IGB NEWS

Upcoming Events

Monthly Profiles

Happenings at IGB

Image Of The Month

IP @ IGB

Department Announcements

Volume 9 Number 1

UPCOMING EVENTS

Lunch With The Core

What's New in the Core
February 17, 2016, 12:00 p.m.
612 Carl R. Woese Institute for Genomic Biology

Lunch and learn hosted by IGB Core Facilities.

Glenn Fried, PhD
Director, IGB Core Facilities

IGB Seminar (BCXT)

Simple Models of Evolution and Population Dynamics of Bacterial Strains: Kill-the-Winner, Kill-the-Loser, and Kill-the-King
February 23, 2016, 12:00 p.m.
612 Carl R. Woese Institute for Genomic Biology

Sergei Maslov, PhD
Department of Bioengineering
University of Illinois, Urbana-Champaign

IGB Seminar (GNDP)

The Microbiota Gut-Brain Axis in Medicine: Why the Intersection of Microbiology and Neurobiology Matters
March 1, 2016, 12:00 p.m.
612 Carl R. Woese Institute for Genomic Biology

Mark Lyte, PhD
Department of Veterinary Microbiology and Preventive Medicine
Iowa State University

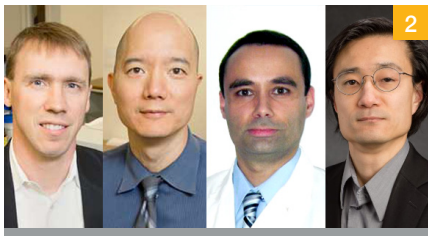
Lunch With The Core

Matrix Composition and Biophysical Characteristics Coordinately Influence Liver Progenitor Differentiation
March 2, 2016, 12:00 p.m.
612 Carl R. Woese Institute for Genomic Biology

Lunch and learn hosted by IGB Core Facilities.

Andreas Kourouklis, PhD
Chemical Engineering
University of Massachusetts, Amherst

FEATURED NEWS



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Cancer and Companion Animals Focus of New IGB Theme

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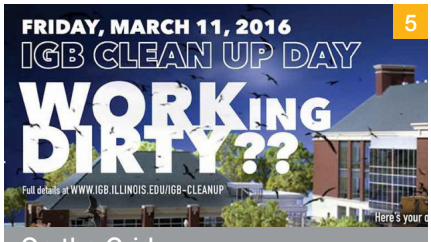
RIPE

syngenta

Illinois and Syngenta Sign Agreement for RIPE IP

4

Profile: Roy Dar



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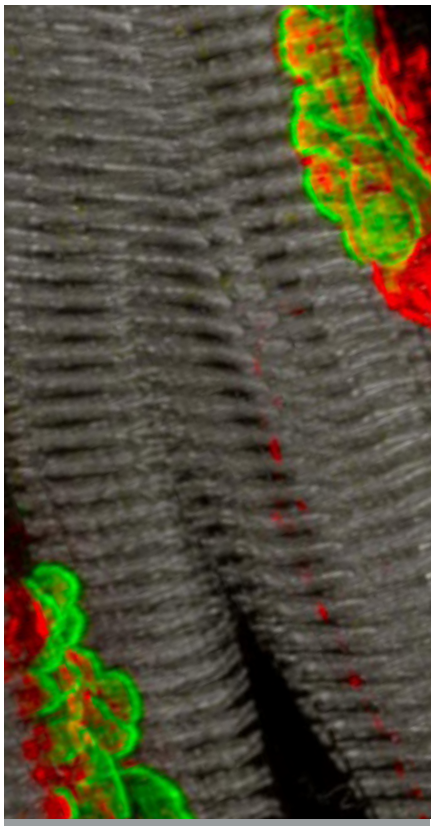
On the Grid: Happenings at IGB

IMAGE OF THE MONTH

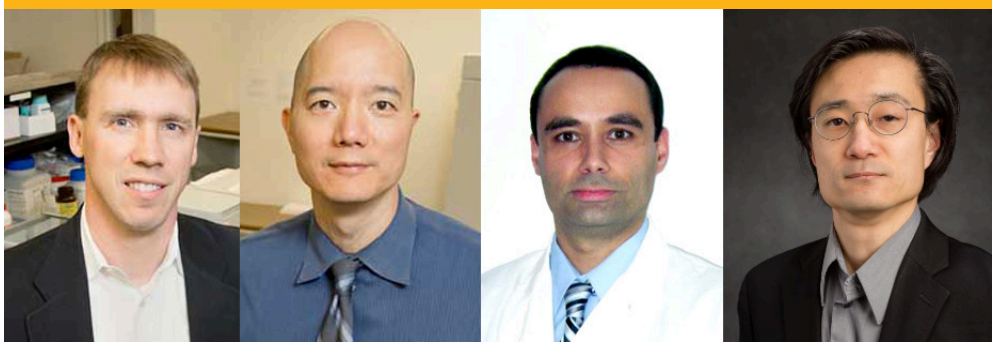


This month's image features the neuromuscular junction in a rat larynx, imaged with the LSM 710 confocal system and using two photon second harmonic generation imaging microscopy. The nerve terminal (red) attaches to the motor endplate (green) together with the muscle (grey SHG image). This image shows how the neuromuscular junction interacts with the muscles of the vocal fold to cause contractions after receiving signals from the brain. Image courtesy of Vignesh A. Sivaguru from Aaron M. Johnson Lab.

IGB News

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

FEATURE



Cancer and Companion Animals
Focus of New IGB Theme

Despite dramatic advances in diagnostics and treatment, cancer still accounts for nearly 1 in 4 U.S. deaths, as well as over half of disease-related pet mortality. Using translational approaches to discover new and effective treatments for both is the goal of new research theme Anticancer Discovery from Pets to People (ACPP) at the Carl R. Woese Institute for Genomic Biology. Led by Professor of Chemistry Paul Hergenrother, ACPP will leverage discoveries proved in companion animals such as cats and dogs with cancer to pioneer new drugs and novel targets to treat human cancers.

While traditional drug discovery and testing is often performed in laboratory mice and rats, Hergenrother believes that pets hold a few distinct advantages as a model organism. "When these studies are performed in rodents, they're given cancer and then cured. Though that's the way most drugs are developed, it's a very contrived model … of the anti-cancer compounds that make it to human trials through that pipeline, over 90% don't become drugs."

"With ACPP, we're studying companion animals that are exposed to all the same toxins that you and I are, and that in many cases come down with cancers that are very similar to the human disease ... we believe that compounds that show efficacy in these veterinary cancer patients will have a much better chance of working in human clinical trials."

Hergenrother's research has already discovered the procaspase-3 activator PAC-1, which induces apoptosis—self-destruction—in cancer cells. PAC-1 has already been used to treat over 50 pet dogs with cancer in collaboration with Professor Timothy Fan in the College of Veterinary Medicine. The compound has since moved to phase I clinical trials in human cancer patients, testing for dosage tolerance, safety, and any hints of efficacy—promising first steps on the road toward becoming an approved cancer treatment.

From left, Professor of Chemistry Paul Hergenrother will lead the IGB's newest theme with faculty members Timothy Fan, Associate Professor of Oncology, Pablo Perez-Pinera, Assistant Professor of Bioengineering, and Jun Song, Founder Professor of Bioengineering and Physics.

Hergenrother, along with theme members Timothy Fan (Associate Professor of Oncology, College of Veterinary Medicine), Pablo Perez-Pinera (Assistant Professor of Bioengineering), and Jun Song (Founder Professor of Bioengineering and Physics), hopes to not only continue development of PAC-1 but identify novel cancer targets using genomic methods. After these targets are identified, improved screening platforms can be used to find molecules that hit them and can be developed into therapeutics.

"We're hoping to expand in a major way on this first success," said Hergenrother. "We have a good blueprint, and I think at the IGB we'll be able to very rapidly test a lot of our hypotheses about these targets … We have a great chance to improve the lives of veterinary cancer patients, and in doing so develop new drugs for human disease that have a higher likelihood of success." ■

Written by Kathryne Metcalf. Photos by L. Brian Stauffer and Department of Bioengineering.

In a recent presentation to Illinois Senator Dick Durbin, ACPP Theme Leader Paul Hergenrother had the opportunity to describe the new theme but also stress the importance of funding from the NIH.

View the entire presentation at https://youtu.be/dR2Oa8JJSs8 (Professor Hergenrother's remarks begin at the ~22 minute mark).

Illinois and Syngenta Crop Protection, LLC, have signed an agreement to implement a commercialization strategy for IP developed under the Gates RIPE project.

Illinois and Syngenta Sign Agreement
for Access to RIPE Intellectual Property

The University of Illinois (Illinois) and Syngenta Crop Protection, LLC, have signed an agreement to implement a commercialization strategy for intellectual property developed under the "RIPE: Realizing Increased Photosynthetic Efficiency for Sustainable Increases in Crop Yield" project, which is funded by the Bill & Melinda Gates Foundation. In the context of this project, Illinois is collaborating with seven other institutions to improve photosynthetic efficiency in food crops in an effort to help resource-poor farmers increase their sustainable yields.

The Illinois and Syngenta collaborative partnership brings leading academic groups working in the area of photosynthesis together with a major agriculture industry partner to evaluate and advance the technologies developed by the RIPE project. Syngenta will serve as a commercialization partner by providing research materials and facilities to support RIPE project goals, as well as bring the industry perspective for bridging key, fundamental photosynthetic research to commercial product development.

Mitchell Altschuler, former Intellectual Property Manager for the Energy Biosciences Institute at the University of California, Berkeley, will be the RIPE Intellectual Property Officer. He will work to ensure that RIPE inventions are protected for commercial development in a manner that is consistent with Gates Foundation objectives.

The collaboration is the first of its kind for a Gates Foundation-funded project. Both Illinois and Syngenta, as well as all of the RIPE collaborators, are truly excited about the potential collaborative opportunity created by this partnership. It ensures that products, technologies, and services are promptly and broadly distributed to developing nations while reserving potential IP rights in developed countries.

"The translational science and product development experience of Syngenta complement the research capabilities of the world-class academic partners brought together by the Gates Foundation in the RIPE consortium. This partnership increases the chance of breakthroughs in photosynthesis research resulting in new high yielding crop varieties for growers in both the developing and developed world," said Ian Jepson, Head of Plant Performance Biology for Syngenta.

Michael Nuccio, the Syngenta RIPE Project Director commented, "This is an exciting bridge between basic and applied research. It represents a fast track to facilitate delivery of important new discoveries in plant productivity to the people who would benefit the most, which speaks directly to the first commitment found in the Syngenta Good Growth Plan. We've committed ourselves to increasing crop yields by 20 percent without using more land, water or inputs."

"This is a win-win-win deal, the synergies giving the academic partners, Syngenta and the Gates Foundation, benefits that none of the partners alone could gain," said RIPE Project Director Steve Long, who is a Gutgsell Endowed Professor of Crop Sciences and Plant Biology at Illinois. "It is a unique alliance that will accelerate the cause of increasing global crop yield potential, and provide a new model for industry-academia collaboration for the mutual benefit of society and industry."

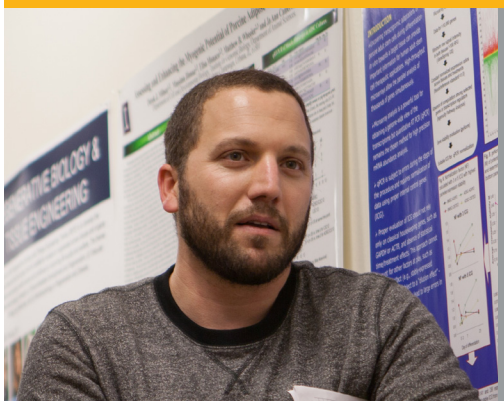
Associate Project Director, Robert Emerson Professor of Plant Biology at Illinois, and USDA–Agricultural Research Service Research Leader at Illinois Don Ort, noted that in the search for photosynthetic traits to improve crop yield potential, there is a huge gulf between proof of concept discovery and delivering traits to farmers' fields.

"This partnership with Syngenta will be invaluable to RIPE in navigating the many obstacles that typically hinder implementation of RIPE discoveries to practice and make a difference for farmers," he said. "Syngenta's experience and expertise in evaluating RIPE discoveries for commercialization potential will be critical in helping us focus our efforts in the most promising directions." ■

About Syngenta
Syngenta is a leading agriculture company helping to improve global food security by enabling millions of farmers to make better use of available resources. Through world class science and innovative crop solutions, our 28,000 people in over 90 countries are working to transform how crops are grown. We are committed to rescuing land from degradation, enhancing biodiversity and revitalizing rural communities. To learn more visit www.syngenta.com and www.goodgrowthplan.com.

Cautionary Statement Regarding Forward-Looking Statements
This document contains forward-looking statements, which can be identified by terminology such as 'expect', 'would', 'will', 'potential', 'plans', 'prospects', 'estimated', 'aiming', 'on track' and similar expressions. Such statements may be subject to risks and uncertainties that could cause the actual results to differ materially from these statements. We refer you to Syngenta's publicly available filings with the U.S. Securities and Exchange Commission for information about these and other risks and uncertainties. Syngenta assumes no obligation to update forward-looking statements to reflect actual results, changed assumptions or other factors. This document does not constitute, or form part of, any offer or invitation to sell or issue, or any solicitation of any offer, to purchase or subscribe for any ordinary shares in Syngenta AG, or Syngenta ADSs, nor shall it form the basis of, or be relied on in connection with, any contract therefor.

PROFILE



Assistant Professor of Bioengineering Roy Dar is an affiliate of the Center for Biophysics and Quantitative Biology. His research examines how variation in gene expression within single cells can help explain the behavior of biological systems.

Professor Dar's lab site can be found at: http://dar.bioengineering.illinois.edu

Roy Dar:
Discovering when the noise is the signal

Zoom in close enough to anything—a smooth marble surface, the delicate network of woven lace—and you will see the tiny imperfections and fluctuations, the "noise." For many people, these variations are like static, detracting from the beauty of nature. For Roy Dar, this variation is the key to understanding the biological systems he studies.

"To some extent, biological noise exists throughout every cellular process and pathway, and is associated with the expression of every gene in every genome," said Dar, an assistant professor of bioengineering who joined the Illinois faculty in 2015. "Noise has now become a probe or magnifying glass" with which to investigate how many different systems function.

Work in Dar's laboratory uses this conceptual lens, the importance of biological noise, to examine how the stochastic behaviors of single cells can be the driving force behind processes like viral or bacterial infections, cancer metastasis and organ development. In these processes, the extremes of variation in a handful of cells allow them to spark a widespread change in the cells around them. The noisy gene activity is the cells' decision-making mechanism.

"Noise is starting to gain momentum and biologists ... are now teaming with engineers and physicists to address this through modeling and carefully designed experiments."

How does this work? One question that Dar has explored is how viruses decide between lying dormant within just a few cells or multiplying and spreading as part of an active infection. Some viruses, including human immunodeficiency virus (HIV) and herpesviruses, introduce a stable form of their genetic material into human cells. The viral DNA can remain in the cells indefinitely without harming them. Only when viral activity reaches a sufficient level will the cell be converted into a diseased factory for the production of more virus.

What Dar focuses on is how the fluctuations or noise of viral gene expression, shifts the cells from latent to active infection. The viral genes are expressed—that is, read and translated into many copies of viral proteins—in fits and starts. Pauses in expression are followed by sporadic bursts, and when a burst of expression is large enough, a molecular switch is flipped and the viral infection awakens. If researchers can discover the mechanisms that promote the noisy bursts of gene activity, they could identify new drugs to control them and the infections they promote.

The important role of noise in this type of viral infection and other processes is increasingly capturing the interest of biologists, Dar said: "Noise is starting to gain momentum and biologists ... are now teaming with engineers and physicists to address this through modeling and carefully designed experiments."

Dar has been using a blend of biology, physics, and engineering to study biological noise since his graduate work at Oak Ridge National Laboratory and the University of Tennessee, Knoxville, continuing through a postdoctoral fellowship at the Gladstone Institutes at the University of California, San Francisco. In Illinois' Department of Bioengineering and through his affiliations with the Center for Biophysics and Quantitative Biology and the IGB, he has found a welcoming environment for his interdisciplinary work.

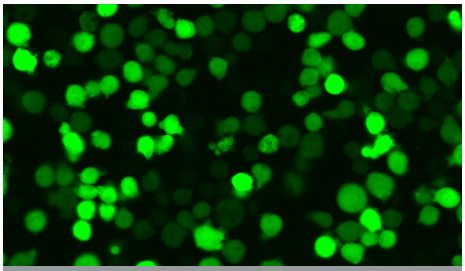
"Researchers here are very open to discussion, sharing of ideas, and initiating potential collaborations," he said. "Through the IGB and my other affiliations I have found numerous exciting and potential collaborative projects in fields as diverse as big data and bioinformatics, plant sciences, behavior and neuroscience, and emergent behaviors in stem cell differentiation."

Future research opportunities and practical applications for the study of biological noise are equally diverse. Dar hopes that his work will lead to new technologies to quell infections and block the spread of cancer, and to innovations in nanomedicine, whose sensors, materials, and drug delivery systems must function in a stochastic, molecular-scale world inside the body.

Ultimately, Dar is inspired both by his desire to tackle and solve real-world problems, and by his insatiable curiosity and drive to "explore the unknown." These feelings attracted him to research and continue to be his primary motivations, and he shares his passion through presentations, publications, and pedagogy.

"When you've got that research bug where you can't wait to get back to the lab or computer to analyze a new result or enjoy discovering that you have been thinking about a problem all wrong and can see the success in a failure," he said, "then I think scientific research may be for you." ■

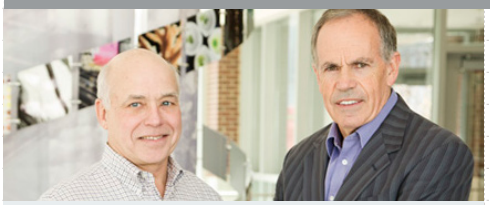
Written by Claudia Lutz. Photos by Kathryn Faith and the Dar Lab.



The differing color intensity of these human T-cells, imaged with fluorescence microscopy, shows individual variation in gene activity in a population of genetically identical cells.

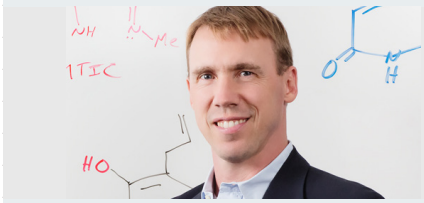
ON THE GRID
HAPPENINGS AT THE IGB

AWARDS



DONALD ORT & STEPHEN LONG

Donald Ort, Robert Emerson Professor of Plant Biology and Crop Sciences (Genomic Ecology of Global Change) and Stephen Long, Gutgsell Endowed Professor in the departments of crop sciences and plant biology (Genomic Ecology of Global Change) were named by Thomson Reuters as Highly Cited Researchers for 2015.



PAUL HERGENROTHER

Paul Hergenrother, Professor of Chemistry (Anticancer Discovery from Pets to People) received the Innovation Transfer Award from the 2016 Innovation Celebration, a joint venture between the Champaign County Economic Development Corporation, University of Illinois, and Parkland College to recognize entrepreneurial spirit on campus and in the community.

PRINCESS IMOUKHUEDE

Princess Imoukhuede, Assistant Professor of Bioengineering (Regenerative Biology & Tissue Engineering) received a Scientist Development Grant from the American Heart Association, given to highly promising scientists with research broadly related to cardiovascular function, bioengineering, biotechnology, and public health problems.

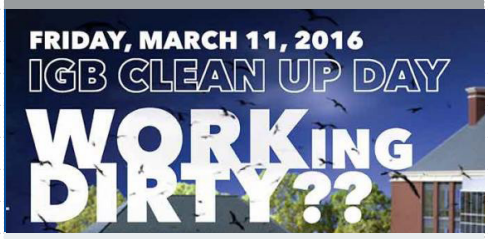
KAREN SEARS

Karen Sears, Associate Professor of Animal Biology (Regenerative Biology & Tissue Engineering) has won the Lynn Martin Award for Distinguished Women Teachers from the College of Liberal Arts and Sciences.

TANDY WARNOW

Tandy Warnow, Founder Professor of Bioengineering and Computer Science (Biocomplexity, Computing Genomes for Reproductive Health) has been named a 2015 Fellow of the Association for Computing Machinery (ACM), for contributions to mathematical theory, algorithms, and software for large-scale molecular phylogenetics and historical linguistics.

CLEAN UP DAY



IGB CLEAN UP DAY

The IGB will be holding a clean up day on March 11, 2016, to provide you the opportunity to clean out offices, laboratories, storage spaces, and shared areas, and to offer guidance in the disposal of computer and lab equipment that is broken, outdated, or no longer needed. Full details available at **www.igb.illinois.edu/igb-cleanup**.

SAVE THE DATE

PLANTS IN SILICO SYMPOSIUM

The Plants in silico Project team's research symposium will be May 18-20, 2016, at NCSA. Funded by the Institute for Sustainability, Energy, and Environment, the Plants in silico (Psi) Project is a global research effort to provide comprehensive computer modeling of plants, growth, and productivity — at the molecular, cellular, plant, and ecosystem levels.

The Psi Symposium will feature presentations by experts in modeling plant processes, leaders in achieving in silico representation of other organisms, and computational scientists. The workshop portion of the Symposium will facilitate collaboration and map a course to achieve plants in silico. More details at: **sustainability.illinois.edu/outreach/plants-in-silico-conference/**

SURVEY

CARL R. WOESE INSTITUTE FOR GENOMIC BIOLOGY
ENTREPRENEURSHIP LECTURE SERIES

ENTREPRENEURSHIP AND INNOVATION PROGRAM SURVEY

The IGB is currently working to create a more in depth entrepreneurship certificate program for grad students, scientists and professionals and we would like your input. We are interested in learning about the specific classes, lectures and activities you believe would make an effective certificate.

Please complete our short survey at **www.igb.illinois.edu/Innovation-survey** to give your feedback and email Courtney Cox, IGB outreach fellow, with any additional comments at *cox22@illinois.edu*.

IP @ IGB

PROTECTING AND PROMOTING U OF I'S INTELLECTUAL PROPERTY: THE OFFICE OF TECHNOLOGY MANAGEMENT

The Carl R. Woese Institute for Genomic Biology is a hub of cutting-edge and revolutionary inventions in life sciences. Some of these inventions can be patented to protect the intellectual property of the inventors and UIUC. The Office of Technology Management (OTM) is dedicated to protecting and promoting U of I's inventors and their inventions. The following are some questions you might have with regard to the patentability of your inventions and the role of OTM.

What is a patent and what can I patent?
A patent gives the inventor exclusive rights to an invention for a defined period. A patent may be obtained for any man-made process, machine, manufacture, or composition of matter. In order to be patentable, the invention must be novel, useful, and non-obvious. An enabling public disclosure, such as presentations made outside of U of I or a manuscript publication, may render your invention ineligible for patent protection. If you think your technology might have commercialization potential, we strongly encourage you to speak with OTM personnel prior to public disclosures to retain the novelty of your invention.

How does the OTM ensure my invention is protected?
The OTM performs numerous services to protect the intellectual property of the inventors. The OTM staff assess the patentability of inventions through a standard screening process which typically starts with a disclosure filed by the inventors describing the technology they wish to protect. The OTM Technology Managers and interns then have an in-depth interview with the inventors to understand the invention, followed by an extensive search for previous inventions and publications pertaining to the invention being patented, and an evaluation of the commercialization potential of the invention. This analysis typically takes 6-8 weeks, at the conclusion of which the inventors are notified of the decision. The OTM files either a provisional or a regular patent application for technologies that are deemed patentable and makes recommendations for the subsequent way forward.

In addition to determining the patentability and marketability of inventions and filing patent applications, the OTM also acts as a liaison between the inventors and licensees, oversees license and material transfer agreements, provides crucial support for start-up ventures, and helps to bring the invention for public use.

Where can I learn more about the OTM?
The OTM is located in 319 Ceramics Building and for more information about OTM's mission, activities, and services, please visit our website at **http://otm.illinois.edu/**. This website contains links to disclosure forms as well as the inventor's handbook, an easy-to-follow guide to patenting your inventions. If you have other questions about the patentability of your technology, please contact our Technology Manager RK Narayanan at *rkn@illinois.edu*. ■

UNIVERSITY LIBRARY

ILLINOIS RESEARCH CONNECTIONS BETA

The University Library and the Office of the Vice Chancellor for Research have announced the BETA launch of Illinois Research Connections (IRC), which is a searchable web portal of research and scholarship for faculty and researchers at Illinois (http://go.illinois.edu/IRCportal).

For this initial go-live, IRC BETA includes more than 1,700 STEM and social science faculty and OVCR institute researcher profiles. The portal is currently populated with more than 90,000 publications from Elsevier's Scopus database, updated automatically on a weekly basis, so the research of the Carl R. Woese Institute for Genomic Biology is well represented, but here are some important notes about the BETA launch:

- This is an initial, information-gathering introduction.
- It will expand in both scope and value over time, eventually growing to 2,500 profiles.
- During initial launch and testing, some profiles will be robust and accurate, while others will be incomplete.
- The Library will be actively working in the coming weeks and months to develop a resource that is both inclusive and representative of the breadth of research strengths at Illinois.
- IRC BETA currently limits portal access to Illinois IP addresses only, so be sure to access the site from the University's network.

The IRC is intended to enable faculty, staff, and students to discover research expertise and potential collaborators; serve as a showcase for research and scholarly achievements at Illinois; and provide a central system for external audiences seeking information about Illinois expertise.

Consult **http://go.illinois.edu/irc** for more information about the project, including training videos and FAQs. During the BETA launch, the Library is interested in input from faculty and staff related to usability, display, and content. Feedback can be sent to: *irc-help@illinois.edu*. ■

RECENT PUBLICATIONS

Please include your connection to the IGB in your author byline when submitting publications, as it will greatly help track potential newsworthy items and increase the possibility of coverage.

Brenner MD, Zhou R, Conway DE, et al. Spider silk peptide is a compact, linear nanospring ideal for intracellular tension sensing. *Nano Lett*. 2016.

Klionsky DJ, Abdelmohsen K, Abe A, et al. Guidelines for the use and interpretation of assays for monitoring autophagy (3rd edition). *Autophagy*. 2016;12(1):1-222.

Cann I, Bernardi RC, Mackie RI. Cellulose degradation in the human gut: *Ruminococcus champanellensis* expands the cellulosome paradigm. *Environ Microbiol*. 2016.

Glowacka K, Kromdijk J, Leonelli L, Niyogi KK, Clemente TE, Long SP. An evaluation of new and established methods to determine T-DNA copy number and homozygosity in transgenic plants. *Plant Cell Environ*. 2016.

Chekan JR, Cogan DP, Nair SK. Molecular basis for resistance against phosphonate antibiotics and herbicides. *MedChemComm*. 2016;7(1):28-36.

Yuan Y, Andersen E, Zhao H. Flexible and versatile strategy for the construction of large biochemical pathways. *ACS Synth Biol*. 2016;5(1):46-52.

Soleh MA, Tanaka Y, Nomoto Y, et al. Factors underlying genotypic differences in the induction of photosynthesis in soybean [glycine max (L.) merr.]. *Plant Cell Environ*. 2016.

Lee H-, Mitra J, Lee S, et al. Kaposi's sarcoma-associated herpesvirus viral interferon regulatory factor 4 (vIRF4) perturbs the G1-S cell cycle progression via deregulation of the cyclin D1 gene. *J Virol*. 2016;90(2):1139-1143.

Jayakody LN, Lane S, Kim H, Jin Y-. Mitigating health risks associated with alcoholic beverages through metabolic engineering. *Curr Opin Biotechnol*. 2016;37:173-181.

Mao J, Lu T. Population-dynamic modeling of bacterial horizontal gene transfer by natural transformation. *Biophys J*. 2016;110(1):258-268.

Mcneill MS, Kapheim KM, Brockmann A, Mcgill TAW, Robinson GE. Brain regions and molecular pathways responding to food reward type and value in honey bees. *Genes Brain Behav*. 2016.

Roein-Peikar M, Xu Q, Wang X, Ha T. Ultrasensitivity of cell adhesion to the presence of mechanically strong ligands. *Physical Review X*. 2016;6(1):011001 (9 pp.).

He F, Li Y, Tang Y-, Ma J, Zhu H. Identifying micro-inversions using high-throughput sequencing reads. *BMC Genomics*. 2016;17(1).

Wang M, Yu C, Zhao H. Identification of an important motif that controls the activity and specificity of sugar transporters. *Biotechnol Bioeng*. 2016.

Vetting MW, Bouvier JT, Gerlt JA, Almo SC. Purification, crystallization and structural elucidation of d-galactaro-1,4-lactone cycloisomerase from *agrobacterium tumefaciens* involved in pectin degradation. *Acta Crystallogr Sect F Struct Biol Commun*. 2016;72:36-41.

Mota N, Sumner JA, Lowe SR, et al. The rs1049353 polymorphism in the CNR1 gene interacts with childhood abuse to predict posttraumatic threat symptoms. *J Clin Psychiatry*. 2015;76(12):e1622-e1623.

Sinha S, Song J, Weinshilboum R, Jongeneel V, Han J. KnowEnG: A knowledge engine for genomics. *J Am Med Informatics Assoc*. 2015;22(6):1115-1119.

Rao CV. Control challenges in synthetic biology. *IFAC Proc Vol (IFAC-PapersOnline)*. 2015;48(8):996-1001.

Hudson GA, Zhang Z, Tietz JI, Mitchell DA, Van Der Donk WA. *In vitro* biosynthesis of the core scaffold of the thiopeptide thiomuracin. *J Am Chem Soc*. 2015;137(51):16012-16015.

Peterson JR, Cole JA, Fei J, Ha T, Luthey-Schulten ZA. Effects of DNA replication on mRNA noise. *Proc Natl Acad Sci U S A*. 2015;112(52):15886-15891.

Raman R, Bhaduri B, Mir M, et al. High-resolution projection microstereolithography for patterning of neovasculature. *Adv Healthc Mater*. 2015.

Samee MAH, Lim B, Samper N, et al. A systematic ensemble approach to thermodynamic modeling of gene expression from sequence data. *Cell Syst*. 2015;1(6):396-407.

Motti JMB, Hagelberg E, Lindo J, Malhi RS, Bravi CM, Guichón RA. First complete mitochondrial genome sequence from human skeletal remains of the coast of santa cruz, argentina. *Magallania*. 2015;43(2):119-131.

Peso M, Even N, Søvik E, Naeger NL, Robinson GE, Barron AB. Physiology of reproductive worker honey bees (*apis mellifera*): Insights for the development of the worker caste. *J Comp Physiol A Neuroethol Sens Neural Behav Physiol*. 2015:1-12.

Maxson T, Mitchell DA. Targeted treatment for bacterial infections: Prospects for pathogen-specific antibiotics coupled with rapid diagnostics. Tetrahedron. 2015.

Baldwin EA, Walther-Antonio M, MacLean AM, et al. Persistent microbial dysbiosis in preterm premature rupture of membranes from onset until delivery. *PeerJ*. 2015;2015(11).

McGhee KE, Feng S, Leasure S, Bell AM. A females past experience with predators affects male courtship and the care her offspring will receive from their father. *Proceedings of the Royal Society B: Biological Sciences*. 2015;282(1819). ■

ILLINOIS

IGB News is published by the IGB Communications Office.
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www.igb.illinois.edu 16.015