



# IGBNEWS

Achievements, awards, and information about the IGB community

Volume 6, Number 8



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## Upcoming Events

### IGB Seminar (MMG)

January 28, 2014

12:00 p.m.

612 Institute for Genomic Biology

Brian T. Cunningham, PhD  
*Professor, Electrical and Computer Engineering,  
University of Illinois, Urbana-Champaign*

**"Biophotonics in the Life Sciences: New Tools  
Enabled by Optical Nanostructures"**

### IGB Seminar (CDMC)

February 4, 2014

12:00 p.m.

612 Institute for Genomic Biology

Ben J. Raphael, PhD  
*Associate Professor, Computer Science,  
Brown University*

**"Title to be Announced"**

### IGB Seminar (BioBEL)

February 11, 2014

12:00 p.m.

612 Institute for Genomic Biology

Robert Cook-Deegan, MD  
*Research Professor, Genome Ethics, Law & Policy,  
Duke University*

**"Title to be Announced"**

### IGB Seminar (BCXT)

February 18, 2014

12:00 p.m.

612 Institute for Genomic Biology

Laurie M. Barge, PhD  
*Jet Propulsion Laboratory,  
California Institute of Technology*

**"Title to be Announced"**

### IGB Seminar (BCXT)

February 25, 2014

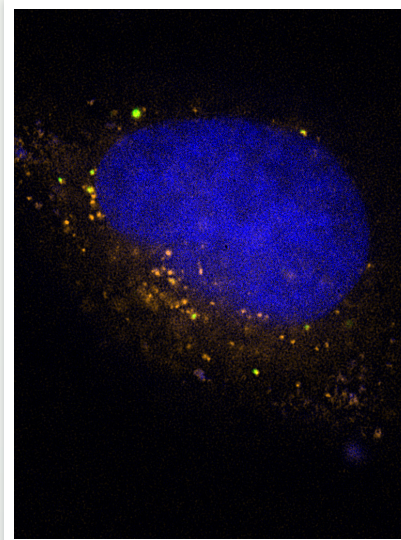
12:00 p.m.

612 Institute for Genomic Biology

Gregory H. Underhill, PhD  
*Assistant Professor, Bioengineering, University of  
Illinois, Urbana-Champaign*

**"Title to be Announced"**

## Image of the Month



This month's image, "Co-localization of polymer and DNA in HeLa", displays the uptake of polymer-DNA complexes in HeLa cells. We see the polymer (red), DNA (green) and cell nuclei (blue color). Image courtesy of Qian Yin and Nan Zheng of the Cheng Research Group, taken with the Zeiss Elyra S1 SIM.

## IGB News

Share your news with the IGB. Send your story ideas to [nvasi@illinois.edu](mailto:nvasi@illinois.edu)

# Researchers Unmask Centuries-old Elephant Imposter

*Through state-of-the-art ancient DNA and protein research and an exhaustive investigation of historical literature, researchers have determined a 300-year-old type specimen for Asian elephants is actually an African elephant.*

In a study in the *Zoological Journal of the Linnean Society*, led by Enrico Cappellini and Thomas Gilbert in Denmark, researchers have established a new specimen to represent the species, which is likely the remains of Hansken, the famous performing elephant from the 1600s.

### What's in a name?

Whenever a new species is discovered, under the International Code of Zoological Nomenclature, it is given a scientific name using binomial nomenclature and a "type" specimen is preserved, usually in a museum or research collection, so that other researchers can refer to it for physical details about the species.

"The type specimen is considered to be the representative for the entire species," said Alfred Roca, a professor of animal sciences and member of the Institute for Genomic Biology at the University of Illinois, who led Illinois's efforts in the study.

As the father of modern taxonomy, Carl Linnaeus solidified binomial nomenclature as the universal naming system and introduced a hierarchical scientific classification system where every organism is placed in a kingdom, phylum, class, order, family, genus, and species based on defining characteristics.

Thus, Linnaeus had the first opportunity to name more than 10,000 plants and animals, including elephants.

"Linnaeus didn't distinguish between African and Asian elephants," Roca said. "He just named the elephant."

In 1758, Linnaeus named elephants *Elephas maximus* in his definitive work, Edition 10 of the *Systema Naturae*. In his description, he cited several "syntypes" or examples of elephant specimens in Europe, including an elephant fetus as well as a skeleton described by John Ray, the famous 17th century naturalist.

Later, African elephants were separated into the genus *Loxodonta* designating two African species, the African bush elephant (*L. africana*) and African forest elephant (*L. cyclotis*).

Asian elephants remained known as *E. maximus*, and Linnaeus' original syntypes became associated with Asian elephants exclusively. But historical evidence and physical characteristics indicated that the fetus was most likely an African elephant.

### A case of missing identity

The fetus was originally owned by the Dutch West India Company and later sold to Albertus Seba, a Dutch pharmacist, zoologist and collector. Seba published a thesaurus of the "principal and rarest natural objects" in his expansive natural history collection, including the fetus that (according to the text) originated in Africa.

Swedish King Adolf Fredrik and Queen Lovisa Ulrika bought the fetus at an auction of Seba's collection, or shortly after. Linnaeus described the fetus after seeing it in the King's collection. Today, it is held at the Swedish Museum of Natural History in Stockholm.

Unlike Asian elephant fetuses that have domed heads, relatively small ears, and a single "finger" at the end of their trunks, this fetus has a convex-shaped head, relatively large ears, and two "fingers" at the end of its trunk—characteristics of an African elephant.

Through genetic analyses, the study definitively concluded that the fetus is an African elephant and should no longer be considered a syntype for Asian elephants.

European researchers discovered a peptide sequence differs in African and Asian elephants, and Illinois researchers confirmed the finding. Not surprisingly, the fetus had the African elephant version of the peptide.

Researchers also found three instances where a single nucleotide (represented by an A, T, C, or G) was different in the genetic code for Asian and African elephants. Again, the fetus matched the

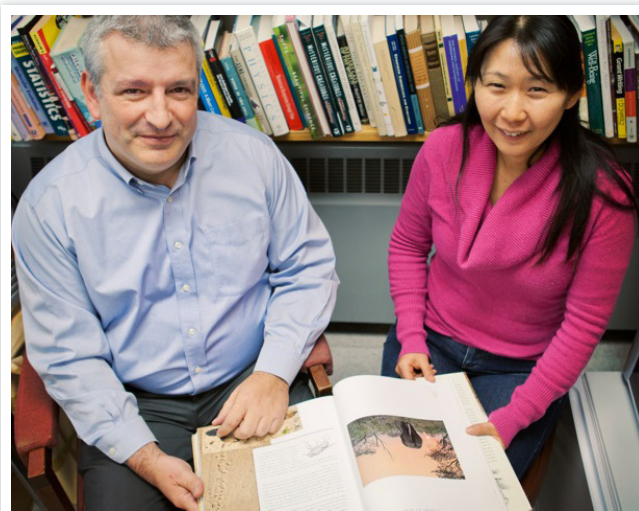
*Loxodonta* genus, not *Elephas*.

Yasuko Ishida, a research specialist in Roca's lab, compared the mitochondrial DNA (mtDNA) of the fetus to the mtDNA of African elephants from different regions of Africa.

"Using a database with DNA from more than 650 African elephants, Ishida found the fetus was from West Central Africa," Roca said. "That is actually the place where historical records suggest the fetus was collected."

### Worthy of the name

Once researchers established that the fetus was an African elephant, they set out to find an Asian elephant lectotype, which is a specimen that serves as a single type specimen for a species that was originally described by a set of syntypes.



» Assistant Professor of Animal Sciences Alfred Roca, left, with Research Specialist Yasuko Ishida

After scrutinizing references by Linnaeus in *Systema Naturae*, researchers discovered Ray's detailed description of an elephant skeleton that he observed in Florence, Italy, in 1664.

"One of the things Ray mentions is that the sternum of the elephant was missing," Roca said. "We did a little bit of sleuthing and contacted the National History Museum of the University of Florence. Sure enough, they have a specimen there that has a wooden replica of a sternum. We were able to use the museum records and track this elephant all the way back to the 1600s when Ray first saw it."

Due to the specimen's size, bone structure and teeth wear, researchers determined that the skeleton was a 25 to 30-year-old female Asian Elephant. DNA analysis confirmed that the skeleton

*continued on page 3*



## Monthly Feature cont.

belongs to *E. maximus*.

In accordance with the International Code of Zoological Nomenclature, researchers designated the elephant skeleton in Florence, catalogue number MZUF-734, as the lectotype of *E. maximus* to “preserve the traditional understanding and application of this name to the Asian elephant.” This change will go into effect in January of 2014.

### **A different name written all over it**

Historical references create an unmistakable link between this new lectotype and the famous 17th century circus elephant, Hansken.

Both were said to have been born in Ceylon, now Sri Lanka, in 1630. Both were female Asian elephants. Both had absent or very small tusks. Both were said to have had their weight measured at 6,600 pounds while in the presence of royalty. Both were said to have traveled in Germanic lands.

An account from 1651 said Hansken was 21 years old, which means four years later she would have been 25—the same as the estimated age of the Florence elephant at its death in 1655.

Most convincingly, both are said to have been able to draw a sword with their trunks. “How many elephants were in Europe at the time and how many were said to be able to draw a sword?” Roca said. “That’s what convinced me.”

The world may never know if Hansken’s skeleton remains in Florence where she was drawn by Stefano della Bella after her death in 1655. But thanks to modern technology, researchers were able to resolve the identity of Seba’s fetus and establish a credible lectotype for Asian elephants 320 years after Linnaeus named the species.

“It is remarkable to think that combining observations made more than 200 years ago by Linnaeus, Seba and John Ray, with state-of-the-art analysis

in ancient proteomics and DNA, has enabled us to give the Asian elephant its correct type specimen,” said Cappellini, the lead author of the study, from the Natural History Museum of Denmark. “That you can still see it as a life drawing by Rembrandt demonstrates how science and art remain inseparable.”

*This work was reported in the October 31, 2013 issue of Zoological Journal of the Linnean Society (<http://onlinelibrary.wiley.com/doi/10.1111/zoj.12084/abstract>). Researchers included Enrico Cappellini, Anthea Gentry, Eleftheria Palkopoulou, Yasuko Ishida, David Cram, Anna-Marie Roos, Mick Watson, Ulf Johansson, Bo Fernholm, Paolo Agnelli, Fausto Barbagli, Time Littlewood, Christian Kelstrup, Jesper Olsen, Adrian Lister, Alfred Roca, Love Dalén, and Thomas Gilbert.*

*The United States Fish and Wildlife Service supported Roca and Ishida’s research by funding earlier studies that contributed to these discoveries. ■*

## Monthly Profile

# Bryan Endres: The Regulation of Biofuels

Bryan Endres studies the ecological implications of biofuel feedstocks, including the potential of new biomass feedstocks to be invasive.

Not as an ecologist, but as a lawyer.

Today Endres studies the legal issues related to the approval of new bioenergy crops and works with a team of ecologists and crop scientists to study the regulation of bioenergy crops.

He has found that federal and state regulations for invasive plants are discordant instead of complementary and neither sufficiently regulates potentially harmful species.

“We found the vast majority of plants that are considered invasive by the ecological and crop science community are actually not regulated at the state or federal level,” he said. “There are serious problems in the existing regulatory regime that could allow someone to start planting an invasive plant for bioenergy purposes.”

Endres and his research team support the need for alternative fuels while protecting the country from “unintended consequences.” He says just because it is legal to plant something, doesn’t make it right.

“Think about the fact that kudzu was intentionally introduced into the country as this great feedstock,” he said. “It’s literally eaten the south and is spreading.”

Endres’ team has also found regulated plants that are not considered harmful.

“That’s an indication of a lack of science-based decision making that is just as harmful,” he said. “We are trying to calibrate the law so we have the right regulation that matches up with the right feedstock.”

While it may take a long time for Endres’ efforts to be integrated into national and state regulations, the EPA has acknowledged that they need to consider a plant’s potential to become invasive and how that plant will be cultivated and managed when they approve feedstocks for the renewable fuel standards.

“That’s why it is so important to fund this research on a long-term basis,” he said. “It’s a long process to see our work enacted.”

For years, Endres has studied biotechnology regimes in the United States’ Plant Protection Act that also regulates invasive species; so it was a natural jump for Endres to become involved in the Energy Biosciences Institute’s (EBI) efforts to increase biomass production while preventing the introduction of invasive species into natural



» Bryan Endres’ work addresses the legal as well as the ecological aspects of bioenergy crops.

ecosystems.

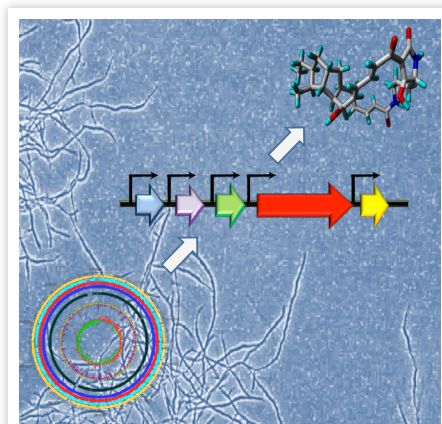
After high school, Endres received a bachelor’s degree in mathematical economics from The United States Military Academy at West Point. While serving in the army, he earned a master’s degree in administrative management from Bowie State University in Heidelberg, Germany. After five years of service, he attended law school at the University of Illinois and graduated *summa cum laude* in 2000.

“In law school, I was very interested in agro-environmental issues,” he said. “I started looking at the intersection of the law, the environment, and the farm and how it all fit into the larger system.”

After practicing law in Washington, DC and Phoenix, AZ, Endres joined the University of Illinois faculty in 2003. Now, ten years later, he is an asso-

*continued on page 4*

## New Method of DNA Editing Allows Synthetic Biologists to Unlock Secrets of a Bacterial Genome



A group of Illinois researchers, led by Centennial Chair Professor of the Department of Chemical and Biomolecular Engineering Huimin Zhao, has demonstrated the use of an innovative DNA engineering technique to discover potentially valuable functions hidden within bacterial genomes. Their work was reported in a *Nature Communications* article on December 5, 2013 (DOI: 10.1038/ncomms3894).

The genome of every bacterial species contains genes that can synthesize a diverse arsenal of compounds. These include natural antibiotics, antifungals, and other biochemicals that help the bacteria fight off unfriendly fellow microbes; such compounds are of potentially great medical importance. The genes encoding the enzymes a bacterium needs to create these compounds are often arranged in clusters. Each gene corresponds to one of a set of proteins that work together in a biochemical pathway to create one or a few products.

If a colony of bacteria is producing a biologically active compound, sometimes referred to as a natural product, scientists can isolate it, study its structure and function, and discover its potential uses. Many natural products have already been discovered by screening the compounds produced by different bacterial and other microbial species.

The compounds discovered so far, however, represent a small fraction of those that bacteria are capable of producing.

Bacteria are masters at survival; their genomes represent a set of contingency plans for a wide array of environmental situations. Like a painter laying out a palette with only the colors needed

that day, a bacterium will only express the genes and synthesize the compounds that will help it thrive in its current setting. Constant expression of the gene clusters that aren't useful in a given situation would be energetically wasteful.

This conservation of energy is good for bacteria, but bad for researchers hoping to discover new natural products. This was the challenge that Zhao and colleagues hoped to address when they began their project. "Sequence analysis of bacterial genomes indicates that there are many cryptic or silent pathways that have not been discovered," Zhao said. "...they need the right signal to turn on expression of the whole gene cluster."

Several strategies have been employed to trick cells into activating their little-used, "cryptic" gene clusters, such as culturing bacteria in a variety of harsh conditions or inserting sets of genes from one species of bacteria into the genome of another species. These techniques involve labor-intensive trial and error, with no guarantee of success.

Zhao's group, rather than attempting to manipulate the environment, focused on reprogramming the control of gene expression within the cell. They used a genetic engineering method previously developed by Zhao's laboratory, called DNA assembler, to insert small sections of DNA between each gene in a cryptic gene cluster. The sections of DNA added were promoters, specialized regions that help control when and how much nearby genes are expressed. By adding the right promoters, Zhao and colleagues forced the cell to increase expression of every gene in the cluster.

What makes Zhao's strategy possible is the ability of the DNA assembler method to join many different fragments of DNA in a single step. Previous methods for DNA editing limited researchers to making a series of sequential changes; the number of experimental steps required to add a promoter to each gene in even a small cluster

would have been prohibitive. In contrast, Zhao said, "we can actually build the whole cluster, so that gives us ultimate flexibility, because we can add different promoters," ensuring that every gene within the cluster is consistently activated.

For the study published in *Nature Communications*, Zhao and his coauthors modified a cryptic cluster of six genes from *Streptomyces griseus*, a species of soil bacterium. They added a promoter before each gene in the cluster to increase expression, and inserted the cluster into a related bacterial species, *Streptomyces lividans*, that is easier to grow in a laboratory setting.

The resulting bacterial strain expressed all the genes in the previously silent cluster, and produced several previously unknown compounds. These compounds belonged to a class of natural products called polycyclic tetramate macro-lactams or PTMs, many of which have useful biomedical applications. By examining the compounds produced by strains missing one of the six genes in the cluster, the researchers were able to discover the function of each gene's encoded protein, leading to a better understanding of how bacteria synthesize PTMs.

Zhao sees the work as an important step toward a larger goal: to create a generalized, automated high-throughput method to reconstruct any biochemical pathway in a target experimental organism. Zhao is the leader of the recently formed Biosystems Design Research Theme at the Institute for Genomic Biology, and development of this type of method is a major goal of the Theme.

"We want the technology platform established, then we can actually work on mammalian systems, on plant systems, on microorganisms," said Zhao. Yet his ultimate motivation is the discovery of potentially useful biochemicals: "It's very likely some of the compounds will turn into new drugs, and that's very exciting." ■

## Monthly Profile cont.

ciate professor in the Department of Agricultural and Consumer Economics.

Endres is a member of the IGB's Business, Economics, and Law of Genomic Biology research theme and a co-principal investigator of the EBI's Environmental, Social & Economic Impacts research area. He often collaborates on research projects with his wife, Jody Endres, who is also a member of the EBI and an expert in sustainability standards.

Currently, Endres serves as the Interim Associate Provost for International Affairs and Interim Director of International Programs and Studies, an office that supports international partnerships, area study centers, international students, and study abroad programs for the Urbana-Cham-

paign campus.

Despite all these responsibilities, Endres' interdisciplinary research continues. "The best part of my week is when I get to have my lab meetings with my research team," he said.

*The Energy Biosciences Institute is a public-private collaboration in which bioscience and biological techniques are being applied to help solve the global energy challenge. The partnership, funded with \$500 million for 10 years from the energy company BP, includes researchers from the University of California, Berkeley; the University of Illinois at Urbana-Champaign; the Lawrence Berkeley National Laboratory; and BP. Details about the EBI can be found on the website: [www.energybiosciencesinstitute.org](http://www.energybiosciencesinstitute.org)* ■



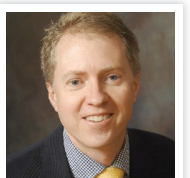
## Awards

### Stephen Boppart



Stephen Boppart was named a Fellow of the American Association for the Advancement of Science. ■

### Brian Cunningham



Brian Cunningham was elected a Fellow of the Optical Society of America "for the invention, development, and commercialization of biosensors and detection instrumentation based upon nanostructured surfaces, and the development of biological applications." ■

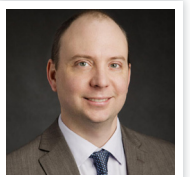
### Brendan Harley



Brendan Harley was selected to receive the 2014 Young Investigator Award of the Society for Biomaterials. This award is given to recognize an individual within ten

years of their terminal degree who has demonstrated outstanding achievements in the field of biomaterials research. ■

### Charles Schroeder



Charles Schroeder was named a Center for Advanced Study 2014-15 Fellow, pending BOT approval in January. ■

### Huimin Zhao



Huimin Zhao received the 2014 Gaden Award. Named in honor of Elmer L. Gaden, Jr., the founding editor of the journal *Biotechnology & Bioengineering*, the award

recognizes an outstanding published paper from the journal in the last year. ■

## Advisory

### May Berenbaum to Serve on NSF Advisory Committee

Chancellor Phyllis M. Wise nominated May Berenbaum, professor and head of the Department of Entomology, to the Directorate for Biological Sciences Advisory Committee (BIO AC) at the National Science Foundation (NSF).



"Since NSF is the principal funder of basic life science research, the advisory committee has the potential to have a significant impact on the future direction of basic life science research across the country," Berenbaum said. "In the past, NSF has really encouraged and facilitated curiosity-driven research that could be considered high risk, but high risks, in my opinion, often lead to big rewards.

"It is of utmost importance for U.S. scientific competitiveness that politics remain out of the process by which decisions are made that relate to funding basic research. I am more than willing to do whatever I can to preserve the integrity of the process of funding basic research." ■

## Magazine

### Biomarker Volume 7



The newest issue of the IGB magazine, Biomarker, is now available. Featuring research highlights of the year including articles on schistosomes, a new grant to study social behavior, coverage of our newest research team, and much more.

Download a copy from the IGB website at <http://www.igb.illinois.edu/facilities-services/communications> or request a printed copy by emailing [nvasi@illinois.edu](mailto:nvasi@illinois.edu) ■

## Security

### Email Security Guidelines

Steffan Nass, FBI WMD Coordinator, has provided updated guidelines based on the security talk he presented at the IGB last November:

"Due to the sensitive nature of the research conducted at the Institute for Genomic Biology, there exists a desire by some nations/entities to acquire access to such through fraudulent means. Every person, from principal investigator to graduate assistant, at the IGB may be targeted through an e-mail Phishing attack.

"E-mail is inherently insecure and the overwhelming majority of computer intrusions in the past year utilized some form of Phishing attack. Never click on a link or attachment sent from an unknown account. It is also good practice to verify with the sender prior to opening any links or attachments sent through e-mail.

"If you notice any suspicious activity or receive any such unsolicited requests, report it immediately to security personnel." ■

## Email

### New Way To Stay Informed About IGB News Coming In January!



In order to reduce the amount of email sent to our IGB members, coming next year we will debut a new method of delivering important information via a scheduled message to everyone at the IGB.

A weekly email will be sent out every Friday that lists upcoming events at the IGB and around campus, and includes relevant content concerning announcements, proposals, competitions, and other topics of interest to a genomic audience.

If you would like to submit content for the weekly email, simply send your post to [IGBsubmissions@igb.illinois.edu](mailto:IGBsubmissions@igb.illinois.edu) by 12:00pm Thursday to be included in the next post.

Our first email will go out on Friday, January 10, 2014! ■

## Nominations still being accepted for Innovation Celebration 2014!

Innovation Celebration is an annual event that recognizes the entrepreneurial spirit in our community and on our campus. Awardees are recognized for contributions in several categories, including economic impact, social entrepreneurship, and student start-ups.

The Office of Technology Management is proud

to partner with event organizers to host the Innovation Transfer award, which is specific to nominees from the University of Illinois.

This award recognizes an individual or group from the University of Illinois whose research has resulted in either a discovery or a work with the potential for significant societal impact.

Nominations will be accepted through December 18, 2013. Nominate yourself or a colleague today by filling out a very brief form that can be found at [www.innovationcelebration.com](http://www.innovationcelebration.com).

This year's event will take place on **February 27, 2014** from 5:00 – 8:00 p.m. at the NCSA, 1205 W. Clark Street in Urbana. ■

## ADMINISTRATIVE NEWS

### Operations & Facilities

#### IGB Building Holiday Schedule Changes

- The IGB building will be closed December 23 thru January 1. This means that all exterior doors will be locked and all card access doors will require entry with a valid IGB prox card. Please take care when entering or leaving the IGB not to allow someone you do not recognize into the IGB.
- If you notice any urgent building issues (water leaks, CT room temperature problems, etc.) please call 333-0340 for the F&S Service Office. This number is answered by Public Safety during off-hours and they will be able to assist you. Emails sent to [facilities@igb.uiuc.edu](mailto:facilities@igb.uiuc.edu) during this time will not be immediately addressed.
- IGB administrative offices will be closed December 23 thru January 1.
- IGB Shipping and Receiving will be closed December 23 thru January 1. No packages or mail will be received or sent during this time period. If you have any questions related to shipping, receiving, or mail, please contact IGB Shipping and Receiving ([receiving@igb.uiuc.edu](mailto:receiving@igb.uiuc.edu)). If you have questions related to purchasing, please contact the Business Office ([purchasing@igb.uiuc.edu](mailto:purchasing@igb.uiuc.edu)).
- Array Cafe will be closed December 23 thru January 1.
- If you are in the building when it is closed, please turn off all lights when you leave your area.
- "No parking" areas are still enforced even when the building is closed. IGB bagged meters on Mathews are still permit parking only.

#### I-Card Expiration Date

- Please be mindful of the expiration date on your I-Card. If your card is scheduled to expire during the holiday break, make plans to visit the I-Card Center soon to update your card. If your card expires, your card access is deactivated! ■

### Communications

#### The IGB is on LinkedIn—are you?



There's been a lot of discussion about the value of having a LinkedIn account. In **this article**, *Nature* outlines many of the benefits for scientists who maintain a profile and provides tips on how to make yours "look good." If you don't have one, follow these **directions** to create your profile.

Okay, so you have a profile—but is the IGB listed?

Consider adding your affiliation to the IGB to your profile—for all the same reasons that you initially joined this interdisciplinary institute. Directions are **available here**.

By adding your affiliation to the IGB, you are illustrating a commitment to collaborative research to colleagues, committees, funding institutions and others, including anyone who might Google you. It's one more opportunity to showcase your unique contributions to science while expounding on why your work is important to you and society.

That's not all. You can also follow the IGB's **company page** for updates about IGB news, events, and employment opportunities. Download **directions here**. If you'd like to submit any content for the LinkedIn company page, or have any questions on how to complete the above steps or the benefits of LinkedIn in general, please contact Claire Sturgeon of the IGB Communications group at [csturg@illinois.edu](mailto:csturg@illinois.edu).

We look forward to connecting with you on LinkedIn today! ■

### CNRG

#### New Slide Scanner

CNRG has added a slide scanner to its inventory of tools. If you have any old slides that you would like to have converted into an image, this is the tool for you. CNRG also has tools for paper binding as well.

If you have questions, please contact [help@igb.uiuc.edu](mailto:help@igb.uiuc.edu) ■

## Business

### Holiday Schedule/Reduced Service Days

As we approach the holiday season we are providing a reminder of the upcoming holiday schedule and the accompanying reduced service days.

Monday, December 23, 2013 — Reduced Service Day

Tuesday, December 24, 2013 — ½ Gift Day from Chancellor Wise and President Easter, ½ Excused Day

Wednesday, December 25, 2013 — University Holiday

Thursday, December 26, 2013 — University Designated Holiday

Friday, December 27, 2013 — Reduced Service Day

Monday, December 30, 2013 — Reduced Service Day

Tuesday, December 31, 2013 — Reduced Service Day

Wednesday, January 1, 2014 — University Holiday

#### Reduced Service Days:

- It is expected that most units will be closed and most employees will not be working those three days.
- Employees may use floating holidays or vacation to cover this time if they do not work.
- In addition, non-exempt (eligible for overtime) employees may use accrued compensatory time or take the time excused without pay.
- Exempt employees who do not have accrued vacation or floating holidays to cover this time cannot have their pay docked. The unit may require such employees to work on the unit and the employee may make arrangements to account for the reduced service days in an alternative way.
- Since the reduced service days are not official holidays, employees who are required to work and those who choose to work will be paid their regular hourly rate of pay. For payroll time reporting purposes, non-exempt staff employees who work should record their time for these three days as regular hours. Exempt employees who are required to work on one or more of these days should not record anything for the days they work, since they record only "exception time" (e.g., vacation or sick leave usage).

Questions regarding reduced service days may be directed to Connie Foran, Labor and Employee Relations at 333-3105 or Yulee Kim, Academic Human Resources at 333-0033. ■

## Recent Publications

Serao, N. V. L., D. Gonzalez-Pena, J. E. Beever, G. A. Bollero, B. R. Southey, D. B. Faulkner, and S. L. Rodriguez-Zas. 2013. "Bivariate Genome-Wide Association Analysis of the Growth and Intake Components of Feed Efficiency." *Plos One* 8 (10): e78530.

Cingolani, P., X. Cao, R. S. Khetani, C. -C Chen, M. Coon, A. Sammak, A. Bollig-Fischer, et al. 2013. "Intronic Non-CG DNA Hydroxymethylation and Alternative mRNA Splicing in Honey Bees." *Bmc Genomics* 14: 666.

Ju, K. S., J. R. Doroghazi, and W. W. Metcalf. 2013. "Genomics-Enabled Discovery of Phosphonate Natural Products and their Biosynthetic Pathways." *Journal of Industrial Microbiology & Biotechnology*.

Burns, P. D., Y. Li, J. Ma, and M. Borodovsky. 2013. "UnSplicer: Mapping Spliced RNA-Seq Reads in Compact Genomes and Filtering Noisy Splicing." *Nucleic Acids Research*.

Dong, Y., C. G. Kumar, N. Chia, P. J. Kim, P. A. Miller, N. D. Price, I. K. Cann, et al. 2013. "Halomonas Sulfidaeris-Dominated Microbial Community Inhabits a 1.8 km-Deep Subsurface Cambrian Sandstone Reservoir." *Environmental Microbiology*.

Albright, J. C., A. W. Goering, J. R. Doroghazi, W. W. Metcalf, and N. L. Kelleher. 2013. "Strain-Specific Proteogenomics Accelerates the Discovery of Natural Products Via their Biosynthetic Pathways." *Journal of Industrial Microbiology and Biotechnology*: 1-9.

He, Y., D. Li, S. L. Cook, M. -S Yoon, A. Kapoor, C. V. Rao, P. J. A. Kenis, J. Chen, and F. Wang. 2013. Mammalian Target of Rapamycin and Rictor Control Neutrophil Chemotaxis by Regulating Rac/Cdc42 Activity and the Actin Cytoskeleton. *Molecular Biology of the Cell*. Vol. 24.

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