Making better medicines with chemical building blocks

By Liz Altbarg
Physical Sciences Editor

Soon, making and improving medical drugs could be as easy for chemists as stacking blocks is for a child.

Subo of 1 chemist Martin Burke, a pioneer of a technique that constructs complex molecules from simple chemical “building blocks,” led a group that found that thousands of compounds in a class of molecules called polyenes — many of which have great potential as drugs — can be built simply and economically from a single dozen different building blocks.

The researchers published their findings in the journal Nature Chemistry.

“We want to understand how these molecules work, and synthesis is a very powerful engine to drive experiments that enable understanding,” said Burke, a chemistry professor at the U. of I. and the Howard Hughes Medical Institute. “We think this is a really powerful road map for getting there. Once you have the pieces in a bottle, you can make naturally occurring molecules, or you can change the pieces slightly to make them better. Usually, that’s such a heroic task that it slows down research. But if that part becomes easier, you can make anything you want, and it can powerfully accelerate the drug discovery process.”

In the same way that plastic building blocks of different sizes and shapes can snap together because they share a simple connector, the chemical building blocks are linked together with one simple reaction. This gives scientists freedom to build molecules that may be difficult or expensive to extract from their natural source or to make in a lab.

One advantage of the building-block approach is that it allows the researchers to mix and match parts to build many different molecules, and to omit or substitute parts to make a potentially therapeutic substance better for human health.

For example, Burke’s group recently synthesized a derivative of the antifungal medication amphotericin (pronounced AM-foe-TAIR-ul-sin), which led to a big breakthrough in understanding how this clinically vital but highly toxic medicine works and the discovery of another derivative that is nontoxic to human cells while still effective at killing fungi.

After their success in synthesizing derivatives of amphotericin, which fall into the polynene class, the researchers wondered how many different build- blocks they would need to make all the polynenes? (Polynene is pronounced pol-ee-en.)

Looking at the structures of all the known naturally occurring polynenes — thousands in all — Burke and graduate students Eric WOole and Jahnabi Roy focused on the smaller pieces that made up the molecules and found that many elements were common across numerous compounds. After careful analysis, they calculated that more than three-quarters of all natural polynene frameworks could be made with only 12 different blocks.

“My dream is to do this,” Burke said. “We’ve had this gut instinct that there will be a set number of building blocks from which most natural products can be made. We’re convinced, based on this result, that we can put together a platform that would enable on-demand assembly of complex small molecules. Then researchers can focus on exploring the function of these.”

Serious threat
U. of I. crop sciences professor Aaron Hager is warning Illinois farmers about Palmer amaranth, an invasive weed that can take over farm fields in a season or two.

At least $11 million in 2009 to manually remove Palmer amaranth from 1 million acres could “something not normally done,” the magazine reported.

Adam Davis, a researcher with the U. S. Department of Agriculture Agricultural Research Service and a professor of crop sciences at the U. of I., reported at a recent agricultural conference that Palmer amaranth can reduce soybean yields by 78 percent and corn yields by 91 percent.

In Illinois, a state with a $9 billion agricultural commodities market and 80 percent of its land area devoted to farming (mostly corn and soybeans), could see significant losses associated with fighting — or failing to properly fight — this weed, Hager said.

“If you think about the value of agricultural crops in this state, that’s why we’re very, very concerned about how devastating this could be to us,” he said.

So far, researchers have confirmed the presence of Palmer amaranth in more than two dozen Illinois counties, from the southern tip of the state to Will County, about 50 miles south of downtown Chicago. In about half of those counties, the weed is already

Palmer amaranth threatens Midwest farm economy

By Diana Yates
Life Sciences Editor

A n invasive weed that has put some southern corn farmers out of business is now finding its way across the Midwest — and many corn and soybean growers don’t yet appreciate the threat, U. of I. researchers report.

Palmer amaranth (Amaranthus palmeri), a flowering plant native to the Sonoran des- erts of Arizona and Mexico, has a laun- cht but has not been discovered to date. It can tolerate drought and heat extremes that would kill other plants. And it is becoming resistant to the most common herbicides used to combat it, he said.

Killing the plant before it can go to seed is the best way to control it, he said. That means treating young plants with herbicides when they are less than 4 inches tall.

“Once it is taller than 4 inches, the effective- ness of herbicide treatments drops off very dramatically and very quickly,” Hager said.

Catching the plant that early is problematic, however. As a seeding, Palmer looks a lot like waterwheat, another problematic weed that is difficult to control. This means farmers have the dual challenge of determining whether Palmer has invaded their fields and, if it has, taking effective action to kill it before it takes over.

“In other parts of the U. S., this spe- cies has devastated cotton production and in many areas, especially in Georgia, it was not uncommon to see cotton fields literally mowed down to prevent this weed from producing seed,” Hager said. Some growers who failed to recognize the threat lost their farms as a re- sult, he said.

Preventing a Palmer amara- nth takeover also comes at a cost, however. In 2010, for ex- ample, Southeast Farm Press reported that the cost of weed control efforts on Georgia farms had risen from $25 per acre to $60 to $100 an acre in response to Palmer amaranth invasions. The state spent at half of those counties, the weed is already

Drugs & Devices

A new analysis of more than six decades of death rates shows hurricanes with female names are more deadly than male-named storms.
Illinois MSE professor wins Humboldt Prize

By Liz Alliberg

Physical Sciences Editor

of I. mechanical sci-
ence and engineering

A researcher in the field of control

Hovakimyan has been chosen to

The Alexander von Humboldt

 annually honors up to 100

researcher received a multi-
national, multidisciplinary panel of

According to the founda-

tion, the recipients are “academics whose fundamental discoveries, new methodologies, and strong influence on their own
discipline and who are expected to continue to contribute to

A Humboldt Award recipient is

Hovakimyan received the

the Mechanics and Control

from the American Institute

of Aeronautics and Astronautics

in 2011.

Humboldt Award recipients are

award for her work on adaptive

control system.

Hovakimyan earned her doctorate in physics and mathematics in 1992 at the Keldysh Institute of Applied Mathematics, part of the Russian Academy of Sciences. She joined the faculty at Illinois in 2008. She is a member of the American Society of Mechanical Engineering, the Society of Indus-

trial and Applied Mathematics, the Institute of Electrical and Electronic Engineers and the American Institute of Aeronautics and Astronautics.

Research honors

Professor Naira Hovakimyan was honored with a Humboldt Research Award for her work with adaptive flight

control systems.

Board members hear public comments, meet with legislators

By Mike Holenthal

Assistant Editor

James Kilgore, the embattled Urbana campus lecturer with a criminal past, urged the U. of I. Board of Trustees on Tuesday to adopt a pre-employment criminal background check, adding that a missed educational opportunity is a missed educational opportunity.

"As a young man I committed acts of which I stand ashamed, acts he and the group committed, including a armed robbery of a California bank during which a customer was fatally shot." He said the board is considering adopting a pre-employment criminal background screening policy, and that the Provost on the Urbana campus has convened a committee to discuss Kilgore’s case and to develop a specialized faculty grievance policy.

"The hard part is where do you put the limits? It’s an important question and one we’re dealing with.”

Kilgore, who has his master’s in the public comment portion at the May 14 board meeting in Springfield, and his supporters, continued his assault on African Studies as not re-

He said the board’s concern was focused on an employee’s conduct, not on the employee himself, but utterly destructive to innocent members of the community and damaging to my family, loved ones and all those who campaigned for social justice and peace,” he said.

He said denying employment to the university with a criminal background is a missed educational opportunity.

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TRUSTEES. CONTINUED FROM PAGE 2

year, providing the money to maintain the aca-

demic quality that serves the needs of students and

donors. The U. of I. system has an annual operating budget of

$5.5 billion, of which $663.5 million is provid-

ing for the U. of I. He said he’d like to see

study the yield of in-state students apply-

ing to the university president, reported on

in the implementation of recommendations

from the recently completed review of University Administration.

The report suggests developing a system

The National Institutes of Health

molecules, rather than spending all their

time and energy trying to make them.

To demonstrate this surprising find-

ing, the researchers synthesized sev-

eral compounds representing a wide

range of polyenes, we are committed to figur-

ing out a new global collection of building

blocks – how to make them, how to put

them together – to create a generalized

approach for small-molecule synthesis.”

The National Institutes of Health

The university also is seeking relief from

state procurement regulations that create
delays and impose additional costs in purchas-
ing goods and services, particularly involving
research grants. Officials say reforms would
improve efficiency while preserving ethics and

access to, and we will engage where

you see fit.”

The recommendations, Adams said
the “landscaper change” initiative that
calls for annual budget and performance

committees with oversight for each U. of I.
Campus, he said, is divided into eight
academic leaders.

LAURIE WILDER, of Parker Executive
Search, said her company would aid in
the search process but not run it.

A search is underway for a successor to university President Bob Easter (at right), shown at the recent U. of I. Board of Trustees meeting May 14 in Springfield with board chair Christopher Kennedy. Those on the Urbana campus who would like to give input during the process may attend a town hall meeting at 3 p.m. June 25 in the auditorium at the Beckman Institute for Advanced Science and Technology. The search committee hopes to make its final recommendation to the board by December, with the board expected to finalize the process with a replacement announcement in January. Easter’s term ends June 30, 2015.

Aldrich, a chemical company.

“Now that we have this quantifiable
result, that with only 12 building blocks
we can make more than 75 percent of
polyenes, we are committed to figuring
out a new global collection of building
blocks – how to make them, how to put
them together – to create a generalized
approach for small-molecule synthesis.”

The National Institutes of Health

Burke’s group hopes eventually to

identify and manufacture a set of build-
ing blocks from which any researcher –
these and others – can build any small
molecule.

“We are not here to select your next pres-
ident,” she said. “We will aggressively re-
cruit, facilitate and advise. You will have
access to every piece of information that
we have access to, and we will engage where
you see fit.”

The search firm will assist with generat-
ing a pool of prospects, reviewing their back-
ground information and arranging interviews
with candidates. Parker has assisted in vari-
ous university searches, including a search
currently underway to replace UIC Chap-
elor Paula Allen-Meares when her term ends
in January, and searches for a chancellor and
provost on the Urbana campus.

The report noted that while the overall
Facility Condition Index had improved since
2007, funding amounts to tackle long-term maintenance projects had fluctu-
ated during the process. Spending for 2014 is earmarked at $25 million.

Further, the university is working on
developing a system to conduct more regular assessment of cam-
pus maintenance, stable funding to address those needs, and the use of student fees and the extension of Academic Facilities Main-
tenance Fund Assessment to fund them.

The report also recommends involving the
UA office of Community Engagement in

renovation work, consideration of using
name rights to raise funds and a greater
dependence on energy-efficient work to
help recover construction costs.

ROY CAMPBELL, the SEC chairman and
a professor of computer science, an-
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study the yield of in-state students apply-
ing for the U. of I. He said he’d like to see
strategies developed to increase faculty in-
volvement in the process of in-state student
recruitment.

Wise discusses proposed medical school at SEC meeting

By Mike Helenthal

Assistant Editor

“Chancellor Phyllis M. Wise plans to

reach out to critics of a proposed

medical school on the Champaign campus, which he had
declared would create a cam-
pus-based medical college.

In April the campus released the findings

of a feasibility study that officials commis-

sioned to determine if such a venture was

possible.

Wise said the study shows that “Il-

linois and Carle each would bring unique

possible.

One of the important parts of the pro-
cess is to bring our communities into this
process,” she said.

Buck said committee members should
spend time outside of the committee struc-
ture to talk with constituents, collect their
thoughts and recommendations, and report
them to the committee.

“We don’t want to own the hospital; we
want to be partners,” she said.

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Researchers see stem cells take first step toward development

By Liz Ahlberg

Physical Sciences Editor

T he gap between stem cell research and regenerative medicine just became a lot narrower, thanks to a new technique that coaxes stem cells, with potential to become any tissue type, to take the first step to specialization. It is the first time this critical step has been demonstrated in a laboratory.

U. of I. researchers, in collaboration with scientists at Notre Dame University and the Huazhong University of Science and Technology in China, published their results in the journal Nature Communications.

“Everybody knows that for an embryo to form, somehow a single cell has a way to self-organize into multiple cells, but in vivo microenvironment is not well understood,” said study leader Ning Wang, a professor of mechanical science and engineering at the U. of I. “We wanted to know how they develop into organized structures and organs. It doesn’t happen by random chance. There are biological rules that we don’t yet understand.”

During fetal development, all the specialized tissues and organs of the body form out of a small ball of stem cells. First, the ball of specialized cells separates into three different cell lines, called germ layers, which will become different systems of the body. This crucial first step has eluded researchers in the lab. No one has yet been able to induce the cells to form the three distinct germ layers, in the correct order — endoderm on the inside, mesoderm in the middle and ectoderm on the outside. This represents a major hurdle in the application of stem cells to regenerative medicine, since researchers need to understand how tissues develop before they can reliably recreate the process.

“It’s very hard to generate tissues or organs, and the reason is that we don’t know how they form in vivo,” Wang said. “The problem, fundamentally, is that the biological process is not clear. What is the biological environment that controls this, so they can become more organized and specialized?”

Wang’s team demonstrated that not only is it possible for mouse embryonic stem cells to form three distinct germ layers in the lab, but also that achieving the separation requires a careful combination of correct timing, chemical factors and mechanical forces, the researchers found.

Now, Wang’s group is working to improve the technique for greater efficiency. He hopes that other researchers will be able to use the technique to bridge the gap between stem cells and tissue engineering.

“It is the first time we’ve had the correct three-germ-layer organization in mammalian cells,” Wang said. “The potential is huge. Now we can push it even further and generate specific organs and tissues. It opens the door for regenerative medicine.” •

Phenomenal forces

By Charles Hillman

Life Sciences Editor

C hildren who are physically fit have faster and more robust neuroelectrical brain responses during reading than their less-fit peers, researchers report.

These differences correspond with better language skills in the children who are more fit, suggesting that they appear to be able to better allocate their cognitive resources to the task at hand, said study leader Charles Hillman, right, and graduate student Mark Scudder, left, in a photo by L. Brian Stauffer.

“We focused on the N400 because it is associated with the processing of the meaning of a word,” he said. “And then we also looked at another ERP, the P600, which is associated with the grammatical rules of a sentence.”

The researchers used electroencephalography (EEG), placing an electrode cap on a small ball of stem cells. First, the ball of specialized cells separates into three different cell lines, called germ layers, which will become different systems of the body. This crucial first step has eluded researchers in the lab. No one has yet been able to induce the cells to form the three distinct germ layers, in the correct order — endoderm on the inside, mesoderm in the middle and ectoderm on the outside. This represents a major hurdle in the application of stem cells to regenerative medicine, since researchers need to understand how tissues develop before they can reliably recreate the process.

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Brain signals link physical fitness to better language skills

By Diana Yates

Life Sciences Editor

F or example, if you hear or read a word in a sentence that makes sense (“You wear shoes on your feet”), the component of the brain waveform known as the N400 is less pronounced than if you read a sentence in which the word no longer makes sense (“At school we sing shoes and dance,” for example), Scudder said.

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Life Sciences Editor

Videos reaching tens of thousands of Ethiopian farmers

By Diana Yates

Teff, a nutritious grain, is a staple in Ethiopia. Its name is derived from an Amharic word for “lost.” Now, thanks to a creative educational initiative that some say its name was lost. Now, thanks to a creative educational initiative

The traditional planting technique is to plant more than 90 percent of teff seed per hectare than is actually needed to yield a good crop. That seed could feed a lot of hungry people.

The traditional planting technique is to use 40 to 50 kilograms of seed per hectare, just randomly dispersing the seeds,” Pittendrigh said. But other techniques, such as row planting or transplanting teff that is first sown in smaller plots, require a fraction of that amount (less than 1 kg to 3 kg per hectare) to grow a healthy crop, he said.

“It’s a massive reduction in the amount of seed that can now instead be used for food,” said SAWBO co-director Julia Bello-Bravo, who is the assistant director of the Center for African Studies and of U. of I.’s Illinois Strategic International Partnerships.

“The teff row-planting videos are narrated in Amharic, Oromo and Tigrigna, three of the major languages in Ethiopia. Efforts are underway to translate the narrations into more languages as well. Illinois students and volunteers help out with the voice-overs and narrations,” SAWBO and Illinois student animators worked with Gemechu Olana, of Adama Science and Technology University, to create the teff animations and have them and other postharvest loss prevention videos narrated in local languages.

In support of such extension activities, the Ethiopian ATA purchased 640 electronic tablets and distributed them to agricultural offices, called woredas, around the country. With the animated videos on the tablets, the woredas are able to reach an estimated 168,000 teff growers. Olana said the ADM Institute for Post-harvest Loss at Illinois funds SAWBO’s postharvest loss prevention work. Other SAWBO support comes from the Chancellor’s Fund.

Campus to sell carbon credits to Chevrolet

Because it has dramatically reduced its carbon dioxide emissions in the past several years, the U. of I. is selling an estimated 150,000 metric tons of certified carbon credits to Chevrolet, which is retiring them on behalf of the environment.

“Our campus has taken a significant first step in reducing its carbon footprint,” said plant biology professor Evan DeLucia, the director of the university’s Institute for Sustainability. Energy and Environment. “Chevrolet has rewarded these positive actions, governments and more can implement these sorts of changes the world over.”

Around the world Researchers bring development education animations to the world. Pictured, from left: U. of I. entomology professor and SAWBO co-director Barry Pittendrigh, SAWBO project manager Juan Cantuapiedra, SAWBO co-director Julia Bello-Bravo, who is the assistant director of the Center for African Studies; and student animator Benjamin Blalock.

ON THE WEB sawbo-illinois.org/main.htm VIDEOS: go.illinois.edu/SAWBO_videos

ON THE WEB sustainability.illinois.edu

Creative initiative Gemechu Olana, a professor at Adama Science and Technology University, left, shares SAWBO animations with Ethiopian farmers.

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ON THE WEB sustainability.illinois.edu
Home Away From Home

Laura Barnes

Somewhere just south of the auto-graphed Brisco County Jr. glossy photos, maybe behind a collectible librarian “action” figure and underneath a child’s homemade art project, there may be a placard that reads, “A cluttered office is the sign of an intelligent mind.”

Or at least there should be.

Laura Barnes, a librarian at the Prairie Research Institute with liaison responsibilities to the Illinois Sustainable Technology Center, and the executive director of the Great Lakes Regional Pollution Prevention Roundtable, has been using her U. of I. office space for inspiration for 20 years.

“I just like having stuff to look at while I’m at work,” she said. “If it’s something odd or it just looks good, I bring it in. Things have just accumulated over the years, but I think it makes my office interesting.”

She said her proclivity for collecting was influenced by her father, Bob Reid, a U. of I. journalism professor whose central academic message was “Be a Curious George.” It wasn’t long before Reid’s students and colleagues started giving him Curious George memorabilia for his office.

Reid died in 2004.

“He always had all these things in his office,” she said. “I guess that just rubbed off on me.”

Barnes said she goes through the occasional cleaning binge, though during busy times the paperwork overtake the office and things must be rearranged. She’s moved offices twice during her tenure, requiring additions or subtractions to her collection.

As for work, most times she employs the “ordered piles” method of office organization, a trait often associated with geniuses.

“I cleaned up a little when I heard you were coming over because it had been about three years since I really reorganized everything,” she said. “It’s been kind of nice to use my desk again.”

The librarian action figure may be the best of her collectible conversation starters – the action coming from a posing figure and electronic, noncomative “shushing” sound that activates with the push of a button.

But she is most proud of the homemade artwork created by her daughter, which is scattered throughout the office. The daughter is now a junior in high school, but one can trace the development of the aspiring graphic artist just bycombing Barnes’ office walls.

“She has a great eye for combining patterns and colors,” she said. “I also have a few pieces of pottery here that I painted, but I can’t draw to save my life.”

Other pieces in her office collection include educational campaign posters from the American Library Association (one noting that “librarians are heroes every day”), a poster of Wrigley Field; various newspaper cartoon clipplings; a collection of “funny” writing pens; and a large assortment of figurines, Lego creations and toys.

There also are photos of the pet rabbits she and her family have adopted through her association with the House Rabbit Society (http://www.rabbit.org), a volunteer organization that promotes spaying and neutering rabbits, advocates bringing them indoors to live as companion animals and campaigns against using them as prizes or gifts.

“My bunny is for life, not just for Easter,” she said, repeating the organization’s motto.

Visual stimulation also plays a role in her work. Her current Great Lakes grant has an extensive work plan, which led Barnes to create a brightly colored task checklist that hangs on the wall in front of her desk.

The chart helps to organize myriad project tasks while simultaneously compelling her to drop the Legos and get to work. She said the checklist wouldn’t have the same impact if viewed only on a computer monitor.

“It’s a physical thing that I can see when I’m sitting at my desk,” she said. “I don’t have to pull anything up on the computer and I feel a great sense of accomplishment when I check something off.”

On the Web

The Zombie Outbreak Shelter was inspired by the movie “Zombieland,” which she recently saw and became a fan of. Although Gillett loves Halloween and never misses the opportunity to create and dress in an original costume, she said she normally isn’t a fan of the zombie genre. “Zombieland” changed her perspective because she regularly consults, and several references and homages to llamas – which by definition are the favorite animal after a Parkland College promotion and a report about llamas that her daughter wrote for school.

Suddenly, it seemed, llamas were popping up everywhere in her life.

“I know more about llamas than most people should,” she said.

Gillett said that her office decorations, some of which change with the season, are more than just fun – they help her relax and open up her mind when she’s developing a creative project for one of the 70 departments within LAS.

“The variety helps keep things fresh,” she said. “I just try to keep the office comfortable and fun. I’d like a couch but I don’t know where I’d put it.”

Inside Illinois

June 5, 2014

Home Away From Home

By Mike Helenthal, Assistant Editor

Photos by L. Brian Stauffer

Shhhhhhh … Laura Barnes, a librarian for the Prairie Research Institute and the executive director of the Great Lakes Regional Pollution Prevention Roundtable, shows off her librarian action figure, one of the many pieces in her office collection.
Ability to finish college affected by family debt

By Shunita Fenest
Social Work Professor Min Zhan and doctoral student Deirdre Laneskog, both at the U. of I., examined the impact of debt on the college graduation rates of 915 young adults who enrolled in college between 2000 and 2004. The authors explored links between students’ graduation rates and families’ household assets and debt at two time points: the years that the students enrolled and when they graduated.

Data for the study were drawn from the National Longitudinal Survey of Youth, which began in 1979, and a related survey called the Young Adult sample. Participants in the Young Adult sample, who were the children of women who participated in the NLSY, were interviewed biennially beginning in 1994.

Most prior studies that examined associations between familial assets and children’s education focused on the early childhood or adolescent years and paid very little attention to the impact of debt. “Examining parental assets and debt around the time of college enrollment is important because that is when youth and their families are evaluating college options and how to pay for them,” Zhan said.

Unlike many prior studies, the sample for the current study also included Hispanic young people. Along with 199 Hispanics, the final study sample comprised 399 white students and 317 black students.

Most of the young people (96 percent) enrolled in public universities and about half (49 percent) obtained student loans. When the authors examined graduation data in 2010, just 39 percent of the young people in the sample had earned bachelor’s degrees.

White students were about twice as likely as blacks or Hispanics—47 percent vs. 25 percent and 23 percent, respectively—to report holding a bachelor’s degree, the authors found.

When the authors controlled for student and family income and mother’s education, the racial gaps in graduation rates were slightly reduced; however, white students were still about twice as likely to graduate as their black or Hispanic peers.

A small portion of the racial/ethnic gaps in college graduation rates may be explained by differences in the types of household assets and debt that black, Hispanic and white families have, Zhan suggested.

“Family assets are positively related to college graduation for both black and white students, but family debt has a negative impact on black students’ chances of graduating,” Zhan said. “The magnitude of the association indicates that family debt hurts black students’ chances of graduating much more than it hurts white students’ chances of graduating. The overall debt-to-assets ratio was much higher—nearly 50 percent higher—among black families than white families, which may explain why debt had a stronger negative impact on black students.”

PALMER AMARANTH, CONTINUED FROM PAGE 1

resistant to glyphosate, the most commonly used herbicide on Midwest farms, Hager said.

The plant grows so quickly and so tall that it can completely obscure low-growing crop plants. Some soybean fields in Kankakee County, Illinois, became so overgrown with Palmer amaranth that the soybeans were barely visible to the eye.

Many farmers think they can use the same techniques that tend to work against other common weeds—a onetime application of glyphosate herbicide, for example—to control Palmer amaranth, Hager said. This assumption could endanger their farms.

“There is not one magic herbicide that a farmer could use one time and be done with it,” he said. “It doesn’t work that way.”

And if the weed gains a foothold in planted fields, corn and soybean growers in Illinois should take a tip from Georgia cotton farmers and do everything possible to remove the plants, he said. Not a single plant should be tolerated.

“We have to set the threshold at zero. It has to be zero,” Hager said. “It’s hard to imagine another weed species that would be more injurious to crop production than what this one will be.”

The U. of I. has set up a service to help farmers identify the plant in their fields and test whether it is resistant to common herbicides. They also published a series of guidelines for controlling the plant.

Family debt...
Decisions on patent cases a rebuke to ‘baseless lawsuits’

By Phil Ciciora
Business and Law Editor

The U.S. Supreme Court recently handed down two decisions on patent cases, both of which were watched closely by technology companies because they could set the framework for how they do business.

In 2011, the court ruled in a case involving a company that was uninvolved in the technology industry but had purchased a number of patents in the hopes of using them as leverage against technology companies. The court said that such companies, known as “patent trolls,” should not be able to sue other companies for patent infringement if they do not have a genuine business interest in the patents they own.

The second case, which involved a company that had sued a number of technology companies for patent infringement, was also watched closely. The court ruled that the company had no legitimate business interest in the patents it owned and therefore did not qualify as a patent troll.

The rulings set the framework for how technology companies can be sued for patent infringement and how they can respond to such claims.

The court’s decisions could have a significant impact on the way technology companies do business and could help to reduce the number of baseless lawsuits that are filed against them.

Law professor Paul Heald says the court’s decisions are a step in the right direction.

“Technology companies have been under attack for years,” Heald said. “The court’s decisions make it clear that these companies are not really using the patents they own to develop new products or improve the technology they offer. Instead, they are using the patents to leverage their power and squeeze the technology companies.”

Heald says that the court’s decisions could help to reduce the number of baseless lawsuits that are filed against technology companies and could help to create a more level playing field for all companies.

However, some technology companies have said that the court’s decisions could make it harder for them to defend themselves against baseless lawsuits.

“While the court’s decisions are a step in the right direction, they don’t go far enough,” said John Doe, chief executive officer of a technology company. “We still have to worry about baseless lawsuits. We need the government to do more to protect us.”

The Supreme Court is expected to issue more rulings on patent cases in the future.

Patent laws are complex and can be difficult to navigate. It is important for technology companies to stay informed about the latest developments in patent law and to seek legal advice when necessary.

**Related Articles**
- The Future of Patent Law
- The Impact of Patent Law on Innovation
- The Role of the Patent Office

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**Deaths**

Luella Bearman, 69, died May 29 at Carle Foundation Hospital, Champaign. She was a building service worker for the University of Illinois, Urbana-Champaign, for 39 years, retiring in 2009.

Carolyn Reel, 70, died May 15 at Carle Foundation Hospital, Champaign. She was a building service worker for the University of Illinois, Urbana-Champaign, for 32 years, retiring in 1993 as an assistant manager of food service for University Housing.

Shirley Rohl, 81, died May 20 at Presence St. John’s Hospital, Bloomington. She was a building service worker for the University of Illinois, Urbana-Champaign, for 23 years, retiring in 1996.

Dr. Carol Bickford, 69, died May 17 at Bickford Assisted Living, Crystal Lake, Ill. She was a professor of horticulture at the University of Illinois, Urbana-Champaign, for 39 years, retiring in 2000.

**Patent trolls**

Law professor Paul Heald says two recent high-profile Supreme Court rulings on intellectual property make it easier for courts to award attorney’s fees to companies that bring baseless patent lawsuits.

“Companies can now sue other companies for baseless patent lawsuits and then ask the court to award them attorney’s fees,” Heald said. “This will make it harder for companies to bring baseless patent lawsuits.”

**Supreme Court**

See Supreme Court, Page 9
New test helps differentiate Alzheimer’s from normal aging

By Chelsey B. Coombe
Life Sciences Staff Reporter

Researchers have developed a new cognitive test that can better determine whether memory impairments are due to very mild Alzheimer’s disease or the normal aging process. Their study appears in the journal Neuropsychology.

The Alzheimer’s Association estimates that as the population ages the number of Americans living with Alzheimer’s disease will increase from 5 million in 2014 to as many as 16 million by 2050. Memory impairments and other early symptoms of Alzheimer’s are often difficult to differentiate from the effects of normal aging, making it important to identify the condition for those affected until the disease has progressed substantially.

Previous research has shown that a part of the brain called the hippocampus is important to relational memory — the “ability to bind together various items of an event,” said Jim Monti, a U. of I. postdoctoral research associate who led the work with psychology professor Neal Cohen, who is affiliated with the Beckman Institute at UIUC. Being able to connect a person’s name with his or her face is one example of relational memory, and two pieces of information are stored in different parts of the brain, but the hippocampus “binds” them so that the next time you see that person, you remember his or her name, Monti said.

Previous research has shown that people with Alzheimer’s disease often have impairments in hippocampal function. So the team designed a task that tested participants’ relational memory.

Participants were shown a circle divided into three parts, each having a unique design and face binding, the hippocampus works to bind these three pieces of the circle together. After the participants studied a circle, they would pick its exact match from a series of 10 circles, presented one at a time.

People with very mild Alzheimer’s disease did worse overall on the task than those in the healthy aging group, who, in turn, did worse than a group of older adults. The task also revealed an additional memory impairment unique to those with very mild Alzheimer’s disease, indicating that the changes in cognition that result from Alzheimer’s are qualitatively different from healthy aging. This unique impairment allows researchers to statistically differentiate between those with and without Alzheimer’s more accurately than some of the classical tests used for Alzheimer’s diagnosis, Monti said.

“That was illuminating and will serve to inform future work around detecting and understanding the first changes in brain and cognition that are due to Alzheimer’s disease,” Monti said.

Although this new tool could eventually be used in clinical practice, more studies need to be done to refine the test, he said.

“We’d like to eventually study populations with fewer impairments and bring in neuroimaging techniques to better understand the initial changes in brain and cognition that are due to Alzheimer’s disease,” Monti said.

Leisure activities stressful for working adults with disabilities

By Sharita Forrest
Education Editor

While leisure activities are essential to physical and emotional well-being and quality of life — they also can be very stressful for people with disabilities, research suggests.

The research, which has been accepted for publication in the journal Leisure Sciences, examines how leisure activities in the lives of employed adults with mobility impairments, and their perceptions of how their disabilities influenced their work and recreational activities.

The number of working age 55 and over is projected to increase to roughly 25 percent of the U.S. labor force by 2020, with many of these individuals having had a severe injury, said lead author LaWanda H. Cook.

Understanding the role of leisure and disability coping will become increasingly important as these older workers and their younger counterparts who have or acquire disabilities seek to enter or remain in the workforce and strive to maintain a high quality of life.

Cook interviewed eight adults with physical disabilities, all of whom had worked in professional settings and ranged in age from their early 30s to their late 50s. The study explored what beliefs, strategies and relationships contributed to participants’ quality of life, coping and sense of well-being.

Cook conducted the research while studying for a doctoral degree in the department of recreation, sport and tourism at the U. of I. Kimberly Shinew, who is a professor in the department, was Cook’s doctoral adviser.

Cook is now a training specialist at the Northeast ADA Center, a unit within the ILR Industrial and Labor Relations School at Cornell University.

“Five people with disabilities, leisure can play significant roles in coping and managing the demands of work and other life domains,” said Cook, who is a certified rehabilitation counselor. “Although all of the study participants were people with disabilities and had a tenacity that they were unable to display in their sedentary jobs. Nevertheless, all of the participants said that recreational activities were stressful for them as well as stressful for their jobs, according to some. Concerns such as needing to plan in advance to participate, potential inaccessibility of facilities or recreation areas, the availability of bathrooms, and needs for assistive devices or help from their friends all made leisure activities taxing.

Five participants said that physical activities were important in helping maintain their physical functioning and independence. However, people who shunned using mobility devices such as wheelchairs and scooters in order to maintain a sense of independence found their choice of recreational activities curtailed as aging affected their endurance and physical capabilities.

Another concern that was mentioned by many of the workers in the study was feeling pressured to do things not permitted or possible at work, and to nurture relationships with family members, friends and one’s self.

Two people, a school counselor or in his late 40s and a secretary in her 50s who used a wheelchair and çizıtıldiği gibi Resmi dışındaki herhangi bir sorunun kamu politikası ve başka contemplate the law, Heald said.

“There’s no doubt that the federal circuit is typically very closely because it has exclusive jurisdiction in patent case and other courts cannot participate in the development of the law, Heald said.

“The Supreme Court feels a greater obligation to monitor the federal circuit than it does other circuits because the federal circuit has a monopoly on all patent cases,” he said. “The Supreme Court usually waits until there’s a split in circuit court decisions. But with patent cases, there’s no chance for other circuits to chime in, so the circuits to work things out for themselves.”

The Supreme Court also may feel an obligation to watch what the federal circuits do more closely because it “doesn’t have any competition,” Heald said.

“It’s like antitrust law — you always regular monopolists more heavily than you do mar-

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Film scholar Julie Turnock on special effects, from “Star Wars” to “Godzilla”

Turnock says, “With the groundbreaking innovations on display in 1977’s ‘Star Wars’ and ‘Close Encounters of the Third Kind,’” and by the effects company Industrial Light and Magic (ILM) – all of which are a focus of her book. She spoke with News Bureau social sciences editor Craig Charnetiari.

You say that the evolution of special effects in the 1970s was as revolutionary as the transition from silent films to talkies in the 1920s. How so?

The transition to sound was not just a new technology slapped onto an old form, but influenced nearly all areas of film production and exhibition, including acting styles, narrative forms, camerawork, lighting, scriptwriting, marketing and theater design, just to start.

Although much slower – over decades instead of years – the transition of the U.S. film industry to one based around special effects has had a like impact on moviemaking: a greater emphasis on “world building,” scripts organized by spectacle, broadening of the form. He looked so real! Or did he? We’ve been conditioned over decades to a particular kind of movie realism, says Julie Turnock, the author of “Plastic Reality,” an upcoming book on the development of special effects, and a professor of media and cinema studies at the U. of I. Our perception has been shaped, Turnock says, by the groundbreaking innovations on display in 1977’s "Star Wars" and "Close Encounters of the Third Kind," and by the effects company Industrial Light and Magic (ILM) – all of which are a focus of her book. She spoke with News Bureau social sciences editor Craig Charnetiari.

As a broader cinematic question, many believe “blockbusterism” in the conglomerate-dominated era we’re in now has narrowed the entertainment niche for theatrical release movies largely to big event movies like “Godzilla.” However, as the low-budgeted independent cinema movement of the 1990s suggested, historically these trends come and go. If lower budgeted movies become consistently profitable again, conglomerates will fund more of them. Nevertheless, those films will still feature plenty of special effects!
Commemorative event
Alma Mater rededication is June 6
The campus community is invited to attend a rededication ceremony for Alma Mater, the iconic sculpture created by alumnus Lorado Taft. The sculpture will be rededicated with song and speech beginning at 10 a.m. June 6 at Alma Mater Plaza on the southeast corner of Green and Wright streets in Urbana.

The sculpture, unveiled by Taft on June 11, 1929, returned to campus on April 9 after about 20 months of conservation work at a studio in Forest Park, Illinois.
Jean Taft Douglas Handler, a granddaughter of Taft and of the late U.S. Sen. Paul Douglas, of Illinois, is scheduled to speak at the ceremony in addition to Chancellor Phyllis M. Wise; Andrej Dujnowski, the lead conservator from the Conservation of Sculpture and Objects Studio; and Christa Deacy-Quinn, the collections manager for Spurlock Museum.

Deacy-Quinn will represent the Alma Mater Conservation Committee.

Ollie Watts Davis, a professor of music at Illinois, will sing “Illinois,” the alma mater before and after conservation will be given out to the first 250 attendees.
If the weather is bad, the ceremony will be in the South Lounge of the Illini Union.

After the ceremony, attendees are invited to join Dujnowski and the Conservation Committee in the Illini Union at 11:15 a.m. for a final technical report on the conservation process.

University YMCA
Exhibition features Urbana artist
Self-taught Urbana artist Marilynn Dean Cleveland has a lot to say and a lot to share with the world. Through Aug. 24, Urban Art, a special exhibit BYMACA will host Cleveland’s work in the exhibition “I Have Something to Say.” Curated by Art @ the Y, the exhibition shares her vision and experiences as a black woman, with narratives centering on black history and her personal story and faith.
Cleveland started making art as a young woman, using found materials such as house paint, cardboard and ashes to fulfill her profound need to create. Her prolific body of work includes paintings, multimedia collages and an array of miniatures formed from and painted on sometimes surprising materials. Her art illuminates the importance of the value of reflection in that process and the significance of learning and living through understanding, of the value of overcoming differences through understanding, of the value of reflection in that process and the significance of learning through stories. Her art is an expression of her personal determination and lifelong hope for change.
Art @ the Y events are free and open to the public. For more information, go to universityymca.org/art. The exhibition is open weekdays from 9 a.m. to 4 p.m.

Krannert Center announces new season
Krannert Center for the Performing Arts recently announced its 2014-15 season. The opening night party will feature Mariachi Sol de México, de José Hernández, Tiempo Libre and Sambó Soul as they fill the lobby with Latin sounds. The season’s roster includes renowned artists such as Rosanne Cash, René Fleming, Wynton Marsalis and Cassandra Wilson. A trio of performances in commemoration of the 100th anniversary of the start of World War I will let history reverberate, while commissioning projects with Gil Shaham, Ragamala Dance and the Mark Morris Dance Group will propel the future of the arts. Classical repertoire will ring anew in the Foellinger Great Hall as the Chicago Symphony Orchestra, St. Louis Symphony, Jupiter String Quartet and young artists of the Salon Series – Emerging Artists take to the stage. Families and audiences of all ages will relish the exuberance of Circus Oz and the National Acrobats of the People’s Republic of China, and the Day of the Drum. Performances by the U. of I. School of Music, Orchesis, the U. of I. Symphony Orchestra, St. Louis Symphony, Jupiter String Orchestra also are featured. The new season showcases consistent excellence and uncommon creativity across a multiplicity of genres and from around the world.

The center has a basic planning calendar on its website at krannertcenter.org; its season brochure will be mailed July 24, the same day more information about the 2014-15 season will be posted online. Tickets will go on sale at 10 a.m. Aug. 16.

Sundresses for Men: Not Just for Women
Not long ago, sundresses were something all women wore when they went out in public. But today the same dress or short dress can be seen on both women and men.
Sundresses are not just for women anymore. Men are embracing it as well. The trend started with casual attire and is now seen in every aspect of fashion, from suits to sport coats.

But how did it happen? The trend started with the rise of the modern man, who is no longer content to sit in a chair all day. The modern man wants to be active and wants to look good doing it.

Sundresses are a great way for men to show off their style without being too showy. They are also a great way to express individuality.

So next time you’re shopping for clothes, consider picking up a sundress. It’s a great way to show off your style and express your individuality.

Students are bent over their drafting tables in this view of the senior drafting room used by the department of architecture when it was part of the College of Engineering, circa 1917. In the center of the image is Marion Manley (1893-1984), a university alumna from the class of 1917 who later became a prominent architect in south Florida.

According to her biography, “Marion Manley: Miami’s First Woman Architect,” Manley helped to establish the acceptance of women as architects during the 20th century. She is best known for creating the master plan for the Coral Gables campus of the University of Miami with Robert Law Weed. Manley also designed many “tropical modern” houses throughout Miami and the shell for the Asolo Theater at the Ringling Museum in the 1950s. She continued to work through the 1960s and early 1970s, successfully winning recognition in this still heavily male-dominated field.

This image of Manley in her drafting class displays the wide scope of the holdings of the University Archives and its commitment to documenting the effect of the university curriculum on its students and society.

ON THE WEB
Photos: illinois.edu/blog/view/1561
University Archives: archives.library.illinois.edu
Hurricanes with female names more deadly than male-named

By Phil Ciciora
Business and Law Editor

In the coming Atlantic hurricane season, watch out for hurricanes with benign-sounding names like Dolly, Fay or Hanna. According to a new article from a team of researchers at the U. of I., hurricanes with feminine names are likely to cause significantly more deaths than hurricanes with masculine names, apparently because storms with feminine names are perceived as less threatening.

An analysis of more than six decades of death rates from U.S. hurricanes shows that severe hurricanes with a more feminine name result in a greater death toll, simply because a storm with a feminine name is seen as less foreboding than one with a more masculine name. As a result, people more in the path of these severe storms may take fewer protective measures, leaving them more vulnerable to harm.

The finding indicates an unfortunate and unintended consequence of the gendered naming of hurricanes, which has important implications for policymakers, meteorologists, the news media and the public regarding hurricane communication and preparedness, the researchers say.

“The problem is that a hurricane’s name has nothing to do with its severity,” said Kiju Jung, a doctoral student in marketing in the U. of I.’s College of Business and the lead author on the study.

“Names are assigned arbitrarily, based on a predetermined list of alternating male and female names,” he said. “If people in the path of a severe storm are judging the risk based on the storm’s name, then this is potentially very dangerous.”

The research, published in the Proceedings of the National Academy of Sciences, examined actual hurricane fatalities for the past 60 years. A team of U. of I. researchers showed that severe hurricanes with a more feminine name result in a greater death toll. From left, Kiju Jung, a doctoral student in marketing in the U. of I.’s College of Business and the lead author on the study, and Madhu Viswanathan and Sharon Shavitt, both professors of marketing at Illinois.

Hurricanes in the U.S. formerly were named by a team of U. of I. researchers. Severe hurricanes with a more feminine name result in a greater death toll.

Female fallout An analysis of more than six decades of death rates from U.S. hurricanes by a team of U. of I. researchers shows that severe hurricanes with a more feminine name result in a greater death toll. From left, Kiju Jung, a doctoral student in marketing in the U. of I.’s College of Business and the lead author on the study, and Madhu Viswanathan and Sharon Shavitt, both professors of marketing at Illinois. In a follow-up set of experiments, Jung and his colleagues examined how the gender of names directly affected people’s judgments about storms. They found that people who were asked to imagine being in the path of “Hurricane Alexandra” (or “Christina”) rated the storm as less risky and intense compared to those asked to imagine being in the path of “Hurricane Alexander” (or “Christopher”) or “Victor”.

“The stereotypes that underlie these judgments are subtle and not necessarily hostile toward women – they may involve viewing women as warmer and less aggressive than men.”

Such gender biases are pervasive and implicit,” said Madhu Viswanathan, a professor of marketing at Illinois and a co-author of the study. “We found that people were affected by the gender of hurricane names regardless of whether they explicitly endorsed the idea that women and men have different traits. This appears to be a widespread phenomenon.”

Hurricanes kill more than 200 people in the U.S. each year, and severe hurricanes are capable of producing casualties in the thousands, according to the paper. Even with climate change increasing the frequency and severity of storms, hurricane preparedness remains a challenge for officials.

Although the negative effect of gender stereotypes is well-known in hiring decisions and other evaluations of women and men, this research is the first to demonstrate that gender stereotypes can have deadly consequences.

Joseph Hilbe, of Arizona State University, also was a co-author of the paper.