Global Partnerships

Administrators travel abroad building relationships, creating partnerships

By Mike Holenthal
Assistant Editor

W ith trips to Brazil, China and India last semester, Chancellor Phyllis M. Wise saw firsthand the length of the U. of I.’s international reach.

“I’ve always known that Illi- nois is a global university with a presence in countries throughout the world,” Wise said. “But these trips made me realize how deeply engaged we are in these countries. It was a real reminder of our reach, which is broad, deep and impactful.”

Wise’s first out-of-country trip as the Urbana campus’s top official was to Brazil in September as part of a trade and tourism mission sponsored by Gov. Pat Quinn’s office. That was followed by an October trip to China and a December trip to India.

While the 30-person Brazil delegation was created to focus on the state’s already established business and commercial connections, Wise said the topic of higher education also was at the forefront.

The U. of I. already has a growing alumni base in Brazil, she said, and it could increase more if Brazil’s new Science Without Borders – a scholarship program sponsored and funded by the Brazilian government that brings students to study at U.S. universities – is successful.

“The governor believes higher education is something we can export,” she said, noting Brazil’s minister of education also was present for the trip.

“I felt very privileged to be a part of it,” she said. “We were promoting the state, and I promote the university and our campus wherever I can.”

Author Wise led a university-sponsored delegation on a five-day tour of four Chinese cities, which culminated in a speech before the China 9 Consortium, a group of China’s top research universities.

“We had 26 meetings in five days,” she said, all of them aimed at developing research partnerships and corporate relationships, and forming a stronger relationship with the 20,000 U. of I. alumni who call China home.

“It was a great opportunity to make new connections and to build on the connections we have already established,” she said.

The Urbana campus has a relationship with China that dates back to the beginning of the 20th century, and the university has for years been a national leader in the number of Chinese students who attend Illinois.

Wise said conversations have led to the idea of the university establishing an office in China to further foster the long-standing relationship. And there are plans under way to establish a Confucius Institute on campus devoted to Chinese learning and culture.

“It wasn’t Wise’s first visit to China (she previously represented the University of Washington to the country),” she said. “She had the format of the six-day India trip was similar to the China endeavor, in that meetings with leaders of industry, education and government were arranged in several cities.

In India, Wise was introduced to several of the exchange programs being implemented between India and the university; she was offered opportunities to meet with prominent alumni; and she toured rural schools participating in a microloan and literacy initiative started by Madhu Viswanathan, a faculty member in the College of Business.

“Pradeep Khanna, the associate chancellor for public engagement, who planned the trip, said the university had had a relationship with India since the 1950s and would like to continue expanding that partnership.”

“Warm welcome Chancellor Phyllis M. Wise is greeted in India in December as she tours the offices of a literacy initiative started by Madhu Viswanathan, a faculty member in the College of Business.

Wise visited cities in Brazil, China and India last fall in an effort to build on longstanding academic, corporate and alumni relationships.

“It was the chancellor’s first trip to India so we wanted to impress upon her how important this country is for our campus,” Khanna said. “We already have strong ties with several Indian Universities and it’s something we’re always working to develop. The goal is to find ways to grow these.”

Strength training improves vascular function in young black men

By Diana Yates
Life Sciences Editor

S ix weeks of weight training can significantly improve blood markers of cardiovascular health in young African-American men, researchers report in the Journal of Human Hypertension.

The researchers measured blood markers associated with inflammation; the response or the remodeling of arteries that normally occur after tissue damage, infection or other types of stress. They found that levels of two of these markers dropped significantly in African-American men but not in Caucasian men.

“This suggests that resistance exercise training is more beneficial in young African-American men than in Caucasian men of the same age,” said Bo Fernhall, the dean of the College of Applied Health Sciences at UIC. Fernhall led the study as a professor in the department of kinesiology and community health at the Urbana-Champaign campus. The 14 African-American and 18 Caucasian study subjects were matched for body mass index, cardiovascular fitness and age. None had previously been trained in endurance or resistance exercise.

African-Americans are known to have higher rates of cardiovascular disease than Caucasians, Fernhall said. In particular, “hypertension, stroke and kidney disease are much, much higher in the African-American population,” he said.

Some of these problems start young. “Higher blood pressures in African-American children have been shown as young as 8 to 10 years of age,” Fernhall said.

“So there’s obviously something going on that predisposes the African-American population to end-stage disease, hypertension and stroke and the more debilitating diseases later on in life.”

A previous study led by Fernhall and his doctoral student Kevin Heffernan (an author on the new paper as well) found that resistance training reduced levels of C-reactive protein (CRP) in the blood of African-American, but not Caucasian, men.

This protein is a reliable marker of systemic inflammation. Levels of CRP rise after injury or infection, and chronically elevated levels are sometimes associated with heart disease and cancer.

The new study looked at other markers that could signal trouble in the arteries: MMPs, which help remodel blood vessels after injury or infection; and 8-isoprostane, a marker of oxidative stress involving chemically charged ions or molecules called free radicals.

Fighting staph

Researchers have discovered a new compound that overcomes drug-resistant Staph infection in mice.

FISCAL CLIFF

According to a U. of I. expert, the fiscal cliff bill passed by Congress settles most of the significant tax issues for the average taxpayer.

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University of Illinois officials advocate keeping job classification authority

By Mike Holenthal
Assistant Editor

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eakers at the U. of I. presented a united front at a Jan. 3 State Univer-
sities Civil Service System public hearing urging SUCSS officials to recommend that job classification exemp-
tion authority be left with universities. The SUCSS Merit Board, which audits employees' pay rates every two years, is in-
extpected to decide at its Jan. 30 meeting on a proposal to take back exemption authority. That is why State Univer-
sities' exemption authority began in earnest following the most recent SUCSS audit of the process, which officials said uncovered instances of abuse within the system state-
wide and the incorrect categorization of too many positions as academic professional. The most recent audit process conducted at the Urbana campus reported that 122 of 200 investigated positions should be reclassi-
ified.

Universities were granted the authority to exempt employees from the civil service system about 15 years ago, but only if spe-
cific skill positions warranted the reclassifi-
cation. Maureen Parks, the university's execu-
tive director and associate vice president for human resources, said there is room for improvement in the exemption and auditing process.

"In looking at the most recent audit re-

sults for each state university, it is clear that the human resources leaders need consistent guidance," Parks said. "We are working to stand-
fully the SUCSS protocols and mathemati-
cal equation used as an audit standard," she
said. "We welcome this assistance.

But, she added, entirely taking exemp-
tions away from local campus officials would damage the institution's ability to nimby fill positions unique to higher edu-
cation. "We know that in order to serve our campuses in the manner that they require, exemption decisions must remain localized with each employer," she said. "The staffing
needs of each campus can vary tremen-
dously, based on differences in institutional missions and culture."

"If more than half of an organization's em-
ployees sign cards expressing interest in form-
ing a union, the union is given the power to bargain for all of the employees, even those who did not sign a card.

Peter Schnell, the university's vice chancellor for research, said eliminating the exemption authority would have implications for science-based and re-
search jobs — which include highly special-
ized positions. "It is incompatible with the degree of generaliza-
tion routinely employed for positions in the civil service system," he said.

"The bottom line for us is that delays in receiving classification decisions from the SUCSS office will have a serious impact on our ability to serve our students, conduct our research and care for our patients," he said. "This is unacceptable."

He recommended keeping the current system, but revising job descriptions and hiring guidelines in an effort to improve the exempt and audit process.

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Inside Illinois

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On the Job

Angie Wisehart
By Mike Helenthal
Assistant Editor

Not unlike the scientists of the institute’s Biomechanics Laboratory, Angie Wisehart on any given day can be found digging in something new as an administrative assistant in the PRI director’s office.

Unlike the scientists, Wisehart’s excavation work isn’t done by pick, shovel or dissolved oxygen probe, but over the phone and by computer.

“I’m very organized, so I can find things quickly when a question arises,” said Wisehart. “I’ve tried to pay pretty close attention to even the small details.”

Wisehart started in 1998 as extra help for the Office of the Vice Chancellor for Research and was hired permanently by that division in 2008.

Three years later she moved to the Office of the Chancellor and then to the Office of Sponsored Programs and Re- search in 2005 before being hired at PRI in 2008.

Wisehart was a veritable sponge at those previous job locations, learning how to navigate the institutional obstacles that can keep things from getting done.

At PRI, while minimal knowledge was doubly important to PRI at the time Wisehart arrived because officials were steeped in the process of moving the state’s primarily historical, archaeological and geological surveys, as well as the Illinois Sustainable Technology Center, into a single utility agency.

“I think it was helpful that I was already versed in university administrative policy and procedures when I started here,” she said. “I think that’s one of the reasons they brought me in for this job.”

The details of Wisehart’s job entail day-to-day office management, which includes scheduling meetings, making travel arrangements and Web page maintenance.

Special events like the Naturally Illinois Expo held in March and last fall’s Prairie Lightning Symposium bring with them ongoing planning components for Wisehart that can pop up any time.

With some 50 exhibits and a public open house featured (and held in conjunction with events at the colleges of Agricultural, Consumer and Environmental Sciences and of Engineering), the expo means extra work for everyone.

But Wisehart said these events also present the opportunity for co-workers to see up close the groundbreaking scientific endeavors their efforts support.

“People really want to see what the scientists are doing and it makes you proud to be a part of it, even if in a small way,” she said. “I don’t have a scientific background, but I find the work they do here very interesting. I would encourage anyone to attend the expo. It’s really enjoyable.”

Wisehart serves four administrators, all of whom she said are a pleasure to work with.

“They’re excited about the work they’re doing, and they love to share their excitement with others,” she said. “They make it easy for everyone to understand.

Prior to working at the university, Wisehart was employed as a teller supervisor at Busey Bank, eventually transferring to the student loan department and card services division.

She has lived in Mahomet all of her life, is married and has an 18-year-old daughter who is an avid pageant participant and a 10-year-old son who is heavily involved in sports.

“They keep us really busy,” she said.

Still, Wisehart has found time to return to school, where her goal is to earn a general studies bachelor’s degree from Eastern Illinois. She said the studies have gone more slowly in recent years as the children became involved in school activities – but she is committed to finishing the degree.

“It’s not a top priority for me right now but I want to finish it for my own satisfaction,” she said. “With a family, I felt like I couldn’t do both as well as I wanted.

What she most enjoys are nice, slow Sundays where she is able to find a good book to curl up with on the couch.

“Sundays are my day and I don’t even leave the house if I don’t have to,” she said.

On the Job features UI staff members. To nominate a civil service employee, email insides@illinois.edu.

Family plays part in reducing stress for young Mexicans
By Shailita Forrest
News Editor

Family members may play a unique and influential role in helping Mexican youth reduce the association between stress and depressive symptoms, according to a study by Mexican scientists at the Universidad Autonoma de Mexico.

More than 6,700 Mexicans ranging in age from 16 through 21 participated in their study reported that family members were their most important source of emotional support. They note that young people received from family members may play a unique and powerful role in meeting the mental health needs of Mexican youth.

The study is part of an ongoing collaborative research project called UP-AMIGOS (University of Puerto Rico: A Multidisciplinary Investigation on Genetics, Obesity and Social-environ- mentalism), which is examining factors among Mexican college students that are linked to health outcomes and ame- nable to intervention.

The study appeared in a recent issue of the Journal of Research on Adolescence.

Other co-authors of the study at Illi- nois: Flavia C.D. Andrade, a professor in the department of kinesiology and community health, Angela K. Wiley, a faculty member in the department of hu- man and community development; and graduate student Laura L. Edwards.

Co-authors at Universidad Autono- ma de San Luis Potosi: Omar Sanchez-Armass, a faculty member in the depart- ment of psychology; and Celisa Ariadna- las-Garcia, a professor in the School of Medicine.

On the Job

By Mike Helenthal
Assistant Editor

WEIGHT TRAINING, CONTINUED FROM PAGE 1

Researchers are seeing an upturn. Both men and women went down in the African-Americans, but not the Caucasians, after resistance training.

The researchers were surprised to see that initial levels of MMP-9 were lower in African-Americans before the weight training.

“It may be that MMP-9 has a different effect on the vasculature of African-Americans than it does on Caucasians,” said Illinois doctoral student Mark Cook, who conducted the new analysis. “We don’t know.”

The decrease in MMP-9 was signifi- cantly correlated with the increase in mus- cle strength in the African-American men, Cook said. He sees the reduction in MMP-9 and 8-isoprostane as a positive outcome in the African-American men.

Previous studies showed that “aerobic exercise actually reduces oxidative stress, and reduces isoprostane,” Cook said. “But nobody had a clue about resistance train- ing.”

Cook said he now knows what to say to African-American men who ask him why they should exercise.

“If you don’t like cardiovascular exer- cise, if you don’t like running on a tread- mill, if you can’t play basketball or you’re not good at it, you can lift weights and im- prove your health, especially when it comes to high blood pressure, which happens to run in our family,” he said. “If you just want to lift weights and you do it on a regular ba- sis, you could improve your function.”

“The overall goal of our departmental research here at the U. of I. is to explore the use of exercise as adjunct therapy for disease, while providing a public health message and evidence about how exercise is beneficial, even at an early age,” said Illinois kinesiology and community health professor Jeffrey Woods, a co-author on the study.

This work was partially funded through the National Institutes of Health and the American Heart Association.
**Expert: Internet gambling could enable money laundering**

By Phil Ciciora

Internet gambling, U. of I. emeritus professor John W. Kindt says legislation that would de-criminalize Internet gambling could facilitate money laundering by terrorists and organized crime.

"Illinois is the first state to legalize online lottery tickets, so legalizing other forms of online gambling would be the next logical step, especially considering the budget crunch the state faces," he said. "The statehouse is teeming with gambling lobbyists and advocates.

But cities and states cannot gamble their way to prosperity -- whether it's in a real-life or virtual casino, Kindt says. "Internet gambling in particular shrinks the consumer economy and destroys consumer confidence by promoting a ubiquitous gambling philosophy," he said. "Legalizing online gambling would allow dubious parties to create a queue of speculative bubbles in international stock markets that could collapse the already fragile financial systems and destabilize essential international economic security."

Kindt likens gambling to "an economic cancer" that would only metastasize with more Internet gambling.

"Here's an example: The so-called Congressional Gaming Caucus used the 9/11 tragedy to cripple the 2002 Economic Stimulus Bill with $40 billion in tax write-offs for slot machines and associated electronics -- and the caucus had originally asked for $133 billion in tax write-offs," he said. "These recurring write-offs for slots are still draining the U.S. Treasury and could easily be transposed into more write-offs for Internet gambling technologies."


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**Nanofibers clean sulfur from fuel**

By Liz Ahlberg

Sulfur compounds in petroleum fuels have met their nano-structured match.

U. of I. researchers developed mats of metal oxide nanofibers that scrub sulfur from petroleum-based fuels more efficiently than traditional materials. Such efficiency could lower costs and improve performance for fuel-based catalysis, advanced energy applications and toxic gas removal.

Co-led by Mark Shannon, a professor of mechanical science and engineering at the U. of I. until his death this fall, and chemistry professor Prashant Jain, the researchers demonstrated their material in the journal Nature Nanotechnology.

Sulfur compounds in fuels cause problems on two fronts: They release toxic gases during combustion, and they damage metals and catalysts in engines and fuel cells. They usually are removed using a liquid treatment that adsorbs the sulfur from the fuel, but the process is cumbersome and requires that the fuel be cooled and reheated, making the fuel less energy efficient.

To solve these problems, researchers have turned to solid metal oxide adsorbents, but those have their own sets of challenges. While they work at high temperatures, eliminating the need to cool and re-heat the fuel, their performance is limited by stability issues. They lose their activity after only a few cycles of use.

Previous studies found that sulfur adsorption works best at the surface of solid metal oxides, so graduate student Ma- yuak Behl, from Jain’s group, and Junghoon Yeom, then a postdoctoral researcher in Shannon’s group, set out to create a material with maximum surface area. The solution: tiny grains of zinc titanate spun into nanofibers, uniting high surface area, high reactivity and structural integrity in a high-performance sulfur adsorbent.

The nanofiber material is more reactive than the same material in bulk form, enabling complete sulfur removal with less material, allowing for a smaller reactor. The material stays stable and active after several cycles. Furthermore, the fibrous structure grants the material immunity from the problem of sintering, or clumping, that plagues other nano-structured catalysts.

"Our nanostructured fibers do not sinter," Jain said. "The fibrous structure accommodates any thermophysical changes without resulting in any degradation of the material. In fact, under operating conditions, nanotubes grow from the parent fibers, enhancing the surface area during operation."

Jain’s group will continue to investigate the enhanced properties of nanofiber structures, hoping to gain an atomically-level understanding of what makes the material so effective.

"We are interested in finding out the atomic sites on the surface of the material where the hydrogen sulfide adsors," said Jain, who is also affiliated with the Beckman Institute for Advanced Science and Technology at the U. of I. "If we can know the identity of these sites, we could engineer an even more efficient adsorbent material. The atomic or nanoscale insight we gain from this material system could be useful to design other catalysts in renewable energy and toxic gas removal applications."

This work was supported by the National Science Foundation, the department of chemistry and the Frederick Seitz Materials Research Laboratory at the U. of I. ◆

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**Cleaner fuel**

Nanofibers of metal oxide provide lots of highly reactive surface area for scrubbing sulfur compounds from fuel. Sulfur has to be removed because it emits toxic gases and corrodes catalysts.

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**Better scrubber**

The nanofiber scrubbers created by chemistry professor Prashant Jain’s team work much more effectively than traditional materials. The study was co-led by Mark Shannon, a professor of mechanical science and engineering until his death this fall.
The filibuster used to be a difficult maneuver, requiring someone to hold the Senate floor through continuous talking, and it was rarely used. Now just the threat of a filibuster does the trick. Why and when did a rule favoring the minority get so easy to employ?

Technically, a filibuster is any action that delays setting the time to vote on a piece of legislation. Before the 1960s, the filibuster was a true game of exhaustion. The minority was required to hold the floor by continuously speaking. This meant that the speaking senator had to literally stand at his desk and talk constantly without taking any breaks or even moving about in the Senate chamber.

At the same time, the majority had to ensure that they had enough senators on hand to form a quorum at a moment’s notice. If the majority could not form a quorum, the session would come to a halt.

The costs of waiting out a filibuster came to a head when civil rights legislation came to the fore. Senators realized that a strong, determined and organized minority could paralyze the Senate and senators themselves for weeks. The costs of a quorum, the session would come to a halt.

For these reasons, the majority decided that instead of waiting out a filibuster, it was going to utilize a cloture rule originally adopted in 1917. The approval of a cloture rule ends the debate and terminates any filibuster. This is the rule that we are familiar with today because cloture requires 60 votes. Thus, the magic number for the passage of any contested legislation is 60, not 51. There have been many threats and attempts since then to reform the filibuster, from Democrats and Republicans. Why has it never happened?

The reality is that senators have chosen to maintain the filibuster at times when they had the opportunity to change the rules. Basically, the filibuster provides individual senators with leverage and bargaining power. Even the threat to filibuster can get senators concessions from the opposition, the House and the president. It increases the visibility of a particular senator or brings an issue to the public’s attention.

Is it fair to say the Senate has become truly dysfunctional under the current rules? Or is that just partisan talk from Democrats frustrated by Republican success in blocking their agenda?

In theory, a filibuster promotes bipartisanship and compromise. As mentioned earlier, both parties have used the filibuster to their advantage to extract concessions. However, the intensified polarization we have witnessed during the last 10 years, reflected in the skyrocketing use of the filibuster, means that the minority has the incentive to stick together with virtually no negative consequences. The reality is that senators can avoid a vote on a bill or nomination by simply sending a letter to the party leader indicating their intent to filibuster. The paralysis caused by filibustering is more damaging when the economic crises like the one we are experiencing demand urgent legislation.

What changes in the rules related to the filibuster would have the most effect on the movement of legislation and other business through the Senate?

There are different things that could be modified. The most oft-cited solution is to simply change the number of senators necessary to invoke cloture (that is, end the filibuster) from 60 to 51. Other alternatives focus on putting the burden of filibustering almost entirely on the minority. Examples of this include requiring the minority to gather 41 votes to keep the debate going, or requiring the majority to have only one senator physically present on the floor while the minority engages in a filibuster. By shifting the cost of filibustering to the minority, the hope is that opposition for the sake of opposition will be precluded.
Curbing car travel could be as effective as cutting calories

By Chelsey Coombs
News Bureau

Researchers report that changes in social well-being are closely tied to one’s personality, with positive changes in one corresponding to similar changes in the other. Their study reveals potential new mechanisms that can help individuals thrive as they age. Their findings appear in Social Psychological and Personality Science.

Psychologists often use the “big five” traits – extraversion, openness to experience, conscientiousness, agreeableness and neuroticism – to describe personality. A person who scores high in conscientiousness is organized, responsible and hardworking. Although previous research has linked personality traits with eating behavior, no one has examined if changes in personality may lead to changes in eating habits, which are related to obesity reduction, which implies that both daily automobile travel and caloric consumption are related to body weight.

The researchers developed a multivariable model to predict the health of an individual based on their personality traits, travel habits and dietary practices. The model predicted an associated decrease in BMI that predicted by the model, could represent a modest decrease in BMI, like that predicted by the model, could result in significant cost savings. If drivers nationwide traveled 1 mile less by car each day, those who only would fuel consumption fall, but annual health care costs could drop by billions of dollars as fewer people would be classified as obese or overweight. Jacobson estimates.

“The most important thing for people to learn from this study is that they have a choice,” Jacobson said. “One has to be just as careful as when you choose to drive as when you choose to eat. These small changes in our driving and dietary habits can lead to long-term significant changes in social well-being.

“If you change the traits that help you in your social life, your social life also improves. Similarly, if you improve your social life, you might improve the way people see you,” said Jacobson. “We believe that the changes in our driving and dietary habits can lead to long-term significant changes in social well-being.”

Car travel could be as effective as cutting calories.
New compound overcomes drug-resistant Staph infection in mice

By Diana Tate
Life Sciences Editor

Researchers have discovered a new compound that restores the health of mice infected with methicillin-resistant Staphylococcus aureus (MRSA), an otherwise dangerous bacterial infection. The new compound targets an enzyme not found in human cells but which is essential to bacterial survival.

The research team, led by scientists at the U. of I. and the University of California at San Diego, reports the new findings in the Proceedings of the National Academy of Sciences. The team discovered and developed several compounds that are promising leads for antibacterial drug development, and the most potent was tested in mice infected with MRSA.

The rise of antibiotic-resistant bacterial infections is a global public health problem, said U. of I. chemistry professor Eric Oldfield, who led the research with UC San Diego professor Andrew McCammon.

“There’s an urgent need for more antibiotics because of drug resistance,” Oldfield said. “There are, for example, completely drug-resistant strains of tuberculosis. None of the current drugs against these strains of tuberculosis, and so, if you get it, you die.”

Other infections, such as gonorrhea, which once were easily cured with antibiotics, are also becoming resistant to treatment, Oldfield said. “And Staph itself actually kills more people in the U.S. than does HIV/AIDS.”

To begin the study, McCammon and his colleagues at UC San Diego used computer simulations to look for potential chinks in the armor of a bacterial enzyme known as FPPS that aids in bacterial cell wall formation. The researchers then screened libraries of small molecules to identify some that might target those sites and interrupt the activity of FPPS. Oldfield’s team tested some of these molecules against FPPS, but found that they were not particularly potent inhibitors of the enzyme.

“We tested the most promising compound against the next enzyme in the pathway, and we found that it was 20 times more active against that enzyme,” Oldfield said.

That enzyme, called UPPS, “is important because it’s involved in bacterial cell wall biosynthesis,” he said. “And a lot of the antibiotics that we have – drugs like penicillin, methicillin, vancomycin – all target bacterial cell wall biosynthesis.”

Graduate student Wei Zhu and research scientist Yonghui Zhang worked with Oldfield to develop and test new analogs of the compound that worked against UPPS.

“And we found that one was about 1,000 times more active than the first hit we had against FPPS,” Oldfield said.

Illinois chemistry and Institute for Genomic Biology professor Douglas Mitchell said, “The new compound against regular and drug-resistant S. aureus in cell culture and found that it had potent activity against both.”

He also found that it augmented the effects of methicillin in methicillin-resistant Staph infections, Oldfield said.

“Twenty out of 20 animals survived if they were treated with this drug lead and zero survived if they weren’t treated,” Oldfield said.

More years of study will be needed to determine whether this compound or others like it will be effective in humans, Oldfield said, but the findings may allow scientists to target multiple enzymes essential to bacterial survival, thus reducing the likelihood that new forms of drug resistance will emerge.

The National Institutes of Health, National Science Foundation and Howard Hughes Medical Institute supported this research.

Engineers roll up their sleeves ... and their inductors

By Liz Ahlberg
Physical Sciences Editor

In the road to smaller, high-performance electronics, U. of I. researchers have smoothed one speed bump by shrinking the size of key components, yet notoriously large, component of integrated circuits.

Three-dimensional rolled-up inductors have a footprint more than 100 times smaller without sacrificing performance. The researchers published their new design paradigm in the journal Nano Letters.

“It’s a new concept for old technology,” said team leader Xiuling Li, a professor of electrical and computer engineering at the U. of I.

Inductors, often seen as the sprawling metal spires on computer chips, are essential components of integrated circuits. They store magnetic energy, acting as a buffer against changes in current and modulating frequency, Li said.

“We’re making 3-D structures with 2-D technology,” Li said. “Instead of spreading experimental data show strong correlation with the modeled designs.

“The once we have optimized this process, we should be able to make an integrated circuit with a completely different platform that could be much smaller,” Li said. “It’s an ambitious goal.”

The Illinois research team, in collaboration with electrical and engineering professor Jose Schutt-Acinney, developed a new design paradigm for inductors. The design can be adjusted to fit target parameters including metal thickness and type, frequency, tube diameter and number of turns. According to Li, this technique could be used for capacitors and other integrated circuit elements as well.

Now, Li’s group is working to produce high-performance prototype circuitry. The research team, which Li said is expanding the number of collaborators involved in the work, is reaching out to industry. The research is also being conducted in collaboration with electrical and computer engineering professor Doug Kim, professor of physics at the University of Illinois at Urbana-Champaign.

“Once we have optimized this process, we should be able to make an integrated circuit with a completely different platform that could be much smaller,” Li said. “It’s an ambitious goal.”

The Illinois researchers developed a new design paradigm for inductors. Processed while flat, the inductors then roll up on their own, taking up much less space on a chip.

Shrinking footprint

Illinois researchers developed a new design paradigm for inductors. Processed while flat, the inductors then roll up on their own, taking up much less space on a chip.

On a roll

Experimental images of a self-rolled inductor, printed on a very thin film of silicon nitride.

Events to commemorate MLK, Emancipation Proclamation

Several upcoming programs and events commemorate the legacy of civil rights leader Martin Luther King Jr. and the sesquicentennial of the Emancipation Proclamation.

“One of the key objectives of this commemoration is to draw upon the Emancipation Proclamation and its legacy, along with the work of Dr. King, and to reflect on the meaning of freedom today,” said Chancellor Phyllis M. Wise in a massmail to the campus.

“‘The sesquicentennial is an appropriate moment to reflect on the progress and the work that remains in combating invidious discrimination and fulfilling the promise of freedom throughout the global community.”

Featured events include an art exhibit by the U. of I. Black Chorus and the Illinois Symphony Orchestra, a screening of the film “The Shoemaker’s Fiend” and a celebration in the art gallery.

Myrlie Evers-Williams with performances by the U. of I. Black Chorus and the Illinois Symphony Orchestra.

“We are fortunate to be part of a campus where the arts and education so easily and beautifully intersect to create new ideas and foster different perspectives,” Wise wrote. “I don’t think we could find a better showcase of that creativity than we’ll see in these upcoming events.”

Primary sponsors of the events are the Office of the President and the Office of the Chancellor, the Office of the Provost and the Office of Public Engagement.

ON THE WEB
http://inclusiveillinois.illinois.edu/mlk/emanproc.html
Fiscal cliff deal yields tax certainty at expense of simplification

By Phil Ciclera Business and Law Editor

Although major battles over spending cuts and raising the federal debt limit have been fought for another two months, the fiscal cliff bill passed by Congress settles most of the significant tax issues that would have an immediate and direct impact on the average taxpayer’s pocketbook, a U. of I. expert on taxation and retirement issues says.

“Perennial issues like the alternative minimum tax now have a permanent solution, while many extremely important tax parameters like the rate structure and the treatment of capital gains have been settled,” said Kaplan, the Peer and Sarah the treatment of capital gains tax benefit is largely preserved. “Indeed, many new ones were added for specific industries and their effective tax rates rise, but their rates were reactivated,” he said. “Not a single deduction or credit was eliminated,” he said. “Yet, despite all of the campaign talk about taxes paid by very wealthy individuals, this new legislation does not really address that issue. The Warren Buffett and the Koch Brothers of the world keep their effective tax rates rise, but their rates still be well below the rates applicable to less wealthy people because the capital gains tax benefit is largely preserved.”

The new law does, however, provide both increased certainty and lower tax rates than if legislators had done nothing and extending a tax benefit related to Puerto Rican rum. Capital gains still receive preferential treatment, and the number of tax brackets his actually increased.

Fiscal cliff crisis The fiscal-cliff bill passed by Congress settles most of the significant tax issues that would have an immediate and direct impact on the average taxpayer’s pocketbook, says Richard L. Kaplan, the Peer and Sarah Pedersen Professor of Law at the U. of I. Pedersen Professor of Law at the U. of I. for more than 30 years, retiring in 1997. Memorials: American Cancer Society, cancer.org.


Robert Justin Edwards, 86, died Dec. 8 at Carle Foundation Hospital, Urbana. Edwards was a U. of I. football player in 1948. Memorials: The music department of the donor’s family to be distributed to missionaries.

Spurgeon was a U. of I. locksmith for 28 years, retiring in 1987 from the Division of Operation and Maintenance (now Facilities and Services). Memorials: Holy Cross School, 410 W. White St., Champaign, IL 61820, www.holycrossschool.org.

Carl R. Woese A memorial service for Carl R. Woese, who discovered a “third domain” of life, will begin at 3 p.m. Jan. 26 at the Levis Center. Woese, 84, died Dec. 30 at his Urbana home. Known for his discovery of a “third domain” of life, Woese joined the U. of I. faculty in 1964 as a professor of microbiology and served in that capacity ever since. He also was affiliated with the Institute for Genomic Biology. Memorials: Carl R. Woese Research Fund at the Institute for Genomic Biology. Contact Melissa McKillip, the director of development, at 217-333-4619.

Fiscal cliff crisis The fiscal-cliff bill passed by Congress settles most of the significant tax issues that would have an immediate and direct impact on the average taxpayer’s pocketbook, says Richard L. Kaplan, the Peer and Sarah Pedersen Professor of Law at the U. of I.
Jan. 17, 2013

American news coverage in the past has focused on Chávez’s autocratic tendencies, yet he has been re-elected twice in popular votes. How would you explain this?

For the last 14 years, Venezuelan politics have been dominated by Hugo Chávez and his Chavismo movement. He was first elected in 1998 when the country was in the midst of a severe socio-economic and political crisis. At that time, the conditions for a political rupture were ripe, helping to explain why a political outsider like Chávez was able to win the majority of the popular vote. Once in power, Chávez relied extensively on his charisma and populist leadership style, and on the use of institutions and resources of the Venezuelan government to build and maintain a large base of electoral support. This has brought him and his party, the United Socialist Party of Venezuela (PSUV), a number of electoral victories.

The regime that Chávez orchestrated defies neat conceptualization as democratic or authoritarian. What we have seen over the last years in Venezuela is how a democratically elected president has slowly but effectively worked to weaken the principles and institutions of liberal democracy. During Chávez’s rule, we have witnessed a growing concentration of powers in the hands of the president, the dwindling of institutional checks, the diminishing protection of civil and political rights, and the use of public-sector resources to benefit supporters and punish opponents.

Although Chávez has won three presidential elections, many scholars contend that Venezuela today is best characterized as a competitive authoritarian regime. In such a regime, incumbents amass so much power for their own political gain that challenging those incumbents in elections typically is a futile, even quixotic, endeavor. If Chávez dies or is unable to return to his duties, what should we expect in the transition?

This is a critical question, and the answer is necessarily uncertain. In the short-, and perhaps medium-term, I suspect that a likely scenario is that Venezuela will enter a period of “Chavismo without Chávez.” If the president cannot return to office, the constitution requires that a new election be held. Given the full control that Chávez’s party has over government institutions and the base of popular support that the party will inherit from Chávez, it seems likely that his political successor would win such an election. What is far less certain is how long “Chavismo without Chávez” could thrive.

Most observers of Venezuelan politics agree that there are two major factions within Chávez’s party. One is civilian, highly ideological, and closely aligned with Cuba. This faction’s leader is Nicolas Maduro, who was endorsed by Chávez as his heir. The second faction represents military and business interests. If Chávez does not return to office, a key question will be whether these two factions will continue to co-exist or splinter into openly competitive movements. While that dynamic plays out, a second key question concerns the extent to which Venezuela’s current political opposition would be energized by the prospects of competing in a political arena no longer dominated by Hugo Chávez.

The Venezuelan government is very dependent on revenue from its oil exports, and about 40 percent of those exports go to the U.S. – yet Chávez, especially during the Bush administration, has often spoken out forcefully against the U.S. and its policies. Why?

Chávez’s vociferous and radical rhetoric against the United States is an element of a populist political strategy that he uses to strengthen his leadership both domestically and regionally. This strategy has never affected U.S.-Venezuelan economic relations. Venezuela has always been a significant supplier of oil to the U.S. If the United States is reliant on Venezuelan oil, Venezuela is even more dependent on the U.S. market. Although the United States is nominally one of Chávez’s worst enemies, it is also Venezuela’s best client. There is a relationship of economic interdependence that has not been dramatically altered during Chávez’s tenure.

What might the end of Chávez in office mean for Latin America?

There is no question that Chávez has been influential throughout Latin America. Using resources from record-high oil prices, Chávez has followed a foreign policy course that includes initiatives that have moved Venezuela and other countries in the region away from their historic relationship with the United States. The future prospects of this foreign policy orientation will depend on the health of the Venezuelan economy and the willingness of Chávez’s successor to continue Venezuela’s regional activism.
Faculty Fellows Program
Apply for NCSA research collaboration
The Institute for Advanced Computing Applications and Technologies is seeking applicants for its Faculty Fellows Program, which provides seed funding for developing long-term research collaborations between U. of I. faculty members and staff members at the National Center for Supercomputing Applications.

Proposals can be submitted by individuals or by teams of Illinois faculty members from a variety of disciplines with overlapping interests or projects that are relevant to NCSA's strategic plan, including the exploitation of large data sets, genomics and innovative computing.

Proposals will be peer reviewed with particular attention to the scientific merit of the work, evidence of collaboration among Illinois faculty and NCSA staff members, and plans and prospects for future funding. It is expected that one proposal per faculty member or per team will be funded. Questions about individual proposals will be funded, depending on suitability and quality of proposals and available funding.

For complete details about the competition, including how to apply, go to http://iacat.illinois.edu/faculty_fellows. Applications are due Jan. 31.

Wellness Center
Healthy Weigh starts Jan. 29

New in 2013, Healthy Weigh participants at the U. of I. Campus Wellness Center will receive a personalized dietary consultation with a registered dietician as part of the program. This enhanced program begins on Jan. 29.

Healthy Weigh, the center’s weight-management program, allows participants to use the proper tools to lose weight safely and effectively. The program is not a diet, but a skill-building program that teaches the basics of effective weight management.

Participants will learn to monitor portion size, maximize success by keeping a food journal, set realistic goals, understand the role of physical activity, overcome barriers to weight management, and to shop, cook and eat healthfully.

The eight-week program meets Tuesdays from 5:15 to 6 p.m., starting Jan. 29. Sessions will meet in the Wellness Center in the Activities and Recreation Center.

The cost of the program is $100. This fee covers six weeks of program materials from the Instructional Kitchen, a personalized food analysis, dietary consultation with a registered dietician and a Healthy Weigh manual.

To register, contact the center at 217-265-9355 or email ui-wellness@illinois.edu.

Graduate College
2013-14 Focal Point proposals sought

The Graduate College invites proposals from faculty members of the U. of I. campus for 2013-14 Focal Points, projects that the full RFP is available on the Graduate College website at www.grad.illinois.edu/focalpoint. Focal Points seeks to stimulate the formation of intellectual communities of the graduate college and graduate students addressing topics that undergird important issues and problems. The RFP solicits proposals from a broad range of topics.

Proposals that are consistent with the college’s strategic plan and with the interests of the graduate college are encouraged. The college’s strategic plan includes the following areas:

- In support of the renewed campus effort on diversity, the Graduate College is interested in collaborating research communities that promote diversity initiatives in graduate education. Such projects may also propose collaborations with domestic institutions to enhance diversity in graduate education.
- In collaboration with the Academy of Entrepreneurial Leadership, the Graduate College also seeks projects that highlight and build entrepreneurship activities across campus.

Phases two proposals that build upon successful projects and provide new directions and opportunities for graduate students are encouraged to apply. The college will also accept new project ideas.

Proposals should be uploaded to the Graduate College website by March 25.

Sustainable food systems
Center for Food Integrity CEO to speak

Charlie Arnot, the CEO of the Center for Food Integrity, will present on the topic of sustainable food systems at a course in the College of Agricultural, Consumer and Environmental Sciences. Arnot’s talk, from 2 to 3:20 p.m. in the Monsanto Room of the ACES Library, is free and open to the public.

“We invite interested faculty members and students across campus to visit our class that day and hear what Charlie has to say about consumer confidence in our U.S. food system,” said Robert Hughes Jr., a professor and the head of the department of human and community development.

Since 2007, CFI has been at the forefront of ground-breaking research to measure and track consumer attitudes www.osfa.illinois.edu/aid/employment/every.html.

The student employee recognition event will take place during National Student Employment Week, April 7-13. All nominators and their student employees are invited to the event to help celebrate and support the hard work of undergraduate students.

The Office of Student Financial Aid encourages all departments and organizations to apply for the award to promote the value of student employees.

Osher Foundation
Major endowment announced for OLLI

The Osher Foundation has committed $1 million to the U. of I. to endow and support its Osher Lifelong Learning Institute. This is the second $1 million endowment the foundation has given to OLLI, a member-driven program of the University of Illinois.

OLLI director Christine Canzian says: "I am extraordinarily grateful to the Bernstein Osher Foundation for this generous support of OLLI at Illinois – and for promoting a vision of curiosity and discovery as a lifelong project. Our members are actively engaged in shaping the contours of our institute, and our campus and community partners share in this unique vision that invites the viewer to explore their own relationship to the world around them and the ecological challenges of the day."

The April 15 exhibition will be on view weekdays from 9 a.m. to 9 p.m. through Feb. 23.

‘Marijuana, Monsters and Milk’ Free health discussion is Jan. 24

The public is invited to a free community forum on health issues ranging from energy drinks and bottled water to antimicrobials in milk and government regulations of the legalization of marijuana. The forum will be held from 7 to 9 p.m. Jan. 24 at the U. of I. College of Veterinary Medicine.

It is the first in the series "One Health & You: News You Can Use," featuring four talks this spring that are being organized through the college’s Center for One Health Illinois.

The Jan. 24 session, "Marijuana, Monsters & Milk: Public Health Perspectives," will feature four speakers covering the topics below.

- Dan Linn, executive director, Illinois NORML: "Marijuana research and policy"
- Sam Port, president of the U. of I.: "energy (+ monster) drinks and heart disease, cellulitis and cancer studies"
- Aweis Vaid, Champaign-Urbana Public Health District: "vaccination safety, rabies and gastroenteritis"
- Jack Herrmann, U. of I.: "antimicrobials in milk and meat; safety of bottled water; hand sanitizers"

Throughout the series, the first hour will be devoted to scientists discussing research from a layperson’s perspective. The second hour will allow attendees to ask questions and offer comments.

"The purpose of the lecture series is to provide the public with reliable information and to clear up misconceptions," said Herrmann, one of the directors of the Center for One Health Illinois and an organizer of the series. Herrmann, a faculty member and College of Veterinary Medicine, holds a doctor of veterinary medicine degree and a master’s in public health.

The additional public forums have been scheduled: "Health Risk or Hope: Emerging Diseases You Should Care About" (March 7)
- "The Raw Facts: Food Fadd, Fears, Fables and Safety" (April 15)
- "Of Pugs, Pigs, and Pandas: Animal Welfare at Home, Farm, Lab and Zoo" (May 21)
- "Science brings attention to the way human, animal and environmental health are interrelated," Herrmann said. •

Art @ the Y
Local artists focus on the environment

Art @ the Y will host the opening reception of "Artists on the Environment" on Jan. 24 featuring paintings by Molly Briggs, Glen Davies and Viktoria Ford. A viewing of the exhibition will begin in the Murphy Gallery on the first floor of the University YMCA at 6:30 p.m. with an artist talk beginning at 7 p.m.

"Artists on the Environment" offers three local artists’ unique visions that the viewer to explore their own relationship to the world around them and the ecological challenges of the day. The event, which is free and open to the public, will be on view weekdays from Jan. 17 to Feb. 23.

"Artists on the Environment" is a sponsored event of OLLI at Illinois – and for promoting a vision of curiosity and discovery as a lifelong project. Our members are actively engaged in shaping the contours of our institute, and our campus and community partners share in this unique vision that invites the viewer to explore their own relationship to the world around them and the ecological challenges of the day."
Brazilian artists address global transition in society

By Dusty Rhodes
Arts Editor

Since the 1940s, Brazil has been called the “country of the future.” The tag has hung on for so long, it has generated another adage: “Brazil is the country of the future – and always will be.” This position perpetually on the cusp serves in part as the inspiration for “Blind Field,” an exhibition of contemporary Brazilian art on display at Krannert Art Museum Jan. 25 through March 31. The museum will host a public reception at 6 p.m. Jan. 24.

The title is a term coined in the 1970s by Henri Lefebvre, a French sociologist and philosopher who used it to describe an ideological gap between socio-economic production modes (agriculture, industrial and globalization) – a space that needed to be filled. But the pieces in “Blind Field” instead freeze the transitional moments.

Included in the exhibition is a 2008 photographic series by Cao Guimarães, working in collaboration with Carolina Cordeiro, focusing on rural road signs obscured by red dust. In the exhibition’s catalog, Tumelo Mosaka, curator of contemporary art at Krannert Art Museum, describes this series, titled “Campo Cego” (Portuguese for blind field), as “suspended between obsolete use and possible signification,” insisting on “the tangibility of opacity as significant in and of itself.”

Irene V. Small, guest co-curator of the exhibition, explains a blind field as “a kind of double or inversion of ideology,” a rejection of “the illusion of transparency” and an embrace of “all that is elliptical, artificial and opaque.” Small is a professor of art history and archaeology at Princeton, and is writing a book on the innovative Brazilian artist Hélio Oiticica.

The 20 emerging and mid-career artists whose work will be presented all live and work in Brazil, but this exhibition can’t be pigeonholed as “Brazilian” art. Through a variety of media – photography, video, installation and painting – the artists address the global transition in contemporary society.

In Rodrigo Matheus’ installation, “Work Station,” computer terminals display landscapes cribbed from video games while nearby audio speakers, disguised as rocks, emit “nature sounds,” suggesting that the digital images are models for, rather than facsimiles of, actual life. Héctor Zamora’s “Errant,” presented in digital photos, shows trees growing implausibly in pots suspended on steel cables over the Tamanduatei River, which once marked the city limits of São Paulo. With the city’s expansion, the river now flows between concrete banks through an intensely urban, virtually treeless setting.

The photographs in Carlos Mélo’s “Eve” series look at what appears to be an office or conference space on the night before a presentation. Chairs, microphones and flowers are positioned, ready for an unknowable event. In Lais Myrrha’s video “Not Yet,” test-pattern images – familiar to viewers who recall the flickers that appeared when an analog television was switched on or off – are extended to last more than a minute, celebrating a past artifact of potentiality.

“Counterpoints: Moshekwa Langa, In and Out of Africa” also opens Jan. 25. This is the result of Krannert Art Museum’s invitation to Langa, a South African artist, to respond to the objects and broader interpretive framework of the museum’s newly re-installed African gallery. Langa works fluently across the spectrum of media, using drawing, painting, video, photography, portraiture, collage and installation to challenge the conventional understanding of “African” art. He will present an Artist Talk at 5:30 p.m. Feb. 21 at Krannert Art Museum. This exhibition runs through May 12.

“Jacob Lawrence: Toussaint L’Ouverture Series,” on loan from the Amistad Research Center at Tulane University, also opens Jan. 25 as part of the U. of I.’s celebration of the Sesquicentennial Anniversary of the Emancipation Proclamation. Lawrence began this series of 41 paintings in 1937, when he was 20 years old, depicting the life of L’Ouverture, the revolutionary leader who helped former slaves establish the republic of Haiti in 1804. This exhibition will close on April 28. ◆

Cao Guimarães and Carolina Cordeiro, “Campo Cego” (Blind Field) #2 (detail), 2008.

Cinthia Marcelle, “A Herdeira” (The Heiress), 2011, C-print, collection of the artist.
High-frequency stock trading of little value to investors, public

By Phil Ciciora
Business and Law Editor

The increase in the speed of stock trading from microseconds to nanoseconds leads to an increase in order cancellation, but little else of value to investors and the public, says research by a U. of I. business professor.

According to a forthcoming study by Mao Ye, a professor of finance at Illinois, the arms race in speed at the sub-millisecond level of stock trading is a “purely positional game” in which a trader’s payoff depends on transaction speed relative to other traders.

“There are lots of extreme views about high-frequency trading, but if you look at high-frequency trading scientifically, you would see that it’s neither good nor evil.” Ye said. “Although some people think it’s good, and others, necessarily, think that it’s really bad, our paper shows that neither extreme view is correct. So stock exchanges are investing heavily in order to play what’s really a zero-sum game.”

The research shows an increase in the cancellation-execution ratio of orders, as well as a corresponding increase in short- and term volatility and a decrease of market depth.

According to the research, co-written with Jiading Gai and Chen Yao, both graduate students at Illinois, since the current exchange fee structure only charges for executed trades, and not order cancellations, legitimate traders and investors essentially subsidize high-frequency traders who purposefully cancel orders, reflecting a wealth transfer from low-frequency traders to high-frequency traders.

“If you increase the speed of trading from micro- to nanoseconds, which is a 1,000 percent increase in speed, there’s really no social value to that,” Ye said. “There is, however, a lot of private value in that for traders.”

The research also finds evidence consistent with “quote stuffing,” a practice that involves submitting an extraordinarily large number of orders followed by immediate cancellation for the sole purpose of congesting the market.

“Quote stuffing is certainly an external-ity-generating activity – the equivalent of noise or pollution in financial markets,” Ye said. “We’ve found evidence that’s consistent with quote stuffing, and the economic incentive for that is pretty straightforward. If only relative speed matters, then people invest heavily to increase their speed. But firms have invested a sufficiently large amount of money simply to max out their speed, which in essence has created a positional arms race in the markets.”

The researchers say the study is one of the largest computing efforts ever conducted in academic finance.

“From a computational standpoint, this paper involved calculations that were both data-intensive and computing-intensive, which represented a special challenge,” Gai said.

“One year of trading data is equivalent to if you were to digitize all of the books in the Library of Congress – and the majority of that data is cancellations,” Ye said. “On an average trading day, a stock like Microsoft has over a million messages – and the majority are cancellations. Canceling trades is taking over the system and monopolizing resources.”

So how do you create “speed bumps” in the market so that trade cancellations don’t overtake the system? There needs to be a level-playing field so that no one can game the system, Ye says.

“Mary Shapiro, the chairman of the Securities and Exchange Commission, wants to impose a minimum quote life,” Ye said. “But let’s ask an extremely simple question: What’s the distribution of a quote life now? Well, no one really knows, because to draw a summary statistic from that data takes lots of computing power. Without a scientific approach, the debate has become based on ideology, on whether you think high-frequency trading is inherently good or bad.”

As a result, a restriction on trading speed should only be imposed unilaterally by an outside authority, which means slowing down everyone by the same amount, Ye says.

“What that means is that you can’t push the order and then cancel it within 50 milliseconds,” he said. “What do orders less than 50 milliseconds contribute to liquidity? I don’t think anyone has looked at that. Considering the investment that was made, that wasn’t really the best allocation of resources. There’s a lot of debate over that, and we have some concerns about that. If you continuously increase the speed, our results indicate that the benefits do not justify the costs, because it only slightly increases volatility.”

But it’s probably not a good idea to move high-frequency traders’ profits in the current market just yet.

“It let it continue to grow because they’re eventually going to hit a speed wall, and at a certain point there will be no value to it,” he said.

The research was sponsored by the National Science Foundation’s Extreme Science and Engineering Discovery Environment program. The data for the research were provided by The NASDAQ OMX Group Inc.