

IGB NEWS

Upcoming Events

Monthly Profiles

Happenings at IGB

Image Of The Month

IP @ IGB

Administrative News

Volume 7, Number 1

UPCOMING EVENTS

Institute for Universal Biology (IUB) - NASA Astrobiology Institute Seminar Lecture Series

The Art of Yellowstone Science: Mammoth Hot Springs as a Window on Evolutionary Processes

February 14, 2014, 12:00 p.m.

612 Institute for Genomic Biology

Bruce W. Fouke

Director, Roy J. Carver Biotechnology Center

Departments of Geology & Microbiology

University of Illinois at Urbana-Champaign

IGB Seminar (BCXT)

Chemical Disequilibrium, Hydrothermal Vents, and the Origin of Metabolism

February 18, 2014, 12:00 p.m.

612 Institute for Genomic Biology

Laurie M. Barge, PhD

Jet Propulsion Laboratory

California Institute of Technology

The Center for Advanced Study Twenty-Third Annual Lecture

Me to We: Searching for the Genetic Roots of Sociality

February 19, 2014, 7:30 p.m.

Knight Auditorium, Spurlock Museum

Gene E. Robinson

Director, Institute for Genomic Biology

University of Illinois at Urbana-Champaign

IGB Seminar (ReBTE)

Engineered Microenvironments for Probing Cell Fate Decisions

February 25, 2014, 12:00 p.m.

612 Institute for Genomic Biology

Gregory H. Underhill, PhD

Assistant Professor, Bioengineering

University of Illinois, Urbana-Champaign

FEATURED NEWS



Genomics for Judges:
Educating Judges on DNA



Profile:
May Berenbaum

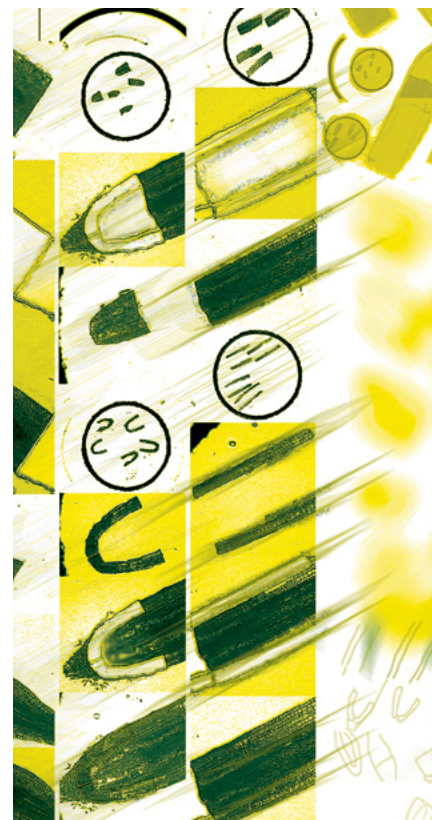


Microbes Dominate Deep
Sandstone Formations



On the Grid:
Happenings at IGB

IMAGE OF THE MONTH



This month's image, "Laser Capture and Microdissection of Sorghum Roots," shows root tips of sorghum plants treated with aluminum. Researchers used lasers to dissect out specific types of cells and tissues in treated plants in order to study the plant's response to toxicity.

This image was created using the Veritas laser capture microdissection and laser cutting system, and is provided courtesy of Mayandi Sivaguru of Core Facilities.

IGB News

Share your news with the IGB. Send ideas on stories, articles, and features to nvasi@illinois.edu.



Genomics for Judges: Educating Illinois Judges on DNA and Genetics

Genomic research will eventually uncover a complete picture of how our genetic information, acting in concert with our experiences, influences our behavior, our risk for disease, and our responsiveness to medical treatments. These are all subjects of great academic and personal interest, but what happens when they are connected to a question of legality? When considering whether an individual's genetic inheritance can be blamed for criminal behavior, or how information on disease predisposition should be used, who is qualified to testify, and what kinds of knowledge are needed to make sound judicial decisions?

The Supreme Court of Illinois and its Administrative Office of the Illinois Courts, in coordination with members of the Illinois Judicial Conference Committee on Education, appointed by the Supreme Court, are responsible for facilitating educational resources for Illinois judges, including those pertaining to sciences in the law. The Institute for Genomic Biology (IGB) at the University of Illinois had the unique opportunity to work with the AOIC in offering a new seminar, "Genomics forTM Judges," that was designed to prepare judges to grapple with legal questions involving DNA sequencing and analysis, as well as related technologies, in the courts today and in the future.

The two-day course, held at the IGB on the Urbana-Champaign campus, was also supported by the Office of the Vice Chancellor for Research and

the College of Law. The program capitalized on the IGB's record of public education and depth of expertise in both basic genomics research and the impact of genomics on society. The seminar included presentations by internationally renowned scientists and legal experts from the University of Illinois and other major institutions, as well as Gina Kolata, a *New York Times* science journalist.

Forty-eight judges and justices from around Illinois were immersed in a rich scientific experience that included the structure and function of DNA, how

(above) Hon. Heinz Rudolf working in the IGB lab, extracting DNA during one of the exercises during the seminar.

gene function is influenced by the environment, and how genome sequences are analyzed. Other sessions explored intersections between genomics and legal issues, including the patentability of genomic technologies, the relationship between genetics and criminal behavior, and the accuracy and admissibility of DNA evidence. As part of a simulated exercise, judges were given the opportunity to work in a lab and to extract DNA from strawberries. The full agenda for the seminar can be viewed at <http://bit.ly/M60a6N>.

The rapid pace of progress in genomic biology

means that the gap between current knowledge and the biology that most adults learned in high school or college courses is continually increasing. Continuing education courses such as the Genomics for Judges program provide an opportunity to close that gap. This can be crucial to judges' ability to understand and interpret evidence and testimony heard in the courtroom. "We can only make decisions about a case based on the evidence that we hear in the courtroom," said Hon. Kathleen Kauffman, Illinois Judge and a member of the Committee on Education. "So these kinds of programs are really important because they can give us some background information."

Hon. Heinz Rudolf, an Illinois Judge, member of the Committee on Education, and a Fellow in the Advanced Science & Technology Adjudication Resource Center (ASTAR), a program that provides science and technology training for judges, acted as discussion facilitator during the Genomics for Judges seminar. Judge Rudolf highlighted the importance of a judicial education course focused on genomics. "As technology and our society evolves, we know science is going to be more and more prevalent in our courtroom and we as judges need to be prepared."

Hon. Scott Shore, Illinois Judge, and also a member of the Committee on Education, agreed: "I believe that genomics will have a large impact on us in our daily lives, in our national lives . . . why not be in-

terested in the field?" he said. "What fascinated me about the field of genetics is the potential that it has for impact on the law, and the law will also impact genetics."

The level of enthusiasm among the attendees was high, and many asked insightful questions of the presenters and expressed their excitement about the

content of the course. "When the seminar became available, I ran to my chief judge and I said I want to do this!" said Hon. Susan Tungate, Illinois Judge, "...there were a lot of judges who felt that way."

As DNA sequencing and other biotechnologies advance, the rate of new developments in genomic biology and its impact on society and in the court-

room will continue to grow. The success of the Genomics for Judges program has already prompted plans to address the need for genomics education by offering the seminar on a regular basis. ■

Written by Claudia Lutz. Photo by Kathryn Coulter.

PROFILE



May Berenbaum serves as professor and head of the Department of Entomology, is the author of several books, and the organizer of the Insect Fear Film Festival.

May Berenbaum: Ecologist By Training, Entomologist By Trade

May Berenbaum studies how insects eat plants.

"Insects that eat crop plants cause, globally, billions of dollars worth of economic losses and create massive food instability," said Berenbaum, professor and head of the Department of Entomology. "If food stability and sustainability are desirable economic goals then it's really important to understand the basic components that underlie interactions between plants and insects."

By understanding the basic principles by which a plant-feeding insect finds host plants, overcomes host plant defenses, and ultimately goes about its life, researchers will have newfound insight into managing many crop pests.

"How insects eat plants can be addressed at the molecular level by examining the genes that encode the enzymes that metabolize toxins all the way up to the landscape level where we have examined how plant-insect interactions have helped shape community composition," she said.

As an ecologist by training, Berenbaum admires these pests.

"They are amazing," she said. "It's not easy for an insect to eat hundreds of different crop plants. It's a real challenge."

While most herbivorous insects can only consume a narrow range of host plants, the naval orange worm

has managed to colonize just about every nut tree in California. It's a major pest for almonds, walnuts, pistachios, figs, pomegranates, citrus, and other plants.

"How does this insect manage to process the tremendous diversity of phytochemicals in these unrelated plant families?" Berenbaum asks. "How can it overcome these chemical challenges in a relatively short amount of time, as pistachios were not grown in California until the 1970s? Why did it leave its native leguminous hosts to prey upon this unusual and phytochemically-challenging tree?"

It's not just a matter of how many plants a bug eats. Berenbaum is equally impressed with the type of plant an insect will consume.

Take the parsnip webworm for example.

"Here is an insect that is native to Europe that feeds on just a handful of plants that are all closely related," Berenbaum said. "It feeds on the plant parts that are richest in a group of chemicals that are incredibly toxic to just about every other life form."

Parsnip webworms consume about 10 percent of their body weight in these deadly toxins, not only in Europe but also in other corners of the world where parsnips are grown. For Berenbaum, these insects raise some important, fundamental questions.

"How do you become so good at utilizing this one

particular crop?" she said. "How do you find it? How do you get there? How do you deal with new, entirely different ecological communities?"

Berenbaum has been trying to answer some of these questions about parsnip webworms since her doctoral thesis. She earned her doctorate in ecology and evolutionary biology from Cornell University and before that graduated *summa cum laude* from Yale University with a bachelor's degree in biology.

In 1980, two weeks after she finished her thesis, she began working at the University of Illinois. She became a professor in 1990 and began serving as the head of the Department of Entomology in 1992. Today she is also a member of the Genomic Ecology of Global Change research theme at the IGB.

Among many awards and honors, Berenbaum has received the Presidential Young Investigators' Award and the Tyler Award for Environmental Achievement, and has been named a University Scholar, Elected Fellow by American Association for the Advancement of Science, and Elected Member of the National Academy of Sciences.

Recently, she was nominated by Chancellor Phyllis Wise to join the National Science Foundation's Advisory Committee for the Biology Directorate. ■

Written by Claire Sturgeon. Photo by Kathryn Coulter.

RESEARCH



Study leader Bruce Fouke conducts research on microbes in extreme environments. His work in Yellowstone offers a basis for interpreting new research on subterranean microbes.

Oil- And Metal-Munching Microbes Dominate Deep Sandstone Formations

Halomonas are a hardy breed of bacteria. They can withstand heat, high salinity, low oxygen, utter darkness and pressures that would kill most other organisms. These traits enable these microbes to eke out a living in deep sandstone formations that also happen to be useful for hydrocarbon extraction and carbon sequestration, researchers report in a new study.

The analysis, the first unobstructed view of the microbial life of sandstone formations more than a mile below the surface, appears in the journal *Environmental Microbiology*.

"We are using new DNA technologies to understand the distribution of life in extreme natural environments," said study leader Bruce Fouke, a professor of geology and of microbiology. Fouke also is an investigator with the Energy Biosciences Institute, which funded the research, and an IGB affiliate.

Underground microbes are at least as diverse as their surface-dwelling counterparts, Fouke said, and that diversity has gone largely unstudied.

"Astonishingly little is known of this vast subsurface reservoir of biodiversity, despite our civilization's regular access to and exploitation of subterranean environments," he said.

To address this gap in knowledge, Fouke and his colleagues collected microbial samples from a sandstone reservoir 1.8 kilometers (1.1 miles) below the surface.

The team used a probe developed by the oilfield services company Schlumberger that reduces or eliminates contamination from mud and microbes at intermediate depths. The researchers sampled sandstone deposits of the Illinois Basin, a vast, subterranean bowl underlying much of Illinois and parts of Indiana, Kentucky and Tennessee, and a rich source of coal and oil.

A genomic study and analysis of the microbes the

team recovered revealed "a low-diversity microbial community dominated by *Halomonas sulfidaeris*-like bacteria that have evolved several strategies to cope with and survive the high-pressure,

"Astonishingly little is known of this vast subsurface reservoir of biodiversity, despite our civilization's regular access to and exploitation of subterranean environments."

high-temperature and nutrient deprived deep subsurface environment," Fouke said.

An analysis of the microbes' metabolism found that these bacteria are able to utilize iron and nitrogen from their surroundings and recycle scarce nutrients to meet their metabolic needs. (Another member of the same group, *Halomonas titanicae*, is so named because it is consuming the iron superstructure of the Titanic.)

Perhaps most importantly, the team found that the microbes living in the deep sandstone deposits of the Illinois Basin were capable of metabolizing aromatic compounds, a common component of petroleum.

"This means that these indigenous microbes would have the adaptive edge if hydrocarbon migration eventually does occur," Fouke said.

A better understanding of the microbial life of the subterranean world will "enhance our ability to explore for and recover oil and gas, and to make more environmentally sound choices for subsurface gas storage," he said.

The research team also included scientists from The Institute for Systems Biology, in Seattle; the Mayo Clinic; the Asia Pacific Center for Theoretical Phys-

ics in South Korea; Shell Oil Co.; Argonne National Laboratory; four U. of I. departments: chemical and biomolecular engineering, civil and environmental engineering, natural resources and environmental sciences, and animal sciences; and the Illinois State Geological Survey at the Prairie Research Institute at Illinois.

The Energy Biosciences Institute is a research collaboration involving the U. of I., the University of California at Berkeley, the Lawrence Berkeley National Laboratory, and BP, the energy company that funds the work. ■

Written by Diana Yates. Photo by Tom Murphy.



Halomonas bacteria are well-known for consuming the metal parts of the Titanic.

Photo courtesy of NOAA.

ON THE GRID HAPPENINGS AT THE IGB

AWARDS



CARL BERNACCHI

Assistant Professor of Plant Biology Carl Bernacchi has been selected as a 2014-2015 Helen Corley Petit Scholar, an endowment which funds development of the scholarship and teaching of LAS college members early in their career.

NEW ARRIVALS



JOHN (J. D.) MALONEY

J.D. Maloney joins the IGB as a Research Programmer, supporting faculty and staff's computers and assisting with other Information Technology needs. J.D. received his B.S. in Technical Systems Management from this campus. He has 4 years of experience in Information Technology working in both the public and private sector.

CAMP



POLLEN POWER! SUMMER CAMP RETURNS

Once again the IGB will be hosting Pollen Power!, a week-long day camp for talented girls who are interested in the biological sciences.

This year's camp will take place July 7-11, 2014. Save the date and register early!

For more information please visit
<http://pollensummercamp.illinois.edu/>.

IP @ IGB

BRIAN CUNNINGHAM

Brian Cunningham, professor of Bioengineering and of Electrical and Computer Engineering and director of the Micro and Nanotechnology Laboratory, has been elected as a 2013 Charter Fellow of the National Academy of Inventors.



NINTH ANNUAL INNOVATION CELEBRATION

Thursday, February 27, 2014
NCSA Auditorium and Atrium,
1205 West Clark Street
5:00 pm - 8:00 pm

The University of Illinois and the Champaign County Economic Development Corporation are pleased to announce the Ninth Annual Innovation Celebration in recognition of those individuals and organizations that have made significant contributions, taken risks, and provided leadership to ensure the continuing economic success of Champaign County, the ongoing success of the University's economic development mission, and the growth of entrepreneurial talent and energy in our community.

ART EXHIBIT



ART OF SCIENCE 4.0

Save the date for the next show of the IGB's Art of Science exhibit!

Opening Reception is Thursday, April 3, from 6:00 to 8:00pm at the indi go gallery. The exhibit will run April 4 through 7.

GIVING



WALK OF LIFE

Walk of Life pavers are the perfect way to commemorate a special event, like graduation. For a paver to be installed by May 18, please contact Melissa McKillip at mmckilli@illinois.edu before Friday, March 7.

More information can be found at
www.igb.illinois.edu/about/giving.

ON THE GRID HAPPENINGS AT THE IGB

CEM



CERTIFICATE IN ENTREPRENEURSHIP AND MANAGEMENT

Tuesday, March 11th, 2014
IGB Conference Room 612/614
5:00pm - 7:00pm

Please join the IGB and the Office of Technology Management for IGB's Proof of Concept (POC) Program Wrap-up and Pitch Presentations. This event will highlight the inaugural two years of IGB POC projects and will provide the investigators an opportunity to show the IGB community how POC funding has enabled their projects to bridge the gap between the laboratory and commercial applicability.

5:00-5:30 PM

Pizza will be served

5:30-5:45 PM

Brendan Harley
Spatially-Patterned Composite Biomaterial for Improved Clinical Treatment of Tendon Defects

5:45-6:00 PM

Bill Metcalf
"Evolutionary Pharmaceuticals"

6:00-6:15 PM

Hyun Joon Kong and Rashid Bashir
"Stereolithographically Assembled Living Vascular Stamp for Neovascularization of Wounds and Ischemic Tissue"

6:15-6:30 PM

Victor Jongeneel and Roy Campbell
"Accurate Sequence Alignment using Distributed Filtering on GPU Clusters"

6:30-6:45 PM

Matt Wheeler
"Customized Implantable Therapeutics for Wound Healing"

THEME HOP



IGB THEME HOPPING

Friday, February 28
Room 2410 IGB
4:00pm - 5:30pm

Come and meet the theme next door. IGB Theme Hopping provides the different groups at IGB the opportunity to meet members of the other themes, and learn who they are and what they are working on.

Join us to learn what is new in the Gene Networks in Neural & Developmental Plasticity research theme!

CAS LECTURE

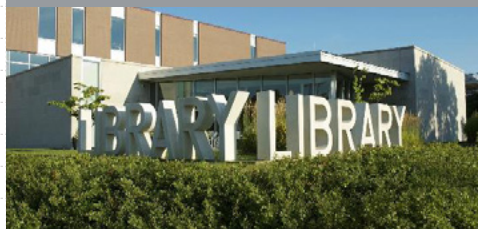


CENTER FOR ADVANCED STUDY'S 23RD ANNUAL LECTURE

February 19, 2014
Knight Auditorium, Spurlock Museum
7:30 p.m.

IGB Director Gene Robinson will deliver the CAS annual lecture, continuing the center's tradition of showcasing the university's most distinguished scholars. His lecture, "Me to We: Searching for the Genetic Roots of Sociality," will use the honey bee and related species to demonstrate how researchers who have used genomics to study the social life of insects in molecular terms have documented mechanisms that regulate selfish behavior.

SCIENCE CAFE



CHAMBANA SCIENCE CAFE

Bringing scientists to the public to talk about their research in an informal setting, join us every month this semester at the Champaign Public Library in Robeson Pavilion Room C.

The first talk (previously scheduled for February 5 but rescheduled due to weather) will take place Friday, February 21st, at 5:30 featuring Nathan Medeiros-Ward on "Driven to distraction: A look at multitasking and driving."

Visit <https://www.facebook.com/Chambana-ScienceCafe> for full info.

BAKE OFF



IGB BAKE-OFF AND CULINARY COMPETITION

Monday, Feb. 17,
Array Café, starts 4:00pm

All individuals and groups are invited to attend and to participate. Bring a sweet or savory dish and join in the competition! If possible drop off at Gatehouse 2nd floor, Office 2634, and email mmckilli@illinois.edu with a list of ingredients.

ADMINISTRATIVE NEWS

BUSINESS

W-2 REISSUE PROCESS

Process

Employees who do not receive their mailed Form W-2 or Form 1042-S by posted date, or who need to replace a lost or misplaced form, may obtain a reissued form through either electronic retrieval or by mail.

Electronic Form W-2/1042-S Reissue

Employees that did not consent to receive their Form W-2 and/or 1042-S electronically may still retrieve an electronic reissue of their Form W-2 and/or 1042-S after the posted date through NESSIE, under the **compensation tab**. This process can be used for current and past 1042-S back to 2012 and past W-2s back to 2004.

Mailed Form W-2 or Form 1042-S Reissue

If you need a reissue of your Form W-2 or Form 1042-S to be mailed to you, call the JAT Reissue Call Center at 866-923-6767 between the hours of 8:00 a.m. to 8:00 p.m. (Central Standard Time), Monday through Friday. If calling after hours, a voicemail system is available to leave a message. Messages will be retrieved and processed the next business day. Provide your Social Security Number, password (birth date), mailing address, and a contact phone number in case the duplicate is returned to the vendor. If an address change is required, a representative at the Center will change the address on the form and send the reissue to the correct address. The requested form will be mailed the next business day.

NOTE: This change of address will only be reflected on the reissued form. To permanently change your address for future mailings, you would need to make that change through NESSIE. See the **Employee Address Change** page for instructions on how to change your mailing address in NESSIE.

Employees who need to request a duplicate of Form W-2 (prior to 2004) or Form 1042-S for a prior tax year need to do the following:

1. Fill out the **Request for Duplicate Tax Form** (W-2 and/or 1042-S).
2. Submit the completed form to the University Payroll & Benefits (mailing addresses for Chicago, Springfield, and Urbana-Champaign campuses are included on the form). Allow five business days to process your request.

Employees who need to request a correction to their Form W-2 or Form 1042-S should call the UPB Customer Service Center at:

- UIUC: 217-265-6363
- UIC: 312-996-7200
- UIS: 217-206-7211 ■

UNIVERSITY LIBRARY

DATASET DOI PILOT PROJECT

Researchers at the University of Illinois at Urbana-Champaign will soon have an opportunity to obtain Digital Object Identifiers (DOIs) for their data as part of a pilot service focused on data sharing and management. The EZID pilot is spearheaded by the University Library and will run during the spring and summer of 2014. It is open to students, faculty and staff.

By obtaining DOIs for your data, you will make it easier for other researchers to find and cite your data. DOIs will be obtained from DataCite (www.datacite.org), which is an international organization that provides metadata about (i.e., descriptions) and persistent identifiers to registered datasets. The Library will be using the EZID system to submit metadata to DataCite and obtain DOIs.

The pilot is open to a variety of data resources (e.g., spreadsheets, databases, visualizations, code). As a requirement of the pilot, the data resources must be accessible via the World Wide Web, and the data creator must supply basic metadata about each resource to be submitted to DataCite.

For more information about the pilot and a link to the application form: <http://publish.illinois.edu/research-data/2013/11/15/ezid-pilot-dois-for-datasets/>.

If you have questions about the dataset DOI pilot or other research data issues, feel free to contact Sarah Williams, Life Sciences Data Services Librarian, at scwillms@illinois.edu. ■

COMMUNICATIONS

IGB WEEKLY UPDATE EMAIL GUIDELINES

We've seen great success with the new IGB Weekly Update email, which is sent out every Friday concerning news and events at the IGB and around the campus. If you're submitting items for the Weekly Update, please keep these guidelines in mind:

- Items should be sent to IGBsubmissions@igb.illinois.edu.
- The deadline for submissions is Thursday of each week by noon.
- To keep the Update relevant, items are typically listed only for the following week. If you have an item you feel should be listed in multiple Updates, please indicate in your message in some way, such as "Post starts March 7, should run through March 21."
- We will do our best to include every item received by the deadline, but may delay early items as needed until the week prior. ■

ADMINISTRATIVE NEWS

OPERATIONS & FACILITIES

IGB PLAZA PAVERS

The pavers on the IGB are very slippery when wet or covered with snow or ice. With recent extreme temperatures making ice melt ineffective, here are some alternate entry routes that can be used in order to avoid crossing the plaza during inclement weather:

- Enter via the dock door, use the freight elevator to concourse level
- Enter through the north gatehouse door. If you are entering or exiting the plaza from the north, use hand rails to assist you on the steps
- Travel through the tunnel from ERML

We are happy to announce that towards the end of March the white pavers on the IGB plaza will be replaced. The new pavers should provide a less slippery surface.

EQUIPMENT LOAN TO EMPLOYEES AND STUDENTS

In accordance with the University of Illinois Office of Business and Financial Services (OBFS) Policies and Procedures, Section 12 – Property Accounting, an Equipment Loan To Employees and Students Form must be completed annually for any University asset being used primarily off campus. Primarily is defined as more than 50% time or transport-

ing between work and home, in case lost or stolen. It is especially important this form be completed and on file for laptops, iPads, or small electronics, which are targets of theft. If you have not received an email from Kathy Millage to complete this form and are using an IGB asset primarily off campus, please complete and return the form located at <http://www.obfs.uillinois.edu/bfpp/section-12-property-accounting/loan-equipment-faculty-staff-student-employees/>. For additional information or questions, feel free to contact Kathy at 265-8022 or kmillage@igb.illinois.edu.

ARRAY CAFE

If you haven't visited Array Cafe lately, they have restocked with a number of new breads, muffins, sandwiches, chili dogs, and more! Enjoy some new selections as well as your old favorites like chicken panini and italian beef.

Array cafe has also brought back the Columbia Street Roastery Iced Tea—available as self-serve by the Coca-Cola machine. Back by popular demand, this has replaced the former 4-in-1 iced tea dispenser. ■

SAFETY

WORKING SAFELY WITH ETHER

Diethyl ether is a common solvent used in the laboratory. Ether is highly volatile and extremely flammable as a liquid or vapor, it is considered one of the most dangerous fire hazards commonly used in the lab. Inhalation of high concentrations of ether vapor can result in sedation, unconsciousness, and respiratory paralysis. Ether can form explosive peroxides upon storage in contact with air. Diethyl ether in storage should be checked periodically for the presence of peroxide crystals. Due to these characteristics, all work with diethyl ether should be done in a chemical fume hood.

Below are some safety guidelines researchers should follow when working with diethyl ether.

- Maintain the smallest amount necessary for ongoing work. Use in the smallest practical quantities for the experiment being performed.
- Never open a dented or otherwise compromised container of ether.
- Purchase ether with inhibitors added (for peroxide-forming) when possible.

- Due to its peroxide-forming hazard, ether containers should be dated upon receipt and at the time they are opened. If tested, note the date it was tested.
- Periodically test ether containers with peroxide test strips.
- Do not allow to evaporate to near dryness unless absence of peroxides has been shown.
- Consult the Safety Data Sheet (SDS) to determine how long an opened container can be used safely, and dispose of unused amounts after that period of time has passed (or if peroxides are found to be present by testing).
- Know the location of the nearest fire extinguisher before beginning work.
- Eliminate ignition sources such as open flames, hot surfaces, steam baths, and operation of mechanical and electrical equipment that is not intrinsically safe.
- Ensure proper grounding and avoid creating static electricity. Be sure to ground metal containers when transferring flammable liquids. ■

RECENT PUBLICATIONS

Wheeler MB. Transgenic animal research conference: Setting the stage. *Transgenic Res.* 2014;23(1):187-188.

Kim SJ, Seo SO, Park YC, Jin YS, Seo JH. Production of 2,3-butanediol from xylose by engineered *saccharomyces cerevisiae*. *J Biotechnol.* 2014.

Melby J,O., Li X, Mitchell D,A. Orchestration of enzymatic processing by thiazole/oxazole-modified microcin dehydrogenases. *Biochemistry (N Y).* 2014;53(2):413-422.

Bagley JE, Desai AR, Harding KJ, Snyder PK, Foley JA. Drought and deforestation: Has land cover change influenced recent precipitation extremes in the amazon? *J Clim.* 2014;27(1):345-361.

Si T, Luo Y, Xiao H, Zhao H. Utilizing an endogenous pathway for 1-butanol production in *saccharomyces cerevisiae*. *Metab Eng.* 2014.

Southey BR, Lee JE, Zamdborg L, et al. Comparing label-free quantitative peptidomics approaches to characterize diurnal variation of peptides in the rat suprachiasmatic nucleus. *Anal Chem.* 2014;86(1):443-452.

Denard CA, Huang H, Bartlett MJ, et al. Cooperative tandem catalysis by an organometallic complex and a metalloenzyme. *Angew Chem Int Ed.* 2014;53(2):465-469.

Benedict MN, Henriksen JR, Metcalf WW, Whitaker RJ, Price ND. ITEP: An integrated toolkit for exploration of microbial pan-genomes. *BMC Genomics.* 2014;15(1).

Duque T, Samee MAH, Kazemian M, Pham HN, Brodsky MH, Sinha S. Simulations of enhancer evolution provide mechanistic insights into gene regulation. *Mol Biol Evol.* 2014;31(1):184-200.

Biase FH, Everts RE, Oliveira R, et al. Messenger RNAs in metaphase II oocytes correlate with successful embryo development to the blastocyst stage. *Zygote.* 2014;22(1):69-79.

Wang M, Beissner M, Zhao H. Aryl-aldehyde formation in fungal polyketides: Discovery and characterization of a distinct biosynthetic mechanism. *Chem Biol.* 2014.

Jiang J, Wang X, Chao R, et al. Smartphone based portable bacteria pre-concentrating microfluidic sensor and impedance sensing system.

Sens Actuators, B Chem. 2014;193:653-659.

Caliari SR, Mozdzen LC, Armitage O, Oyen ML, Harley BAC. Periodically perforated core-shell collagen biomaterials balance cell infiltration, bioactivity, and mechanical properties. *J Biomed Mater Res Part A.* 2014.

Yi Z, Su X, Revindran V, Mackie RI, Cann I. Molecular and biochemical analyses of CbCel9A/Cel48A, a highly secreted multi-modular cellulase by *caldicellulosiruptor bescii* during growth on crystalline cellulose. *PLoS One.* 2013;8(12).

Feng X, Zhao H. Investigating xylose metabolism in recombinant *saccharomyces cerevisiae* via C-13 metabolic flux analysis. *Microb Cell Fact.* 2013;12:114.

Yin L, Song Z, Qu Q, et al. Supramolecular self-assembled nanoparticles mediate oral delivery of therapeutic TNF-alpha siRNA against systemic inflammation. *Angew Chem Int Ed Engl.* 2013;52(22):5757-5761.

Luckey D, Gomez A, Murray J, White B, Taneja V. Bugs & us: The role of the gut in autoimmunity. *Indian J Med Res.* 2013;138(NOV):732-743.

Marietta EV, Gomez AM, Yeoman C, et al. Low incidence of spontaneous type 1 diabetes in NonObese diabetic mice raised on gluten-free diets is associated with changes in the intestinal microbiome. *PLoS One.* 2013;8(11):e78687. ■

CNRG

BIOCLUSTER

With funds from the existing Biocluster charges and from a one-time grant from the IGB, twenty new compute nodes have been ordered for Biocluster. These nodes each contain 24 cores and 384 GB of RAM each, but more importantly, they will only cost the same \$1/core/day as the existing equipment on biocluster. With this new equipment coming in, we will make some additional changes to biocluster, and drop some of the other rates to make them more appealing to budget-conscious users. If everything goes as planned, all changes should be in place by the end of February. ■



IGB News is published by the IGB Communications Office.
Contact Nicholas Vasi (nvasi@illinois.edu)
www.igb.illinois.edu 14.008