

IGB NEWS

Upcoming Events

Monthly Profiles

Happenings at IGB

Image Of The Month

IP @ IGB

Department Announcements

Volume 9 Number 5

IF YOU ARE NEW TO THE IGB THIS SEMESTER, WELCOME. IF YOU'VE BEEN AWAY FROM THE IGB FOR THE SUMMER, WELCOME BACK!

UPCOMING EVENTS

Fox Family Innovation and Entrepreneurship Lecture

Drug Research & Development: Extraordinary Opportunities in Uncertain Times

September 13, 2016, 12:00 p.m.

612 Carl R. Woese Institute for Genomic Biology

Michael S. Kinch, PhD

Washington University

Associate Vice Chancellor and Director,
Center for Research Innovation in Business

Professor of Radiation Oncology,
School of Medicine

IGB Seminar (BCXT)

The STEAM Factory Facilitating Grassroots Interdisciplinary Collaboration within Academia

September 15, 2016, 12:00 p.m.

612 Carl R. Woese Institute for Genomic Biology

Roman Holowsky, PhD

The Ohio State University

Department of Mathematics

IGB Pioneers Seminar (BSD)

Synthesizing and Scrambling Eukaryotic Genomes

September 27, 2016, 12:00 p.m.

612 Carl R. Woese Institute for Genomic Biology

Jef Boeke, PhD

New York University

Department of Biochemistry and Molecular
Pharmacology

FEATURED NEWS



New IGB theme builds on Illinois tradition



New research theme to develop precision medicine tools

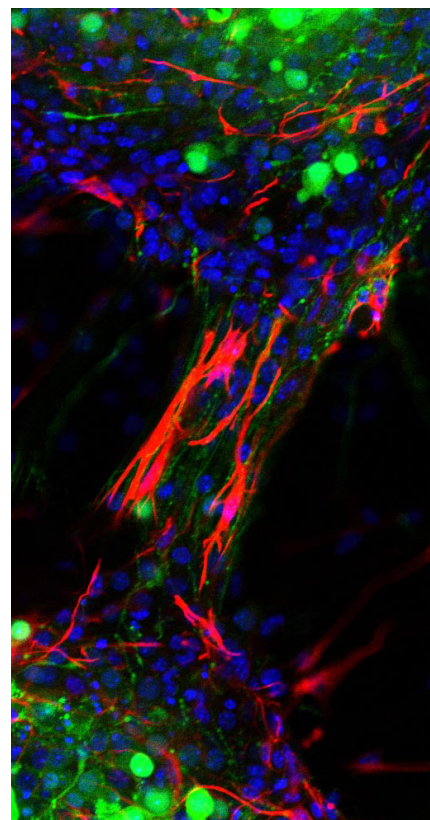


Monthly Profile:
Rebecca Stumpf



On the Grid:
Happenings at IGB

IMAGE OF THE MONTH



This month's image was taken with the LSM 710 confocal microscope and shows two embryoid bodies (EBs), spherical aggregates of pluripotent cells. These EBs are mouse embryonic stem cells differentiated into motor neurons (green) and glia (red); nuclei are stained in blue. Over time, the cells extend neurites across the underlying collagen substrate to form synapses with each other. This research is supported by an NSF-funded STC, Emergent Behaviors of Integrated Cellular Systems. Image courtesy of Kingsley Boateng of IGB Core Facilities.

IGB News

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

FEATURE



A new IGB theme builds on an Illinois tradition

The IGB has formed a new research theme, Microbiome Metabolic Engineering (MME). Led by microbiologist and animal scientist Isaac Cann, the theme will focus on one of the grand challenges in biology today—how humans interact with their microbiomes and how these interactions affect human health and nutrition.

The research will integrate knowledge and experimental approaches from microbial physiology, microbial biochemistry, microbial ecology, enzymology, nutrition, animal model development, toxicology and environmental health, and systems biology to gain a better understanding of the microbiome's role in health, develop new methods to assess host-microbe interactions, and examine how environmental toxicants affect human-microbiome interactions and the host.

The microbiome contains millions of genomes, each of which contains a large number of genes and proteins of unknown function and uncharacterized RNA. Cann said that while NIH has put a lot of money into research to determine what is in the gut microbiome, very little work has been done to gain a mechanistic understanding of how it develops and functions.

The team will work on identifying unique pathways in the human/microbiome milieu that impact human health and nutritional status. "We have to find out what all these bugs and all these genes are doing. Then our team is going to use information that is already out there and from our individual labs to do the mechanistic studies," Cann said.

Most of the published work has looked at the adult microbiome. MME scientists will look at both adults and infants.

The human infant studies will involve collaboration with two ongoing prospective cohort studies: the STRONG (Synergistic Theory and Research on Obesity and Nutrition Group) Kids research study and the IKIDS (Illinois Kids Development Study) research study. "I'm really happy and excited that we get to work with them," Cann said. "This area is not just microbiology or biochemistry. You need people who understand human nutrition."

They will also develop devices as proxies for biological processes.

"One of the things that is very difficult to do is to be able to bring the gut outside because you can't really use the human for the sort of experiments that we want to do. So we want to be able to develop fermentation systems in the lab," said Cann. "The lower gut for the microbes is basically a fermentation vat. It's a bioreactor."

The researchers will initially direct most resources at growing the entire gut microbiome community without losing critical components. "You have to feed them in such a way that you maintain the entire community and if you do not do it right you are going to start losing some of the critical microbes that occupy a particular niche or that play a particular role," Cann explained.

"We would be able to take a pathogen and spike the community and see how the community interacts with it; how they are able to overcome it, or how they succumb to it."

Another question they want to address is the effect of environmental pollutants on humans. Microbes carry out biotransformations on foreign substances that enter the body—toxic substances can be made

non-toxic, but the reverse is also true. The researchers will look at these processes in the gut and the lung to understand how environmental toxicants affect human/microbiome interactions, the impact on the host, and how to alleviate any harm they cause.

Cann sees the work of the theme as carrying on the work of the late Abigail Salyers, a former Arends Professor of Microbiology whom he described as "the person who really had a vision of the impact of the human microbiome and its effect on the entire human body."

"It is a University of Illinois tradition and it is important that some of us devote some of our time to continue in the work that Abigail started many years ago," he said.

Noting that different people have different gut microbial communities in their gut, he asked, "Is it possible for (us) to be able to determine the community that survives and protects you the best?"

Theme faculty members include (top, left to right) Isaac Cann of Animal Sciences; Sharon Donovan of Food Science and Human Nutrition and Nutritional Sciences; Yong-Su Jin of Food Science and Human Nutrition and Nutritional Sciences; Jodi Flaws of Veterinary Medicine; Wen-Tso Liu of Civil and Environmental Engineering; Roderick Mackie of Animal Sciences and Nutritional Sciences; Christopher Rao of Chemical and Biomolecular Engineering; Susan Schantz of Veterinary Medicine; and Cari Vanderpool of Microbiology. ■

Written by Susan Jongeneel. Photos courtesy of L. Brian Stauffer.



New research theme to develop precision medicine tools

Researchers at Mayo Clinic, the Carl R. Woese Institute for Genomic Biology and from the University of Illinois Macro and Nanotechnology Laboratory (MNTL) have collaborated on a new research theme focusing on using micro RNAs and nanotechnology to develop technologies to characterize tumors and monitor how they grow.

Brian Cunningham, a professor of electrical and computer engineering, bioengineering, and Director of the MNTL, leads the “Omics Nanotechnology for Precision Cancer Medicine” (ONC-PM) theme. The group is working on designing tools to track material shed in the blood by tumors (biomarkers).

Illinois researchers are working with clinicians at the Mayo Clinic as well as a group at the University of Wisconsin that is one of the leaders in the biomarker identification and validation. Their goal is to help clinicians select the treatment that is most likely to work for a specific patient.

Thanks to advances in biotech instrumentation and techniques over the last decade, many new molecular targets for cancer treatment have been identified. Nonetheless, selecting optimal therapeutic regimens remains challenging. Often, there are many therapies that can slow disease progression, but they work only for some patients. Moreover, tumors can develop mutations that allow them to evade the treatment. There are no reliable predictive factors, and performing a biopsy on a tumor is invasive and expensive.

ONC-PM researchers will work on non-invasive genomic “liquid biopsies” to define disease outcomes

and identify the appropriate treatment. These tests look at molecules, known as micro-RNAs (miRNAs) that tumors shed in the blood of cancer patients. The goal is to develop at-home sample collection assays that can be used to identify sub-classes of cancer and to track treatment progress.

“Rather than a genome sequencing approach that requires a million dollar instrument, we envision a lower cost method that could be performed in health clinics or local diagnostics labs.”

The theme includes people working on the bioinformatics side who will mine genetic information and genomic sequencing studies to identify specific mutations and then identify the miRNAs that can be unique identifiers for a specific type of cancer. Andrew Smith (Bioengineering) is developing methods that tag individual molecules with a semiconductor quantum dot or some other type of metallic nanoparticle. Yi Lu (Chemistry) uses specially engineered nucleic acid probes that can selectively bind with the target molecule.

The patient would use a finger stick to collect a drop of blood that would be put into a cartridge and mailed to the laboratory.

“The person might not ever come into the clinic,” explained Cunningham. “The lab could perform this

kind of measurement on a routine basis. What we’re considering are detection approaches that would allow the testing to be done very inexpensively with a desktop-sized instrument that may cost only several thousand dollars. Rather than a genome sequencing approach that requires a million dollar instrument, we envision a lower cost method that could be performed in health clinics or local diagnostics labs.”

In addition to reducing medical costs and stress on the patient, such a tool would allow the doctor to see right away when the treatment was no longer working.

“Being able to identify when that is happening quickly and then to change to a new treatment before the tumor has grown again can be an important way to manage cancer and perhaps to treat it more like a chronic condition,” Cunningham said.

The theme is using facilities at both the IGB and the MNTL. ONC-PM theme members include (top, left to right) theme leader Brian Cunningham of Electrical and Computer Engineering and Bioengineering; Rashid Bashir of Bioengineering; Timothy M. Fan of Veterinary Clinical Medicine; Auinash Kalsotra of Biochemistry; Benita S. Katzenellenbogen of Molecular & Integrative Physiology; Manish Kohli of Medical Oncology, Mayo Clinic; Zeynep Madak-Erdogan of Food Science and Human Nutrition; Olga Milenkovic of Electrical and Chemical Engineering; Andrew Smith of Bioengineering; and Liang Wang of Pathology, Medical College of Wisconsin. ■

Written by Susan Jongeneel. Photos courtesy of L. Brian Stauffer.

MONTHLY PROFILE



Rebecca Stumpf (with her grad student Abigail Asangba, right) is an Associate Professor in the Department of Anthropology and the African Studies Department and has been studying wild chimpanzees since 1998. She co-directs the Laboratory for Evolutionary Endocrinology where she conducts hormone analyses on human and non-human primates.

Rebecca Stumpf: Studying the Primate Microbiome

The microbiome has become a popular research subject as genomic technologies improve, allowing for cheaper and easier bacterial identification: studies document the microbial communities that colonize our mouths, our intestines, and our skin, examining how their presence influences our health and wellbeing. It's a topic that bridges disciplines and techniques to reach broad, innovative conclusions about the interactions between macro- and microscopic life.

Professor of Anthropology and African Studies Rebecca Stumpf has been at the University of Illinois since 2003, studying questions of sexual selection, development, and evolutionary metagenomics in biological anthropology through examining the primate microbiome. Stumpf joined the IGB soon after its inception and has become a fixture at the Institute, working in and collaborating with several research themes, including previous membership in the Host-Microbe Systems theme, and her current affiliations with Biocomplexity and Computational Genomics for Reproductive Health.

"I really enjoy and appreciate the collaborative nature facilitated here by the IGB, and learn a lot from the diverse perspectives and expertise present," said Stumpf. "There's so much expertise under one roof, genuine interest in collaborative research, and in creating and developing new perspectives and methods to address both novel and age-old questions."

In turn, Stumpf's own research is highly interdisciplinary: complementing the complexity of the systems she researches, her collaborators include other biological anthropologists, microbiologists, computational biologists, veterinarians, entomologists, virologists and more. By combining a wide range of approaches, including morphology, behavioral studies of apes, and microbes and hormones to study the interaction between primates and their microbiomes, Stumpf's work lifts the veil on how

our invisible microbial communities affect health and fitness.

Some of her primate research focuses on understanding the dispersal of females in wild chimpanzee communities, and how group composition and

"Biological anthropologists benefit because it opens the door to this transformational way of understanding primate evolution, and microbiologists benefit from gaining new perspectives on human microbes in comparative perspective."

female social bonds are affected by shared natal origins. By tracking the microbial "signatures" of each chimp's unique microbiome, says Stumpf, "we can apply these microbial findings to understand female dispersal patterns and sociality in wild chimpanzees."

"In short, this work will contribute to a greater understanding of female chimpanzee dispersal and their relationships across their lifespans [...] so we can apply these metagenomics concepts to improve and inform conservation strategies." Stumpf is focused on integrating applications of microbial analyses to conservation. "To date, microbiome analyses have not been used to inform conservation policies and legislation, however, incorporating metagenomic analyses has enormous potential for monitoring and protecting wild and captive populations."

Chimps aren't the only primates Stumpf studies, however: much of her current work relates to the human microbiome, and its relationship to preterm birth rates. "Specifically," she explains, "our research group evaluates some of the genetic and environmental factors that underlie vaginal microbial diversity, and seeks to understand microbiome colonization, residency, and transmission, with an ultimate goal of mitigating risks for preterm birth."

"Preterm birth (birth before 37 weeks) occurs in approximately 12% of all pregnancies, and can create serious health risks related to breathing issues, sensory impairment, trouble feeding and more. One factor associated with preterm birth is vaginal microbiome dysbiosis [microbial imbalance]. [...] We are working to identify the genetic and environmental factors affecting variation across human vaginal microbiomes and microbial transmission pathways, with the goal of mitigating the risk for preterm birth." By identifying microbiome and other biomarkers that indicate or accompany preterm deliveries, Stumpf and colleagues hope to understand influences on variation, identify risk factors and improve interventions.

From conservation to human health, Stumpf's research represents the collaborative, interdisciplinary ideals of genomic research. "Studying these microbial populations is such a good cross-disciplinary partnership," says Stumpf. "Biological anthropologists benefit because it opens the door to this transformational way of understanding primate evolution, and microbiologists benefit from gaining new perspectives on human microbes in comparative perspective."

"We are really just at the tip of the iceberg," she says of the value of studying host-microbiome interactions. ■

Written by Kathryn Metcalf. Photo by Kathryn Faith.

ON THE GRID HAPPENINGS AT THE IGB

NEW ARRIVALS



ALAINA KANFER

Dr. Alaina Kanfer has joined the IGB as Director of Engagement & External Relations. She received her Ph.D. in Mathematical Social Science from the University of California, Irvine, with a focus on social network analysis and the sociology of science. She came to the University of Illinois as a postdoctoral fellow in Quantitative Psychology and remained at the National Center for Supercomputing Applications (NCSA) to build a research and outreach group with government and corporate partners while maintaining adjunct positions in the Colleges of ACES and Commerce. More recently she has been teaching in the program in Agricultural Communications. At the IGB, Dr. Kanfer will work to engage the public, from local community to national associations and corporate partners, with our grand challenge scientific research.



CHEMYONG KO

Professor CheMyong Ko has joined the IGB as an affiliate member in the Computing Genomes for Reproductive Health (CGRH) Research Theme. He is a faculty member in the Department of Comparative Biosciences in the College of Veterinary Medicine. He received his Ph.D. from Seoul National University and was a post-doctoral research associate at the University of Kentucky. His current research focuses on the mechanism of ovulation, and the pathogenesis of polycystic ovarian syndrome.



ZEYNEP MADAK-ERDOGAN

Professor Zeynep Madak-Erdogan has joined the IGB as a faculty member in the Omics Nanotechnology for Cancer Precision Medicine (ONC-PM) Research Theme. After receiving her Ph.D. in 2009 from the University of Illinois, she joined the faculty in the Department of Food Science and Human Nutrition. Her lab uses Systems Biology approaches to understand how hormones and nutrition affect women's health. She is also studying the molecular basis of how breast tumors become deadly and the impact of synthetic and botanical estrogens on metabolic health of postmenopausal women.



BENITA KATZENELLENBOGAN

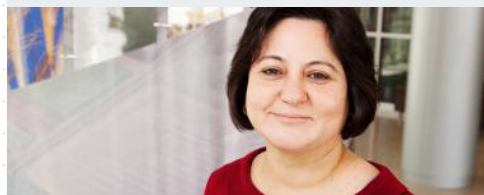
Professor Benita Katzenellenbogen has joined the IGB as an affiliate member in the Omics Nanotechnology for Cancer Precision Medicine (ONC-PM) Research Theme. She is a faculty member in the Department of Molecular and Integrative Physiology, as well as a Swanlund Professor. She has a major interest in hormones and breast cancer and in mechanisms of endocrine sensitivity and resistance to cancer therapies, as well as biomarker discovery and improving cancer treatments. Her research also focuses on reproductive biology and the improvement of fertility.

AWARDS



STEPHEN A. BOPPART

Stephen A. Boppert, Abel Bliss Professor of Engineering (Regenerative Biology & Tissue Engineering) received the 2016 Technical Achievement Award from the Institute of Electrical and Electronics Engineers (IEEE) Engineering in Medicine and Biology Society.



MADHU KHANNA

Madhu Khanna, Professor of Agricultural and Consumer Economics (Energy Biosciences Institute) was selected as one of five Agricultural & Applied Economics Association (AAEA) 2016 Fellows.



HYUNJOON KONG

Hyunjoon Kong, Associate Professor and Centennial Scholar in Chemical and Biomolecular Engineering (Regenerative Biology & Tissue Engineering) received the 2016 Campus Distinguished Promotion Award.



GENE ROBINSON

Gene Robinson (Director) was awarded the 2016 IBANGS Distinguished Investigator Award.

ON THE GRID HAPPENINGS AT THE IGB

NEW ARRIVALS



MICHAEL MILLER

Professor Michael Miller has joined the IGB as an affiliate member in the Microbiome Metabolic Engineering (MME) Research Theme. He is a faculty member in the Department of Food Science and Human Nutrition, and he received his Ph.D. from Michigan State University. This was followed by postdoctoral training at North Carolina State University. His research interests are in the areas of functional genomics of lactic acid bacteria, the relationship between gut microbiota and health, industrial fermentation, and food microbiology and safety.



ANDREW SMITH

Professor Andrew Smith has joined the IGB as a faculty member in the Omics Nanotechnology for Cancer Precision Medicine (ONC-PM) Research Theme. He joined the Department of Bioengineering as a faculty member in 2012. He received his Ph.D. from the Georgia Institute of Technology, and this was followed by postdoctoral training at Emory University from 2008-2012. His research interests are in the areas of obesity comorbidities, live-cell imaging, intravital microscopy, single-molecule imaging, and cancer biology.



ADITYA PARAMESWARAN

Professor Aditya Parameswaran has joined the IGB as an affiliate member in the Gene Networks in Neural and Developmental Plasticity (GNDP) Research Theme. He is a faculty member in the Department of Computer Science. He received his Ph.D. from Stanford University and spent 2013-2014 visiting MIT CSAIL and Microsoft Research New England. His research interests include data analytics, visual analytics, information extraction and integration, and recommender systems.

LECTURE SERIES

FOX FAMILY

INNOVATION & ENTREPRENEURSHIP LECTURE



FOX FAMILY INNOVATION AND ENTREPRENEURSHIP LECTURE

Entrepreneurship and innovation at the Carl R. Woese Institute for Genomic Biology provides an opportunity for academics to combine their scientific and technological background with business methodologies. Currently, the IGB offers a lecture series to introduce scientists to intellectual property, business fundamentals, venture funding and the Illinois entrepreneurial ecosystem.

Join us for a talk from Michael S. Kinch, PhD, Washington University, Associate Vice Chancellor and Director, Center for Research Innovation in Business and Professor of Radiation Oncology, School of Medicine entitled *Drug Research & Development: Extraordinary Opportunities in Uncertain Times* on September 13, 2016, 12:00 p.m. in room 612 IGB.

CNRG



COMPUTER NETWORK AND RESOURCES GROUP (CNRG) NEW LOCATION

The Computer Network and Resources Group (CNRG) has moved to their new offices on the concourse level of the IGB. They are now located in and around room 131.

Please contact them for computer and network assistance, and for poster printing, either in person in the new offices or via: help@igb.illinois.edu.

GIVING



WALK OF LIFE

The double helix—the classically beautiful twisting ladder that forms the shape of DNA—is forever depicted within the landscape of the IGB.

Located to the west of the IGB building, adjacent to the historic Morrow Plots, the Walk of Life pays tribute to the historical discoveries that enable our work on the cutting edge of genomic research. Contributing to the Walk of Life is a unique opportunity to simultaneously support our mission and become a permanent part of IGB history.

Walk of Life pavers are also the perfect way to commemorate anniversaries or special events. Contact Alaina Kanfer at akanfer@illinois.edu or find more information at www.igb.illinois.edu/about/giving.

DEPARTMENT ANNOUNCEMENTS

OFFICE OF TECHNOLOGY MANAGEMENT

INTELLECTUAL PROPERTY & COMMERCIALIZATION: THE OFFICE OF TECHNOLOGY MANAGEMENT

The Carl R. Woese Institute for Genomic Biology was founded on a vision to address grand challenges facing society and is a hub of cutting-edge and revolutionary innovations in life sciences. Some of these innovations can be patented to protect the intellectual property (IP) 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, to commercialize the IP, and to bring the innovations to public use.

You are invited to a Lunch and Learn Session on Thursday, October 20, 2016 at Noon in IGB room 612 to hear OTM talk about "Intellectual Property and Commercialization." This talk is open to all students, including graduate students and postdocs as well. Please bring your friends along if they are curious about these issues. Pizza will be provided. If you would like to attend, [please RSVP](#).

The following are some questions you might have with regard to the patentability of your inventions and the role of OTM. You will hear more about these at the **Lunch and Learn Session**.

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 be patentable, we strongly encourage you to speak with OTM personnel prior to public disclosures to retain the patentability of your invention.

OTM Tip of the Month: Disclose to OTM before you disclose to the public!

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 patent. 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 licensing and material transfer agreements, and provides crucial support for start-up ventures. This process of commercialization, of bringing technologies from academic research to the marketplace is called "technology transfer" and OTM serves as the University's Technology Transfer Office.

Where can I learn more about the OTM?

Come to the Lunch and Learn Session on Thursday, October 20, 2016 at Noon in IGB room 612.

The OTM is located in 319 Ceramics Building and for more information about OTM's mission, activities, and services, please visit our website - otm.illinois.edu. This website contains links to disclosure forms as well as the inventor's handbook (otm.illinois.edu/disclose-protect/inventors-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 Managers RK Narayanan at rkn@illinois.edu and Lisan Smith at lisan@illinois.edu.

OTM will have this column on IP and Commercialization in each IGB newsletter. We look forward to discussing the issues facing the technology transfer field and their impact on academic research. ■

UNIVERSITY LIBRARY

ILLINOIS DATA BANK

The University of Illinois' data repository – Illinois Data Bank (<https://databank.illinois.edu/>) – is now available. The Illinois Data Bank is a free, self-serve publishing platform that centralizes, preserves, and provides persistent and reliable access to University of Illinois research data. The Illinois Data Bank is a product of the University's Research Data Service (<http://researchdataservice.illinois.edu/>), which is headquartered in the University Library.

Illinois Data Bank Datasets:

- can include files of any format and sizes up to 15 GB/file
- can be deposited for immediate release or temporarily embargoed
- receive a stable, unique identifier (DOI) for persistent access and ease of citation
- are registered in a central, world-wide catalog for better discovery
- are professionally managed and curated
- are preserved at the University Library for a minimum of 5 years

Visit the Illinois Data Bank's Policies webpage (<https://databank.illinois.edu/policies>) for more details about data access and use, preservation, and the deposit agreement. Feel free to contact the Research Data Service (researchdata@library.illinois.edu) with questions or feedback. ■

BUSINESS

IGB COPIER ACCESS

For black & white copier machine access please fill out the "copier access form" located in the link below, indicating each floor you need access too. If you need multiple floors or access to the copiers on each side of a certain floor, please note that on [this form](#).

Once you have been added to the copier, you will receive an email letting you know you have access has been granted. In addition, the IGB will provide our users a drop box so you can receive all scanned documents on your desk top. To access the copier, you will input the last six numbers of your UIN, and this will become your log on number.

Copies are charged to the CFOP you provide at .06¢ a copy, all scans are free. If you have any questions, please contact Amy Roberts at 217-244-8959 alrobert@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.

Tsai, T. K., & Iyer, R. K. (1995). FTape: A fault injection tool to measure fault Tolerance. In 10th Computing in Aerospace Conference. (pp. 339-346). [AIAA-95-1041-CP] *American Institute of Aeronautics and Astronautics Inc, AIAA*. DOI: 10.2514/6.1995-1041

Zhao, H., & Medema, M. H. (2016). Standardization for natural product synthetic biology. *Natural Product Reports*, 33(8), 920-924. DOI: 10.1039/c6np00030d

Sivaguru, M., Urban, M. A., Fried, G., Wesseln, C. J., Mander, L., & Punnasena, S. W. (2016). Comparative performance of airyscan and structured illumination superresolution microscopy in the study of the surface texture and 3D shape of pollen. *Microscopy Research and Technique*. DOI: 10.1002/jemt.22732

Zhang, C., Zhou, G., Yuan, Q., Zhuang, H., Zheng, Y., Kaplan, L., ... Han, J. (2016). GeoBurst: Real-time local event detection in geo-tagged tweet streams. In SIGIR 2016 - Proceedings of the 39th International ACM SIGIR Conference on Research and Development in Information Retrieval. (pp. 513-522). *Association for Computing Machinery, Inc*. DOI: 10.1145/2911451.2911519

Paull, R. E., Chen, N. J., Ming, R., Wai, C. M., Shirley, N., Schwerdt, J., & Bulone, V. (2016). Carbon Flux and Carbohydrate Gene Families in Pineapple. *Tropical Plant Biology*, 9(3), 200-213. DOI: 10.1007/s12042-016-9176-1

Zhang, M. M., Wang, Y., Ang, E. L., & Zhao, H. (2016). Engineering microbial hosts for production of bacterial natural products. *Natural Product Reports*, 33(8), 963-987. DOI: 10.1039/c6np00017g

Lohan, D. J., Allison, J. T., & Dede, E. M. (2016). Topology optimization formulations for circuit board heat spreader design. In 17th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference. *American Institute of Aeronautics and Astronautics Inc, AIAA*.

Sweedler, J. V. (2016). The Analytical Chemistry Advisory Boards. *Analytical Chemistry*, 88(15), 7435. DOI: 10.1021/acs.analchem.6b02639

Laure, C., Karamessini, D., Milenkovic, O., Charles, L., & Lutz, J. F. (2016). Coding in 2D: Using Intentional Dispersity to Enhance the Information Capacity of Sequence-Coded Polymer Barcodes. *Angewandte Chemie - International Edition*. DOI: 10.1002/anie.201605279

Saltzman, J. A., Pineres-Leano, M., Liechty, J. M., Bost, K. K., Fiese, B. H., Harrison, K., ... Fiese, B. (2016). Eating, feeding, and feeling: Emotional responsiveness mediates longitudinal associations between maternal binge eating, feeding practices, and child weight. *International Journal of Behavioral Nutrition and Physical Activity*, 13(1), [89]. DOI: 10.1186/s12966-016-0415-5

Jiang, S., Hu, Y., Kang, C., Daly, T., Yin, D., Chang, Y., & Zhai, C. (2016). Learning query and document relevance from a web-scale click graph. In SIGIR 2016 - Proceedings of the 39th International ACM SIGIR Conference on Research and Development in Information Retrieval. (pp. 185-194). *Association for Computing Machinery, Inc*. DOI: 10.1145/2911451.2911531

Zamroziewicz, M. K., & Barbey, A. K. (2016). Nutritional cognitive neuroscience: Innovations for healthy brain aging. *Frontiers in Neuroscience*, 10(JUN), [240]. DOI: 10.3389/fnins.2016.00240

Varatharajah, Y., Iyer, R. K., Berry, B. M., Worrell, G. A., & Brinkmann, B. H. (2016). Seizure Forecasting and The Preictal State in Canine Epilepsy. *International Journal of Neural Systems*. DOI: 10.1142/S0129065716500465

Kale, S., Sabet, F. A., Jasiuk, I., & Ostoj-Starzewski, M. (2016). Effect of filler alignment on percolation in polymer nanocomposites using tunneling-percolation model. *Journal of Applied Physics*, 120(4), [045105]. DOI: 10.1063/1.4959610

Medema, M. H., & Zhao, H. (2016). Editorial: Synthetic biology and bio-informatics. *Natural Product Reports*, 33(8), 913-914. DOI: 10.1039/c6np00031c

Doty, J., Yerkes, K., Byrd, L., Murthy, J., Alleyne, A., Wolff, M., ... Fisher, T. S. (2015). Dynamic thermal management for aerospace technology: A review and outlook. In 53rd AIAA Aerospace Sciences Meeting. [AIAA 2015-2086] *American Institute of Aeronautics and Astronautics Inc, AIAA*. DOI: 10.2514/6.2015-2086

Zhang, X., Liang, P., & Ming, R. (2016). Genome-Wide Identification and Characterization of Nucleotide-Binding Site (NBS) Resistance Genes in Pineapple. *Tropical Plant Biology*, 9(3), 187-199. DOI: 10.1007/s12042-016-9178-z

Zhang, Y., & Zhai, C. (2016). A sequential decision formulation of the interface card model for interactive IR. In SIGIR 2016 - Proceedings of the 39th International ACM SIGIR Conference on Research and Development in Information Retrieval. (pp. 85-94). *Association for Computing Machinery, Inc*. DOI: 10.1145/2911451.2911543

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