pursuing their scholarly efforts. Moran is using a five-year, \$1.6 million grant from the National Institutes of Health for infrared spectroscopy aimed at measuring molecular vibrations in an attempt to understand how such vibrations influence the function of enzymes.

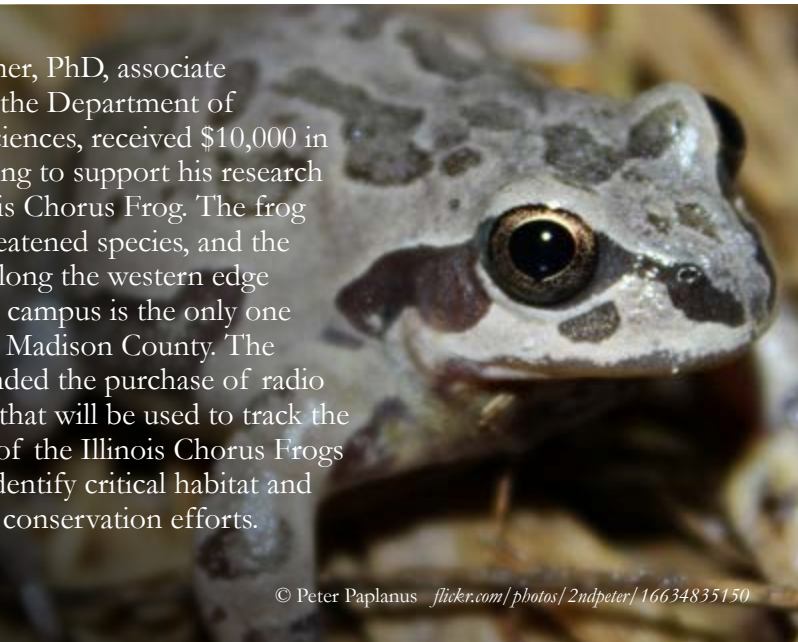


SIUE

1 The National Science Foundation awarded SIUE and the University of Illinois a three-year \$287,690 Research Experiences for Undergraduates (REU) grant. The award supports the multi-institutional promotion of scientific skills and interdisciplinary research among first-generation students in the areas of archaeology and ecology in an effort to document the onset of the Anthropocene, the most recent geological time period, dominated by human impacts on the Earth. The project is a partnership among the SIUE Center for STEM Research, Education and Outreach; SIUE College of Arts and Sciences Department of Anthropology; U of I Illinois Natural History Survey; and Western Illinois University.

2 The American Heart Association granted SIUE \$154,000 to support research being conducted by Jon Klingensmith, PhD, assistant professor in the Department of Electrical and Computer Engineering whose background is in ultrasound signal processing and coronary imaging. Collaborating on the project is Maria Fernandez-del-Valle, PhD, assistant professor in the Department of Applied Health and an expert on obesity and the use of intervention to affect the deposits of fat around internal organs. The team is creating a software-based tool that provides specific volume measurements of the cardiac adipose tissue using only echocardiographic ultrasound imaging. This will facilitate and accelerate future studies on obesity and cardiovascular disease.

Richard Essner, PhD, associate professor in the Department of Biological Sciences, received \$10,000 in private funding to support his research on the Illinois Chorus Frog. The frog is a state-threatened species, and the population along the western edge of the SIUE campus is the only one remaining in Madison County. The donation funded the purchase of radio transmitters that will be used to track the movements of the Illinois Chorus Frogs in order to identify critical habitat and inform their conservation efforts.



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SIU MEDICINE

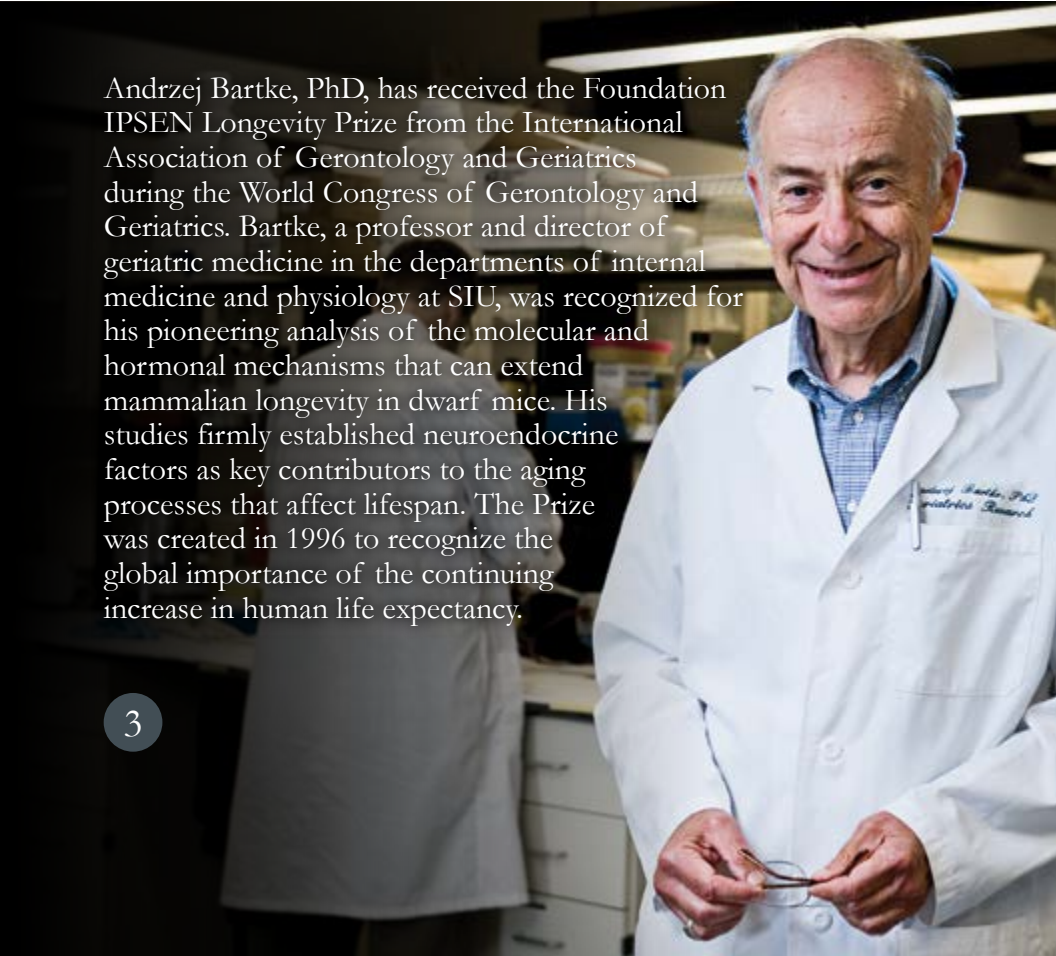
1 Thomas Brozoski, PhD, and Boris Odintsov from UIUC, created a comprehensive, interactive rat brain atlas. The atlas will aid researchers worldwide with a tool to compare specimens and data that can be used for research and medical diagnosis.

2 Anthony Huang, PhD, was the winner of the Fellows Grant Award Program, receiving \$25,000 to advance his research on understanding the complex physiology and anatomy of taste buds. He is exploring the effect of neurotransmitter release on taste receptors to help explain the complex interplay between taste cells and chemosensory neurons.



Andrzej Bartke, PhD, has received the Foundation IPSEN Longevity Prize from the International Association of Gerontology and Geriatrics during the World Congress of Gerontology and Geriatrics. Bartke, a professor and director of geriatric medicine in the departments of internal medicine and physiology at SIU, was recognized for his pioneering analysis of the molecular and hormonal mechanisms that can extend mammalian longevity in dwarf mice. His studies firmly established neuroendocrine factors as key contributors to the aging processes that affect lifespan. The Prize was created in 1996 to recognize the global importance of the continuing increase in human life expectancy.

3



POINTS OF PRIDE

SIU Southern Illinois University
CARBONDALE

1 ECLIPSE DAY BRINGS SCIENCE AND FUN TO SIUC

SIUC played host to tens of thousands of sky watchers – professional and otherwise – on Aug. 21 as the Great American Eclipse reached its point of greatest duration just a few miles south of Carbondale.

Officials estimated about 30,000 people viewed the eclipse on campus, including 14,000 at Saluki Stadium, where the university hosted a guided experience with scientists and entertainers. More than two years of planning on campus paid off as more than 300 journalists from dozens of organizations, including many foreign countries, descended on SIUC for the big day.

Though thousands were entertained and awe-struck by the total eclipse – the first over the mainland United States since 1979 – science was also a big winner. SIUC played host to researchers from NASA, Adler Planetarium and other research groups. Citizen CATE observers also were on hand to play their part in a nationwide effort to capture a “movie” of the event as it swept across the nation. The National Solar Observatory will use the data to assemble a visual record of the total eclipse, in an attempt to capture elusive pictures of the sun’s corona, which is usually obscured by the sun’s brightness.

2 SIU ROBOTICS TEAM CONTINUES WIN STREAK

The robotics team at SIU Carbondale continued its dominance at a national engineering competition, winning top honors in three out of four categories and winning the overall competition.

The five-member student team, along with its faculty adviser competed at the Association of Technology, Management and Applied Engineering’s robotics contest during its annual conference and competition, Nov. 1-3 in Cincinnati. The team took first place in the obstacle course, presentations and was named overall champion.

The performance followed the team’s top marks at last year’s event in Orlando, Fla. During that competition, the team won nearly half of all the possible points available to all teams competing, dominating in the head-to-head obstacle course competition, as well as winning Best Electronic Control, Methodology, Best Fabrication/Innovation, Best Poster, Best Technical Presentation and Audience Favorite.

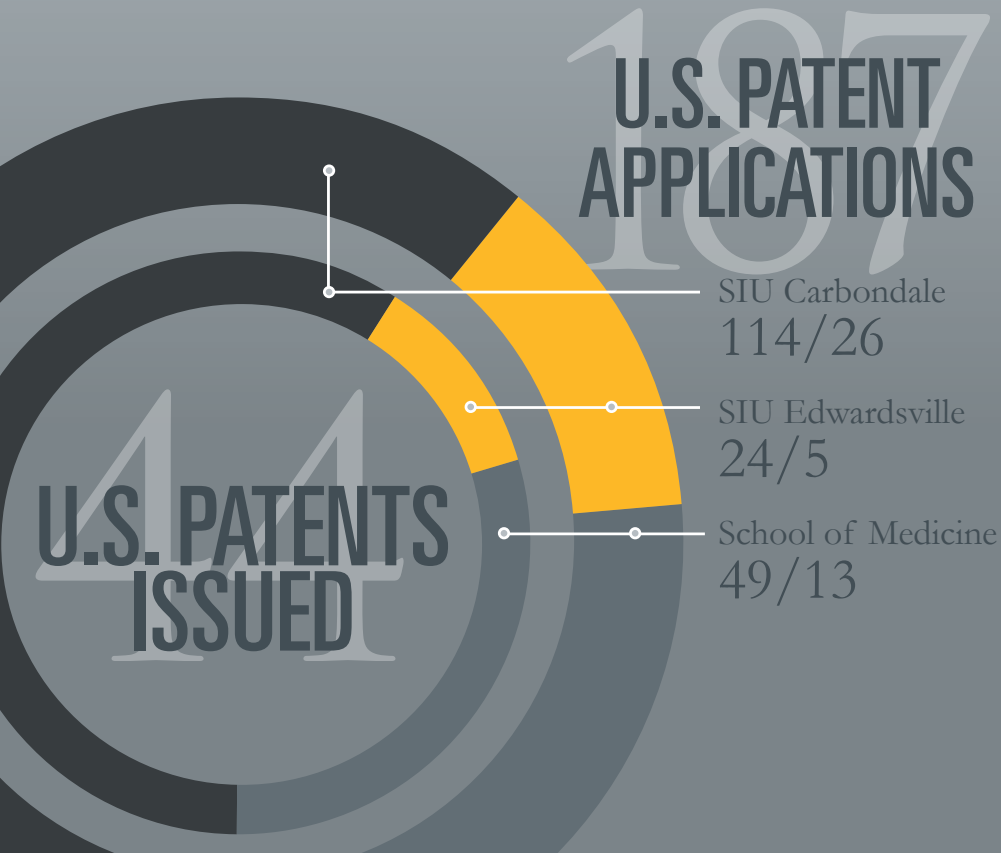
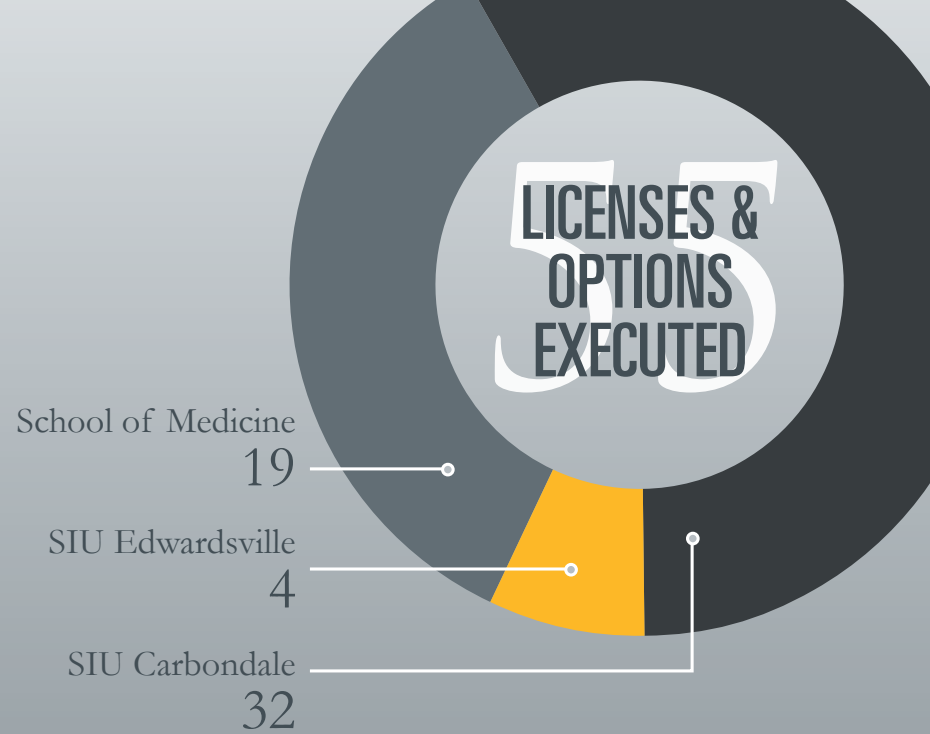
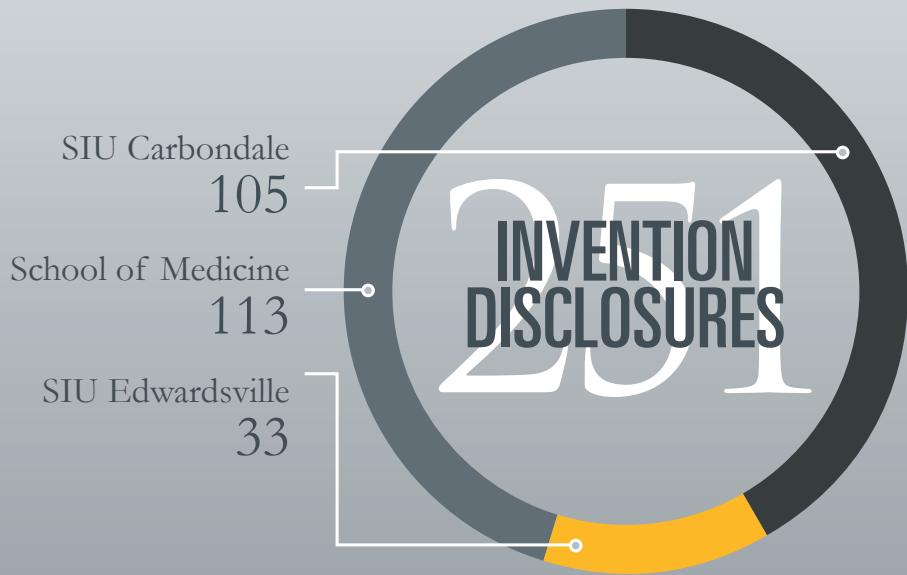
This year’s contest coincided with ATMAE’s 50th anniversary. The team members operated their custom-designed-and-built robot dubbed “Winston,” in honor of the recently retired and well-known bagel man in Carbondale.

3 INSTITUTE RANKS SIUC 76TH IN NATION FOR TECHNOLOGY TRANSFER

A national organization promoting economic opportunity has ranked Southern Illinois University Carbondale among its top 100 in the country for technology transfer.

The Milken Institute’s Center for Jobs and Human Capital placed SIUC at No. 76 (out of 225) in the nation in its Technology Transfer and Commercialization Index of Universities & Research Institutions ranking, which it released in April.

The California-based Milken Institute is a nonprofit, nonpartisan think tank that seeks to grow global prosperity by advancing collaborative solutions that widen access to capital, create jobs, and improve health. The Center for Jobs and Human Capital promotes prosperity and sustainable economic growth around the world by increasing the understanding of the dynamics that drive job creation and promote industry expansion.



EXTERNAL AWARDS AND CONTRACTS

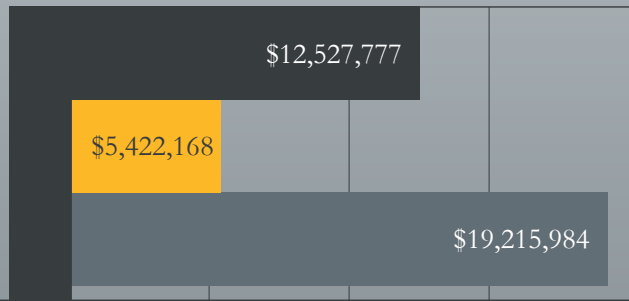
Fiscal Year 2017
By date processed

- Research
- Training
- Other

in millions \$5 \$10 \$15 \$20



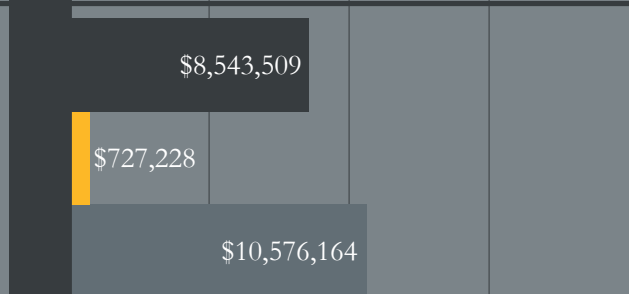
FY 2017 total:
\$37,165,928



FY 2017 total:
\$7,404,004



FY 2017 total:
\$19,846,901



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SERVE

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ALIGN

STRENGTH

MISSION

HIGH PERFORMING

MEET SIU

With more than 1,000 faculty researchers spread across three main campuses, Southern Illinois University is an innovation and economic engine for the southern half of the state.

SOUTHERN ILLINOIS UNIVERSITY CARBONDALE

As a nationally ranked public research university, SIU Carbondale embraces a unique tradition of access and opportunity. Recently, SIU Carbondale was ranked the 27th most entrepreneurial research university in the US by Forbes magazine and was designated an Innovation and Economic Prosperity University by the Association of Public and Land-grant Universities.

SOUTHERN ILLINOIS UNIVERSITY – EDWARDSVILLE

SIU Edwardsville is a nationally recognized university that provides students with a high-quality, affordable education. Built on the foundation of a broad-based liberal education and enhanced by hands-on research and real-world experiences, SIU Edwardsville equips students to thrive in the global marketplace and make Illinois communities better places to live.

SIU SCHOOL OF MEDICINE

The Springfield-based SIU School of Medicine is a publicly-assisted medical school focused on the health care needs of downstate Illinois. As an academic medical center, SIU School of Medicine trains caring and competent physicians, works closely with the School's SIU HealthCare clinical practice, and engages in innovative scientific research and community service projects.

ONE UNIVERSITY, MANY LOCATIONS, STATEWIDE IMPACT

The Southern Illinois University System – where learning comes first, where students are valued and encouraged to explore new ideas, and where progress is complemented by tradition.

The two institutions that constitute Southern Illinois University today – SIU Carbondale, with a School of Medicine in Springfield and partnership in the University Center of Lake County, and Southern Illinois University Edwardsville, with its School of Dental Medicine in Alton and its East St. Louis Center – reach not only from the Shawnee National Forest to the bluffs of the Mississippi River, but also through the flatlands of central Illinois to the shores of Lake Michigan.

With a total budget of about \$867 million, the university employs more than 7,000 faculty, staff and administrators who serve over 28,000 students. As a modern and comprehensive post-secondary educational system, SIU offers a broad range of academic programs that lead to associate, baccalaureate, master's, specialist's, and doctoral and professional practice degrees in 32 fields, including law, medicine, pharmacy and dental medicine.



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