Stem cells aid muscle repair, strengthening after resistance exercise

By Diana Yates
Life Sciences Editor

A new study in mice reveals that mesenchymal (meso-END-uh-mahdl) stem cells (MSCs) help rejuvenate skeletal muscle after resistance exercise.

By injecting MSCs into mouse leg muscles prior to several bouts of eccentric exercise (similar to the lengthening contractions performed during resistance training in humans that result in mild muscle damage), researchers were able to increase the rate of repair and enhance the growth and strength of those muscles in the exercising mice.

The findings, described in the journal Medicine and Science in Sports and Exercise, may one day lead to new interventions to combat age-related declines in muscle structure and function, said U. of I. kinesiology and community health professor Marni Boppart, who led the research.

“We have an interest in understanding how muscle responds to exercise, and which cellular components contribute to the increases in repair and growth with exercise,” she said. “But the primary goal of our lab really is to have some understanding of how we can rejuvenate the aged muscle to prevent the physical disability that occurs with age, and to increase quality of life in general as well.”

**Site MUSCLE REPAIR, PAGE 2**

Faculty, staff members mentor student through I-Promise

By Sharita Forrest
Education Editor

Many adults who mentor students in the Illinois Promise program often had “aha moments” during their youth, instances when a caring adult’s guidance or insight changed the course of their lives, said Susan Gershenfeld, the director of Illinois Promise Student Services.

U. of I. engineering professor Andy Ferguson’s “aha moment” occurred when a lecturer in one of the courses Ferguson took as an undergraduate suggested that he consider obtaining an advanced degree — perhaps at a university in Australia or the U.S.

“That thought had never occurred to me,” said Ferguson, a native of Scotland. “I thought I was just going to get my bachelor’s degree in chemical engineering and go to work for an oil company. He really opened my eyes to that being a potential future track, and then he helped guide me through the application process. I don’t think I would be where I am today if I hadn’t had supportive mentors.”

Currently a professor in the department of materials science and engineering at Illinois, Ferguson is nurturing the next generation of scientists by serving as a mentor for students in the Illinois Promise program, also called I-Promise.

Created in 2005, I-Promise provides full scholarships to high-achieving students from low-income families. Recipients, who must be Illinois residents, also benefit from enrichment and support programs that promote their college success, such as the voluntary mentoring program.

Intended to ease new students’ transition to college, the mentoring program enables participating students to select an adult or peer mentor to provide them with social support during their first year on campus.

Adult mentors are U. of I. faculty or staff members, academic professionals or community members. Peer mentors, who must be sophomores, juniors or seniors, often are I-Promise students who are alumni of the mentoring program.

“Every mentor puts together a non-academic, biographical sketch that tells about their own experiences, why they want to be a mentor, how they’ll be of service and their other interests,” Gershenfeld said of the mentor application process. “Based on what I learn from interviews with prospective mentors and mentees, I narrow the potential mentors down to three or so people, and mentors look at their bio sketches and make a selection.”

Most students seeking mentors select adults, often choosing people who have similar academic/professional interests, hobbies or life circumstances.

John Ser, who will be a sophomore in mechanical engineering this fall, said he selected Ferguson to be his mentor because of their shared interest in engineering and similar backgrounds.

Ser, who was born in Korea, moved to the U.S. with his family when he was a first-grader.

Ferguson earned an undergraduate degree from Imperial College in London before moving to the U.S. to earn a doctorate degree in chemical and biological engineering at Princeton University. Ferguson joined Site I-Promise, PAGE 7
Promotions, tenures announced

A

The July, the U. of I. Board of Trustees approved faculty promotions in academic rank and academic policies. His appointment is effective Aug. 16, pending approval by the U. of I. Board of Trustees. He will replace Barbara J. Wilson as the Harry E. Preble

MUSCLE REPAIR. CONTINUED FROM PAGE 1

MSCs occur naturally in the body and may differentiate into several different cell types. They form part of the stroma, the connective tissue that supports organs and their tissues. As such, MSCs may also regenerate muscle from injured or diseased muscle tissue. However, the regenerative potential of MSCs is limited, and they are not able to integrate into the damaged muscle fibers. MSCs are also limited in their ability to differentiate into other cell types, which is why they are not used to regenerate muscle function in patients who have sustained muscle damage.

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Returning troops, families have work to do after the reunion

By Craig Chamberlain
Scalise Scholar

About 20,000 service members are headed home from Afghanistan before the end of this year. Thousands of others will be returning from other deployments.

Many will arrive in the U.S. to happy reunions, but the majority of the couples and families will have work to do in the months that follow, says Leanne Knobloch, a U. of I. communication professor who has studied the relationships of military families post-deployment for about five years—and is starting new research funded by the U. of I. Office of Defense.

“Post-deployment is a new chapter that’s very complex for military families,” Knobloch said, adding that it’s a time of great attention. “The vast majority thrive despite the challenges; they’re incredibly resilient. A significant minority of reasons struggle.”

Knobloch studies how and why problems can occur during the months after the reunion, as well as why couples and families thrive. She hopes her research will eventually provide families with guidance timed to when they need it.

So far, research has been conducted so far by herself and others. Knobloch offered the following advice to military families during the reintegration period following deployment:

- Be realistic. “After being separated for months, expectations for reunion can be so high that the return may not live up to expectations, and normalcy can be disappointing. Returning service members need to be ready to be surprised by how much the family has changed since they’ve been gone. And that the service member, as well as family members at home, may have gone through life-changing experiences during the deployment.”
- Take it slow. “The first days and weeks will be exciting, but they won’t be normal. It may take some time for everyday routines to get smoothed out. Returning service members may not be ready to talk about their deployment experiences right away. At home, spouses also may have experienced challenges that they are not yet ready to share.”
- Give kids a break. “Kids may think that the returning service member will jump into fun activities, but he or she may be exhausted and just fall asleep on the couch. Also, children may have a lot of questions about deployment that they know they’re not supposed to ask, but at the same time, they’re really curious. Military kids tend to thrive when they have a sense of meaning about the deployment—that it was a personal sacrifice but it was for a common good.”
- Know when to ask for help. “Some up front and openness about what is normal and what is perfectly normal during reintegration. But if those feelings linger and become debilitating, then it’s time to ask for professional help. If they have symptoms of depression, for example, it’s going to reverberate through the entire family. Families need to get comfortable with asking for help, getting practical help, if it’s needed.”

Knobloch’s new research is funded with a four-year, $60,000 grant from the U. of I. Department of Defense. Her co-investigator on the project is Lynne Knobloch-Fedders, the director of research at The Family Institute at Northwestern University. The two researchers also are twin sisters.

For the study, they are seeking 250 military couples in which both partners are willing to complete an online survey once per month for the first eight months following the service member’s return from deployment. Couples need to enroll in the study within seven days of homecoming and will receive e-gift cards for participating.

The research can find more information online.

‘Big picture’ thinking doesn’t always lead to indulging less

By Phil Ciciora
Business and Law Editor

By the latest electronic gimmick du jour, or use that money to fix a leaky roof? Go out with friends, or stay home to catch-up on work to meet that looming deadline? And after you finish that big project, do you treat yourself to a slice of chocolate cake or settle for a piece of fruit?

These are the kind of self-control dilemmas people face all the time. And according to research from a U. of I. expert in new product development and marketing, self-control plays an important role in how consumers make decisions.

When prompted to think abstractly, too much self-control can lead to feelings of missing out on life, which then induces regret and leads to corrective overindulgence—a finding that runs counter to much of the extant consumer psychology literature, says self-focus plays an important role in how consumers make decisions.

“The role of the self in this whole phenomenon plays a very key role,” he said. “If I were to ask you to imagine yourself 10 years from now, and then tempt you with indulgent behavior, that essentially grants you a license to indulge.”

In the scenario above, why would a person give in to, say, a decadent dessert? “Because you picture yourself 10 years from now—you have no idea where you will be, or what your situation will be like,” Mehta said. “You might think about focusing on your own self at the expense of the big picture.”

While the majority of research routinely considers consumers for being too impulsive, Mehta contends that consumers exhibit self-control the vast majority of the time. “You only give in to your impulses,” he said. “Even though most people have self-control, it’s just those few failures that you remember the most. And here we are saying, ‘We control our everyday behavior, but we only indulge when we think long-term.’”

The study also asked a sample of consumers to compare their behavior in general—be it car buying, or even giving up their long-term financial well-being and ‘engaging in hedonistic behaviors.’

But a new study co-authors found it all depends upon “how much you think about yourself in consumption situations.”

‘Big picture’ thinking plays an important role in how consumers make decisions, says new research from business professor Ravi Mehta.

“The classic line of research said that if people thought abstractly, they would be better able to control their impulses most of the time. But 81 percent of respondents said they control their impulses most of the time. But 81 percent of respondents said they control their impulses most of the time. And that’s because you are focusing on your own self at the expense of the big picture.”

One reason the research is also relevant to public health is its focus on self-control and adhesion to plans, Mehta said. “It’s just the opposite—they would want to create copy that emphasizes near-future events,” he said.

The research is also relevant to public health or public policy campaigns.

‘Big picture’ thinking doesn’t always lead to indulging less

Dr. Jack C. Cooley, 89, died July 17 in Scottsdale, Arizona. He was a faculty member for 33 years, retiring in 1990 as a clinical assistant professor in physiology. Me- morials: The Carle Center for Philanthropy, 611 W. Park St., Urbana, IL 61801; or The Greyhawk Classic Residents’ Foundation, Box 100, 7501 E. Thompson Peak Parkway, Scottsdale, AZ 85255.


Robert Soucie, 70, died July 19 at Cham- paign Urbana Nursing and Rehab, Savoy. He was dean of students in conflict resolution at the U. of I. for 10 years, retiring in 2007. Memorials: Alzheimer’s Association, aliceavis.alm@matrixcatholicchurch.com.

Beverly Thomas, 82, died July 22 at Sun- coast Hospital in St. Petersburg, Florida. She worked at the U. of I. for seven years, retiring in 1990 as assistant to the director in the department of chemistry. Memori- als: First Baptist Church of Mahomet, PO Box 196, Mahomet, IL 61853; or Suncoast Hospice Foundation, 5771 Roosevelt Blvd., Suite 100, Clearwater, FL 33760.
When student-athletes sue the NCAA, they win the initial round of litigation almost half of the time. But according to a new study from a U. of I. expert in labor relations and collective bargaining in athletics, the NCAA eventually wins more than 70 percent of the time on appeal – a finding that could pressure both groups to adopt a new model for amateur athletics that more closely aligns itself with the employment relationship.

Michael LeRoy, a professor of labor and employment relations, compiled a database of 81 state and federal court rulings from 1973 to 2014 in which students sued the governing body of college athletics. According to the study, students won all or part of 49 percent of first-round court rulings, but the NCAA won in 71 percent of second-round cases, and won another 71 percent of third-round appeals.

“The first round of litigation is essentially a coin flip, but the win-probability for the student-athletes quickly plummets in subsequent rounds of appeals,” said LeRoy, author of the recently published legal casebook “Collective Bargaining in Sports and Entertainment.”

Venue also played a significant role, the study found. Students won 75 percent of first-round decisions in state courts, while the NCAA won 61 percent of first-round federal decisions. Forty percent of cases in the study involved football, but the rest involved a wide variety of NCAA sports.

The NCAA's record of winning most cases on appeal suggests that the ultimate outcome will favor the association, LeRoy said.

“Under the Sherman Act, courts will likely also conclude that NCAA rules have a pro-competitive effect on the business of college football – a ruling which, again, favors the NCAA,” he said.

But even occasional initial victories by student-athletes means that the NCAA will likely be pressured to adopt a new model of amateurism that mimics the employment relationship, LeRoy said.

“The most vexing problem for the NCAA could be the soft power of pickets, boycotts and other concerted activities that more closely resemble the employment relationship, says Michael LeRoy, a professor of labor and employment relations at Illinois.

“Without enabling legislation that regulates this private association, courts have no authority to surgically snip and other enhancements in exchange for dollars and other benefits,” he said.

According to LeRoy, the future of labor rights in college sports will likely bring more court rulings involving the National Labor Relations Act and the Sherman Act.

“If the future of labor rights in college sports will likely bring more court rulings involving the National Labor Relations Act and the Sherman Act.”

The study is titled “Courts and the Future of Athletic Labor in College Sports.”
Home Away From Home

By Mike Helenthal, Assistant Editor     Photo by L. Brian Stauffer

It's a little hard for a visitor to miss Mark Mitchell's office in the U. of I. College of Veterinary Medicine's Small Animal Clinic.

Along a row of wooden doors framed on all sides by white-painted concrete blocks, his entryway is the one covered in brightly illustrated children's drawings. There are paper spiders, crabs, turkeys and even a blue platypus.

"Thanks for teaching us about reptiles," says one letter sent from a first-grade class in St. Joseph, Illinois, where Mitchell, a professor of veterinary clinical medicine, once gave a school presentation.

"I like for the people who need to come and visit me to be comfortable and to feel like they can come on in," he said.

And they do.

It's not a huge office by any means, but Mitchell, a U. of I. Vet Med graduate and an Illinois professor for seven years, has managed to pack in several full-sized bookshelves near the entrance, displaying everything from scientific journals to Dr. Seuss' "Oh, the Places You'll Go!"

There's an assumption, but not necessarily a guarantee, that the books are kept in some particular order.

"I call this part my library," he said, which leads to two freshwater aquariums (125 and 55 gallons) on one side, and a tree that serves as a chameleon perch on the other side.

The aquariums hold living plants, snails and discus fish. The perch is empty for now, until Mitchell can find the perfectly tempered lizard (only those with a prehensile tail need apply).

Mitchell, who travels extensively to research sea turtles and other water-dwelling creatures, has a desk in the far reaches of the room, the location of which appears almost an afterthought.

The office walls are covered in drawings and paintings of birds that he has collected over the years. A rhinoceros head thrusts prominently out of one wall, and nearby lurks a Bengal tiger head wearing a Louisiana State University baseball cap (both animal heads are fake; the LSU cap, a shrine to the school where he earned his doctorate, is not).

"It's just stuff I've collected in my travels, or gifts from former students," he said. "Current students have volunteered to help with the care of the aquariums when he's traveling. In return, Mitchell gives them liberal access to his office.

"Students have been more than willing to take care of things while I'm gone," he said. "I let them squat in my office when they need a place to study. It's a pretty fair trade."

Mitchell's office pales in comparison with his home collection, which includes 50 basement fish tanks, snakes and, at one point, more than 200 turtles.

"My hobbies have always been fish and old cars," he said, noting his home garage is filled with the latter. "It's all of the stuff my mother told me I couldn't have."

"I've always loved animals," he said. "I wanted to be a vet since I was 7. If you told the 14-year-old Mark Mitchell what he'd be doing every day when he grew up, he'd say just one word: 'Awesome!'"

Mitchell is finishing out a sabbatical this year that has led him to Jekyll Island, Georgia, to study climate stress on sea turtle reproduction, and to Germany to study lizard reproduction.

That would have been considered rock star status by the 14-year-old Mitchell.
Cancer cells that break away from tumors to go looking for a new home may prefer to settle into a soft bed, according to new findings from researchers at the U. of I.

Some particularly enterprising cancer cells can cause a cancer to spread to other organs, called metastasis, or evade treatment to resurface after a patient is thought to be in remission. The Illinois team, along with colleagues in China, found that these so-called tumor-repopulating cells may lurk quietly in stiffer cellular environments, but thrive in a softer space. The results appear in the journal Nature Communications.

“What causes relapse is not clear,” said study leader Ning Wang. Wang is the Leonard C. and Mary Lou Hoeft Professor in Engineering and a professor of mechanical science and engineering at the U. of I. “Why are there a few cells left that can come back stronger? We thought cancer cells may have some properties in common with stem cells, which allows them to metastasize to different tissues. Normally, if you take a liver cell and put it in your lung, it will die. But an undifferentiated cell will live.”

Two years ago, Wang’s group published a method for selecting tumor-repopulating cancer cells (TRCs) from a culture. Thanks to this selection method, the researchers isolated and studied TRCs from melanoma, an aggressive skin cancer notorious for spreading and recurring, to see how the mechanical environment around the cells affected their ability to multiply and cause new tumors.

The researchers grew the cells on gels of different stiffnesses – some very soft and some more firm, to mimic different types of tissues in the body. What they found surprised them.

The TRCs placed in very soft gels grew and multiplied, as expected. The cells placed on stiffer gels did not proliferate; however, they did not die, either – they became dormant. When the researchers later transferred the dormant TRCs to a soft gel, the cells “woke up” and began to multiply and spread.

Wang speculates that these properties of dormancy and reawakening when the mechanical environment is more inviting may explain why soft tissues, such as the brain or lungs, are most vulnerable to metastasis.

“We have many different types of organs where solid tumors originate, but if you look at the metastasized sites, the majority are in soft tissues,” said Wang. “Brain, lung, liver and bone marrow, all soft. So it may not be coincidence. We need to do more research.”

Next, Wang and colleagues hope to tackle the question of what makes TRCs so resistant to drugs, a trait that makes recurrent cancer much harder to treat. Unlocking this puzzle may help doctors fight recurrent cancer, although Wang hopes that understanding how TRCs work can lead to treatments that prevent metastasis in the first place.

“The key issue in this paper is outlining the mechanisms that control how TRCs proliferate,” Wang said. “The importance of knowing these mechanisms is that we now have targets that we didn’t have before, specific targets for new types of drugs that will interfere with this renewal pathway. It could give us a new avenue for treatment and preventing relapse.”

The National Institutes of Health supported this work. Wang also is affiliated with the department of bioengineering, the Beckman Institute for Advanced Science and Technology, the Institute for Genomic Biology, and the Micro and Nanotechnology Laboratory at the U. of I.
U. of I. Arboretum

Hosta Garden is national display garden

The gardens at the U. of I. Arboretum serve as a living museum of plants as well as a place of enjoyment and education for the public. The Arboretum’s two-year-old Hosta Garden has been designated as an American Hosta Society National Display Garden, thanks to a gift and volunteer hours donated by the Garden Club of Illinois. The Hosta Garden was recently officially dedicated as a national display garden in a ceremony held at Japan House on the grounds of the Arboretum. The garden, located north of Japan House along the Kari walkway, was dedicated as the 18th national hosta display garden in North America just this year. In order to gain the national display designation, the garden must feature at least 100 different hosta varieties.

Barbara Schroeder, a former president and the current treasurer of the Garden Club of Illinois, said the Hosta Garden at the Arboretum features more than 200 cultivars, with 127 varieties meeting the national registry requirements. “There is a hosta variety in the garden for everyone’s preference,” she said.

Bill Kruidenier, the director of the U. of I. Arboretum, said members of the society approached the Arboretum a few years ago to see if there would be interest in such a garden. “We thought this location near Japan House was ideal. There is high visibility along the Kari walkway, and more than 1,000 people visit Japan House each year,” he said.

Kruidenier added that the Illinois Prairie Hosta Society and its members not only provided the financial backing for the garden, but also provided “countless hours of support” to design, install and care for the garden. “The society worked with our staff, but they took the lead on this. The garden is the vision of this volunteer staff that put it into place,” he said.

Chancellor Phyllis M. Wise attended the dedication ceremony and said the gardens bring together the university and the community. “Hosta Garden is a way for us to give the campus and the community in such a meaningful way,” Wise said. “I come to the Arboretum for a walk, for quiet and contemplative meditation, whenever I can, and the Hosta Garden is clearly someone’s experience at the Arboretum even more beautiful.”

University YMCA Dump and Run

Convenient ways to donate announced

The University YMCA and the Stephens Family YMCA are accepting donations of property, including furniture and bikes, to the University YMCA’s 13th Annual Dump and Run community recycling event.

Furniture and bike pickup: On Aug. 9, the University YMCA staff and volunteers will provide convenience-driven ways to donate furniture and bikes to the University YMCA’s annual Dump and Run community recycling event.

Furniture and bike drop-off: Additionally, from 6 a.m. to 6 p.m. on Aug. 9, the Stephens Family YMCA, 2501 S. Fields Drive, Champaign, will set up a community recycling event to accept donations of furniture and bikes in good condition.

Donation drop-off: Donations will be accepted at the University YMCA, 8 a.m.-noon, 4-6 p.m. Aug. 13-15, and 9 a.m.-noon Aug. 16.

Sale dates: The University YMCA will host the Dump and Run Sale at the U. of I. Pack Station from 8 a.m.-4 p.m. Aug. 23 ($2 admission, international U. of I. students get in free); and 11 a.m.-2 p.m. Aug. 24 ($3 bag sale and half-price furniture) and 2-3:30 p.m. (free Illinois faculty, staff members and students with a unique opportunity to purchase furniture and bicycle donations only.

For more information about Dump and Run, visit universityymca.org/dump_and_run.

Blue Waters supercomputer

U. of I. researchers apply by Sept. 15

Researchers at the U. of I. are invited to apply by Sept. 15 for allocations of time on the powerful Blue Waters supercomputer.

Blue Waters is one of the world’s most powerful computing systems. Each year, 3-4 million node-hours will be allocated to projects from the U. of I.’s Urbana campus. As each node has many powerful cores, this is significantly more computing power than most universities have available to their researchers. In addition to giving Illinois faculty, staff members and students with a unique opportunity to perform groundbreaking work in computational science. (System details can be found at blue.waters.ncsa. illinois.edu/hardware-summary.)

These allocations are intended for problems that need the unique capabilities of Blue Waters at large scale, which need not be just floating-point speed; it could be total memory, data size or data bandwidth or even computational scale. Project proposals are expected to demonstrate that no other resource would be sufficient to solve the problem.

Blue Waters is not merely a large source of computer cycles. Illinois faculty and staff members can apply now for both annual educational and non-educational allocations (intended for Blue Waters) and general allocations (intended for large-scale research projects). A typical exploratory propos- al will request 20,000-50,000 node hours, which will permit a full exploration of the capabilities of Blue Waters. A proposal that is acceptable for an exploratory proposal will be acceptable for testing at smaller scales. A typical general proposal will be for 30,000-100,000 node hours.

Applications are due Sept. 15. Proposals will be judged on the scientific and/or educational merit, their suitability for Blue Waters, and their demonstrated need for the unique capabilities of Blue Waters.

For complete instructions on how to apply by Sept. 15, visit https://blue.waters.ncsa.illinois.edu/allocations.

I-Promise, CONTINUED FROM PAGE 1

The information includes what to do and where to go in the case of a campus emergency, such as a weather event or security threat.

Individual building floor plans showing exits, storm refuge areas, evacuation assembly areas and areas of rescue assistance can be accessed at police.illinois.edu/emergencyplanning/fireplans.

Faculty members asked to provide emergency information to students

Officials with the Division of Public Safety are re-镍ing campus instructors of their responsibility to disseminate emergency response information to students on the first day of class.

Instructors are encouraged to distribute the emergency response information by attaching it to the class syllabus or, if possible, embedding it as a link or an embedded video into a learning management system. Both options are available online at police.illinois.edu/emergencyplan/ general.

Reminder emails already have been sent to instructors, department heads and deans, and will be sent again Aug. 14. Parents also are being emailed to inform them of the emergency information being provided to their children.

“We want to let parents know that their students will be receiving emergency information from a variety of sources,” said Chancellor Phyllis M. Wise, “and we’ll ask them to talk to their students with the messages we are sharing.”

The information includes what to do and where to go in the case of a campus emergency, such as a weather event or security threat.

Individual building floor plans showing exits, storm refuge areas, evacuation assembly areas and areas of rescue assistance can be accessed at police.illinois.edu/emergencyplanning/fireplans.

Faculty, staff and students also can sign up for emergency text messages at emergency.illinois.edu. Parents and others may sign up for emergency text messages at www.cites.illinois.edu/illinialert/index.html.

ON THE WEB

Sign up for emergency text messages

emergency.illinois.edu

More information

police.illinois.edu | 217-333-1216

Allenort Park and Retreat Center

New Art to be unveiled Aug. 8

It’s been a long time coming. At 5:30 p.m. Aug. 8, Al- lerton Park and Retreat Center and the Champaign Public Art League will unveil the first new piece of art at Allerton Park since 1942.

The park invites the public to the unveiling of “Reflective Moments,” a new sculpture in the Allerton collection. “It’s the perfect time to unveil a new piece of art,” said Bill Kruidenier, the director of the U. of I. Arboretum, “because the park is at the height of its season of beauty.”

“Allerton Park and Retreat Center offers a unique opportunity for art to be appreciated by the public,” said Robert Allerton, the founder of Allerton Park. “It’s fitting that we unveil a new sculpture in the Allerton collection.”

Ongoing support for mentors is provided through monthly brown-bag lunches, which provides an opportunity to work, solicit advice and share information.

Members commit to meeting at least one hour a month with their mentees, and the program offers social opportunities, such as receptions during the fall and spring semesters, held at the director’s home and Me- morial Stadium, respectively. Students and their mentors also can share a multi-course meal while polishing their manners under the guidance of an etiquette expert at the Allerton estate retreat. Between the two events next year, “We hope to continue to add to Allerton’s art collection as well over time,” Peterson said.

More information about the unveiling and the concert is online at www.allerton.illinois.edu.
Radio frequency ID tags on honey bees reveal hive dynamics

By Diana Yates
Life Sciences Editor

Scientists attached radio-frequency identification (RFID) tags to hundreds of individual honey bees and tracked them for several weeks. The effort yielded two discoveries: Some foraging bees are much busier than others; and if those busy bees disappear, others will take their place.

The findings are reported in the journal Animal Behaviour.

Tagging the bees revealed that about 20 percent of the foraging bees in a hive brought home more than half of the nectar and pollen gathered to feed the hive.

“We found that some bees are working very, very hard as we would have expected,” said U. of I. Institute for Genomic Biology director Gene E. Robinson, who led the research. “But then we found some other bees that were not working as hard as the others.”

Citizen scientist Paul Tenczar developed the technique for attaching RFID tags to bees and tracking their flight activity with monitors. He and Neuroscience Program graduate student Claudia Lutz measured the foraging activities of bees in several locations, including some in hives in a controlled foraging environment. Vikyath Rao, a graduate student in the laboratory of U. of I. physics professor Nigel Goldenfeld, analyzed the data using a computer model Rao and Goldenfeld developed.

Previous studies, primarily in ants, have found that some social insects work much harder than others in the same colony, Robinson said.

“While it is well known that genetic differences underlie differences in many types of behavior, the new findings show that ‘sometimes it is important to give individuals a chance in a different situation to truly find out how different they are from each other,’” Robinson said.

Removal of the elite bees “was associated with an almost five-fold increase in activity level in previously low-activity foragers,” the researchers wrote. The change occurred within 24 hours, Tenczar said. This demonstrates that other individuals within the hive also have the capacity to become elites when necessary, Robinson said.

“Perhaps the less-busy bees function as a kind of reserve force that can kick into high gear if something happens to the super-foragers, Robinson said.

“Our observation is that the colony bounces back to a situation where some bees are very active and some are less active,” he said. “Why is that? We don’t know. Do all bees have that capability? We still don’t know.”

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