Bio-bots walk on command
By Liz Ahlberg
Physical Sciences Editor
A new generation of miniature biological robots is flexing its muscle.
Engineers at the University of Illinois demonstrated a class of walking ‘bio-bots’ powered by muscle cells and controlled with electrical pulses, giving researchers unprecedented command over their function. The group published its work in the online early edition of Proceedings of the National Academy of Science.

‘Biological actuation’ by cells is a fundamental need for any kind of biological machine you want to build,” said study leader Rashid Bashir, Abel Bliss Professor and head of bioengineering at the University of Illinois. “We’re trying to integrate these principles of engineering with biology in a way that can be used to design and develop biological machines and systems for environmental and medical applications. Biology is tremendously powerful, and if we can somehow learn how to harness its advantages for useful applications, it could bring about a lot of great things.”

Bashir’s group has been a pioneer in designing and building bio-bots, less than a centimeter in size, made of flexible 3-D printed hydrogels and living cells. Previously, the group demonstrated bio-bots that “walk” on their own, powered by beating heart cells from rats. However, heart cells constantly contract, denying researchers control over the bot’s motion. This makes it difficult to use heart cells to engineer a bio-bot that can be turned on and off, sped up or slowed down.

The new bio-bots are powered by a strip of skeletal muscle cells that can be triggered by an electric pulse. This gives the researchers a simple way to control the bio-bots and opens the possibilities for further forward design principles, so engineers can customize bio-bots for specific applications.

“Skeletal muscles cells are very attractive because you can pace them using external signals,” Bashir said. “For example, you would use skeletal muscle when designing a device that you wanted to start functioning when it senses a chemical or when it received a certain signal. To us, it’s part of a design toolbox. We want to have different options that could be used by engineers to customize bio-bots for specific applications.”

The bio-bots are powered by muscle cells and controlled by an electric field.

Customizable bio-bots Tiny walking ‘bio-bots’ are powered by muscle cells and controlled by an electric field.

Campus asked for advice on search for president
By Mike Helenthal
Assistant Editor
Representatives of the University of Illinois presidential search committee were on the Urbana campus June 25 asking constituent groups at a town hall meeting what kind of president they would like to lead the university.

“We are in the information-gathering phase and the town hall meetings are an important part of the process,” said Doug Beck, a physics professor and the co-chair of the committee, adding meetings already had been held on the UIUC campus.

“It’s an opportunity to tell us what’s on your mind,” said Pam Strobel, the co-chair of the committee and a U of I trustee.

Audience members didn’t just ask a wide range of questions and making several suggestions to improve the process. Every question was answered and discussed openly by Beck and Strobel.

Three students asked the committee to consider student costs and other student-centric issues when choosing a president—and to hire someone who can connect with students.

“Student costs are an important issue,” said Sam Kaufman, a sophomore studying science and engineering. “We’ll be seeking a demonstration of results (from candidates) in each of those areas,” Beck said.

Joyce Tolliver, a professor of Spanish and a member of the Urbana Senate Executive Committee, said the new president should have an understanding of shared governance concepts and their place in the University of Illinois’ operational structure.

Christopher Z. Mooney, the director of the U of I’s Institute of Government and Public Affairs, said the president will have to be adept at operating amid the political landscape of Springfield.

“There’s been a lot of dialogue, but a drop in the bucket,” she said.

“We’ll be seeking a demonstration of results (from candidates) in each of those areas,” Beck said.

“Biological actuation driven by cells is tremendously powerful, and if we can somehow learn how to harness its advantages for useful applications, it could bring about a lot of great things.”

ONLINE VIDEO
go.illinois.edu/biobot_video2

ON THE WEB
go.illinois.edu/press_search (PDF)

Stormy weather It takes much more than the stormy weather the area experienced in June to threaten Altgeld Hall, one of the campus’s most solid structures. Completed in 1897, Altgeld Hall has withstood the vagaries of Mother Nature for more than a century. The building, the site of the original university library, was designed by professor Nathan Eicker, the first person in the United States to receive an architecture degree (from the U of I, of course).

“We need to know the administration is there for the student,” said Sam Kaufman, a sophomore studying science and engineering.

He needs to be able to actively engage with students and can get his message out and understand how it works.

“Students should be responsive to students. We need more opportunities to express our voice to the administration,” she said. Mitch Dickey, student senate president, said in a letter read to the audience that costs and academic excellence must be the focus of a new president.

Stephan J. Kaufman, a professor emeritus of cell and developmental biology, said after students, a president’s responsibility should rest with protecting the salaries and benefits of university employees.

“There’s been a lot of dialogue, but a drop in the bucket,” she said.

“We’ll be seeking a demonstration of results (from candidates) in each of those areas,” Beck said.

“A new generation of miniature biological robots is flexing its muscle. Engineers at the University of Illinois demonstrated a class of walking ‘bio-bots’ powered by muscle cells and controlled with electrical pulses, giving researchers unprecedented command over their function. The group published its work in the online early edition of Proceedings of the National Academy of Science.”

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Assistant Editor

The final report of the Senate Execu- tion Committee, which was approved by the Board of Trustees on June 23, states that there is a salary gap between the U. of I. and peer institutions.

In addition to salary and benefits recommend- ations, the report proposes developing better methods to compare compensation, including the use of common titles for comparable positions.

As for faculty salary disparity, Brown said the analysis showed some units were more in line with peers than others, and re- commended appropriate funding be targeted to the units that are lagging. One of the rec- ommendations is to develop a more detailed look at how much money goes into merit-based pay, which could be a way to address the salary gap disparity.

Concerning gender/racial pay disparity, Wise noted the analysis did not have the data to ex- tend the analysis, he said.

As for faculty salary disparity, Brown said the analysis showed some units were more in line with peers than others, and re- commended appropriate funding be targeted to the units that are lagging. One of the rec- ommendations is to develop a more detailed look at how much money goes into merit-based pay, which could be a way to address the salary gap disparity.

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Sarah T. Lubienski named interim dean of Graduate College

By Milena Holzenthal

Sarah T. Lubienski has been named the interim dean of the U. of I.’s Graduate College, the fourth member of the Illinois Board of Trustees to accept the provost’s position, according to university President Bob Easter. Lubienski, who has accepted the position of provost at Purdue University, is a professor of education and public policy and will replace Debra Dutta, who has accepted the provost position at Purdue University, a faculty member at Illinois since 2004, Latvia’s Latvian University and NORSAR, SINTEF, Southern and not-for-profit research partners, including the Center for Geologic Storage of CO2, led by Robert J. Finley at the U. of I’s Prairie Research Institute, will work to reduce uncertainties surrounding carbon storage systems through ongoing analysis of recent field test results. Eventually, the project seeks to illuminate potential “showstopper” for real-world, commercial-scale CO2 storage projects. The center will receive funding for four years, and is one of a number of academic and not-for-profit research partners, including Brigham Young University, Indiana University, NORSAT, SINTEF, Southern Illinois University at Carbondale, the University of Southern California, the University of Texas at Austin and Wright State University. Each arc is vital to the success of the project, which will uniquely link staff members with expertise in basic science with staff members who have experience applying current industry technology at the management, engineer and scientist level. "The Center for Geologic Storage of CO2, a second FERC project focusing on new models of reservoir-seal geologic storage systems to help reduce showstoppers of such systems, Finley said. “Our objective is to advance understanding of the basic science that will improve the safety and efficiency of fluid injection, storage and environmental mitigation. "Managing our nation’s energy needs is one of the most pressing societal issues that we face,” said Peter Schiffer, the vice chancellor for research at Illinois. “I’m proud that the U. of I. is playing such a large role in the important work that will enable new scientific discovery and critical new advances in energy research.” In addition to the CO2 storage project, U. of I. researchers also are involved in the following FERC projects: Center for Emerging Carbonatrix, which will be led by Brookhaven National Laboratory Center for Electrical Energy Storage, led by Argonne National Laboratory Center for Molten-Salt Reactor, led by Pacific Northwest National Laboratory Light-Material Interactions in Energy Conversion, led by Caltech "The U. of I. is a national leader in energy research, a vital area as the world’s population grows and economies become more industrialized, even an expert witness who already is aware of the issues Illinois faces. He said the hiring of Hogan after the last search illustrates an outsider may not be the best person for the job. Strobel, who also chaired the previous committee, acknowledged hiring Hogan “ideal,” but said the process this time was stronger. "In working as hard as I can to deconstruct what was done,” she said of the 2010 search “I have not just my own, but the entire State Board. "We can’t even see a joint committee. "What should we have done differently?" One thing that is being done differently is that the candidate pool is more deeply into candidate backgounds and the possible addition of a personality assessment — things you could never get in a personal interview,” Strobel said. She said qualifications are important, but it also is important a president is liked by the people he or she leads. "There is a likely candidate in selecting the right person,” she said. “It’s a lot easier to follow a person when you like them.” Beck said the dynamic position is not an easy one to fill, but is confident the search will produce many viable candidates. "The U. of I. president is the spokesperson and the face of the state,” he said. “He must be able to work with government leaders and develop other outside relationships, which includes the entire Great Lakes region.” Beck reiterated the importance of keeping candidate names anonymous as a way to reduce the distraction of other members, the search team and the entire campus. Beck said university officials prepared a white paper describing the U. of I. environment, the role of the president and what an ideal candidate should possess to be seriously considered for the position. “A lot of thought has already gone into that,” he said. Beck said he expects the committee to receive more than 100 substantive nominations before it starts paring down the list for an executive search recommendation to the U. of I. Board of Trustees. "Soon we’re going to start looking at that big list and see if there’s any dialogue between members of the committee and the candidates. "The committee convened its next meet July 11 at the Alice Campbell Alumni Center. Business will include interviews with U. of I. President Bob Easter and Jim Applegate, the executive director of the Illinois Board of Higher Education. The white paper, candidate nominating forms and other information concerning the work of the presidential search committee is online.
Comfortable."

"We just don’t like this," said Kidd, flipping lights switch on the wall of their office, which is buried somewhere deep within Krannert Center for the Performing Arts.

At Kidd’s touch the incandescent bulbs beneath the plastic fixture on the ceiling light up, but give off a yellowish hue that looks dull and old compared to the clean white light of the competing LEDs.

Of course, Williams and Kidd, respectively the lighting director and associate lighting director at Krannert Center, are a little pickier than most about the glare of their spotlights.

"It’s why they’ve created their own office lighting system."

"It’s nothing special, just fun things I’ve found on sale or at IKEA," Kidd said. "We light our desks as needed, and the rest is just for comfort. If we’re going to spend all of this time in this room, it might as well be comfortable."

"It’s a great conversation starter for anyone visiting the office," Williams said, "and there’s an energy conservation component behind it as well."

Kidd and Williams weren’t always so picky about their lighting.

Williams was trained at the University of Colorado as an opera singer, and had done some lighting and other production work during his training.

The opera career didn’t work out as hoped, so he decided to earn a master’s degree in lighting from the U. of I. to keep close to the performing world.

"I didn’t grow up wanting to be a lighting director," he said.

His job at the U. of I., which he’s held for 17 years, "is the best of everything," he said. "I get to manage and design, and I get to teach."

Kidd, at the U. of I. for 14 years, was a musician who learned early on that she needed another career to pay the bills. The lighting equipment he kept her was a "lighting equipment was a lot lighter."

She said she was inspired by lighting early on by art enthusiasts parents who took her to museums and art galleries when she was a child. She earned her lighting design degree from Southern Illinois University at Carbondale.

Williams said LED technology, developed on the U. of I. campus, has revolutionized the lighting world. The biggest challenge now is not filling a stage with light, but keeping up to date with new and expensive LED technology. LED lights can run several thousand dollars for performance-level equipment.

He said there have been major developments in video projection, which also falls within the lighting director’s purview.

"We’d like to be more current, but these days it seems like you buy something, in three months it’s out of date," he said. "The video world is changing the fastest."

Bots say bad lighting, whether in a small room or one as big as a Feelin’ Groovin’ Hall. Bots, bothers them.

"I’m always worrying about it, and I can be pretty critical," Williams said. "I can see the flaws, but I am able to detach myself somewhat from the mechanics of it."

Kidd said – though the “tick” of fluorescent lights tend to drive her mad.

Eric Oldfield

By Mike Helenthal

A company globetrotting chemistry professor Eric Oldfield on one of his many trips is as easy as stepping through his office door.

Oldfield’s office is filled with photos and artwork collected from nearly 40 years of traveling for lectures, conferences and vacations – and there is a story behind almost every piece.

"I don’t like white walls," he said. "This isn’t a hospital."

Most of the photos are Oldfield’s own, and through the years his office has become a private gallery of sorts.

"I don’t spend as much time as I used to taking photos, but it’s always something I’ve liked to do," he said. "Color photography is just so fun – and 50 years ago it stimulated my interest in chemistry."

Chased travel photos have been blown up cover most of the office’s white space. Bora-Bora, Tahiti and the Grand Canyon you play prominently, as do shots of favorite plants and animals, in his home garden.

Oldfield said his home flower garden is an ongoing inspiration:

"I’ve got a big yard and there are plants everywhere," he said. "I’m British, so I garden. It’s expected."

Some of Oldfield’s more artistic photographic attempts also are displayed, with one three-panel software-altered portrait possessing an Andy Warhol feel.

Another photo is a blurry, dreary shot of what appears to be infrastructure. It’s artistic, but it’s hard to tell exactly what the subject of the photo is.

The explanation: "I got lost in Heathrow Airport and ended up on the roof," he said.

So he started snapping photos of razor wire.

Oldfield’s favorite camera is a high-end wide-angle Hasselblad, but he’s not necessarily a camera equipment snob. He said he has embraced digital photography and enjoys the quality and time-saving features.

He said the biggest challenge for his oldest camera, a 6-by-9-inch camera that uses roll film that he inherited, is in staying current with reproduction technology – meaning he can take all the photos he wants, but making prints can become difficult.

Oldfield said his father, a printer in London who worked near bustling Trafalgar Square, passed on his love for photography.

"My dad was always taking pictures," he said.

In addition to photographs, there also are abstract oil paintings, as well as odd pieces placed strategically on shelves, from the sculpture purchased at a gallery in Taos, New Mexico, to one given to him by a student, to the big red Buddha statue that he bought LED lights hanging from the ceiling.

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Exhibition to showcase cataloger’s crochet-related arts

By Dusty Rhodes
Arts and Sciences Editor

In 1989, when Gilbert Witte started working full-time at the U. of I. Library, he never imagined it would have such a strange effect on his leisure time. After spending eight hours surrounded by books, the last thing he wanted to do at home was read. Consequently, in the took up a hobby — he taught himself to crochet.

“I had free time and no computer at home,” Witte said, “plus a lot of friends who needed baby blankets.”

It didn’t take long for Witte’s avocation and vocation to collide as he searched for crochet patterns and manuals, his cataloging expertise kicked in, leading him to think about organizing and recording the publications. At some point, he became determined to acquire everything ever published by Coats & Clark, and then moved on to other publishers, such as Bucilla, McCalls and Leisure Arts. Over the next couple of decades, Witte systematically amassed thousands of crochet patterns, leaflets, books, magazines, and ephemera.

By 2012, he resolved to give his collection to a library. “It had become a little overwhelming,” he said. But his search for a library already housing needlecraft tomes proved futile. “I could not find a library or museum or anybody in the took up who had a collection like this,” Witte said. “That’s when I decided to give it to the university.”

An exhibition titled “Knot Forgotten: The Tennyson Library of Crochet and Related Arts at Illinois,” featuring Witte’s collection, will open July 1 (Tuesday) on the first floor of the Library Building in the north/south corridor and in the library’s Marshall Gallery. On July 18 (Friday), a “Crochet Extravaganza” will include a crochet class for children ages 8 and older from 10 to 11 a.m., another class for adults from 2 to 3 p.m., and a reception and “ugly sweater contest” from 3 to 5 p.m., all in the Marshall Gallery.

The “Daughters of Pyritha” statues outside the library’s east entrance will be dressed in crochet attire during July.

**Hooked on crochet**

Gilbert Witte poses with some of the thousands of items included in the collection of needlecraft books and ephemera he donated to the U. of I. Library.

Named after Witte’s great-grandmother, Flora Emily Tennyson, the collection contains about 7,000 items, dating as far back as 1844. Most items originated in the United States, but the collection includes pieces from Argentina, Australia, Austria, Belarus, Canada, England, France, Germany, Italy, Japan, Mexico, the Netherlands, Peru, Russia, Scotland, Spain, Sweden and Switzerland.

Valerie Hotchkiss, the director of the U. of I. Rare Book and Manuscript Library, pointed out another special feature of Witte’s collection. “It came with the added bonus that Mr. Witte — a consummate cataloger himself — has cataloged and prepared every item for its addition to our collection,” she said. “Not many donors can make such a claim.”

Witte’s specialty is “problem cataloging,” and those skills came in handy with his own collection — books, leaflets, yarn wrappers, sample books, craft kits, hooks, yarn and assorted accessories. Many complimentary pamphlets were available for pickup in craft stores, as inducements to search for patterns and manuals, as inducements to

“It’s not the sort of stuff that people need,” he said. “Mostly it’s stuff that people share, and then re-used. Some, such as the ‘Workbasket’ newsletter, were published on tissue paper imprinted with the pattern necessary to construct the craft, so loyal ‘readers’ tended to destoy these books. It’s not the sort of stuff that people keep.”

Witte said. “If you’re cleaning out your great-aunt’s estate, this is what people tend to toss. As I’m cataloging, I check to see if other libraries have these, and for a lot of these publications, the answer is no.”

The collection comprises more than 300 hardcover books, about 1,500 magazines and 5,000 booklets showing how to crochet, cross stitch, embroider, applique, quilt, sew, tat, tuft and weave. There are patterns for making baby blankets, baby booties, basic hats, doilies, gloves, mittens and tablecloths, as well as old-fashioned spencers, chair sets, TV scarves, potholders and bikinis.

Witte said donating the collection has freed him up to do more crocheting. He makes scarves, shawls and dishcloths, and claims to have finally found a pattern that produces “the perfect potholder.”

To sign up for the July 18 classes, go to the Rare Book and Manuscript Library website.

Deaths

Joseph A. Diana Jr., 89, died June 15 at his home in Ann Arbor, Michigan. In 1975, he became the vice chancellor for administration at the U. of I. From 1977-1978, he was the associate vice president, responsible for the business affairs of the Chicago Circle and Chicago Medical Center campuses as well as the Urbana campus. Memorials: Ann Arbor Area Community Foundation for the Forest Hill Cemetery. Reformation Program, foresilhemetereyyma.org/reformation-program/ or the University of Michigan C.S. Mott Children’s Hospital, www.mottchildren.org/

Julia “Judy” Flewelling, 94, died June 25 at her Champaign home. She worked at the College of Education until her retirement. Memorials: Urbana Free Library, 210 W. Green St., Urbana, IL 61801, urbanafreelibrary.org


Memorial Service

A memorial service for Andrea Van Proyen will begin at noon July 5 at the I Hotel and Conference Center. A visitation with family is planned for 11 a.m. Van Proyen, 62, died June 26 at Northwestern Memorial Hospi- tal. She worked for Campus Information Technologies and Educational Services for 16 years, retiring in 2013 as the manager of service center communications. Memori- als: Central Illinois German Shepherd Dog Rescue, www.gsdaaven.org; or to the fam- ily for a U. of I. scholarship fund to be es- tablished in her honor.
Allerton Music Barn Festival to offer variety this fall

By Dusty Rhodes
Arts and Humanities Editor

Andrew Megill, Ollie Watts Davis, the Jupiter String Quartet and Chip McNeill are among the musicians scheduled to perform at the eighth annual Allerton Music Barn Festival.

Tickets are on sale for the popular concert series held in the beautifully restored century-old Dutch hay barn at the Allerton Park and Retreat Center near Monticello, Illinois. This year’s festival runs Sept. 18-21 (Thursday-Sunday).

The schedule cements some new festival traditions and revives some old ones. Originally conceived as a Labor Day weekend event, the festival was moved last year to mid-September, to avoid the worst of the summer heat. Jeffrey Magee, the director of the School of Music, has decided to make the barn fest more of an autumnal event.

“We’re delighted to hold the festival later in September, just on the cusp of fall,” he said. “Allerton has always been a cool event, and this makes it even cooler, at least we hope so.”

Another new tradition is the opening-night appearance of the winners of the chamber music competition instituted in 2013 by the Jupiter String Quartet, the artists-in-residence at the U. of I. School of Music. This year, in a concert titled Jupiter Plus, the quartet will be joined by students who won the Jupiter’s second annual chamber music competition – violist Kim Uwate and cellist Seungwon Chun – for Brahms’ Sextet No. 2 in G major, Op. 36. The Jupiters also will play the Dvorak String Quartet in F major, Op. 96 (“American”), which many music scholars believe was influenced by Native American drumming and African American spirituals. The Jupiter Quartet also invited Davis, a U. of I. music professor and the director of the U. of I. Black Chorus, to collaborate in the performance of several spirituals arranged by Margaret Bonds, Harry Thacker Burleigh, Francis Hall Johnson and William Grant Still.

On Friday night (Sept. 19), the faculty of the Illinois jazz studies division will celebrate the 60th anniversary of the Jazz Messengers, the ensemble that popularized the aggressive, driving swing style known as hard bop in the 1950s. Charles “Chip” McNeill, the chair of the jazz studies department, said he won’t finalize the set list until September, but he promised that it will include “Free for All,” “Moanin’,” “Pensativa” and Messengers charts “from all eras.”

On Saturday (Sept. 20), members of the Illinois voice faculty, along with Illinois theater and music students, will perform a concert version of “On the Twentieth Century” – a musical with elements of operetta and farce, set on a luxury train traveling from Chicago to New York City. Yvonne Gonzales Redman, a main stage soprano at the Metropolitan Opera for 15 years before joining the Illinois faculty, will star as movie diva Lily Garland – a temperamental and bankrupt impresario (professor Ricardo Herrera), and a religious lunatic (professor Dawn Harris). The two performances – 2 and 7:30 p.m. – are presented by arrangement with Samuel French Inc.

The festival this year returns to the tradition of a Sunday morning choral concert, this time led by Megill, the newly appointed director of choral activities at Illinois. The Allerton Bach Choir, Orchestra and Illinois voice faculty soloists will perform “O Ewiges Feuer, O Ursprung der Liebe” and “Herr, gehe nicht ins Gericht,” cantatas written for Pentecost and Trinity. The Rev. Roger Digges will deliver a nondenominational homily.

All evening performances begin at 7:30. The Sunday morning Bach concert begins at 10. Tickets are $30 for adults, $25 for students and senior citizens, and are available online at allertonmusicbarn.com; at the Krannert Center for the Performing Arts ticket office; or by phone at 217-333-6280. •

OPENING ACT

The Jupiter String Quartet will perform opening night of the Allerton Music Barn Festival. The concert series is held Sept. 18-21 in a restored century-old Dutch hay barn at Allerton Park and Retreat Center, near Monticello, Illinois.

Night on a train

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Rare Book and Manuscript Library

Exhibition features witchcraft

“Fire Burne and Cauldron Bubble: Witchcraft at the Dawn of Modernity,” a new exhibition at the Rare Book and Manuscript Library, will be on display through Aug. 8.

Curated by graduate assistant David Anthony Morris, the exhibition presents 21 items from the 15th to 18th centuries, chronicling the rise and fall of the witch hunt in late-medieval to early-modern Europe. Witches were feared for their sorcery and devil worship. In Europe, authorities executed tens of thousands of people who were allegedly part of this vast satanic conspiracy. Morris, a doctoral candidate in medieval history at the University of Notre Dame, is available to give scheduled tours to individuals or groups this summer. A parallel Web exhibition is online at go.library.illinois.edu/fireburne.

Audiology Clinic

Screenings, hearing aid demos offered

The Audiology Clinic is offering free hearing screenings and demonstrations June 23 through July 24 with the assistance of graduate assistant David Anthony Morris.

The clinic educates and trains students in the doctor of audiology program to provide clinical diagnostic, consultative and treatment services for individuals with communicative impairments. The clinic is housed in the department of speech and hearing science, which is accredited by the Council of Academic Accreditation of the American Speech-Language-Hearing Association.

The clinic is open to the public to provide diagnostic hearing assessments, industrial hearing evaluations and amplification services (which include hearing aid fitting, dispensing and repairs, and assistive listening devices). Any person who is interested in hearing assessment, hearing protection or management of hearing problems can make an appointment. No referral is needed. The clinic is an out-of-network provider for some state of Illinois employee health insurance.

Clinic hours are weekdays 8:30 a.m. to 4 p.m. For more information, call 217-333-2230.

Highly Cited Researchers

Thomson Reuters recently released its list of Highly Cited Researchers 2014, an online searchable database (highlycited.com). According to the site, the list “represents some of the world’s leading scientific minds.” More than 3,000 researchers are included on the list, earning the distinction by “writing the greatest numbers of reports officially designated by Essential Science Indicators as Highly Cited Papers – ranking among the top 1 percent most cited for their subject field and year of publication, earning them the mark of exceptional impact.”

Urbana faculty members listed on the site: Ruth A. Aguera, business administration; Stephen P. Long, plant biology; Richard J. Masel, chemical and biomolecular engineering; William Murphy, chemistry; and Pramod Viswanath, electrical and computer engineering.

From the archives

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People with tinnitus process emotions differently than peers

By Chelsey B. Coombs
News Bureau Intern

Patients with persistent ringing in the ears — a condition known as tinnitus — process emotions differently in the brain from those with normal hearing, researchers report in the journal Brain Research.

Tinnitus affects 50 million people in the United States, according to the American Tinnitus Association, and causes those with the condition to hear noises that aren’t really there. These phantom sounds are not speech, but rather whooshing noises, train whistles, cricket noises or whines. Their severity often varies day to day.

U. of I. speech and hearing science professor Fatima Husain, who led the study, said previous studies showed that tinnitus is associated with increased stress, anxiety, irritability and depression, all of which are affiliated with the brain’s emotional processing systems.

“Obviously, when you hear annoying noises constantly that you can’t control, it may affect your emotional processing systems,” Husain said. “But when I looked at experimental work done on tinnitus and emotional processing, especially brain imaging work, there hadn’t been much research published.”

She decided to use functional magnetic resonance imaging (fMRI) brain scans to better understand how tinnitus affects the brain’s ability to process emotions. These scans show the areas of the brain that are active in response to stimulation, based upon blood flow to those areas.

Three groups of participants were used in the study: people with mild-to-moderate hearing loss and mild tinnitus; people with mild-to-moderate hearing loss without tinnitus; and a control group of age-matched people without hearing loss or tinnitus.

Each person was put in an fMRI machine and listened to a standardized set of 30 pleasant, 30 unpleasant and 30 emotionally neutral sounds (for example, a baby laughing, a woman screaming and a water bottle opening). The participants pressed a button to categorize each sound as pleasant, unpleasant or neutral.

The tinnitus and normal-hearing groups responded more quickly to emotion-inducing sounds than to neutral sounds, while patients with hearing loss had a similar response time to each category of sound. Over all, the tinnitus group’s reaction times were slower than the reaction times of those with normal hearing.

Activity in the amygdala, a brain region associated with emotional processing, was lower in the tinnitus and hearing-loss patients than in people with normal hearing. Tinnitus patients also showed more activity than normal-hearing people in two other brain regions associated with emotion, the parahippocampus and the insula. The findings surprised Husain.

“We thought that because people with tinnitus constantly hear a bothersome, unpleasant stimulus, they would have an even higher amount of activity in the amygdala when hearing these sounds, but it was lesser,” she said. “Because they’ve had to adjust to the sound, some plasticity in the brain has occurred. They have had to reduce this amygdala activity and reroute it to other parts of the brain because the amygdala cannot be active all the time due to this annoying sound.”

Because of the sheer number of people who suffer from tinnitus in the United States, a group that includes many combat veterans, Husain hopes her group’s future research will be able to increase tinnitus patients’ quality of life.

“It’s a communication issue and a quality-of-life issue,” she said. “We want to know how we can get better in the clinical realm. Audiologists and clinicians are aware that tinnitus affects emotional aspects, too, and we want to make them aware that these effects are occurring so they can better help their patients.”

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