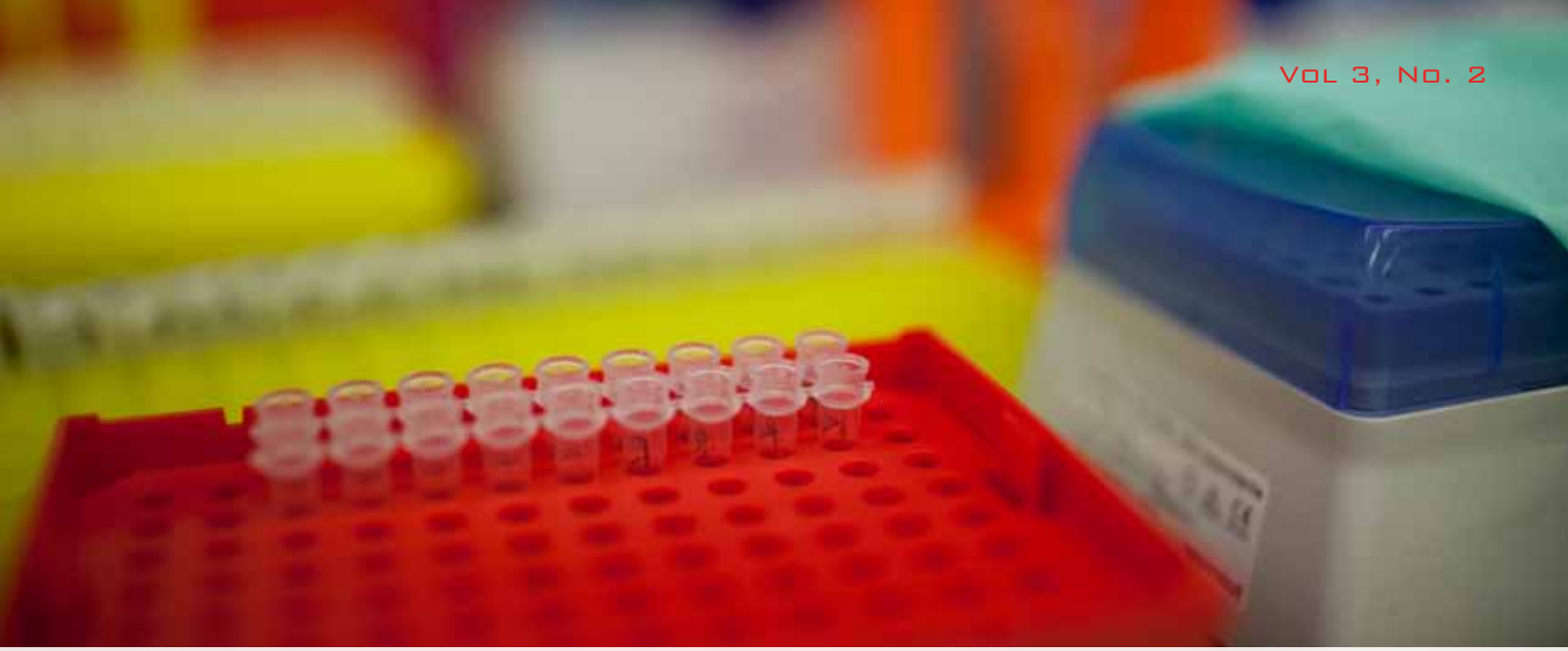
Vol 3, No. 2



IGB NEWS

Achievements, awards, and information about the IGB community

IMAGE OF THE MONTH

This month's Core Facilities Image of the Month was made by Younguk (Calvin) Sun. This image of "E16.5 Mouse Embryo, Zim1 expression (Red)" was created with the Core Facilities' Nanozoomer.

UPCOMING EVENTS

Pioneers in Genomic Biology Lecture Series

David Galas
Institute for Systems Biology
IGB Conference Center #612 | March 16, 2010 | 12:00 p.m.

2nd Annual Biofuels Law and Regulation Symposium

iHotel | April 9, 2010

2010 IGB Fellows Symposium Featured Lecture

Bernhard Palsson
University of California, San Diego
IGB Conference Center | April 16, 2010 | 11:00 a.m.

LOST & FOUND

If you have lost an item or find one that does not belong to you, contact Kathy at the reception desk in the Gatehouse.

The Power of Plants

When school children learn multiplication tables and grammar—before they move on to calculus and physics—they also learn about photosynthesis. In Andrew Leakey's case, the concept of photosynthesis grabbed him by the throat and didn't let go.

"It's fascinating how plants take light and make food, in the form of sugar, and that photosynthesis is the primary producer of all energy in the biosphere," says Leakey, assistant professor of plant biology. "It's interesting both in the small scale details of photosynthesis but also how it scales up to food production and global ecology."

Broadly speaking, Leakey, a member of the Genomic Ecology of Global Change theme at IGB, is interested in understanding how processes like photosynthesis and respiration respond to climatic changes such as elevated CO_2 and drought. In addition, he'd like to elucidate the gene expression that underlies the modifications in plant metabolism in response to environmental changes.

By coming to the University of Illinois in 2002, first as a Fulbright Scholar and later as IGB's first Fellow, Leakey was able to begin using genomics in his research. For example, with the help of his IGB colleagues, Leakey began to conduct microarray experiments on field-grown plants. In plant genetics microarrays were typically used in more controlled settings, such as greenhouses, and used more acute climatic conditions, such as severe drought or temperatures over a shorter time span. Little effort had been made to see if such experiments could be done outside over several growing seasons.

Leakey found that microarray experiments did indeed work in the field. For example, while it had been established that elevated CO_2 resulted in greater photosynthesis and plant growth, how the sugars from carbon were used and whether efficiency of the process could be improved was unknown.

"We found that an increase in respiratory metabolism to use the products of photosynthesis was linked to an increase in gene expression for all enzymes of respiration, the mitochondrial machinery," he says. "You need gene expression to build the machine for metabolism. We didn't have that information before."

Understanding the regulation of that machine "would be a big leap forward to making plants that perform better," he says, adding that he thinks the answers could come within five years.

Leakey is also using microarray techniques to understand crop responses to drought. It is a challenge to create drought conditions in the field, but his team was able to intercept about 79 percent of the rainfall on test plots by using canvas covers on motors that blocked the rain at night, when the majority of it falls.

"The surprise was that the yield was not reduced as much as we had expected," he says of the drought experiments.

Leakey's group found that roots grew deeper than expected, but that growth at elevated CO_2 somehow impaired this response. This preliminary finding challenged the previously widely held expectation that elevated CO_2 enables plants to tolerate drought conditions.

Currently some of Leakey's students are looking at the role of the plant hormone ABA in these responses to drought. As the soil dries, the roots produce ABA, which acts as an early warning. It is carried from roots to shoots where it is sensed by the pores in the leaf surface. These pores then close, conserving water.

"By extracting sap and measuring the level of ABA, it gives us a measure of when a plant is signaling," says Leakey. "To really understand how and when the signal occurs will help us understand how carbon dioxide and drought control plant forms. Now we can put our finger on what is changing, which helps us really see what is causing the stomatal changes."

Leakey, who earned both his undergraduate and doctoral degrees in animal and plant sciences at the University of Sheffield (UK), was drawn to the U.S. and to Illinois because of SoyFACE (Free-Air Carbon Dioxide Enrichment), a technology enabling researchers to study the effect of long-term atmospheric changes on crops, like soybeans or corn. Researchers inject CO_2 and other gases into the atmosphere of the field crops using fumigation pipes arranged in circles 20 meters in diameter. Computerized wind sensors control the release of CO_2, keeping the plot at about 550 parts/million, the projected CO_2 level for 2050. SoyFACE researchers are looking at how elevated CO_2 affects the productivity and ecology of Midwestern agro-ecosystems, specifically crops, over the long term in open field conditions. SoyFACE is part of a network of FACE labs that extends worldwide, including Australia, Japan, China, Italy, and Sweden.

"If you want to do integrated science you need a big group of specialists at various different scales so you can learn the techniques and ask lots of questions," he says, describing the appeal of the U of I.

"These genomic techniques help us dissect all the factors and variables in a given project," he says. "The resulting information makes for increased complexity, but that's the intrigue of biology!"

2010 IGB FELLOWS SYMPOSIUM

Mark your calendar: the fourth annual Fellows Symposium is scheduled for Friday, April 16. The symposium will feature presentations on IGB research and current issues in the life sciences. Five of the nine research themes will host sessions on their work.

The special guest speaker will be Bernhard Palsson, Galetti Professor of Bioengineering and Adjunct Professor of Medicine at the University of California, San Diego. Palsson's feature topic will be "Systems Biology of Metabolism," a discussion of genome-scale metabolic reconstructions and the regulatory and signaling processes behind the translation and transcription mechanisms.

The symposium also will include a Poster Session with prizes for the top three posters. If you would like to take part in the Poster Session, include your poster topic information on the registration form.

We hope you will join us! Registration is free, and everyone who attends will have the chance to win an iPod Shuffle.

For more information, go to www.igb.illinois.edu/fellows10

Registration closes Wednesday, April 7.

HUGO'S 14TH HUMAN GENOME MEETING 2010

The Human Genome Organisation is hosting a meeting on generation technologies in genomics and medicine. The conference will take place in Montpellier, France, from May 18-21. Travel Fellowships are available through HUGO. For more information, visit:

http://www.hgm2010.org/index.php.

A group discount is available if five or more from the IGB attend the meeting. If you would like to attend, please notify Helen Branson at branson@igb.uiuc.edu.

Administrative News

News from the administrative departments that support the research mission of the IGB

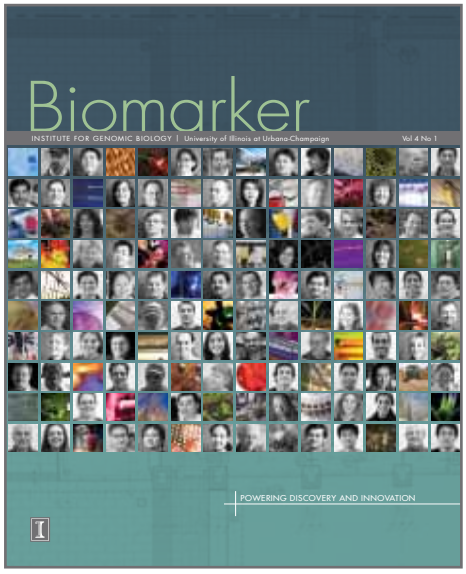
CORE FACILITIES

Image of the Month

The new IGB Core Facilities Image of the Month Display is located on the Concourse level of the Gatehouse along the wall opposite the stairwell. The images highlight the progressive research techniques being used by IGB scientists.

The display includes 10 framed images created by Core Facilities users. Images are selected based on their beauty, innovative use of technology, and relevance to specific research goals. A new image will be showcased each month. The winner will be announced in this newsletter and will receive a custom coffee mug.

COMMUNICATIONS



Biomarker

The most recent Biomarker issue is now available. See Barbara Jauhola, the Office Support Specialist on the second floor of the Gatehouse, to pick one up!

BUSINESS

Voluntary Separation Program for Current Civil Service and Academic Professional Employees

The University is offering a Voluntary Separation Incentive Program (VSIP) to current Civil Service and Academic Professional employees who have worked on this campus for the last four years, at minimum. Eligible employees who choose to voluntarily separate from the University of Illinois at Urbana-Champaign, either through retirement or resignation, may qualify for a lump sum payment of 50 percent of their current annual salary, up to a maximum of $75,000, less required deductions.

This program is not an entitlement and any agreements must correspond with the needs of the University. A fundamental requirement of this program is that entering into such an agreement must result in a benefit to the University, such as a significant cost savings as determined by departmental and campus administration. Therefore, it is possible that not every employee's request for a separation agreement will be approved. Please note that certain employee groups are ineligible to participate.

Employees who apply and are approved for the program will receive a lump sum payment, less required deductions, in exchange for separating from the University by August 15, 2010. The enrollment period for the program is February 3, 2010 through April 2, 2010.

Information regarding the Voluntary Separation Incentive Program for Academic Professional and Civil Service Employees, including the program guidelines and application form, can be found at: http://www.shr.illinois.edu/VSIP.htm.

SAFETY

New Laws for Safe Driving

Two new State of Illinois laws went into effect on January 1, 2010, involving the use of electronic devices while operating motor vehicles. The new laws ban motorists from text messaging while driving in Illinois and make it illegal to talk on a cell phone while driving through a highway construction zone or school zone.

These new laws reinforce the University's policy of no usage of electronic devices while operating University-owned motor vehicles or equipment, which includes the IGB vehicle. For more details on these new state laws, visit: http://www.dot.il.gov/press/Distracted%20Driving%20Press%20Release.doc.

To review the University policy on electronic device usage, visit: http://www.fs.uiuc.edu/cam/CAM/vii/vii-c-5.html.

Employees who are charged with traffic violations resulting from the use of electronic devices while driving will be solely responsible for all liabilities that result from such actions. Employees who violate University policy or Illinois law may be subject to disciplinary actions, up to and including discharge.

Biotechnology Information Center

Did you know that the University Library subscribes to quite a few "protocols" sources? Find links to these resources at http://www.library.illinois.edu/biotech/researchtools/.

Wiley's Current Protocols

Updated quarterly and searchable, you have e-access to such popular titles as:

Current Protocols in Molecular Biology
Current Protocols in Immunology
Current Protocols in Bioinformatics
Current Protocols in Cell Biology

CPs in Cytometry, Human Genetics, Magnetic Resonance Imaging, Microbiology, Neuroscience, Nucleic Acid Chemistry, Pharmacology, Protein Science, and Toxicology also are available.

Nature Protocols

Includes peer-reviewed protocols published in *Nature Protocols*, as well as protocols derived from *Nature* research journals and from content posted directly to the site by the research community. All protocols are searchable and may be commented upon.

Cold Spring Harbor Protocols

Cold Spring Harbor Protocols is an interdisciplinary monthly journal providing a source of research methods in cell, developmental, and molecular biology, genetics, bioinformatics, protein science, computational biology, immunology, neuroscience, and imaging. The searchable site includes protocols from the Cold Spring Harbor courses (Xenopus, Mouse, Proteomics, Yeast Genetics); protocols from *Emerging Model Organisms: a Laboratory Manual;* and kit protocols from Abcam, Bethyl, Bio-Rad, Epicentre, and Qiagen. Part of the site is devoted to recipes for reagents, including purchasing information.

Methods in Enzymology

Volume 1 (1955 to present) is available electronically. This venerable series covers enzymology in the broadest possible sense, covering topics such as photosynthesis, nucleic acids, membranes, hormones, vitamins, immunological techniques, interferons, recombinant DNA, plant molecular biology, microbial toxins, mass spectroscopy, ion channels, and much more.

Questions? Comments? Send to Katie Newman, Biotechnology Librarian, 2130 IGB, florador@illinois.edu, 265-5386.

Operations and Facilities

Parking

If you do not have a permit, please do not park in the departmental parking spaces on the South side of the building. They are reserved around the clock every day of the week. Parking in these spaces could result in being ticketed or towed.

COMPUTER AND NETWORK RESOURCE GROUP

Need a poster printed? CNRG offers high-quality poster printing for $1.00 to $1.50 per inch with a maximum width of 42 inches. A variety of paper choices are available to meet the needs of any project: regular, premium, canvas and vinyl.

Lamination, core backing, and poster tubes also are available for a flat rate. To place an order, visit http://www-app.igb.uiuc.edu/posterprinter/. There is a guaranteed turnaround of less than three business days for poster printing projects.

Around the IGB

Array Café T-shirts

Represent Array Café by purchasing an Array t-shirt. They are available now for $11 each.

Housekeeping

Please do not leave leftover food or food waste in your office or cubicle. Any trash should be placed in the break room trash cans for disposal.

Store food kept in your office space in a hard plastic container. Rodents can be a major issue in a laboratory building setting.

IGB Bake-Off and Culinary Competition

Join the IGB community on Friday, April 23 for a bake-off in the Concourse from 4:00 p.m. to 6:00 p.m. Individuals or groups are invited to attend and participate. The theme that wins the most votes will be the overall winner. If you have a delicious recipe for a baked good or savory appetizer, now is your time to showcase it!

Array Café

Array
The IGB Café

The Array Café will be closed for Spring Break from Monday, March 22 to Friday, March 26. Regular hours will resume on Monday, March 29. In the meantime, be sure to check the IGB specials on Facebook!

IGB Information Manuals

If you have not yet obtained an IGB Information Manual, feel free to pick one up at the reception desk. The manual contains valuable information on topics such as how the IGB runs, who to contact for various services and emergencies, and current safety operations.

Green Ideas at IGB

Have an idea to make the IGB "greener"? Send it to: greenideas@igb.illinois.edu.

Behold the Power of the Notebook: Why Careful Documentation of Inventions is Important for the Patenting Process[1]

For an invention to be patentable, it must first meet three requirements spelled out in the text of the 1952 Patent Act: it must fit into the categories for statutory subject matter; it must be novel; and it must not be obvious.[2]

The third requirement of patentability, "nonobviousness," is perhaps the trickiest to understand, but it has become more important during patent prosecution; that is, review of a patent application by the patent office.

Because of the significance of the nonobvious requirement, some practitioners urge that keeping careful records in the laboratory notebook are very important.[3] Sometimes overlooked, the lab notebook can be one of the most important tools for establishing when an invention was not only created, but reduced to practice.[4]

Therefore, tips for recording information in lab notebooks include:

- keeping simple statements of success along with careful dates that show significance of the invention
- regular reporting in lab meetings or progress reports
- recording what didn't work, so long as failures are not played up too much relative to the successes.[5]

Lab notebooks might be important for settling disputes about the date the invention was conceived and reduced to practice.[6] Because of this, keep in mind that notes must convey that the inventors appreciated the discovery and that the discovery met all of the elements that are later claimed in the patent.[7]

Further, documenting steps and successes along the way help to solidify that the invention is not merely a hope, but demonstrates a "reasonable expectation of success."[8] Having others witness what is in the notebook also is imperative, which in patent lingo is the "corroboration" requirement.[9]

Some things to keep out of lab notebooks include privileged information such as notes on how to design around another patent or meetings with patent attorneys.[10] Informal thoughts about projects should also be kept out of lab notebooks.[11] Finally, if lab notebooks are altered, this might create suspicion during the prosecution process or if the patent is later challenged.[12]

Sloppiness also should be avoided. When the notebook cannot clearly be followed and understood by others, this may actually preclude a showing of corroboration.[13]

Keep these tips in mind while documenting projects in the laboratory, and as always, contact the Office of Technology Management with any questions you may encounter along the way.

1 Written by Nicole A. Janovick, PhD. Nicole is currently a second-year law student at the College of Law and is a Commercialization Analyst Intern for the Office of Technology Management, specializing in life sciences technologies. Nicole holds office hours at IGB in Room 2606 (Gatehouse) on Mondays from 9 a.m. to 1 p.m. and on Tuesdays and Wednesdays from 9 a.m. to 12 p.m. During this time she is available to answer questions about intellectual property and technology transfer. Questions can also be sent to her directly via email: janovick@ad.illinois.edu.
2 35 U.S.C. §§ 101-103 (2006).
3 Steven Carlson, Lab Notebook Tips from a Patent Litigator, 30 GENETIC ENGINEERING & BIOTECHNOLOGY NEWS, Jan. 1, 2010, http://www.genengnews.com/articles/chitem.aspx?aid=3136.
4 Id.
5 Id.
6 Id.
7 Id.
8 Id.
9 Huang v. CIT (Lab Notebook Must be Witnessed), PatentlyO Blog (Jul 14, 2004, 07:31 AM), http://www.patentlyo.com/patent/2004/07/huang_v_cit_lab.html.
10 Carlson, supra note 3.
11 Id.
12 Stephen Albainy-Jenei, Documenting Inventions, Patent Baristas (Jan. 25, 2006), http://www.patentbaristas.com/archives/2006/01/25/documenting-inventions/.
13 Non-Inventors Sloppy Lab Notebook Cannot Corroborate Reduction to Practice, PatentlyO Blog (Feb.08, 2006, 07:47 AM), http://www.patentlyo.com/patent/2006/02/noninventors_sl.html.

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