IGB NEWS

Upcoming Events
Monthly Profiles
Happenings at IGB

Image Of The Month
Research News
Department Announcements

Volume 12 Number 1

UPCOMING EVENTS

IGB Seminar (ONC-PM)

Profiling Cells Inside and Out with Nanostructured Materials
February 19, 2019, 12:00 p.m.
612 Carl R. Woese Institute for Genomic Biology

Shana Kelley, PhD
University of Toronto, Departments of Chemistry, Pharmaceutical Sciences, Biochemistry, Institute for Biomaterials and Biomedical Engineering

Lunch with the Core

Efficient Data Management
February 20, 2019, 12:00 p.m.
607 Carl R. Woese Institute for Genomic Biology

Dan Davidson
Director of CNRG and Research Computing
Please note held in IGB 607

IGB Seminar (CABBI/GEGC)

The Microbial Ecology of Our Homes
March 5, 2019, 12:00 p.m.
612 Carl R. Woese Institute for Genomic Biology

Noah Fierer, PhD
University of Colorado, Boulder, Department of Ecology and Evolutionary Biology

Carl Zimmer Seminar

She Has Her Mother's Laugh
March 7, 2019, 5:30 p.m.
Alice Campbell Alumni Center
601 S. Lincoln Avenue

Carl Zimmer
New York Times columnist and author

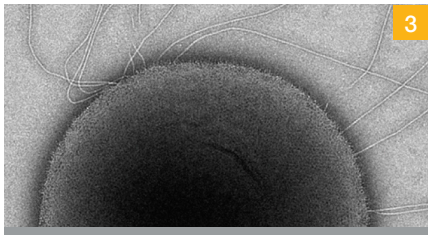
Carl Zimmer will explore ways in which DNA editing and CRISPR may change our world, and examine controversial topics in light of current advances in DNA analysis.

Reception and book signing to follow.

FEATURED NEWS

2

Launch of Center for Genomics in Business and Society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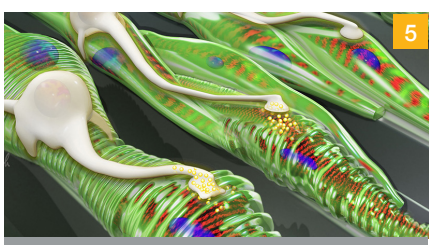
Study of archaeal cells could teach us more about ourselves


4

Monthly Profile: Madhu Khanna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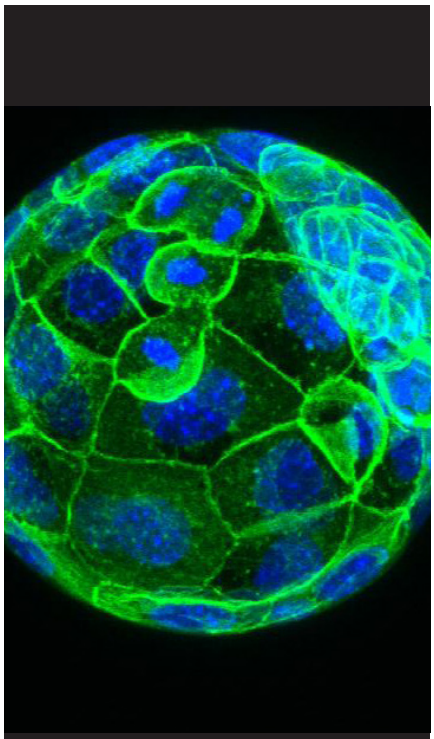
On the Grid: Happenings at IGB

IMAGE OF THE MONTH



This month features an image of a mouse blastocyst exposed to 1µg of a Phthalate mixture. The green color represents E-cadherin expression, a maker for cell adhesion. The blue represents DAPI staining of the nuclei. Phthalates are used in plastic manufacturing to increase flexibility, durability and longevity of plastics. Led by Kadeem A. Richardson under the supervision of Dr. Romana Nowak of the Reproductive Health and Toxicology Laboratory in the Department of Animal Sciences.

IGB News

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

FEATURE

Launch of new Center
for Genomics in Business and Society at IGB

The Carl R. Woese Institute for Genomic Biology (IGB) is excited to announce the launch of the Catherine and Don Kleinmuntz Center for Genomics in Business and Society, which will build on the IGB's innovative genomic research by enhancing its global influence.

The Kleinmuntz Center will be a part of the IGB and will provide unique opportunities for economic development, public engagement and social impact.

Drs. Catherine and Don Kleinmuntz are the co-founders of Strata Decision Technology, a healthcare analytics software company that was an early tenant of the University of Illinois Research Park.

"I was introduced to IGB when I was invited to come speak to the students and faculty about entrepreneurship and building a start-up business. It is easy to see that IGB is a very special place, because of the scientific talent gathered under one roof and because of the importance of the problems being addressed," said Catherine.

"Looking at IGB from my perspective as a former University of Illinois faculty member, what stands out is the interdisciplinary, team-based nature of IGB's research," Don said. "Solving these truly difficult problems requires breaking out of traditional academic silos, drawing together the best minds from across campus, and giving them the resources they need to devise unique solutions."

Established in 2007, the IGB addresses grand challenges in society, relying on interdisciplinary team science research fueled by faculty from 34 departments at the University of Illinois. This work has helped uncover the origins of life, created better cancer therapeutics, and made crops more efficient, among many other discoveries.

"The IGB is part of a powerful, integrated institute ecosystem at Illinois, designed to break down barriers to convergent research and address large-scale societal challenges in unique ways," said University of Illinois Interim Vice Chancellor for Research Susan Martinis. "This means that our world-class scientists will have further opportunities to innovate and push their creativity to greater heights—work that in turn attracts the attention of industry and entrepreneurial pioneers like Catherine and Don."

The IGB is also "where science meets society." The Institute has long prioritized commercializing impactful research and connecting with the public through educational outreach programs.

"Great scientific discoveries do not simply leap out of the laboratory and into the real world," Don said. "We see an opportunity to encourage and facilitate the process of translating great science into applications that will benefit business and society."

"Part of the solution is to help scientists understand what it takes to make the transition to commercial applications," Catherine said. "But we also want to make sure that individuals in business, government, and society at large understand the immense potential that these scientific advances have to impact their health, wealth, and well-being."

A generous donation from Drs. Catherine and Don Kleinmuntz will fund this center and provide researchers with proof-of-concept and pre-commercialization support that will help them bring technologies and innovations to market. The center will support several economic, professional, and outreach initiatives at the IGB and provide funding to prioritize work that has societal impact, scientific merit and commercial potential.

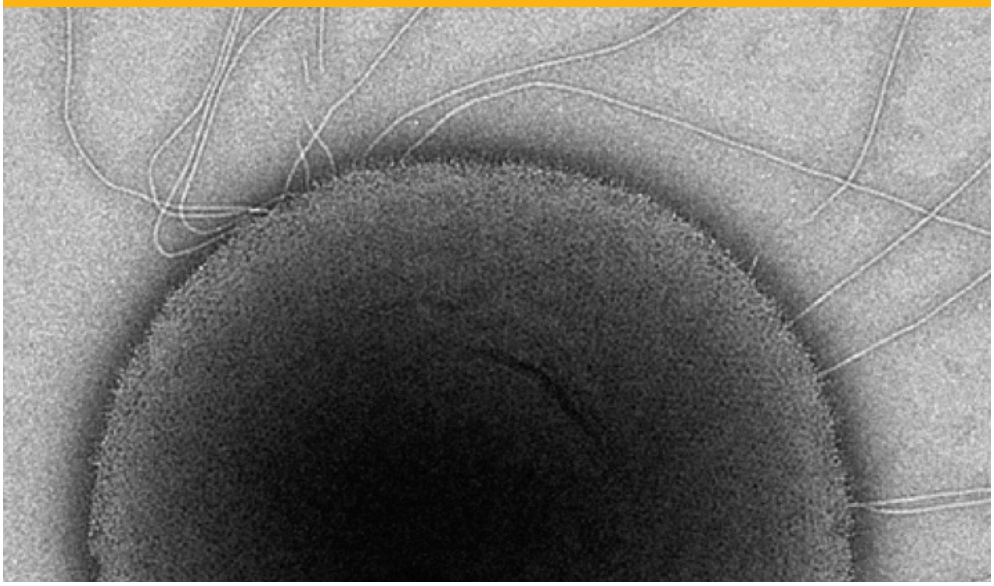
"We are very excited to be able to launch the Kleinmuntz Center, and deeply grateful to Catherine and Don for their generosity and confidence in the IGB," said IGB Director Gene Robinson. "This center will enable us to take our commercialization and social impact efforts to the next level, and help further develop the reputation of the IGB as one of the leading genomics institutes in the country."

The Kleinmuntz Center will also broaden the Genomics For™ program, which teaches basic concepts in genomics to specific demographic or professional groups, helping them understand the full impact of genomics both in their professions and in society. The program will expand to host workshops for journalists, investors and government agencies, and bring in established speakers to share experiences and discuss the current landscape within their disciplines.

The IGB's World of Genomics, an event that continues to bring genomics to the public through hands-on exhibitions at science and natural history museums, will also receive support from the Kleinmuntz Center, enabling this event to reach new locations, delivering the impact of genomic research to broad audiences across the country.

These initiatives assist the IGB in its goal of reaching young students, especially those in underserved and underrepresented communities, through its varied outreach programs. The Kleinmuntz Center will bring together economic development and societal advancement, proving that genomic research has the ability to make a difference in all areas of life.

"The IGB is already a crown jewel of the University of Illinois System, advancing the frontiers of knowledge and solving critical problems," Catherine said. "Don and I want the Kleinmuntz Center to accelerate and leverage the impact of these advances, for the benefit of the people of Illinois and the entire world." ■



Study of archaeal cells could teach us more about ourselves

Forty-two years after Carl Woese defined archaea as the third domain of life, scientists at the IGB are still learning about these ancient organisms in ways that could help us learn more about eukaryotes.

Over time, scientists have realized that archaea have close ancestral relationships to eukaryotes — the domain of life that includes animals, plants, and more.

"Everybody's interested in the origin of eukaryotic cells because we're eukaryotes," said Rachel Whitaker, a professor of microbiology, member of the BCXT theme and leader of the IGOH theme at the IGB. "The more we can learn about archaea, the more we'll understand about our own cells and what makes us unique."

Whitaker and Changyi Zhang, a research scientist at the IGB, wanted to better understand the archaeal cell by studying *Sulfolobus islandicus*, an archaeal microorganism that is found in geothermal hot springs.

Their results, published in *Nature Communications*, give insight into archaea's potential shared ancestry with eukaryotes and the evolutionary history of cells. Their research also overturns previously held beliefs about what S. islandicus requires for growth.

"One of the first questions is: what does it need in order to grow?" Whitaker said.

The researchers determined the essential genes—those that are critical for an organism's growth and survival — of *S. islandicus* and then compared them to the essential genes of bacteria and eukaryotes to see if they could find genes that are shared between them.

In particular, they wanted to see if eukaryotes shared any essential genes with *S. islandicus*, as this could give insight into the origin of eukaryotes.

While they didn't find any shared genes that hadn't already been defined, they did find a set of genes that are both unique to archaea and essential for their growth. Now, they want to understand whether these genes are unique to archaea or whether they were present in a common ancestor of archaea and eukaryotes.

Above: Sulfolobus islandicus *cell from Kamchatka, Russia showing crystalline S-layer coating the surface.*

"There are two options. Either they were once shared by a common ancestor and lost by eukaryotes as they diverge from a common ancestor," Whitaker said. "Or they're new, and they're innovations that happened in the archaeal cell that didn't happen in the eukaryotic cell."

If they can understand this better, they can further understand how archaea and eukaryotes diverged, and just how that process of evolution took place within the cell.

"Can you just evolve new functions?" Whitaker said. "What types of functions are the ones that you can evolve and change, that are essential, and what types of functions are the type you can lose?"

To study *S. islandicus*, a unique organism that grows in high temperatures, Zhang had to develop new tools to analyze its genome. These tools allowed him to make an unexpected discovery about the surface (S-) layer, the outer shell of archaeal cells that provides protection.

"It only has an S-layer surrounding the cell," Zhang said. "If the cell loses the S-layer, it loses its protection against a lot of environmental stress."

The consensus among scientists was that the S-layer was essential to *Sulfolobus*, but Zhang confirmed that it's not. He said this came as a surprise, but they now have the tools to test how the archaeal cell functions with and without this outer shell.

"We think it might be really important in how the cell normally functions," Whitaker said. "We know that they grow, but they look really different (without it). That gives us some ideas about what processes might be impacted, but we don't know yet what they are."

A better understanding of archaeal cells could help the scientific community learn more about functions of eukaryotic cells — many of which are not well understood. These functions can affect our cells' health, and unhealthy cells can cause mutations and genome instability, which can cause cancer.

"Our hope is that, in better understanding the core pieces of those functions, we might be able to better understand those systems, and in doing that, better understand our own selves," Whitaker said.

Whitaker and Zhang said that, since publishing their results, researchers from around the world have contacted them to request access to their data.

"The field of archaeal cell biology has really noticed this work . . . that's great, coming from the IGB and from Illinois," Whitaker said. "It's reminding people that archaeal research is alive and well and really making big impacts here." ■

Written by Emily Scott.

MONTHLY PROFILE

Madhu Khanna examines the motivations for producers to adopt innovative production technologies to meet demands for food and fuel, such as precision farming, biofuels, and to participate in conservation programs. Her work informs stakeholders and policy makers about the cost-effectiveness of various policy approaches to improve environmental quality and their implications for farm profitability, land use and food and fuel production.

Madhu Khanna
brings an economic perspective to biofuel production

Madhu Khanna has years of experience as an environmental economist studying what it takes to get farmers to adopt clean technologies that can benefit them and the environment.

But she now faces a new type of challenge through the Center for Advanced Bioenergy and Bioproducts Innovation (CABBI), a collaboration between the Institute for Sustainability, Energy, and Environment and the Carl R. Woese Institute for Genomic Biology.

Khanna, the ACES Distinguished Professor of Environmental Economics at the University of Illinois, is the leader of CABBI's Sustainability theme, which is providing the environmental and economic perspective for CABBI's goal of developing efficient bioenergy crops.

With CABBI, Khanna is faced with the challenge of tackling long-term questions in a short amount of time. Luckily, she's been thinking about these questions for quite a while.

Her research has focused on changing economic incentives so that farmers are more likely to adopt clean technologies that can increase the efficiency of water and land.

"The goal is to be able to extract the maximum good value out of those inputs, and then at the same time, reduce input waste and pollution," she said.

Though clean technologies are beneficial for both farmers and the environment, they're not as widely used as they should be. This could be because economic incentives for adoption differ across farmers and locations. Farmers also may not see the environmental benefits. Existing policies, or the lack of policies, may not provide incentives that would encourage adoption.

"I'm interested in understanding the barriers to adoption and how we can design better policies so that we can actually motivate more people to adopt cleaner technologies," Khanna said.

In the early 2000s, she became interested in the emerging area of bioenergy — energy that comes from biological sources. She met Stephen Long, professor of plant biology and crop sciences at Illinois, who was just beginning to work with miscanthus, a grass that grows rapidly and has a high yield, making it an attractive candidate for bioenergy.

"It just seemed like a real wonder crop," Khanna said. "I began to look into the economics of growing that crop in Illinois, and what incentives farmers would have for converting their land in Illinois, which is under corn and soybeans, to miscanthus."

While early interest in bioenergy focused on its use for electricity, the Renewable Fuel Standard in 2007 shifted the attention to biofuels. At the same time, Khanna became involved with the Energy Biosciences Institute (EBI), which funded interdisciplinary research to address critical questions about developing a viable bioeconomy.

"The EBI really led to multiple groups of people — agronomists, ecologists, agricultural engineers, soil scientists — working together to understand various aspects of growing these crops and converting them to fuel," Khanna said.

This led her research team to create mathematical models with data generated in collaboration with multidisciplinary researchers. These models analyzed the economic implications of large-scale bioenergy crop production — including how it would affect food and fuel prices.

"Yet there were a lot of unanswered questions," Khanna said. "We did not, at that time, look into other ecosystem benefits like the benefits to water quality, as well as other issues related to this crop that we are now able to explore more fully under the CABBI grant."

Now, CABBI's Sustainability theme is taking a closer look at their impacts on water quality and the potential to reduce hypoxia in the Gulf of Mexico, especially because many bioenergy crops can be grown on rain-fed land in the Mississippi River Basin and reduce nutrient run-off.

The theme is also researching what types of land can grow these crops. Researchers are examining the possibility of growing bioenergy crops on marginal land, which has poor soil or is typically undesirable for crop production. This would ensure that land used for bioenergy crops isn't competing with land used for food production.

"But nobody's really fully quantified the amount of marginal land that's actually available, and where is it available and how productive is it?" Khanna said. "One of the projects we're working on now with one of the teams at CABBI is to do exactly that, to use satellite data to understand which land can be considered marginal, and where it is located."

The theme also wants to understand how farmers' preferences can affect their decision to grow bioenergy crops. Farmers may be faced with the possibility of growing bioenergy crops on their land, and even though this can benefit them in the long run, they may not want to take the risk.

"We're looking at how those kinds of preferences can affect farmer choices and what kinds of policies and programs can be developed to reduce the riskiness of growing these crops for farmers so they are more willing to convert their land to these crops," Khanna said.

Khanna enjoys being able to apply her expertise in agricultural and environmental economics to a real world problem.

"I think climate change is one of the most challenging and pressing problems of our time," she said. "It's largely caused by overconsumption of fossil fuels. The work that I'm doing directly contributes to looking at how we can displace fossil fuels and replace them with renewable fuels."

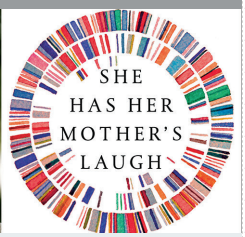
She believes CABBI has the potential to contribute greatly to this work.

"We are able to combine work that has been done on the field with economic and ecosystem models, and then project out to a large scale," she said. "We're really going from lab scale or field scale to regional scale and national scale." ■

Written by Emily Scott.

ON THE GRID
HAPPENINGS AT THE IGB

TALK



NYT COLUMNIST AND AUTHOR CARL ZIMMER TO SPEAK ON NEW BOOK

New York Times columnist and renowned author Carl Zimmer will be giving a lecture on his newest book, titled *She Has Her Mother's Laugh: The Powers, Perversions, and Potential of Heredity*, on March 7th at 5:30pm at the Alice Campbell Alumni Center. Free and open to all, a reception and book signing will follow the event.

In his lecture, Carl Zimmer will redefine heredity, weaving together historical and current scientific research, exemplary original reporting, and his own experience as a parent of two daughters. Introducing audiences to the not-too-distant future, Zimmer will explore the ways in which DNA editing with the powerful new tool CRISPR may change our world—and ourselves. He fearlessly examines controversial topics (Do races actually exist? Is success inherited?) in light of current advances in DNA analysis, and will discuss the ways in which heredity has historically been used to justify racism and social inequality. By challenging long-standing presumptions about heredity, Zimmer takes audiences on a journey of discovery about who we really are, where we came from, and what we can pass on to future generations.

Carl Zimmer is, in the words of The New York Times Book Review, "as fine a science essayist as we have." His newest book, *She Has Her Mother's Laugh*, was named a Notable Book of the Year by the New York Times Book Review. It was also selected for Publisher's Weekly Best Ten Books of 2018 and the 2018 shortlist for Baillie-Gifford Prize for Nonfiction. The Guardian named it the best science book of 2018.

Sponsored by the Department of History and the Carl R. Woese Institute for Genomic Biology.

PRIZE

AINSWORTH TO RECEIVE 2019 NAS PRIZE IN FOOD AND AGRICULTURE SCIENCES

Elizabeth Ainsworth, USDA Agricultural Research Service, also an adjunct professor at Illinois and a member of the IGB Genomic Ecology of Global Change research theme, will receive the 2019 NAS Prize in Food and Agriculture Sciences.

How will the world eat in the face of climate change and other threats? That question dominates Ainsworth's pioneering research, which has helped to reveal how man-made atmospheric changes will affect the physiology and growth of crops around the world.

Ainsworth led the evolution of the SoyFACE Global Change Research Facility, where she serves as lead investigator. There, she has conducted groundbreaking research to show how crops such as maize and soybeans will be affected by increases in atmospheric carbon dioxide and ozone in combination with drought and other environmental stresses, as well as possible solutions. The work recently revealed that a large portion of the United States harvest of corn and soybean was lost due to ozone pollution over the past 20 years.

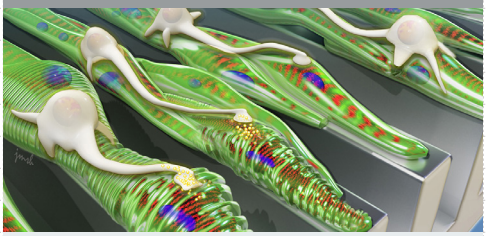
The NAS Prize in Food and Agriculture Sciences recognizes research by a mid-career scientist (defined as up to 20 years since completion of PhD) at a U.S. institution who has made an extraordinary contribution to agriculture or to the understanding of the biology of a species fundamentally important to agriculture or food production. The prize is endowed through generous gifts from the Foundation for Food and Agriculture Research (FFAR) and the Bill & Melinda Gates Foundation. The NAS Prize in Food and Agriculture Sciences is presented with a medal and a $100,000 prize.

PARTNERSHIP

ILLINOIS TEAMS WITH ANHEUSER-BUSCH FOR BEE RESEARCH

Professor of Entomology May Berenbaum (GEGC/IGOH) and IGB Director Gene Robinson (GNDP) led efforts in a new partnership between Illinois and St. Louis-based Anheuser-Busch, LLC, to raise money for bee research through a $5,000 pledge to The Healthy Bee Fund at Illinois. In addition, the company will donate $1 to the fund for every case sold of b, a new alcoholic honey beverage scheduled to go on sale in the Northeast U.S. in March. Read the full story here.

RESEARCH



NEURONS INTEGRATE BETTER WITH MUSCLE GROWN ON GROOVED PLATFORMS

Growing muscle tissue on grooved platforms helps neurons more effectively integrate with the muscle, a requirement for engineering muscle in the lab that responds and functions like muscle in the body, University of Illinois researchers found in a new study led by Hyunjoon Kong, a professor of chemical and biomolecular engineering. Read the full story here.

ON THE GRID
HAPPENINGS AT THE IGB

AWARDS

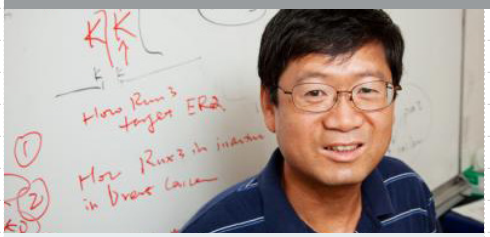
JIAWEI HAN

Jiawei Han, Abel Bliss Professor of Engineering (GNDP) has been named the Michael Aiken Chair by the University of Illinois, one of the most distinguished honors on the campus, established in honor of former Chancellor Michael Aiken.

RACHEL WHITAKER

Rachel Whitaker, Professor of Microbiology (IGOH leader/BCXT) was elected an American Academy of Microbiology Fellow in recognition of excellence, originality, and leadership in the microbiological sciences.

NEW ARRIVALS



LIN-FENG CHEN

Professor Lin-Feng Chen has joined the IGB as an affiliate member in the Microbiome Metabolic Engineering (MME) Research Theme. Dr. Chen is a professor in the Department of Biochemistry. He received his Ph.D. from Kyoto University and was a postdoctoral research associate at the University of California, San Francisco. His current research focuses on the epigenetic regulation of NF-kB and the role of NF-kB in apoptosis and cancer.

MARIA GODOY

Professor Maria Godoy has joined the IGB as an affiliate member in the Microbiome Metabolic Engineering (MME) Research Theme. She is an assistant professor in the Department of Animal Sciences. Prior to joining the faculty, she received her Ph.D. at the University of Kentucky, and was a postdoctoral research associate at the University of Illinois. Professor Godoy's research focuses on improving the quality of life and wellness of companion animals through research focusing on ingredient evaluation and foodomics, pet food technology, and therapeutic nutrition.

COLIN KIEFFER

Professor Colin Kieffer has joined the IGB as an affiliate member in the Infection Genomics for One Health (IGOH) Research Theme. Dr. Kieffer recently joined the faculty in the Department of Microbiology after completing a post doc at the California Institute of Technology. He received his Ph.D. In Biochemistry from the University of Utah and was a postdoctoral research associate at Utah in Oncology. His current research focuses on the mechanisms of HIV pathogenesis in animal models and human patient samples, as well as the development and application of multiscale tissue imaging models.

NAVEEN NARISETTY

Professor Naveen Narisetty has joined the IGB as an affiliate member in the Microbiome Metabolic Engineering (MME) Research Theme. He received his Ph.D. in Statistics from the University of Michigan in 2016, and then joined the faculty in the Department of Statistics at the University of Illinois. He has a broad research interest in methodological, computational and theoretical research in statistics motivated by substantial applications and interdisciplinary collaborations.

DEPARTMENT ANNOUNCEMENTS

BUSINESS

ON-LINE W2 & 1042-S AVAILABLE NOW

If you have consented to receive your form W-2 and /or 1042-S electronically, it is now available. Below are the instructions to retrieve your form.

Access to Electronic Form W-2/1042-S/1095-C for Active Employees

To access the form employees should follow these steps:

1. Go to the System HR website.
2. Select the 'Pay' tab
3. Click the link 'W-2/1042-S/1095-C Tax Statement.'
4. Click the 'Access Tax Forms' green button.
5. Log in using your NetID and password.
6. Provide 2-Factor Authentication
7. Click 'Continue.'
8. On the Online Tax Forms page, click on the link of the 2018 tax form you want to retrieve.
9. Click on the 'Continue to View/Print' button.
10. Select the link of the tax form you want to retrieve (i.e. 2018 W-2 Form or 2018 1042-S Form).

Your Form W-2 or 1042-S will display on the screen. You may print the form (the form is 2 pages so if your printer has duplex printing you may want to turn it on) or save your form to a hard drive or disk. You may also log off and retrieve it again later through the same process via the Systems HR website.

If you have questions, you may contact University Payroll & Benefits Customer Service by phone at UIUC 217-265-6363, (UIUC), 312-996-7200 (UIC), and 217-206-7144 (UIS) or email payinq@uillinois.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.

Liu, K., Pan, C., Kuhn, A., Nievergelt, A. P., Fantner, G. E., Milenkovic, O., & Radenovic, A. (2019). Detecting topological variations of DNA at single-molecule level. *Nature communications*, 10(1), [3]. https://doi.org/10.1038/s41467-018-07924-1

Suriyavirun, N., Krichels, A. H., Kent, A. D., & Yang, W. (2019). Microtopographic differences in soil properties and microbial community composition at the field scale. *Soil Biology and Biochemistry*, 131, 71-80. https://doi.org/10.1016/j.soilbio.2018.12.024

Ghazarian, H., Hu, W., Mao, A., Nguyen, T., Vaidehi, N., Sligar, S. G., & Shively, J. E. (2019). NMR analysis of free and lipid nanodisc anchored CEACAM1 membrane proximal peptides with Ca2+/CaM. *Biochimica et Biophysica Acta - Biomembranes*, 1861(4), 787-797. https://doi.org/10.1016/j.bbamem.2019.01.004

Abueidda, D. W., Elhebeary, M., Shiang, C. S. A., Pang, S., Abu Al-Rub, R. K., & Jasiuk, I. M. (2019). Mechanical properties of 3D printed polymeric Gyroid cellular structures: Experimental and finite element study. *Materials and Design*, 165, [107597]. https://doi.org/10.1016/j.matdes.2019.107597

Juneja, A., Zhang, G., Jin, Y-S., & Singh, V. (2019). Bioprocessing and technoeconomic feasibility analysis of simultaneous production of D-psicose and ethanol using engineered yeast strain KAM-2GD. *Bioresource Technology*, 275, 27-34. https://doi.org/10.1016/j.biortech.2018.12.025

Park, C. J., Barakat, R., Ulanov, A., Li, Z. L., Lin, P. C., Chiu, K., ... Ko, C. (2019). Sanitary pads and diapers contain higher phthalate contents than those in common commercial plastic products. *Reproductive Toxicology*, 84, 114-121. https://doi.org/10.1016/j.reprotox.2019.01.005

Oh, E. J., Wei, N., Kwak, S., Kim, H., & Jin, Y-S. (2019). Overexpression of RCK1 improves acetic acid tolerance in *Saccharomyces cerevisiae*. *Journal of Biotechnology*, 292, 1-4. https://doi.org/10.1016/j.jbiotec.2018.12.013

Chojnacki, M. R., Holscher, H. D., Balbinot, A. R., Raine, L. B., Biggan, J. R., Walk, A. M., ... Khan, N. A. (2019). Relations between mode of birth delivery and timing of developmental milestones and adiposity in preadolescence: A retrospective study. *Early Human Development*, 129, 52-59. https://doi.org/10.1016/j.earlhumdev.2018.12.021

Tisha, A. L., Armstrong, A. A., Wagoner Johnson, A. J., & Lopez-Ortiz, C. (2019). Skeletal muscle adaptations and passive muscle stiffness in cerebral palsy: A literature review and conceptual model. *Journal of*

RECENT PUBLICATIONS

Applied Biomechanics, 35(1), 68-79. https://doi.org/10.1123/jab.2018-0049

Robertson, H. M., Robertson, E. C. N., Walden, K. K. O., Enders, L. S., & Miller, N. J. (2019). The chemoreceptors and odorant binding proteins of the soybean and pea aphids. *Insect Biochemistry and Molecular Biology*, 105, 69-78. https://doi.org/10.1016/j.ibmb.2019.01.005

Wang, Y., Hua, X., Xu, J., Chen, Z., Fan, T., Zeng, Z., ... Zhang, J. (2019). Comparative genomics revealed the gene evolution and functional divergence of magnesium transporter families in *Saccharum*. *BMC genomics*, 20(1), [5437]. https://doi.org/10.1186/s12864-019-5437-3

Lopez Hernandez, H., Takekuma, S. K., Mejia, E. B., Plantz, C. L., Sottos, N. R., Moore, J. S., & White, S. R. (2019). Processing-dependent mechanical properties of solvent cast cyclic polyphthalaldehyde. *Polymer*, 162, 29-34. https://doi.org/10.1016/j.polymer.2018.12.016

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