UI, GEO reach tentative agreement

Two-day strike by grad students suspended

The UI and representatives of the Graduate Employees Organization reached a tentative contract agreement midday on Nov. 17 during negotiations at the Levis Faculty Center in Urbana. The GEO, which represents more than 2,600 graduate and teaching assistants, went on strike Nov. 16 after bargaining sessions over the past weekend failed to resolve the issue of guaranteed tuition waivers. The GEO had been working without a contract since Aug. 15.

The new three-year agreement retroactive to August 2009, and approved by both sides on Nov. 14, include:

- Increases to the minimum stipend for 50 percent appointments (20 hours per week) for the first year:
  - $13,840 (year one, increased from current minimum of $13,430)
  - $14,250 (year two)

- Increases to the student health insurance for subsidy:
  - 65 percent (year one, increased from the current 50 percent subsidy)
  - 75 percent (year two)
  - 75 percent (year three)

- The creation of a parental accommodation period following the birth or initial adoption of a child.

- Amendments to the grievance language and other non-economic language amendments.

During the strike, hundreds of GEO supporters picketed around campus, including the Quad, Davenport Hall, the English Building, Gregory Hall and the Foreign Languages Building. Some classes and events were canceled or moved to other locations.

Chanting and drums from about 75 protesters outside the Public Affairs Center on Vandalia street disrupted the start of the UI Board of Trustees meeting there on Nov. 12, but the situation ended peacefully when board chair Christopher Kennedy and Easter invited them to join the audience inside.

UI study finds credit crisis, debt load a double whammy for investment

By Jan Dennis
Business & Law Editor

Firms with heavy long-term debt can survive a downturn amid the nation's recent credit crisis, slashed investment more than three times as much as companies whose paybacks didn't exceed the interest due, a new UI study found.

The findings show that even seemingly minor financing decisions such as debt maturity deadlines can put firms at risk when the economy sours, cutting into investments that seed future growth, hiring and profits, the study says.

“Our message to firms that should sweat the small stuff,” said Scott Weibensener, a UI finance professor and researcher for the study. “These companies suffered profoundly, putting them at a disadvantage compared to firms that were just lucky enough to have debt just a couple of years earlier or a few years later.

Typically, firms can refinance debt, so maturity schedules pose little problem, according to the study, co-written by finance professors Heitor Almeida, Murillo Campbello and doctoral student Bruno Larangara in a conference on the financial crisis sponsored by Yale University and the Review of Financial Studies, a top academic journal.

But interest-rate spreads on borrowing soared when the credit crisis erupted in August 2007, forcing debt-saddled firms to scale back investment on capital projects such as buildings and equipment that create jobs, future profits and help boost the overall economy.

Investment is really the lifeblood of the firm,” Campbello said. “In the short run, it provides demand for construction, equipment and the jobs that those investments create. In the long run, curbing investment today means reduced sales, employment and profits later because firms don’t have the infrastructure in place to grow.”

The study examined more than 1,000 high-quality, publicly traded firms that rely on long-term debt for financing. Of those, 86 had at least 20 percent of their debt due on the heels of the credit crisis.

Overall, companies trimmed investment by an average of 10 percent during the first three quarters of 2008 as the nation slipped into its deepest economic downturn since the Great Depression. But investment stumbled by nearly a third among firms with steep debt due as the credit crisis lingered.

“Because of the recession, it isn’t surprising that investment declined in 2008,” Almeida said. “But the magnitude of the decline was surprising because you would think firms would manage their liabilities in a way to not get caught by surprise.”

The study found that firms often issue debt in a “lumpy fashion,” with maturity schedules that require large paybacks in a single year rather than spread out over many.

“When you think about the market for corporate debt, you find firms need to keep an eye on how their debt load is staggered,” he said. “There’s a parallel here with individual investing. We preach to individuals not to put all of their eggs in one basket. That turns out to be true for firms, too. If See DEBT, Page 3

Academic retirees

Last year, 129 faculty members and academic professionals retired from the UI. Two share their stories. Page 4

Distinguished Teacher-Scholar

Physicist Tim Sietsema plans to share innovative technologies that foster student participation. Page 9

Trustees discuss budgetary concerns

By Sharita Forrest
Assistant Editor

The UI faces a severe cash flow problem this fiscal year – and severe budgetary constraints Fiscal Reductions FY 2011, which begins July 1 – but it is imperative to provide a salary program next year to retain faculty and staff members, university officials told the UI Board of Trustees when they met Nov. 12 at the Springfield campus.

The board approved a $4.7 billion final operating budget for the current fiscal year, which began July 1, and a budget request for FY 11 that contained $549.9 million – or 0.8 percent – increase in the university’s appropriations. Appropriations remained $743 million during the past two fiscal years.

A $484.2 million salary program was budgeted for FY 11, but “a multi-year approach” is needed, and increased tuition to fund salaries “is not a tenable solution,” vice president and chief financial officer Walter Knorr said.

UIC ranks 14th and the Urbana campus 21st in comparison to peer institutions for tenure system faculty members’ average salaries, said Meena Rao, vice president for academic affairs. Retention of minority faculty members is challenging because salaries are not competitive.

University officials set aside $20 million when the fiscal year began in July, in preparation for a potential mid-year recession by the state, which rescinded $19 million last year.

The state owes the university $317 million for its current appropriation – but has paid only $80 million of a $400 million to date. Units have been instructed to plan contingency reductions by cutting spending by 6 percent, or $45 million total, this fiscal year through personnel attrition, unfilled vacancies and reductions in non-personnel expenditures.

The $548.2 million capital budget request for FY 11 included $66 million for repairs and renovation of buildings ($33.6 million at Urbana) and $85 million for renovating libraries at UIC and Urbana.

Many capital projects – such as renovations to Lincoln Hall at Urbana – were not on the FY11 list because they were funded by the state’s $3 billion “Jobs Now!” capital/economic initiatives.

See TRUSTEES, PAGE 2

INDEX

ON THE JOB 3

On the Web
www.news.illinois.edu/ii

November 19, 2009
Vol. 29, No. 10

In this issue

Academic retirees

Distinguished Teacher-Scholar

Trustees discuss budgetary concerns

Academic retirees

Distinguished Teacher-Scholar

Trustees discuss budgetary concerns

DEATHS 3

On the Job 3

A Minute With... 7

Book Corner 12

Brief Notes 13

Calendar 14

Vol. 29, No. 10

Inside Illinois

For Faculty and Staff, University of Illinois at Urbana-Champaign

Nov. 19, 2009

Vol. 29, No. 10
By Sharnita Forrest
Assistant Editor

The board, which is chaired by Charles Robertson, appointed Isaacson, Miller to identify potential candidates immediately thereafter. It typically takes six weeks to find candidates, gather information about them and get them into the search. When the committee has conducted interviews and narrowed the field of candidates, it will present the board with a list of 10 names to the board. The committee hopes to announce the appointment in May, or before the fall 2010 semester begins.

On the Web
http://senate.illinois.edu

The UI was the only Big Ten university that was not represented on the search committee.

The amended resolution urged campus employees to do their part to help students continue their education. The resolution also encouraged students to participate in the search process.
Focal Point projects announced by Grad College

The Graduate College has announced eight projects that will receive funding in 2009-2010 through its new initiative, Focal Point.

The goal of the initiative is to advance knowledge in areas of critical national and human need. Of particular interest are new collaborations that explore how disparate fields of scholarship have in common.

The projects:

- Cultural Patterns of Sustainable Consumption, co-organizers: Sashia Cuerda, a graduate student in geography; Zouzaa Gille, a professor of sociology; Dana Miny, a graduate student in advertising; and Grant Shoffstall, a student in sociology.
- InfoStructure: Intersections Between Social and Technological Systems, co-organizers: Matthew Crain, a graduate student in the Institute of Environmental Sciences; Karien Karahalios, a professor of computer science; Aimee Rickman, a graduate student in human and community development; Christiaan A. Cuff, a professor of communication and Coordinated Science Laboratory faculty member; and Shiningjao Yao, a graduate student in library and information science.
- Encarceration in America: Exploring Carceral Landscapes, co-organizers: Patricia Wilcox, a graduate student in English; Rebecca Ginsburg, a professor of landscape architecture; Rob Scott, a graduate student in landscape architecture; and William Sullivan, a professor of landscape architecture.
- Investigating Civic Entrepreneurship for Global Sustainability, co-organizers: Ingrid Foyd, a graduate student in library and information science; Susan Frankenberger, museum studies program coordinator; Eric Green, a graduate student in natural resources and environmental sciences; Glenn Henderson, professor of business administration; Poonam Jusrut, a graduate student in geography; and information science; Susan Frankenberger, museum studies program coordinator; Eric Green, a graduate student in natural resources and environmental sciences; Glenn Henderson, professor of business administration; Poonam Jusrut, a graduate student in geography; and information science.
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On the Job

Debbra Sweat

Debbra Sweat, office administrator for the Office of Equal Opportunity and Access, has worked at the UI for over 30 years.

Born in Champaign, Sweat describes herself as a military brat who was raised all over the country. In 1985, she attended Parkland College before joining the university’s workforce.

Sweat started as Extra Help in 1978 while being hired full time in May 1979 as a clerk typist II in what was then the Personnel Services Office. Over the career of her course, she also has worked for Instructional Resources, University Housing and OITES (Campus Information Technologies and Educational Services).

After starting in Personnel Services’ Affirmative Action Division, she says her career has now come full circle after moving to the Office of Equal Opportunity and Access 2 1/2 years ago.

Sweat continues to live in Rantoul and is surrounded by her immediate family.

Tell me about your job.

My day varies depending on the tasks and projects in the office. My primary role is to support the director of the Office of Equal Opportunity and Access by managing her schedule, coordinating office operations and, in conjunction with the director, overseeing the operating budget. I provide assistance and support to six academic professional staff members and supervise two civil service employees at a student worker.

Tell me what your office does.

The goals and objectives of this office are vast and detailed. One of the primary functions is to facilitate affirmative action and equal employment opportunity compliance for the campus, which means we oversee the hiring process for academic vacancies. We also provide campuswide training in workplace issues on diversity, discrimination and harassment, and accessibility.

In addition to the search process, which involves a large volume of data collection, analysis and reports, our office prides itself on the leadership role we have taken in promoting diversity and inclusivity at Illinois through the chancellor’s “Inclusive Illinois” initiative.

We also have numerous ongoing projects and programs, including updating and revising the search guidelines that will involve campuswide training later this semester; the Martin Luther King events to be in January; diversity roundtables; and a women’s leadership conference targeting faculty, staff and students in the spring.

We also co-sponsor several campus and community events.

Could you tell me a little about the search process?

When a college, department or administrative unit has a faculty member or academic vacancy, we work closely with the director, overseeing the operating budget. I provide assistance and support to six academic professional staff members and supervise two civil service employees at a student worker.

Tell me about your education.

I attended Parkland before joining the university work force.

What’s your biggest challenge on the job?

I have taken on the challenge of providing assistance and support to six professional staff and supervise two civil service employees at a student worker.

On the Web

www.grad.illinois.edu/focal-point-projects

deaths

Donald H. Bender, 73, died Nov. 7 in Urbana. Bender was a UI firefighter from 1959 to 1972. Memorials: Carle Cancer Center or the American Cancer Society.

Jerald Hamilton, 82, died Nov. 1 in Albuquerque, N.M. Hamilton retired in 1988 as a professor emeritus of landscape architecture.

George L. Malloch, 77, died Nov. 13 at his home in Champaign. Malloch was a firefighter for 28 years, retiring in 1990 as a captain on a battle crew. During his time at the UI he also worked at Willard Airport as a crash rescue specialist. Memorials: American Cancer Society or St. Peter’s United Church of Christ.

M. Delores Photopulos McFall, 92, died Nov. 13 at the Champaign County Nursing Home in Urbana. She was a clerk for 20 years. Memorials: Alzheimer’s Association.

Carol L. Sarver, 75, died Nov. 5 at Provena Covenant Medical Center in Urbana. Sarver worked at the UI for 35 years, retiring in 1994 as a dietary assistant in the College of Agricultural, Consumer and Environmental Sciences. Memorials: Champaign County Humane Society.
Kimble (still) teaches students near and far

By Sharita Forrest

A U.S. map hangs on the wall in retiree Peter Kimble’s computer lab at the Armory, and it has pins – for Illinois residents – and stars – representing people from other states – stuck on various towns and cities to show the hometowns of students who have attended the workshops that he teaches. The weeklong intensive Web Design workshop, one of several FAST3 workshops that Kimble teaches, draws 50-60 people a year, many from the UI campus but also people from other states: Alaska, California, Florida, Louisiana and Texas, to name a few. And, just a few weeks ago, Kimble placed a star in Idaho to commemorate his first student from that state.

Although Kimble retired from the UI on April 30 as a computer-assisted instruction specialist, he still schedules and teaches FAST3 workshops on campus. Independently, he also teaches workshops and in-service classes for school districts.

FAST3, which stands for Faculty, Students, Teaching, and Technology, originated to provide training solely for computer users at the Urbana campus, it has since opened its classes to anyone who wants to attend, although the majority of participants are affiliated with the UI.

Kimble, who is scheduling workshops for the spring semester, said his teaching schedule varies from week to week.

“I pretty much schedule the workshops according to what I think is most useful, interesting and is going to have the most response,” Kimble said. “But I control the timing of that scheduling. At most, I will have a 40-hour week. At the least, he said, he’ll have two or three weeks during which he doesn’t teach, an ideal situation for someone who wants to travel.

Kimble and his wife, Brenda, who retired three years ago as a music teacher at Robeson School, are avid travelers. They have visited Connecticut, Florida, New Hampshire, New York, North Carolina, South Carolina and Texas since he retired. They’ve also been to Austin, Texas, several times this fall to visit their son – named Austin, coincidentally – who is a professional musician and recent graduate of the University of Texas.

“Over the four years that Austin has been here, we’ve visited fairly frequently, and we’ve really grown to appreciate the city of Austin,” so much so, that they recently purchased a home there, Kimble said.

They have plans to visit the Carolinas again soon, and next spring, visit friends in Maine. While in Maine, Kimble said he hopes to cross the border to see the Canadian Maritime – a region that he has yearned to see every time he’s been nearby.

“That’s a nice thing about being able to travel and not use vacation time,” Kimble said. “We don’t feel that we have to fly somewhere unless it’s a great distance,” and if they see something that piques their interest, they can adjust their itinerary accordingly, he said.

Inspired by filmmaker Ken Burns’ recent documentary on national parks, Kimble, PAGE 5

Meerdink enjoys busy, but leisurely pace

By Sharita Forrest

W elcoming a new grandchild and hosting a 30th birthday party for a daughter-in-law, Alaskan cruise at the end of August, just in time to escape the late-summer heat and humidity of Illinois gardening, canning the bounty and enjoying the changing autumn landscape and the various wildlife – turkeys, deer, opossums and raccoons – that emerge from the woods and into the yard around her home in the country a few miles north of Mahomet.

Although Lois Meerdink only retired five months ago, her schedule has been busy. But Meerdink said that she is relishing a more leisurely pace to her days than when she was assistant dean of Business Career Services in the College of Business. Meerdink helped thousands of students get jobs and internships during her 20-year career at the UI.

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Kimble, PAGE 5

Facility members, academic professionals retire

Between Sept. 1, 2008, and Aug. 31, 2009, 129 faculty members and academic professionals retired from the UI, according to the Office of Academic Human Resources. The retirees, their positions, and approximate years of service appear online.

On the Web
http://news.illinois.edu/ii/09/1119/retirees.html

Familiar face Peter Kimble, who retired April 30 after a 35-year career at the UI, still teaches software workshops on campus for FAST3. He and his wife, Brenda, a retired schoolteacher, also work seasonally for a local technology company that provides computer support for trade fairs around the country.

Nurturing success Traveling, tennis and family activities have kept Lois Meerdink busy since she retired at the end of June.

BCS emerged as a nationwide leader in using technology to assist students in transitioning from the classroom to the workforce.

BCS services now include job shadowing, resume critiques and a forum series that brings employers to campus to share the qualities and skills they seek in potential employees.

This semester, the College of Business implemented Business 101, a required course for freshmen that Meerdink helped develop. The course encompasses three modules that explore self-responsibility, organizational responsibility and societal responsibility – and include topics ranging from dressing for success to group projects designing business solutions to poverty-based market opportunities.

“From day one, it gives students the support and education they need to get the edge in interacting with employers,” Meerdink said.

Meerdink, who spent her entire UI career in the same department, worked in similar offices for six years at the University of Arizona and for four

Sees KIMBLE, PAGE 5
Seymour Hersh receives journalism achievement award

By Craig Chamberlain
Social Sciences Editor
By Craig Chamberlain

Pulitzer Prize-winning reporter Seymour Hersh, longtime contributor to The New Yorker magazine, and the writer who exposed both the Abu Ghraib prison scandal in Iraq and the My Lai massacre in Vietnam, received this year’s Illinois Prize for Lifetime Achievement in Journalism.

The prize was awarded Nov. 7 at the National Press Club in Washington, D.C., following an evening reception and dinner.

Hersh, a Chicago native, is the third journalist to receive the award, following “60 Minutes” newsman Mike Wallace in 2007 and former Washington Post executive editor Benjamin Bradlee last year.

The Illinois Prize honors individuals whose career contributions to public affairs reporting represent the highest and best achievements of American journalism.

The recipient is selected by the UI journalism faculty to honor “work that consistently served as a beacon for other journalists, set the highest standards of excellence in the field, and placed the public good and public awareness before all else.”

Hersh represents “the best of the best that American journalism has to offer,” and is therefore an ideal winner, said Walt Hartington, interim dean of the College of Mass Communications.

Hersh started as a speechwriter and press secretary for President John F. Kennedy, illnesses affecting Gulf War veterans, and the Soviet Union’s shooting down of a Korean airliner in 1983. Among his book prizes are the National Book Critic Circle Award and two Investigative Reporters & Editors awards.

Since retiring, Meerdink has enjoyed spending more time with family — including a grandson who was born Oct. 26 — and visited another grandson’s elementary school in Chicago for Grandparents Day last month, which coincided with her high school reunion in Minnesota. She is looking forward to Thanksgiving, and a family gathering at her home.

The Meerdinks plan to visit Denver, when Gavin attends a continuing education program, and Austin, Texas, to help celebrate Gavin’s father’s 90th birthday.

In the spring, they may travel to California wine country to visit Gavin’s brother, and are considering a trip to London to visit a cousin sometime in the near future.

At home, Meerdink has been gardening, canning, playing bridge with friends, baking pies for church events, and attending performances at Krannert Center for the Performing Arts. Meerdink also has taken up tennis, and plays with a friend on the courts at Parkland College.

And, as with many retirees, the Meerdinks have been busy with home maintenance and renovation projects — sprucing up the garage and the porch, and renovating the finished basement to create a suite with a small kitchen.

In 1969, Hersh broke the My Lai story, about the massacre of hundreds of Vietnamese villagers by U.S. troops and the cover-up that followed, his work resulting in the 1970 Pulitzer Prize for international reporting. In 1972, he joined The New York Times, working in Washington, D.C., and New York until he left the paper in 1979 to become a freelance writer. He wrote his first piece for The New Yorker in 1971 and has been a regular contributor to the magazine since 1993.

Hersh broke the Abu Ghraib story, about the abuse of Iraqi prisoners by U.S. soldiers, in a series of New Yorker pieces in 2004. This brought him his fifth Polk Award — making him the first five-time winner — as well as his second National Magazine Award and an Overseas Press Club Award.

Hersh also is the author of eight books, among them “Chain of Command” (based on his Abu Ghraib reporting), “The Price of Power: Kissinger in the Nixon White House,” and books on My Lai, the Israeli nuclear bomb program, President John F. Kennedy, illnesses affecting Gulf War veterans, and the Soviet Union’s shooting down of a Korean airliner in 1983. Among his book prizes are the National Book Critic Circle Award and two Investigative Reporters & Editors awards.

High standards Pulitizer Prize-winning reporter Seymour Hersh, longtime contributor to The New Yorker magazine, received this year’s Illinois Prize for Lifetime Achievement in Journalism. The recipient is selected by the UI journalism faculty.

KIMBLE, CONTINUED FROM PAGE 4

Kimble said he wants to tour the U.S. national parks and explore the Desert Southwest.

In addition to traveling for pleasure, the Kimbles also have been traveling for J.T. Smith and Associates Inc., a Philo-based computer technology company that provides computer support for vendors at trade shows. The Kimbles and other staff members set up the booth and computers and assist people with ordering products from vendors at the show using Smith’s computers and software.

TRAVELING from place to place, setting up and tearing down equipment for events is nothing new for Kimble, who, during the 1970sworked as a sound technician or “roadie” for several bands, mainly the Grateful Dead but also Black Sabbath, The Carpenters, Procól Harum, Quicksilver Messenger Service and Steppenwolf.

Kimble began his 35-year career with FAST3 as a speechwriter and press secretary. Traveling from place to place, setting up and tearing down equipment for events is nothing new for Kimble, who, during the 1970s worked as a sound technician or “roadie” for several bands, mainly the Grateful Dead but also Black Sabbath, The Carpenters, Procól Harum, Quicksilver Messenger Service and Steppenwolf.

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Team designs molecule to fight muscle degeneration disease

By Diana Yates
Life Sciences Editor

Researchers at the UI have designed a small molecule that blocks an aberrant pathway associated with myotonic dystrophy type 1, the most common form of muscular dystrophy.

The new compound, soon to be tested in cells, binds tightly to its target, an abnormally elongated RNA that hijacks part of the normal cellular machinery and brings on symptoms of the disease. The compound is the first to show high selectivity in binding the target while not disrupting other important RNA functions. The study appeared in the Proceedings of the National Academy of Sciences.

Myotonic dystrophy type 1, a muscle degeneration disease that so far is untreatable, affects about one in 8,000 people worldwide. Some cases are mild, but others lead to a debilitiating loss of muscle control, declines in organ function and other potentially life-threatening conditions.

Scientists have recently identified a primary causative agent of the disease, a mutant version of a gene, called DMPK, which contains an excessive number of thymine-guanine (CTG) repeats.

In the course of basic research into compounds that bind to DNA or RNA, the researchers designed a molecule that would selectively block the MBNL protein because you want it to go into the RNA, according to Anne Baranger. "You certainly don't want to target the protein because you want it to go perform its normal function." baranger said.

"The danger is if you make something that binds to RNA or DNA, it's going to bind to all these other molecules and disrupt those complexes, so you help one problem but you cause all these others. Our molecule doesn't do that," Zimmerman and Baranger, with their colleague, chemistry professor Paul Hergenrother, are the recipients of a new five-year nearly $2 million grant from the National Institute of Arthritis and Musculoskeletal and Skin Diseases at the National Institutes of Health to pursue this research.

Further tests revealed that the new compound has significantly lower affinity for other mismatched RNA in DNA or RNA. Baranger's lab also tested the compound on other normal protein-RNA complexes, and found that it did not disrupt those interactions.

This last finding was critical, Zimmerman said. "The danger is if you make something that binds to RNA or DNA, it's going to bind to all these other molecules and disrupt those complexes, so you help one problem but you cause all these others. Our molecule doesn't do that."

When the mutant DMPK is transcribed into RNA, the first step toward building a protein, these (now CUG) repeats bind to a cellular protein, MBNL, which normally splices other RNA transcripts. The bound MBNL cannot function properly, causing a cascade of negative effects in the cell. Improperly spliced RNAs lead to improperly formed proteins.

Preventing the MBNL protein from binding to the CUG repeats has been shown to ease the symptoms of the disease. "The RNA is the primary target" for drug design, Zimmerman said. "It's quite clear that if we can bind to the RNA and displace the protein, it's very likely to relieve the symptoms."

Fighting muscular dystrophy Chemistry professors Anne Baranger and Steven Zimmerman and their colleagues designed a small molecule that blocks an aberrant pathway associated with myotonic dystrophy type 1, the most common form of muscular dystrophy. The muscle degeneration disease, which so far is untreatable, affects about one in 8,000 people worldwide. Further tests revealed that the new compound has significantly lower affinity for other mismatched RNAs or DNA.
Why are family mealtimes important, especially during the holidays? Actually, all mealtimes are important. They provide an opportunity to catch up on the day’s events and foster a sense of security for young children. Over time, they cement emotional bonds with the entire group. During the holidays, they also provide a chance to catch up with others who you maybe haven’t seen in a while, tell old stories and relive good times.

For some families, the holidays are the most stressful time of the year. What can be done to avoid this type of stress? A positive, healthy experience? The stress can come from two sources: unrealistic expectations and emotional strain.

In our interviews with families, we find that it’s rarely the elaborate parts of holiday traditions and meals that people look forward to; rather, it’s the simple things that come at the same time every year or at the same time in every meal.

In these instances, sometimes just knowing it’s coming can reduce stress. Other times it may be helpful to call the person ahead of time and acknowledge that this is something that occurs every year and see if there is a way to avoid the conflict this time around. Sometimes a change in location can also ease the strain.

One way to avoid this type of stress is to call the family together and identify the three things you really dread. See if you can either drop some of the things that you would rather avoid or at least get some help. You may be surprised that some of the things you feel an obligation to do no one else really cares about either.

The other type of stress comes from expecting there to be conflict or some type of emotional strain during the gathering. This can come about for a variety of reasons – long-standing conflict, people who just don’t see eye-to-eye on a particular topic or mismatched personalities.

The part of rituals that make them meaningful can also add strain to the event, especially if you are looking for a fight. We can all recall events when you know when someone is about to “blow” because it comes at the same time every year or at the same time in every meal.

In these instances, sometimes just knowing it’s coming can reduce stress. Other times it may be helpful to call the person ahead of time and acknowledge that this is something that occurs every year and see if there is a way to avoid the conflict this time around. Sometimes a change in location can also ease the strain.

How do regular family mealtimes affect a child’s health and well-being? What we’ve found is that families who practice regular mealtimes (four times a week and, most importantly, have positive ways of communicating during their meals, have children who have fewer health symptoms when they have a chronic health condition and are less likely to become overweight.

We think this is the case for a variety of reasons. First, it provides a secure emotional base that children can count on, which reduces the overall amount of stress they feel if they already have a chronic health condition such as asthma. Second, when you are demonstrating genuine concern through talking about your day, we think it slows down the pace of food consumption.

There’s the temptation, especially on Thanksgiving Day, to watch football at the dinner table while eating instead of socializing. Does watching TV at the dinner table set a good example for children? Absolutely not. I cannot think of a single good reason to have the TV on while eating.

There are so many studies that indicate you tend to eat more, it prevents positive communication, and it exposes children to targeted food advertising that has been associated with obesity.

What impact on public health do family mealtimes have? Shared family mealtimes have the possibility of being a strong public health message for this generation of young children. Just as we developed seat belt laws and bike helmet laws to protect our youth, protecting the 18 to 20 minutes it takes to share a family meal can not only protect children from chronic health conditions such as obesity, it also can improve their vocabulary, protect them from risks associated with drug and alcohol abuse, and provide a way for parents to keep track of what is going on in their lives.

What could be a better investment in time?
For improving early literacy, reading comics is no child’s play

By Phil Ciciora
News Editor

Although comics have been published in newspapers since the 1890s, they still get no respect from some teachers and librarians, despite their current popularity among adults. But according to a UI expert in children’s literature, critics should stop hugging Superman’s cape and start giving him and his superhero friends their due.

Carol L. Tilley, a professor of library and information science at Illinois, says that comic books are just as sophisticated as other forms of literature, and children benefit from reading them at least as much as they do from reading other types of books.

“A lot of the criticism of comics and comic books come from people who think that kids are just looking at the pictures and not putting them together with the words,” Tilley said. “Some kids, yes. But you could easily make some of the same criticisms of picture books – that kids are just looking at pictures, and not at the words.”

Although they’ve long embraced picture books as appropriate children’s literature, many adults – even teachers and librarians who willingly add comics to their collections – are too quick to dismiss the suitability of comics as texts for young readers, Tilley said.

“They claimed the texts weren’t good enough for children,” she said. “It’s up to the reader’s personality and intellect. As a whole, comics are just another medium, another genre.”

Critics would say that reading comics is actually a simplified version of reading that doesn’t approach the complexity of “real” books, with their dense columns of words and relative lack of pictures. But Tilley argues that reading any work successfully, including comics, requires more than just assimilating text.

“If reading is to lead to any meaningful knowledge or comprehension, readers must approach a text with an understanding of the relevant social, linguistic and cultural conventions,” she said. “And if you really consider how the pictures and words work together in consonance to tell a story, you can make the case that comics are just as complex as any other kind of literature.”

Tilley said some of the condescension toward comics as a medium may come from the je ne sais quoi that the name itself evokes.

“The term ‘comic’ is somewhat pejorative and tends to denote the child-like and ephemeral, and it brings to mind the Sunday funnies that you used to line your birdcage,” she said.

The term “graphic novel” is sometimes used to give comics a measure of respectability, Tilley said. But some artists, including Pulitzer-Prize winner Art Spiegelman, hate the term. “They feel it’s just a dressed up euphemism for comics,” she said.

Despite their popularity among juveniles in the early 20th century, comic strips of that era were written and drawn primarily for an adult readership.

“Comics were originally an adult medium, since newspapers reached a primarily adult audience, but they very quickly turned into something that was appropriated by kids,” Tilley said. “Certainly by the first decade of the 20th century it had become a kids’ medium.”

According to Tilley, even in the early 1900s, there were teachers who raised concerns about children reading comics – that their content wasn’t appropriate content for a children, and that it wasn’t real literature.

And when the first comic books were published as omnibus collections of popular published comic strips in the mid-1930s, “the same concerns sprung up again from adults,” Tilley said. “They claimed the texts weren’t good enough because they used slang, there were misspellings, they used colloquialisms and that the pictures were of questionable merit.”

In 1955, after a sustained outcry over the suitability of comics as children’s reading materials, the comics industry instituted a restrictive editorial code. Soon thereafter, juvenile readership plummeted.

“Between 1955 and the last 10 years, it became very much an adult medium,” Tilley said. “Part of that was because the comics code watered down what could be... See COMICS, Page 10

Pedestrian cell-phone use more hazardous than music

By Diana Yates
Life Sciences Editor

Two new studies of pedestrian safety found that using a cell phone while hoofing it can endanger one’s health.

And older pedestrians talking on cell phones are particularly impaired in crossing the street than their peers who were not on the phone. They also were more likely to fail to cross the street in the 30 seconds allotted for the task, even thought their peers were able to do so.

Each participant walked on a manual treadmill in a virtual environment, meaning that each encountered the exact same conditions – the same number and speed of cars, for example – as their peers.

The second (and not yet published) study gave adults age 60 and above the same tasks, and included some participants who had a history of falling. The differences between those on and off the phone were even more striking in the older group, Kramer said.

“Older adults on the phone got run over about 15 percent more often” than those not on the phone, he said, and those with a history of falling fared even worse.

“So walking and talking on the phone while old, especially, appears to be dangerous,” he said.

Kramer is a researcher at the Beckman Institute for Advanced Science and Technology at Illinois.
Physicist Tim Stelzer will share i-clicker as teaching tool

By Sharita Forrest
Assistant Editor

Tim Stelzer, a professor of physics, compares the current climate in higher education to a white-water rafting trip. “I think we’re at a point where we certainly end up going downriver, but the path you take can be the difference between an exhilarating adventure and a terrifying crash,” Stelzer said.

Unprecedented access to content on the Internet and the growth of economic constraints are pushing the current, according to Stelzer, but he believes that the UI can navigate successful outcomes with educational innovation. And his work as the 2009-2010 Distinguished Teacher-Scholar will contribute to these efforts on campus.

Accordingly, Stelzer and his colleagues in the Physics Education Research group – faculty members Gary Gladding and Mats Selen – have developed some innovative technologies that they say have transformed physics lectures, shifting the focus from content delivery to helping students synthesize content into knowledge.

A common problem in large lectures is that students are hesitant to answer questions because they are afraid of getting the answer wrong and embarrassing themselves. Introducing peer instruction – intermittent breaks in the lecture for students to discuss answers to questions with each other and then report back – was a step toward changing this dynamic.

However, when student participation wasn’t forthcoming, Stelzer, his research group colleagues and graduate student Benny Brown developed the i-clicker, a simple hand-held radio frequency transmitter/receiver that enables students to “vote” for the right answer. The clickers have a power button and buttons labeled A through E for selecting and transmitting answers to a receiver base that instructors plug into their computer’s USB port. When the student transmits an answer to a question, the light on the clicker flashes green if the base received the answer. If the light flashes red, the answer did not go through. In addition to sending the vote, each i-clicker has a unique ID number so that students may receive credit for their responses.

The results are instantly available to the professor, who can tailor the lecture based on the students’ responses. “It’s incredibly fun,” Stelzer said. “When I stop and let the students talk, the energy of the students in the room comes back.”

Stelzer added that the development of the UI was a wonderful cooperation between education, research and industry. The Office of the Provost supported the endeavor and mentors across campus collaborated in field tests, he said.

More than 15,000 students have used i-clickers on the Urbana campus, and nearly 1 million are in use at 800 colleges and universities across North America.

As the 2009-2010 Distinguished Teacher-Scholar, part of Stelzer’s project involves promoting awareness of the i-clicker system as an effective learning tool, sharing best practices, developing Web-based resources and other i-clicker enhancements, and assisting faculty members who are new to the system.

A second innovation arose from the discovery that peer instruction is most effective if students come to lectures prepared. But getting them to read the textbook before the lecture was a challenge. “To address this problem, Stelzer and his colleagues developed Web-based multimedia pre-lectures – short Flash animations with synchronized audio designed to provide students with the essential content necessary to participate in the lecture.”

After the pre-lectures were added to the introductory physics course, the percentage of students who rated the lectures as valuable doubled from 40 percent to 80 percent, according to student surveys.

Research studies of the pre-lectures indicate that they are significantly more effective than a traditional textbook in helping students understand the material. Stelzer was thrilled when he learned that he had been chosen as the year’s Distinguished Teacher-Scholar.

“The DT-S program is one way the university demonstrates its commitment to education,” Stelzer said. “For me personally, it offers a great opportunity to share what we have learned in physics with the broader campus. At a large university, we have the infrastructure, exceptional student body and talented faculty members to make things happen, but one of the difficulties is finding effective methods of sharing our work with each other across campus.”

In addition to offering workshops and other outreach programs this year, Stelzer will speak about the pre-lectures at the Faculty Retreat on Feb. 5.

The Distinguished Teacher-Scholar Program, sponsored by the Teaching and Learning Enhancement Board and the Office of the Provost, honors and supports outstanding instructors who take an active role in enhancing teaching and promoting learning on campus. The program supports innovative projects that nominees develop as part of the selection process. Award recipients serve as consultants and mentors to other faculty members and departments seeking to use new instructional methods and revitalize their teaching programs. Although the appointment lasts one year, honorees carry the designation with them throughout their careers.

Honorees since the program’s inception in 1999:

- Annie K. Abbott, Spanish, Italian and Portuguese
- Bertram C. Bruce, library and information science
- Philip Bunak, agricultural engineering
- O. Vernon Burton, history
- Geonna DeHey, crop sciences
- Paul F. Diehl, political science
- James A. Gentry, finance
- Kim C. Graber, kinesiology and community health
- Gail E. Hawisher, English
- Steve Heite, journalism
- Walter L. Hurley, animal sciences
- Prasanta K. Kalita, agricultural and biological engineering
- Paul Kelter, chemistry
- J. Bruce Litchfield, engineering
- Michael C. Loui, electrical and computer engineering
- Bruce Mihalec, Campus Honors Program
- Rajeshwari Pandharipande, linguistics, religious studies and comparative literature
- Leonard Pitt, computer science
- Robert Reid, journalism (posthumous award)
- Shelly J. Schmidt, food chemistry
- Thomas Schwandt, educational psychology
- Linda C. Smith, library and information science
- Joseph C. Squier, art and design
- Tim Stelzer, physics* 
- Arlette Willis, curriculum and instruction
*Appointed this year
COMICS, CONTINUED FROM PAGE B

sold in drugstores, and also because they were slowly getting out of the affordable price range for kids. Comic books became incredibly tame, and the more sophisticated comics were direct sales to adults from the comics publishers.”

In 1940, a comic book was 10 cents, while the average hardcover juvenile book was $2.

“That’s a 20-to-1 price ratio. Now it’s not quite so generous – maybe 4- or 5-to-1. As it’s become an adult-focused format, kids have been priced out of the market.”

Recently, many publishers and creators of comics – including Spielberg and another Pulitzer Prize winner, Michael Chabon – have advocated reconnecting a juvenile audience with comics.

So far, those efforts have met with mixed success.

“If you look at the comics that are being mass-marketed to kids, Tilley said, “it’s mild, tame stuff with a strong commercial tie-in to another media format. There aren’t many stand-alone titles unless you go to a comic book store.”

The one exception is Manga, the Japanese version of comic books that has its own unique artistic and narrative style whose influence can be seen in the “Astro Boy” and “Sailor Moon” franchises.

“You are going to find a wide selection of Manga at most bookstores,” Tilley said. “That’s another part of comics that has taken off – one that kids have claimed as the format of choice for themselves.”

Although commercial publishers of comics have yet to recapture children’s imaginations, Tilley says that some librarians and teachers are increasingly discovering that comics can be used to support reading and instruction.

“In the last 15 years, we’ve seen some big changes. For instance, comic book publishers and distributors are showing up at library conferences and some review journals regularly evaluate graphic novels. That would have been unimaginable 20 years ago. So it has caught on, to some degree.”

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Only tax increases can cure Illinois budget woes, study says

By Jan Dennis
Business & Law Editor

T ax increases are the only solution to a widening budget crisis that a new study says has landed Illin- ois among the nation’s most financially troubled states, a soon-to-be-released report by a team of UI economists warns.

Illinois is among nine states spiraling toward an economic dis- saster that could rival California, where a $24 billion budget short- fall has netted IOUs, widespread layoffs and forced furloughs, ac- cording to a study released last week by the Pew Center on the States, a nonpartisan think tank.

With a roughly $11 billion budget gap of its own, Illinois can only duck a similar meltdown by raising taxes, says Daniel McMillen, an economist with the UI In- stitute of Government and Public Affairs who co-wrote an analysis of the state’s fiscal crisis for an upcoming report on critical issues facing Illinois.

“Eventually, I think we have to face up to the fact that Illinois has to have higher taxes,” he said. “It’s just not possible with major expenses like pension and Medicaid obligations that you simply can’t reduce.”

The best solution is a two- pronged plan that would boost sagging revenue by raising the state income tax and expanding sales-tax receipts through a new tax on services such as haircuts, plumbing repairs and health clubs, according to the report, co-written by IGPA economist Richard Dye and research assistant Nancy Hud- speth.

An income-tax increase, re- jected by lawmakers last summer, would also ease the state’s over reliance on sales tax, which lags the competitive service sector base narrow as Illinois’ economy has shifted toward services, Mc- Millen said.

“It’s better to have a mix of taxes rather than to rely on any one tax too heavily,” he said. “We have a budget that’s losing this gap and we have a sales tax that is not very broad based, so it’s really hurting state government.”

A sales tax on services could generate more than $7 billion an- nually, according to a report by a commission that provides finan- cial forecasts for the General As- semblty. A proposed 50 percent income-tax increase rejected in May would have netted $4 billion a year.

McMillen says tax increases are long overdue in Illinois, where budget shortfalls have been mounting for nearly a decade.

“It really should have been done 10 years ago, when the econ- omy wasn’t in bad shape,” he said. “But even though the recession is a bad time to raise taxes, I still think they need to do it right away.”

McMillen hopes the Pew Cen- ter’s tax forecast builds new sup- port for tax increases, among leg- islators and the public.

“Illinois has traditionally been in the middle of the pack in re- spects on states’ financial stability,” he said. “To be pushed down to the bottom 10 and to be compared with California could be a wake- up call.”

Male germ cells can be directly converted into other types

By Diana Yates
Life Sciences Editor

Re- searchers have found a way to directly convert spermatogonial stem cells, the precursors of sperm cells, into tissues of the prostate, skin and uterus. Their approach, described in the Journal of Clinical Investigation, may prove to be an effective alternative to the medical use of embryonic stem cells.

The hunt for alternatives to em- bryonic stem cells has led to some problematic and ethical issues, so researchers have found a way to directly convert spermatogonial stem cells (SSCs). Researchers recently observed, for example, that the SSCs grown in the laboratory will eventually give rise to a few cells that look and act like embryonic stem cells. This process can take months, however, and only a small percentage of the SSCs are converted into “embry- onic-like” cells.

Other researchers have used viruses to insert genes into SSCs that will spur them to turn into ES-like cells. But this approach is problematic and the use of viruses to ferry in the needed genes has caused concern.

The new method, recently de- veloped at the UI, takes advantage of the unusual interaction of two tissue types: the epithelium and the mesenchyme. (In adults, the connective tissue is called stroma.)

In the 1950s, scientists discov- ered that the epithelium takes its developmental instructions from the mesenchyme. For example, when researchers put bladder epithelial cells on the mesenchyme of a prostate gland, the bladder cells were changed into prostatic epithelium. The mesenchyme altered the fate of the bladder epithelium.

“The mesenchyme – it’s the di- rector; it’s controlling the show,” said UI veterinary biosciences professor Paul Cooke, who led the new study with postdoctoral researcher Liz Simon.

Cooke began the effort with what even he considered an un- likely proposition.

“We could take spermatogonial stem cells and cause them to di- rectly change into other cell types by putting them with various mes- enchymes and growing them in the body?” he said. “I thought it was possible, but I didn’t think it would work.”

The experiment did work, however. When Simon placed SSCs from mice with prostate mesenchyme and grated the combination into living mice, the SSCs became prostatic epithe- lium. When combined with skin mesenchyme and grown in vivo, the SSCs became skin epithelium. The researchers were even able to convert SSCs into uterine epi- thelium by using uterine mesen- chyme.

The newly formed tissues had all the physical characteristics of prostate, skin or uterus, and pro- duced the telltale markers of those tissue types, Cooke said. They also stopped looking and behaving like SSCs.

To assure that their tests were not contaminated with epithe- lial cells from the source of the mesenchyme cells, the research- ers stopped looking and behaving like SSCs.

Cell conversion Veterinary biosciences professor Paul Cooke cored research with postdoctoral researcher Liz Simon that may prove to be an effective alternative to the medical use of embryonic stem cells. The method uses the unusual interaction of two tissue types: the epithelium and the mesenchyme.
By Melissa Mitchell

Notion of lovesickness in Russian literature explored

Ideas that love that idea – especially the unrequited variety – and the passion associated with it could render one physically ill goes way back on the cultural-historical timeline. According to Valeria Sobol, a UI professor of Slavic languages and literatures, scholars have traced the concept of "lovesickness" all the way back to the Greeks.

"If one is exploring the topic in her recently published book "Febritis Erotica: Lovesickness in the Russian Literary Imagination" (University of Washington Press) – "Febritis Erotica" translates as "love fever" – Sobol said she was unaware that "there was this whole, ancient history behind this concept of lovesickness, with elaborate theories of how you develop this disease, and the 'scientific' mechanisms behind that."

"As it turns out, the connection made between love and illness – in both literature and medicine – is not limited to Western thought and philosophy. Russian literature – most notably, 19th-century novels – tends to be overpopulated with doctor characters, as well distraught young women (and some men) consumed with doctor characters, as well distraught young women (and some men) consumed with so much passion that their bodies just couldn't physically tolerate the heat."

"I became intrigued by the use of physiologically and the use of medical metaphors in Russian literature because it was such a big deal in the 19th century," Sobol said. The themes and language were so pervasive – in works ranging from Nikolai Karamzin's "Letter of a Russian Traveler" and Aleksandr Herzen's "Who Is to Blame?" to Leo Tolstoy's "Anna Karenina" – that "we often take lovesickness for granted in those novels."

"In real life, today, we may talk about depression" being the outcome of stress and anguish attributed to matters of the heart," she said. "But the fact that you could develop a tuberculosis or die as a result of love is too much for contemporary readers."

Not so, among readers of 19th-century Russian fiction, said Sobol, who noted that novels typically were published in thick journals, which also included a mix of scientific and philosophical articles, along with translated works.

"The interesting thing about tuberculosi-," she noted, "was that bacillus wasn’t discovered until 1881. So up until then, they really didn’t know what caused the disease, and often attributed it to the effects of lovesickness."

"As she studied the cultural, philosophical and scientific theories in vogue in Russia during the 19th century, as well as the early modern period that preceded it, Sobol discovered that the metaphors and literary devices employed by Russian writers could be traced to changes occurring within Russian society.

"In Russia and, in general, in Western Europe, there was such a rapid development of empirical sciences, starting from the 1840s on. It immediately pervaded literar-," she said, adding that "Russian literary writers were always interested in other developments outside of literature."

"They always tried to be more than just artists; they wanted to be preachers or phi- losophers or moral leaders, like Tolstoy, fa- mously."

In her book, Sobol argues that "through the use of lovesickness – because it engages the issues of mind, body and human nature – writers were able to indirectly address some of the most pressing issues of their time."

Among the issues Sobol confronted in her research was the tension that ap-, peared to exist between developments in the real world – where modern scientific and philosophical concepts were slowly beginning to gain acceptance – and the fictional realm, where love fever was still the rage.

"What justification did they have to per- mit that? That there might have been some view of the human being and the relation- ship between the physical and emotional realms to justify that connection, because emotion or passion from unfulfilled or re- jected love, can kill you – at least in the fic- tional accounts of the day," Sobol said.

Some of the enduring conflict, she be-, lieves, was borne from the reality that 19th-century Russia was an Orthodox Christian monarchy; therefore, science – including the disciplines of anatomy and physiology – was still regarded as suspect, and fraught with politically charged connotations.

In that swirl of competing changing ideologies, the location of the human soul – to which the emotion of love was often thought to be anchored – remained a conun- drum. And in many respects, Sobol noted, the mind-body connection continues to be a philosophical and cultural enigma, even today.

While the lovesickness eventually ran its course in Russian fiction, and "splinters into different paradigms," Sobol added that "the theme itself doesn’t really go away."

Curiously, Cupid continued to make his rounds – at least occasionally, on the Rus- sian literary circuit.

"There was a novel published in the 1990s, ‘Medea and Her Children,’ by Liudmila Ulitskaja, about a woman in the 1970s who develops strange allergies," Sobol said. "Lovesickness appears to be the likely cause for the character’s afflictions, which also include a high fever when touched by a man."

On the Web
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Exploring the Chicano/a family and its political and cultural history

A s both an idea and an institution, the family has been at the heart of Chicano/a cultural politics since the Mexican-American communities in the United States, said Rodríguez. "I wrote the book to address the impor-, tance of the family for collective empowerment but only as an institution flexible with respect to membership and insistent upon egalitarian principles," he said.

"Within the cultural-inspired literature, film, video, music, painting and other forms of cultural expression created by Chicano men and women, the book addresses the impor- tance of the family as both a social institu- tion and an organizing principle for Mexican-American communities in the United States," Rodriguez said. While writing the book I learned that the importance of the family as a means of collective empowerment is not exclusive to Latinos but rather common in diverse cultural and political situations.

"Ultimately the book argues for the value of the family for collective empower- ment but only as an institution flexible with respect to membership and insistent upon egalitarian principles," he said.

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On the Web
www.washington.edu/uwpress

Ad removed for online version
I space gallery features small portraits by UI artist

By Melissa Mitchell

When I space, the Chicago gallery of the UI’s Urbana campus, opened its doors to the public 17 years ago, Jerry Savage curried the inaugural exhibition of works by photographer and UI alumnus William Wegman.

Fittingly, Savage, an emeritus professor of art and design at Illinois, will return to curate one of the gallery’s final exhibitions, which opens Nov. 20.


Landscapes, still-life etchings of food and other works – some dating back to the 1960s – are included in the exhibition, along with photographs of the artist.

“A consummate draftsman, painter and printmaker, Bushman was unabashed about what Savage calls his ‘ Dionysian view of life,’ ” which he expresses consistently over the course of his career as an artist.

“David expressed this to me by stating that his life and art were about excess,” Savage said. “To him, more was more and less was less. David always tested limits. Would enough ever be enough?”

Savage noted that the works selected for the I space exhibition – despite their execution using a range of materials and processes – are bound by their similar characteristics of flow and flux.

The interactive exhibition features three large boxes constructed from vinyl siding, prefabricated wooden trusses and asphalt roof shingles.

“These constructs serve as frames for views onto drawings that show different opportunities on how one could engage construction materials in a broader discussion about architecture,” Hubeli said.

The drawings can be viewed through binoculars, which project visitors into the world of the drawings. And while looking at the drawings, visitors will be able to call a phone number to get more information on each drawing.

“The information explains how the building materials relate to broader issues, such as the financial crisis or migration,” Hubeli said.

An opening reception for both exhibitions is scheduled for 5-7 p.m. on Nov. 20 at the gallery, 230 W. Superior, Chicago.

I space gallery hours are Tuesdays through Saturday, 11 a.m. to 5 p.m.

The new exhibitions will remain open until the gallery closes on Dec. 19.

According to I space director Mary Antonakos, the university’s School of Art and Design and School of Architecture will continue programming in Chicago in temporary venues in the future.

Information about upcoming art and architecture exhibitions and events will be available on the I space website and Facebook group page.

STEM CELLS, CONTINUED FROM PAGE 11

ers repeated the experiments using a mouse whose cells contained a gene that fluoresces green under ultraviolet light. The SSCs were obtained from a green-fluorescing mouse, but the mesenchyme came from a non-fluorescing mouse. This enabled the researchers to trace the fate of the SSCs. If the newly formed prostatic epithelium gloved green even though the mesenchyme did not, for example, the researchers knew that the SSCs had been converted into prostatic epithelium.

Cooke hopes that a more streamlined approach can be developed that makes use of a man’s own SSCs and stroma (the adult equivalent of the mesenchyme) to produce new skin cells or other tissues when needed – for example, to replace skin damaged in a burn. And his team is investigating the use of ovarian stem cells instead of SSCs to see if the same results can be obtained with ovarian tissue.

This work was supported by the Billie A. Field Endowment, the UI and the National Institutes of Health.
**CALENDAR, CONTINUED FROM PAGE 14**

**Sports**

- **To confirm times, go to** [www.sportsinfo.illinois.edu](http://www.sportsinfo.illinois.edu)

**Friday**

- **Volleyball**
  - UI vs. Iowa: 7 p.m. Huff Hall

**Saturday**

- **Men’s Basketball**
  - UI vs. Fresno State: 8 p.m. Assembly Hall

**Wednesday**

- **Women’s Basketball**
  - UI vs. Bradley: 1 p.m. Assembly Hall

**Tuesday**

- **Men’s Basketball**
  - UI vs. Wofford: 8 p.m. Assembly Hall

**Saturday**

- **Football**
  - UI vs. Illinois State: 6 p.m. Assembly Hall

**Sunday**

- **Gymnastics**
  - UI vs. West Virginia: 2 p.m. Assembly Hall

**Friday**

- **Women’s Basketball**
  - UI vs. Presbyterian (Las Vegas Invitation): 6:05 p.m. Assembly Hall

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Mimicking nature, scientists can now extend redox potentials

By James E. Kloeppel
Physical Sciences Editor

ew insight into how nature handles some fundamental processes is guiding researchers in the design of tailor-made proteins for applications such as artificial photosynthetic centers, long-range electron transfers, and fuel-cell catalysts for energy conversion.

From rusting iron to forest fires to the beating of a human heart, oxidation-reduction reactions (redox), which transfer electrons from one atom to another, are at the heart of many chemical and biological processes. Each process requires a particular redox potential, just as different electronic devices can require their own special battery.

How nature fine-tunes these potentials over a broad range with little change to the protein’s electron-transfer properties or efficiency has largely remained a mystery.

Now, a team led by UI chemistry professor Yi Lu has unearthed nature’s secret, and has utilized it to their advantage. The researchers describe their work in a paper that appeared in the Nov. 5 issue of the journal Nature.

“We show that two important interactions, hydrophobicity (water repelling) and hydrogen bonding can be adjusted to change the redox potential of a protein,” Lu said. Hydrophobicity, a measure of how water-repelling a surface is, is a chemical property that does not change for a given protein. Hydrogen bonding is a secondary interaction that acts on specific subsites of the protein and can be enhanced by binding the protein to other molecules, but is not a property of the protein itself.

“I say that we have a redox agent that we can use to control the redox potential, or with a potential somewhere in between,” Lu said. “We extended the range both above and below what had previously been found in nature.”

Similar to the way that rusting iron can change from red to brown, redox proteins change potential with each electron transfer. This is due to the copper ion in the protein and how it binds to the protein’s surrounding structure. Secondary structures such as helices engage with other proteins to effect the redox potential.

Cupredoxins use a single redox-active center, whose reduction potential is tunable without compromising other electron transfer properties or the efficiency. Cupredoxins are redox-active copper proteins that play crucial roles in many important processes, such as photosynthesis and cell signaling.

The researchers found that two interactions — hydrophobicity and hydrogen bonding — can selectively raise or lower azurin’s redox potential. The interactions occur not in the metalloprotein’s innermost, primary core, but in a secondary sphere that surrounds the primary core.

Increasing the hydrophobicity in the secondary sphere can significantly increase the redox potential, the researchers report. The water, the more the overall charge density around a residue that binds the copper ion becomes destabilized and the higher the potential becomes.

The effect of the hydrogen bonding interaction is subtler than the effect of hydrophobicity, Lu said. Hydrogen bonding can either increase or decrease electron densities around a residue that binds the copper ion in azurin, making the copper ion either easier or harder to reduce and thus slightly changing the redox potential.

“The result is a tailor-made redox agent that can be set with a very high potential, a very low potential, or with a potential somewhere in between,” Lu said. “That by adjusting the hydrophobicity and the hydrogen bonding, we can raise or lower the redox potential, without changing the protein’s electron-transfer properties or decreasing the protein’s efficiency.”

The research was funded by the National Science Foundation and the Frederick Seitz Materials Research Laboratory, and the Center of Biophysics and Computational Biology. The National Science Foundation and the National Institutes of Health funded the work.