First row, from left:
- John Keller delivers a campus address on the State of Graduate Education at Iowa.
- Chemists Anthony Lucio and Courtney Stanford win National Science Foundation funding to study with host researchers in Australia and Taiwan.
- Five University of Iowa graduate students win GRFP fellowships for 2015-16.
- Noaquia Callahan, doctoral student in history, wins 10 competitive grants and fellowships for the 2015-16 academic year.

Second row, from left:
- Five graduate students win Fulbright fellowships.
- The Graduate College promotes undergraduate to graduate programs (U2G), which allow students to earn bachelor’s and master’s degrees in five years.
- The Office of UI Grad Success offers Careers Outside the Academy, a conference for graduate students seeking broader career options.
- The Graduate College collaborates with the Office of the Vice President for Research & Economic Development and the Graduate Student Senate to host the Three-Minute Thesis competition.

Third row, from left:
- Winners of the presentation competition at the 17th annual Jakobsen Research Conference.
- Postdoctoral scholar Phillip Gander makes a breakthrough discovery about tinnitus (ringing of the ears).
- The International Writing Program offers a distance learning course that helps women in Bahrain and Jordan build a community of writers.
- UI team is developing a bioactive gel for knee injuries.
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On March 3, 2015, John Keller delivered a campus address on the state of graduate education at Iowa.

Keller, who serves the UI as Graduate College dean and associate provost of graduate education, spoke about today’s educational climate and the value of graduate-level research and creative work.

Graduate education matters
Citing examples campus wide, Keller points to specific innovations that have been the result of graduate education at Iowa, including automobile safety, better K-12 education, improved city planning, and research to aid the hearing impaired.

Graduate education makes a positive impact locally, at the state and national levels, and internationally. In fact, graduate education has never mattered more. “Finding innovative solutions to many of the greatest challenges facing the nation and the world in the 21st century will depend upon having a highly skilled workforce,” says the Council of Graduate Schools in its 2010 report, The Path Forward.

Graduate education lies at a key intersection between undergraduate learning and professional life. Graduate students go on to become the next generation of faculty, researchers in many industries, leaders of non-profit organizations, creative thinkers, and more.

Pressures
All universities offering graduate programs face a range of pressures that could, over time, compromise the sustainability of graduate education. National and international economies have suffered in recent years, which has meant reductions in funding for higher education. Employment trends shape career options and the job market.

“The rate of change is challenging historical traditions and views,” says Dan Reed, vice president for research and economic development at the UI. “Survivors control their own destiny,” he says.

We have huge opportunities to define who we are and what we do as a student-centered AAU university. How do we approach these opportunities? We look to creative thinkers, like Albert Einstein, who said, “We cannot solve our problems with the same thinking we used when we created them.”

Innovation
This university has a track record of innovation.

For example, we were the first to accept creative works as the thesis requirement to satisfy degree completion (MFA, DMA, etc.). We are top in the nation with five dissertation prizes. Our interdisciplinary doctoral programs foster collaborative work that leads the way in new research areas.

At the Graduate College, we are building on our record of successful innovation by:

• Focusing on a student-centered approach to optimal career preparation for a diverse student body
• Supporting students’ work to solve complex problems
• Fostering collaboration to incubate real-world innovation
• Sustaining programs of distinction through nimble anticipation of state and national knowledge needs and job market realities

Call to action
Our strategic plan calls us to come together to make curricular innovations, harness intellectual synergies, and use our funds strategically to prepare and advise students based on projected market demand for our graduates.

Society’s most pressing and complex problems can be solved best through interdisciplinary efforts that prompt us—urge us—to create, communicate, research, critique, and illuminate to help us see the world differently. From a new vantage points, with collaborators from various fields, our students reimagine our world; they become an incubator for real-world innovation.

Graduate education at Iowa is moving beyond teaching students a set of skills. Our goal is to give graduate students a solid foundation in their field PLUS the abilities in critical and malleable thinking they need to imagine, construct, and utilize fruitful collaborations.
Anthony Lucio and Courtney Stanford, graduate students in the University of Iowa Department of Chemistry, were recently awarded fellowships by the National Science Foundation East Asia and Pacific Summer Institutes for U.S. Graduate Students (EAPSI). The EAPSI competition provides opportunities for doctoral candidates to spend a summer working with host researchers in East Asia and the Pacific.

Stanford will work as a guest researcher with professor Hsin-Kai Wu at National Taiwan Normal University-Graduate Institute of Science Education. The title of Stafford’s proposal is “Investigating Cultural and Instructor Influences on Student Argumentation and Conceptual Understanding in Chemistry Classrooms.”

Lucio will work as a guest researcher in the laboratory of professor Alan Bond at Monash University, Australia. The title of Lucio’s proposal is “Large Amplitude Fourier Transform Alternating Current Voltammetry to Study Electrical Double Layer Transition from Aqueous to Ionic Liquid Phases.”

Lucio has also been awarded a T. Anne Cleary International Dissertation Research Fellowship, named in honor of Professor T. Anne Cleary, former UI associate vice president for academic affairs and professor in the College of Education. These two awards will support Lucio’s proposed research for 12 weeks.

EAPSI fellowship recipients are distinguished by their prior achievements in research and academics, as well as the quality of their research proposals. The awards reflect their potential to make significant contributions to their research fields and to spearhead new directions in research via international collaboration.

Lucio and Stanford win NSF fellowships
Chemists will study with host researchers in Australia and Taiwan

“I was encouraged to apply for fellowships to support my Ph.D. work during the orientation program from the Graduate College.”
—Anthony Lucio, Ph.D. candidate in chemistry

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Q: How have Graduate College staff, services, and workshops helped you apply for and land your NSF funding?
A: Upon arriving to the University of Iowa for my graduate career, I was encouraged to apply for fellowships to support my Ph.D. research during the orientation program from the Graduate College. As someone who routinely reads scientific literature, my writing is very focused and it can be difficult to illuminate hypotheses and results using non-technical language. I have had the pleasure of working with Jennifer Teitle from the Graduate College on most of my fellowship applications and there is no doubt in my mind that she played an instrumental role in helping transform my essays to compete on a national scale.

Q: How will your work in Australia benefit your research endeavors?
A: This collaboration will be productive for my current research group at the University of Iowa and in pursuing a future career as a faculty member. Understanding this unique technique will advance my knowledge of electrochemical voltammetry and serve as a vehicle to explore many more electrochemical research objectives in my professional career.
Since 1952, the National Science Foundation's Graduate Research Fellowship Program (GRFP) has supported outstanding graduate students to advance science and engineering research. Five UI graduate students won this prestigious award for 2015-16.

- Johnathan Culpepper
  Engineering – Environmental
- Ananda Guneratne
  Engineering – Optical Engineering
- Maria Noterman
  Life Sciences – Neuroscience
- Victoria Spring
  Psychology – Social
- Jennifer Verniero
  Physics and Astronomy – Plasma

“This award simply affirms my decision to pursue graduate study at the University of Iowa,” says Culpepper.

The GRFP award provides three years of financial support within a five-year fellowship period ($34,000 annual stipend and $12,000 cost-of-education allowance to the graduate institution) for graduate study that leads to a research-based master’s or doctoral degree.

Applicants for the GRFP must show how their research will benefit society. To address this crucial component of the GRFP application, graduate students turn to the UI’s Office of Graduate Student Success, staffed by Jennifer Teitle (associate director) and Elizabeth Savelkoul and Alex Schott (postdoctoral scholars).

“Our efforts working with the GRFP applicants—from initial workshops to proposal review—are part of the Graduate College’s sustained effort to encourage a culture of application here at Iowa,” says Teitle.

Noterman attended a workshop offered by the Office of Graduate Student Success, during which applicants reviewed each other’s essays and offered feedback. “This workshop helped to clarify my writing for people in different fields,” says Noterman. “I also worked with Elizabeth on my final drafts to help streamline my ideas. Every word has to serve a purpose with the page restrictions on the NSF application.”

Every student who applies for the fellowship gains vital professional development experience in grant writing. “Those students are now better able to discuss and present their work, and their next grant application will be better because of it,” Schott says. “We want to foster a culture of application, where students are working with faculty on external funding applications all the time. Not only will the students win more, but they’ll be better prepared for their careers as well.”

Verniero is a teaching assistant in the UI’s Department of Mathematics. While she enjoys sharing her love of mathematics with undergraduate students, she is eager to spend more time on her research. “With this fellowship, I have more flexibility and am able to start my project a year earlier than planned, which will result in better progress toward getting my degree and pursuing my future goals in space research,” says Verniero.

GRFP fellows also receive opportunities for international research collaborations through the Graduate Research Opportunities Worldwide (GROW) initiative, as well as career development opportunities with federal internships provided through the Graduate Research Internship Program (GRIP). “The GRFP will give me the freedom to travel to more conferences to present my work and the confidence to pursue riskier research ideas,” says Spring.

GRFP recipients are well positioned to make transformative breakthroughs in their respective research fields. “Being a GRFP fellow not only opens doors during graduate school, but also creates the pathways and practices that make for high-achieving and innovative researchers in the long term,” Teitle says.
It's been quite a spring for Noaquia Callahan, a doctoral student in history who has earned 10 competitive grants and fellowships for the 2015-16 academic year.

- Doctoral Fellow in African American History, German Historical Institute in Washington D.C.
- Marcus Bach Graduate Fellowship; College of Liberal Arts and Sciences, The University of Iowa
- Mellon-Moorland Travel to Collections Grant; Moorland-Springarn Research Center, Howard University in Washington D.C.
- Jane A. Weiss Dissertation Scholarship; Gender, Women, and Sexuality Studies Department, The University of Iowa
- Lawrence E. Gelfand Fellowship; History Department, The University of Iowa
- Fellow, Humanities Without Walls Pre-Doctoral Summer Workshop
- Iowa Graduate Success External Fellowship Award; Graduate College, The University of Iowa
- Research Grant; Graduate and Professional Student Government, The University of Iowa
- Supplementary Travel Award for Research; Graduate College, University of Iowa
- Research Award from the Carrie Chapman Catt Center for Women and Politics; Iowa State University

“The Graduate Student Success Staff taught me how to breakdown and tailor my proposals according to each grant funder’s mission, grant description, and requirements,” says Callahan. “Developing this skill is key to success in the world of grant writing.”

**Interview with Callahan**

Q: You were a Summer Research Opportunities Program (SROP) scholar here at the UI. How was that experience?

A: “There was a sense of community here. There was a sense that we all came here wanting to learn about graduate school. It was an amazing opportunity that rarely comes along. There was a positive vibe that we were going to do this together. The SROP program was good prep (for graduate school) because it was intense. Having to produce quality research required intense concentration and work ethic.”

Q: How have your UI graduate advisors, Leslie Schwam and Elizabeth Heinemann, assisted you?

A: “They challenged me and had high expectations, but they also helped me get there. When I needed to slow down when this was too much, they let me step back for a second, then we went back at it.”

Q: Please describe your dissertation topic.

A: “I study early 20th century international feminist organizing in African American and German history. I use the story of Mary Church Terrell’s life to pull big issues together.

“Mary Church Terrell is representative of the challenges of being African American and being a woman at the turn of the 20th century. In Berlin in 1904, she delivered a speech in German called “The Progress of Colored Women.” She was able to present African-American women in a way that the world didn’t know, challenging some of the negative stereotypes of women of color.”

“And she’s also able to connect with these women based on the fact that she’s a women and faces challenges similar to the challenges they face. She argues that the issues of racism and sexism are not exclusive. As African-American women, we deal with both of these simultaneously. For us, they are intertwined.”
Four University of Iowa graduate students and one alumna with UI graduate degrees won Fulbright funding to continue their research and creative work next year in locations around the world.

Gloria Wenman
Gloria Wenman, of Oxford, Iowa, is currently pursuing a graduate teaching certificate and holds an M.S. in urban and regional planning from the UI, an M.P.A. in public administration from Upper Iowa University, and a B.A. in psychology and creative writing from the UI.

Wenman, who is also a member of the U.S. Army, will use her Fulbright U.S. award to address individual learning needs of students and engage them in conversations about American culture as an English teaching assistant in Mongolia.

Beatrice Smigasiewicz
Beatrice Smigasiewicz, of Chicago, Illinois, graduated with an M.F.A in literary translation in May 2014 and will earn a second M.F.A. in nonfiction writing from the UI in May 2015.

Smigasiewicz will use her Fulbright U.S. award to investigate the representation of post-Soviet Polish identity in Krakow, Poland, through interviews, museum research, and study of Polish literature and architecture. She will use her research to write a book of essays titled Recovered Futures.

Steph Rue
Steph Rue, of Cleveland, Ohio, is expected to graduate with an M.F.A in book arts in May 2015.

Rue will use her Fulbright U.S. award to investigate the history and technique of Korean book arts with a special emphasis on paper making in South Korea. She will also create a series of artist books and paper artwork in Seoul that will incorporate her research on traditional bookmaking methods. Her project is intended to help preserve the spiritual and historical tradition of Korean book arts.

Clare Jones
Clare Jones of New Orleans, Louisiana, earned an M.F.A in creative writing (poetry) from the UI Writer’s Workshop and an M.A. in book arts from the UI Center for the Book in May 2014. Jones will use her Fulbright U.S. award to investigate the potential of new creative writing publishing initiatives to bring Pacific area cultures and climate change activism to the attention of the global community and encourage collaboration between specialists within environmental conservation groups and the arts in New Zealand and Polynesia. She will also research and write a book of poetry, Neotype, that weaves together themes of botany, ornithology, and geology of that area.

Daniel Goering
Daniel Goering, of Agency, Iowa, is a Ph.D. candidate in organizational behavior and human resources in the UI Tippie College of Business.

With his Fulbright U.S. award, Goering will study work-life balance issues and investigate methods to increase resilience to work-family stress with experts at the University of Tokyo in Tokyo, Japan.

The Fulbright Program is the flagship international educational exchange program sponsored by the U.S. government. It is designed to increase understanding between people of the United States and other countries by providing participants opportunities to study, teach, conduct research, and contribute to finding solutions to shared international concerns.

Recipients of Fulbright grants are selected on the basis of academic or professional achievement, as well as demonstrated leadership potential in their fields.
The Graduate College has launched a new initiative to promote five-year programs that begin with undergraduate study and lead to a master’s degree.

The UI’s undergraduate to graduate programs—promoted under the name Iowa U2G—offer clear benefits for UI students. Through streamlined studies, students can maximize their tuition dollars and position themselves for career placement.

“The Iowa U2G initiative makes more visible the many degree options and programs that serve the interests of our students,” says John Keller, associate provost for graduate and professional education and dean of the Graduate College. “In the past, these programs have been approached individually by students and their departments. U2G marks a new era in our efforts to make these programs available to eligible students.”

**History of U2G success**
The University of Iowa has a history of success with combined programs in several fields of study. The UI College of Engineering was the first to initiate a combined degree program in 1982. As interest in such programs has grown, other UI graduate programs have developed U2G degree tracks as a means to encourage promising scholars to continue their education at Iowa.

Currently, the UI offers twenty-two U2G programs in a variety of areas ranging from German to Public Health. The University of Iowa offers more combined bachelor’s and master’s programs than any other Big 10 institution.

The decision to launch the initiative grew out of the need to help students address pressures to achieve higher levels of education while facing rising costs of attending college.

Mike Paulsen, professor in the higher education program in the UI College of Education, is a specialist in both higher education and economics. Paulsen outlines the benefits of Iowa U2G, saying, “U2G pathway programs are very really exciting because of all the benefits to students and their families. Combined programs offer substantial reductions in overall tuition costs and significant reductions in the time to complete both degrees. Because students enter the job market more quickly, they also see a faster return on their investment in higher education.”

In addition, Paulsen notes that U2G programs can narrow pay gaps between disciplines. For example, a student with an Iowa U2G master’s in social work or education spends only one additional year in school to earn a salary approaching that of a student who completes a bachelor’s in a STEM field.

**The U2G process at Iowa**
Iowa U2G programs follow a straightforward process. First, undergraduate students must meet the application standards, including a GPA of at least 3.25 and a minimum of 80 semester hours completed. Some programs require more than 80 hours.

Next, students work with their department to select courses to take during their fourth year. Generally, courses allowed for U2G programs count toward both the bachelor’s and the master’s. At the end of the fourth year, students earn their bachelor’s degree. During their fifth year, students devote their time to completing their master’s degree.

**Rising interest in U2G**
Although the programs are popular across campus, some have seen considerably growth. Interest in UI College of Public Health combined programs has increased substantially since the college launched its first in 2012.

“Students with graduate education in public health represent the next generation of public health leaders and innovators. By 2020, the Association of Schools and Programs of Public Health reports the U.S. will face a shortage of 250,000 public health workers,” says Mary Lober Aquilino, associate dean in community and behavioral health. “The changes in health care needs and health care delivery in the U.S. and abroad are providing expanded opportunities and employment prospects for students with public health knowledge and skills.”

Aquilino says Iowa’s programs will help with the shortage. “The undergraduate to graduate program allows students to be prepared in a health field with high workforce demand and to enter the workforce sooner.”

Keller agrees that Iowa U2G programs will serve students well. “There are many reasons this initiative is timely: U2G programs reduce education costs while increasing career earnings potential. More employers need the type of skills that a graduate degree provides, and U2G programs will also help attract our top undergrads to pursue their graduate degrees at Iowa.”
On March 28, 2015, the Graduate College hosted its second annual Careers Outside the Academy conference.

The conference benefits graduate students at all stages of their programs with information about pursuing non-academic jobs.

This year's conference featured:
- STEM keynote presentation by Susan Wood, Ph.D. and CEO of VIDA Diagnostics
- Humanities and Social Sciences keynote presentation by Andrew Epstein, Ph.D., independent international education consultant
- Career breakout sessions with Q&A focused on leadership, transferable skills, and industry jobs
- Panelists from non-profits, biotech, museums, entrepreneurship, and non-academic jobs
- Multiple networking opportunities

**Career prep**

Graduate students gain specialized training in their fields of study, but to compete in a tight job market, they must also acquire additional skills such as writing and public speaking.

Students at the conference learned how to hone and leverage such skills. They also discussed ways to highlight key skills to help potential employers see the high value of hiring a Ph.D.

**Transferable skills**

Panelists gave students the opportunity to see transferable skills at work. From project management to marketing and entrepreneurship, many panelists reported using skills gained during their graduate degree program. Leadership, communication, data analysis, and curriculum development were among many skills highlighted as valuable in today's job market.

**Step or leap?**

For many graduate students, expanding their job search to include careers outside the academy is both a relief and a challenge. While there are more career options to consider, stepping into the world outside academe can seem like a sizable leap. Conference panelists discussed strategies for translating the details of graduate work into compelling talking points for a job interview.

**Creating a career path**

Rather than limiting the job search to openings posted or advertised, panelists advised graduate students to consider creating their own career opportunities through networking. Students were encouraged to look at ways their research might be parlayed into new business ventures. Finding a career opportunity could also come through working as a volunteer. Once established in a volunteer position, a graduate student can hone transferable skills and learn new ones.

Finally, graduate students were advised to engage in careful listening while networking. Specifically, students should listen for details that give a full picture of an organization's needs and the particular skills that would fill those needs.
The Graduate College hosted the University of Iowa’s inaugural Three Minute Thesis (3MT) competition April 13-18, 2015.

The competition was held in collaboration with the UI’s Office of the Vice President for Research and Economic Development, Graduate Student Senate, and the Department of Rhetoric.

Worldwide competition
Developed by the University of Queensland (UQ), Australia, 3MT offers a forum for graduate students to share their dissertation research with a general audience in an oral presentation lasting three minutes at most.

Begun in 2008, the competition has grown to include more than 125 universities worldwide, including 45 in the United States.

Professional development
The 3MT competition at Iowa is part of the Graduate College’s career and professional development effort. The ability to clearly and concisely articulate complex research to non-specialist audiences is a vital skill for scholars pursuing academic and non-academic careers.

Each department selects a candidate for the qualifying rounds. Departments can hold their own internal competition as part of regular colloquia, departmental meetings, or social occasions. Alternatively, departments can work together to hold mini-competitions to give students a chance to practice their presentations.

For the final round, winners are determined by a panel of judges using the official 3MT competition rubrics. Judges are invited from the University of Iowa faculty and staff, Graduate Student Senate, and local community.

Official 3MT rules
The following rules are used for all levels of the competition:

- Each candidate is allowed to present with a single static PowerPoint slide (no slide transitions, animations or ‘movement’ of any description; the slide is to be presented from the beginning of the oration).
- No additional electronic media (e.g., sound or video files) are permitted.
- No additional props (e.g., costumes, musical instruments, laboratory equipment) are permitted.
- Presentations are limited to 3 minutes maximum and competitors exceeding 3 minutes are disqualified.
- Presentations are to be spoken word (e.g., no poems, raps or songs).
- Presentations are considered to have commenced when a presenter starts their presentation through movement or speech.

2015 3MT winners at Iowa

Benjamin Miele, English—1st Place (tie) and People’s Choice, $1,000 prize.
“What we can learn from surveillance practices in Renaissance England”

S. Scott Whitmore, Genetics—1st Place (tie), $500 prize.
“Molecular investigations of age-related macular degeneration”

Annette Honken, Pure Math—3rd Place, $300 prize.
“Knot distance graphs”
The 17th annual James F. Jakobsen Conference, held March 28, 2015, attracted presentations from graduate students across the UI campus.

The conference was established in 1998 and named after associate dean James F. Jakobsen in 2001 in honor of his longstanding commitment to graduate student education and his work with the Graduate Student Senate.

Through the generous contributions of the Jakobsen family, the conference is entirely organized by members of the Graduate Student Senate (GSS). With additional support from the Graduate College and local businesses, GSS offers UI graduate students a local venue in which to present and view research and creative work.

Held each Spring semester, the Jakobsen Conference provides a well-attended, public forum for oral and poster presentations.

Winners, Spring 2015

Biological & Health Sciences
First prize—David Cordie, Geoscience. Stony Coral Soft Tissue Systematics and Use of Histology in Coral Phylogenetics
Second prize—Jyungmean Son, Free Radical & Radiation Biology. Age-associated Metabolic Reprogramming in Normal Human Fibroblasts
Third prize—Ryan Adam, Biomedical Engineering. Traacheal Abnormalities in People with Cystic Fibrosis

Creative Works
First prize—Halle Siepman, Art. Architectural Potential
Second prize—Helen Rubinstein, English—Nonfiction Writing. On Not Eating the Marshmallow

Humanities
First prize—Stefan Schöberlein, English—Literary Studies. Melting Glaciers, Rising Waters—Max Frisch’s Anthropocenic Worries in “Man in the Holocene”
Second prize—Kathryn Polizzi, English—Literary Studies. Interpreting Literature with the City of Literature
Third prize—Matthew Blackwell, English—Literary Studies. What We Talk About When We Talk About Lish: Gordon Lish, James Purdy, and the Silencing of Raymond Carver

Math, Physical Sciences, & Engineering
First prize—Robert Hart, Mechanical Engineering. Development and Implementation of the Experimental Procedure to Examine the Response of Carbon Fiber and Buckypaper Composites Subjected to a High-Intensity Pulsed Electric Field
Second prize—Shani Egodawatte, Chemistry. Synthesis of Electrospun Hematite Nanofibers with a Mesoporous Silica Coating of Controlled Thickness

Social Sciences & Education
First prize—Stacy Astrove, Management & Organizations. Psychological Contract Breach and Counterproductive Work Behavior: A moderated Mediation Model
Second prize—Caitlin Hilliard, Psychology. Height matters: placement of hand gesture affects listener motor movements
Third prize—Alexander Ruch, Sociology. Perceived Organizational Risks and Reputations Are Related to Individuals’ Decisions to Eat Genetically Modified Foods

Third prize—Sage Schissel, Chemical & Biochemical Engineering. Internal Reference Validation for EB-cured Polymer Conversions Measured via Raman Spectroscopy

Poster presentation session at the James F. Jakobsen Graduate Conference. Photo by George Nicolaescu.
In search of tinnitus, phantom ringing in the ears
UI scientists utilize brain monitoring during epilepsy surgery to learn about tinnitus

Mapping the highly specialized expertise of a brain research lab at the University of Iowa, researchers have taken advantage of a rare opportunity to record directly from the brain of a person with tinnitus in order to find the brain networks responsible for this often debilitating condition.

About one in five people experience tinnitus, the perception of a sound—often described as ringing—that isn’t really there. The new study, reported in the Cell Press journal Current Biology on April 23, reveals just how different tinnitus is from normal representations of sounds in the brain.

Perhaps the most remarkable finding was that activity directly linked to tinnitus was very extensive and spanned a large proportion of the part of the brain we measured from,” says study co-leader Will Sedley of Newcastle University in the United Kingdom. “In contrast, the brain responses to a sound we played that mimicked [the subject’s] tinnitus were localized to just a tiny area.”

“This has profound implications for the understanding and treatment of tinnitus, as we now know it is not encoded like normal sound, and may not be treatable by just targeting a localized part of the hearing system,” adds study co-leader Phillip Gander, postdoctoral research scholar in the UI Department of Neurosurgery.

Gander and Sedley are members of the Human Brain Research Laboratory (HBRL) led by Matthew Howard, UI professor and DEO of neurosurgery and a member of the Pappajohn Biomedical Institute. The HBRL is a multinational research team that uses direct recordings of neural activity from inside humans’ brains to investigate sensory, perceptual, and cognitive processes related to hearing, speech, language, and emotion.

Only a few groups in the world have the expertise and collaborative infrastructure to conduct these experiments. It is possible because patients who require invasive brain mapping in preparation for epilepsy surgery also volunteer to participate in research studies. In the current study, the patient was a 50-year-old man who also happened to have a typical pattern of tinnitus, including ringing in both ears, in association with hearing loss.

“It is such a rarity that a person requiring invasive electrode monitoring for epilepsy also has tinnitus that we aim to study every such person if they are willing,” Gander says.

Howard and his team conduct their research with about 15 epilepsy surgery patients each year. “We are putting a recording platform into the patient’s brain for clinical purposes and we can modify it without changing the risk of the surgery. This allows us to understand functions in the brain in a way that is impossible to do with any other approach,” Howard says.

In the new study, the researchers contrasted brain activity during periods when tinnitus was relatively stronger and weaker. They found the expected tinnitus-linked brain activity, but they report that the unusual activity extended far beyond circumscribed auditory cortical regions to encompass almost all of the auditory cortex, along with other parts of the brain.

The discovery adds to the understanding of tinnitus and helps to explain why treatment has proven to be such a challenge, the researchers say.

“The sheer amount of the brain across which the tinnitus network is present suggests that tinnitus may not simply ‘fill in the gap’ left by hearing damage, but also actively infiltrates beyond this into wider brain systems,” Gander adds.

These new insights may help to inform treatments such as neurofeedback, where patients learn to control their “brainwaves,” or electromagnetic brain stimulation, according to the researchers. A better understanding of the brain patterns associated with tinnitus may also help point toward new pharmacological approaches to treatment.

In addition to Gander, Sedley, and Howard, the team included UI researchers Hiroyuki Oya, Christopher Kovach, Kirill Nourski, and Hiroto Kawasaki, as well as Timothy Griffiths at Newcastle University. The research was supported by grants from the National Institutes of Health and the Wellcome Trust and Medical Research Council in the U.K.

This article was written by staff in UI Health Care Marketing & Communications. It first appeared in Iowa Now and was adapted from a release prepared by Cell Press.
Mehr Ul Ain Mushtaq loves putting her thoughts down on paper—she always has. Her father, whom she considers her mentor, was often amused by whatever stories his daughter would write and read out loud to him. During his daughter’s formative years in Saudi Arabia, he encouraged Mushtaq to carry a pocket dictionary; as he would often say, “You can never learn too many words.”

Mushtaq went to college for business, and continued to nurture her writing passion. She sent articles concerning trends and social issues to news blogs and magazines; when her words were published on a regular basis, she realized her true calling, and there was no looking back.

“I love expressing oneself in the depths of words, and the level of contentment I have felt working as a journalist is incomparable to anything else,” says Mushtaq, 28, who lives in Bahrain. “Writing feature stories and local reporting led me to living life to the fullest; getting into the realm of creative writing was like fitting the last piece of the puzzle.”

The International Writing Program’s distance learning program offers web-based courses, exchanges, and events whose goal is to encourage worldwide cultural and creative exchange—the IWP’s principal mission.

Mushtaq was one of nearly 20 female participants in Manama, Bahrain, and Amman, Jordan, to take A Room of One’s Own: Developing the Authorial Voice, a distance-learning course offered in the spring by the International Writing Program at the University of Iowa.

Taught by Iowa Writers’ Workshop graduate Naomi Jackson, the course focused on issues of artistic identity while fostering the participants’ authorial voices and building a community of women writers. It featured weekly live video classes that brought together the participants in Amman and Manama. A course website provided readings and writing assignments and hosted individual online workshops of students’ writing assignments.

“The students in my class are fiercely talented, widely read, intellectually open, and poised to transform the world around them,” says Jackson. “Teaching this class made me confident that the next generation of women writers from Bahrain and Jordan will have a significant impact not just on the literary landscape of the Middle East, but on the larger world stage.”

The IWP worked with U.S. Embassies in Jordan and Bahrain to arrange the course dates and structure; those embassies reached out to local universities to recruit students with sufficient English to take advantage of the unique course structure. From the moment she learned she would be part of A Room of One’s Own, Mushtaq was overcome with excitement. Through the course, she became familiar with acclaimed work in a number of genres, including pieces by Shirley Jackson, Jamaica Kincaid, and Naomi Shihab-Nye. She loved what was called the “imagination station” portion of class, where Jackson would ask the students to create a short piece based on the discussion in process.

“There was immediacy to it, and through this exercise I noticed how we had all grown in expressing our thoughts so confidently and in such creative ways,” Mushtaq says.

Following the eight-week course, Mushtaq gained confidence but also realized the global scope of fascinating writers. She continues to read and explore ways to feed her writing skills—she now carries a journal with her at all times in order to record thoughts and ideas when they arise.

What she has gained from A Room of One’s Own might just propel her toward her goal of a published novel. “This workshop has brought me a step closer to becoming a novelist,” Mushtaq says. “I’m closer to the point where my children can point at my work through a bookstore’s window and exclaim, ‘Look, Mommy’s book is here, too.’”

This article is adapted from a story that first appeared in Iowa Now.
Knee injuries are the bane of athletes everywhere, from professionals and college stars to weekend warriors. Current surgical options for repairing damaged cartilage caused by knee injuries are costly, can have complications, and often are not very effective in the long run. Even after surgery, cartilage degeneration can progress leading to painful arthritis.

But a University of Iowa orthopedics research team is working on a solution with hopes it will result in a minimally invasive, practical, and inexpensive approach for repairing cartilage and preventing osteoarthritis.

“We are creating an [injectable, bioactive] hydrogel that can repair cartilage damage, regenerate stronger cartilage, and hopefully delay or eliminate the development of osteoarthritis, and eliminate the need for total knee replacement,” says Yin Yu, a doctoral student in biomedical engineering and a member of the lab of James Martin, UI assistant professor of orthopedics and rehabilitation. Yu is first author of the study, which is featured on the cover of the May 1 issue of the journal Arthritis and Rheumatology.

Martin’s team had previously identified precursor cells within normal cartilage that can mature into new cartilage tissue. This was a surprising discovery because of the long-held assumption that cartilage is one of the few tissues in the body that cannot repair itself.

The team also identified molecular signaling factors that attract these precursor cells, called chondrogenic progenitor cells (CPC), out of the surrounding healthy tissue into the damaged area and cause them to develop into new, normal cartilage. One of the signals, called stromal derived factor 1 (SDF1), acts like a homing beacon for the precursor cells.

In an experimental model of cartilage injury, Yu loaded the custom-made hydrogel with SDF1 and injected it into holes punched into the model cartilage. The precursor cells migrated toward the SDF1 signal and filled in the injury site. Subsequent application of a growth factor caused the cells to mature into normal cartilage that repaired the injury.

“This process gives us a great result,” Yu says. “The new cartilage integrates seamlessly with the undamaged tissue. It has normal concentrations of proteoglycans, good structural properties, and looks like normal cartilage.”

The new tissue is not as mechanically strong as normal cartilage, but Yu and Martin think that mechanical loading — the type of stress that is exerted during physical therapy and exercise — might improve the mechanical properties. “There’s really no cure for osteoarthritis except for total joint replacement, which is not particularly suitable for younger patients because the artificial joints wear out and need to be replaced multiple times,” says Martin. “Our approach aims to leverage the body’s own capacity for repair, and what we’ve shown is that cartilage does have regenerative potential—you just have to manipulate it just right.”

To translate this approach into a therapy that can be used in people, the team now needs to include the growth factor in the gel in such a way that there is a stepwise release of the attractant SDF1 followed by the growth factor. Martin and Yu have teamed up with UI pharmacy professor Aliasger Salem to engineer that property into the gel.

The long-term goal of commercializing the gel as a human therapy has guided the researchers’ thinking from the start of the project, prompting Yu’s participation in UI Venture School where he and several colleagues, including undergraduate student Jaison Marks, developed a business plan for the product.

Yu and Martin plan to start animal trials within a year and, if the results are good, they hope to be ready to start human trials in about five years. The UI research team also included Marc Brouillette, Dong Rim Seol, Hongjun Zheng, and Joseph Buckwalter. The study was supported in part by grants from the U.S. Department of Defense and the American Arthritis Society.

This article was adapted from a news release that first appeared in Iowa Now.