IGB NEWS

Upcoming Events
Monthly Profiles
Happenings at IGB
Image Of The Month
Research News
Department Announcements

Volume 14 Number 8

UPCOMING EVENTS

IGB Faculty Spotlight Seminar
January 18, 2022, 12:00 p.m.
Join via Zoom

Eva Fischer, PhD
University of Illinois; Assistant Professor of Evolution, Ecology, and Behavior

IGB Seminar - DEI
January 25, 2022, 12:00 p.m.
Join via Zoom - link forthcoming

Kate Clancy, PhD
University of Illinois
Associate Professor of Anthropology

IGB Faculty Spotlight Seminar
February 1, 2022, 12:00 p.m.
Join via Zoom

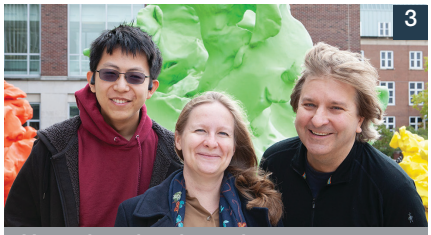
Helen Nguyen, PhD
University of Illinois; Professor, Civil and Environmental Engineering

IGB Lunchbox Series
February 16, 2022, 12:00 p.m.
Join via Zoom - link forthcoming

Join us for a new semester of talks where we highlight the intersection of food, science, and culture. Each lecture will feature food tailored by campus chefs paired with lectures delivered by campus experts.

FEATURED NEWS

New funds to support collaborative projects at the IGB

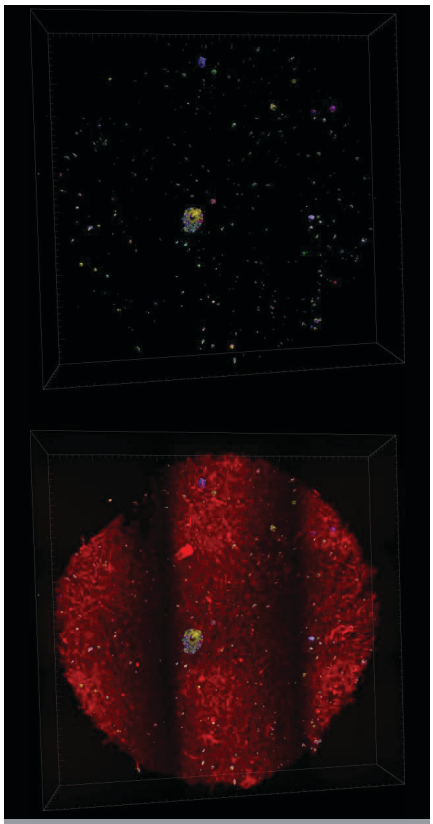


How do microbes choose from a “menu” of food?

Monthly Profile: Alida de Flamingh

On the Grid: Happenings at IGB

IMAGE OF THE MONTH



This image explores the development of a fast and robust protocol for the clearing and imaging of a Mineralized Collagen Scaffold embedded with cells. A secondary goal for this imaging was to adopt a protocol for high through-put clearing and imaging of samples on a large scale. This was imaged with the Miltenyi Ultramicroscope and processed with Imaris 3D Software, authored by Kingsley Boateng, Aliki Kolliopoulos, and Brendan Harley.

IGB News

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

FEATURE

New funds
to support collaborative projects at the IGB

Dr. Denise Elser, pictured above, has always believed in using multidisciplinary collaborations to solve important problems. In 2017, she attended an event hosted by Steven Thayer, a Leadership Council member at the Carl R. Woese Institute for Genomic Biology, where she first learned about the IGB and was intrigued by the social and ethical implications of advances in genomic sciences. During her subsequent visit in 2019, she was impressed by the different IGB themes and was inspired to help the research endeavors by making a generous contribution to the Director's Innovation Fund.

Elser grew up in Chicago knowing that she wanted to become a physician because she was fascinated by the inner workings of the human body. When she started fourth grade, she joined a program that allowed her to pursue any science project she wanted. Unsurprisingly, she studied anatomy. "When I started dissecting animals and seeing how the organs work and how they are connected, I wanted to learn how to put bodies back together. I knew early on I wanted to be a surgeon," Elser said.

When Elser began looking at universities, she was won over by the program at the University of Illinois Urbana-Champaign. To the dismay of her parents, she ripped up her applications for other universities after her visit. "The University of Illinois had everything I needed to become the best physician I could possibly be," Elser said. "Many people had discouraged me from joining because the classes were so big. However, I was never lost; I always had mentors and friends who helped me."

Her favorite memory was the cockroach lab with Fred Delcomyn, a professor of neuroscience and entomology, where she learned about physiology. "The entire class was focused on how electrolytes in the nerves trigger muscle function and it was one of the main labs that was studying nerve damage," Elser said. "Although it is one of my favorite memories, it was also scary because some of the cockroaches were bigger than my hand."

After graduating in 1984, Elser returned to Chicago and joined the Rush University Medical Center where she joined the gynecology program. "At first, I thought I would go into general surgery, but a mentor introduced me to gynecological surgery. In those early days of urogynecology, I was attracted to the challenge of improving surgical techniques to reconstruct a woman's body after childbirth and aging, which causes prolapse and incontinence," Elser said.

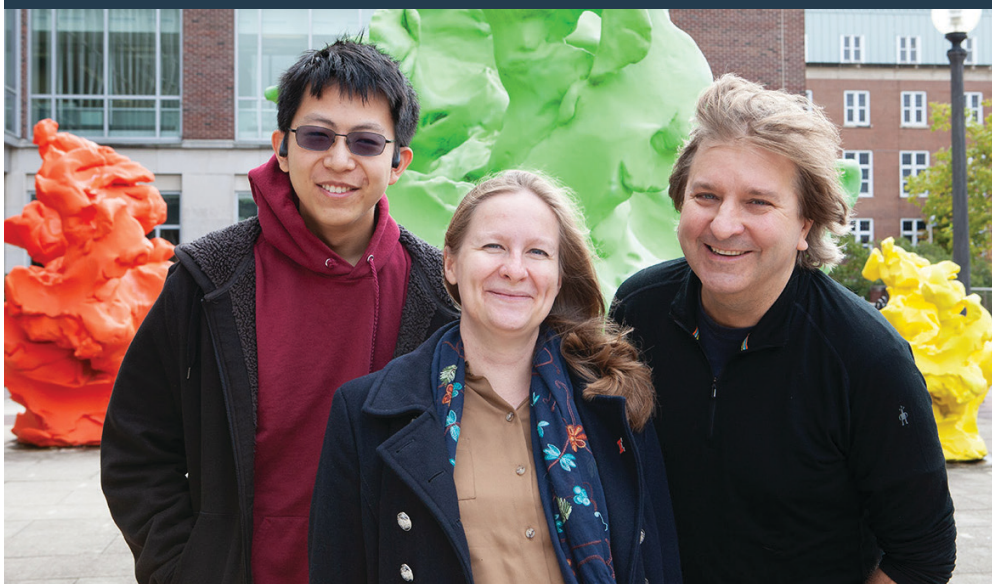
Over the years, Elser has maintained a balancing act between surgery and research, where she studies issues that are often overlooked by surgeons. In 2010, a well-funded national research consortium published a study that led gynecologists to always insert a mesh to prevent incontinence in women undergoing prolapse surgery—a procedure that corrects the condition where one or more organs slip from their normal position and bulge into the vagina. However, the surgeons in the study performed as few as 5 such surgeries per year, while Elser usually performed about five per week. Since she disagreed with the conclusions, she conducted a multi-site study where she looked at whether women need to have surgery that addresses incontinence issues when they undergo prolapse surgery.

"I collected the data from my colleagues and we realized that incontinence surgery was not necessary in every single patient. By analyzing results of urodynamics testing, and only implanting a mesh in women with proven incontinence, the ladies in our study had much better outcomes," Elser said.

Elser also works on projects that solve surgical problems using engineering techniques. In one of her studies, she collaborated with a mechanical engineer to address stress incontinence, where urine leaks out when patients cough. Traditional treatment involves inserting a mesh to tighten the urethra. The engineer, on the other hand, had a less conventional idea. "He said it was like a high-pressure boiler with a leaky valve; you can't just keep tightening the valve," she said. "Instead, he suggested inserting a balloon, which acts as a shock absorber. Now when a woman coughs, the balloon absorbs all the pressure and nothing leaks out." The procedure is safer, easier, and the invention was recently approved by the FDA.

The same spirit of innovation drew Elser to the IGB labs, where she was particularly impressed with the EIRH theme, which focuses on improving reproductive health. Her donation will help the research groups develop tools to investigate how environmental toxins can impact reproductive health. "I decided to donate because there are so many teams of specialists that get together from different walks of life and they make projects work because they approach them from different angles," Elser said. ■

Written by Ananya Sen.
Photo provided by Dr. Denise Elser.



How do microbes choose from a "menu" of food?

Microbial communities often contain several species that coexist even though they share similar metabolic abilities. How they do so is unclear. Researchers have now developed a model to show that if these species have complementary preferences for what they consume, they can more easily coexist.

Many microbes grow diauxically—they consume the available food resources one at a time instead of simultaneously. Each species has a particular order of preferences, ranging from most preferred to least preferred. Importantly, this list differs among the different microbes. Interestingly, sugars like glucose, which should be universally prized, are not preferred by some microbes, allowing them to choose different items from the same menu.

"Although diauxic growth was discovered in the 1940s, people haven't paid much attention to it from a modeling perspective," said Sergei Maslov (BCXT/CABBI), a professor of bioengineering and Bliss faculty scholar. "We have this incredible zoo of microbial ecosystems that are present everywhere and people are trying to understand what allows different species to co-exist. We wanted to understand the basic assembly principles of diauxically growing communities."

The researchers modeled the assembly of a microbial community in serial dilution cultures, where the bacteria are allowed to grow up on a fresh batch of nutrients for a certain time before they are diluted again. "Serial dilution experiments are the simplest experiments to perform in the lab and they represent the boom-and-bust scenarios in nature. For example, in the gut you may have a fresh batch of nutrients, which is used by the microbes until they run out of food. At the end of every boom cycle comes the bust cycle represented by the dilution," Maslov said.

"Each species has a predetermined preference list that is hardwired into its DNA. What we assumed, and what is supported by experiments, is that the order of nutrient consumption is different for different species. Some may have glucose as the top choice while others use, for example, lactose. We are looking at this interplay between the diversity of nutrients and the microbe preferences," Maslov said.

Above: From left, Zihan Wang, Veronika Dubinkina, and Sergei Maslov developed a model to understand how different species coexist in a community.

In the model, the researchers first assumed that a single species can grow on four food resources. It first grows on its most preferred resource until it runs out and then switches to the next one. After all the resources are depleted, a fraction of the bacteria is transferred to a fresh batch of resources, resulting in serial dilution. After this point, a randomly chosen second species is introduced and the researchers modeled the resulting competition and resource depletion. This process continues until no other species from the random pool can invade the community. Across many such simulations, the set of microbes in the final community tends to have complementary resource preferences i.e., their top choices are all different.

Although one might guess that the microbe's top choice is whatever it grows on the fastest, the model has no such assumption. "Experiments have shown that there is no clear relationship between what you prefer and how fast you grow on it. However, the assembled community consists almost exclusively of microbes that grow the fastest on their top choice nutrient," said Akshit Goyal, a postdoctoral fellow at MIT and a collaborator of the Maslov lab.

The researchers used a large pool of bacteria, which was generated randomly, for their model. Consequently, they were looking for patterns which did not depend on the identity of the bacteria. "We have created a geometric theory where you can grab your species and look at their preference lists and growth rates on different nutrients and predict the outcome of the experiment. Even without running the simulations, you can predict whether a species will survive in a particular community or not," said Veronika Dubinkina, a PhD student in the Maslov lab.

This work did not incorporate other growth factors that might affect microbial growth. "We did not consider cross feeding in our model where one bacterium produces products that the others can use. We assumed that all the species can only use the resources that are present in the beginning," said Zihan Wang, a PhD student in the Maslov lab. The researchers plan on including cross feeding into their future studies to see how it shapes the microbial community.

"We are interested in applying this model to real microbial ecosystems and we have started another project to see what happens in actual serial-dilution experiments," Maslov said. "It's very easy to make a big, complicated model. Our philosophy is to add one property at a time, such as diauxie or cross feeding, and understand what is going on at every step. That way you gradually get better at understanding of complex, real-world systems."

The study "Complementary resource preferences spontaneously emerge in diauxic microbial communities" was published in Nature Communications. ■

Written by Ananya Sen. Photo by Jillian Nickell.

MONTHLY PROFILE

Alida de Flamingh is a postdoctoral fellow in the Malhi lab.

Alida de Flamingh
Postdoctoral Fellow

Alida de Flamingh grew up loving animals. She lived on a farm in the northwest province of South Africa, surrounded by chickens, dogs, cats, horses, tortoises, peacocks, and parrots. Her current favorite companion animal is an African grey parrot (pictured) named Wolraadt. "Our farm was like a miniature zoo. People from the town loved visiting us and seeing all the animals," de Flamingh said. "I was always bringing home rescue animals. I had a chicken for seven years who was my companion: he would wait for me by the gate when I arrived back from school. The weirdest animal I brought home was a baby barn owl that had fallen out of his nest."

de Flamingh moved Pretoria, one of South Africa's three capital cities, to pursue her undergraduate and master's degrees in zoology and large mammal ecology. She decided to focus on elephant genetics for her PhD and came to the University of Illinois in 2015 to work with Alfred Roca, a professor of animal sciences. She is currently working as a postdoctoral fellow at the IGB with Ripan Malhi (GSP/GNDP/IGOH), a professor of anthropology.

"My research focuses on three themes: paleogenomic research, conservation genomics, and bioinformatics," de Flamingh said. The first theme includes looking at ancient DNA from across the world, including ivory from a 16th century Portuguese shipwreck, and collaborating with the Field Museum of Natural History in Chicago. de Flamingh also works with Indigenous communities in the U.S. and Canada. "We're trying to understand the impact of historical trauma on communities and we do that by looking at epigenomes—molecules that attach to DNA and turn genes on or off. We also talk with the community members about their experiences," she said.

Her conservation work has taken her across southern Africa to Botswana, Namibia, Zimbabwe, and Zambia. "One of my fondest memories is lying in bed in northern Botswana and hearing elephants at the waterhole that was less than 500 feet away. They were playing and you could hear their trumpets," de Flamingh said. "It was disconcerting but also incredibly moving to be that close to them. It was impossible to get any sleep." de Flamingh has also heard a symphony of other nocturnal animals, including honking hippos, laughing hyenas, and roaring lions. "There is nothing quite as unsettling as hearing a lion roar because it is really loud and you can hear it from miles away," she said.

"As dit pap reën, moet jy skep"
–an Afrikaans idiom.

Although the direct translation is "You should set a plate if it's raining porridge," the actual meaning is that you should use any opportunity you get. I feel like I set my plate for research opportunities here at UIUC and it has been raining the best kind of porridge since I started in 2015.

"I've been fortunate that my family has always fostered a deep respect for nature in me and has really encouraged me to live out my passion. Nature conservation has always important to me and to my family. Although I've always been very close to nature growing up on the farm, we also used to go on holidays to national parks. I'm just lucky to have been born in a country that is as fabulous as South Africa. If you grow up the way that I grew up, there is no way you can't be absolutely crazy about nature," de Flamingh said.

Her hobbies also draw inspiration from nature. In addition to making jewelry, de Flamingh makes charcoal drawings of animals. She is also an avid birder and is the Program Chair for the Champaign County Audubon Society, where she organizes birding adventures.

de Flamingh plans to remain in academia and build her career in the U.S. "I have many collaborators here and I am passionate about giving opportunities to other people," she said. "For example, I want to establish study abroad programs with South Africa to foster collaborative research with students there. My experience in one of the most diverse countries – South Africa – has given me a deep appreciation for the more robust, equitable, and sustainable systems that can be built through the collaboration of people with diverse backgrounds and cultures. My goal is to succeed in academia so that I may use my success as a platform to help others succeed in STEM." ■

Written by Ananya Sen. Photo courtesy of Alida de Flamingh.

ON THE GRID
HAPPENINGS AT THE IGB

AWARDS

BRIAN ALLAN
WILLIAM BARLEY

Brian Allan, Professor of Entomology (IGOH) and William Barley, Associate Professor of Communication, were appointed the inaugural IGB Director's Faculty Fellows for 2021-2022. Their joint project "Does participation in multidisciplinary science centers affect researchers' careers?" seeks to better understand the dynamics of team science, the potential benefits or barriers to research progress, and how these factors may enable or hinder research productivity.

NEW ARRIVALS

JESSICA SMITH

Jessica Smith recently joined IGB as an Office Manager for CGD, BSD, Personal Nutrition Initiative and External Relations. Prior to joining the IGB, she was an Office Manager supporting three departments for the School of Literatures, Cultures, and Linguistics under the University's College of Liberal Arts & Sciences. She's been with the University of Illinois for just under 2 years. Jessica is an Urbana native, married with two daughters, and proud owner of a local food truck.

RANKING

TWO IGB SCIENTISTS RANK AMONG WORLD'S MOST INFLUENTIAL

Crop sciences and plant biology professor Stephen Long (BSD/CABBI/GEGC) and plant biology professor Donald Ort (GEGC leader/CABBI/BSD) have been named to the 2021 Clarivate Analytics Highly Cited Researchers list. The list recognizes researchers who demonstrated significant influence in their chosen field or fields through the publication of multiple highly cited papers during the last decade. Their names are drawn from the publications that rank in the top 1% by citations for field and publication year in the Web of Science citation index.

BIOMARKER

BIOMARKER MAGAZINE NOW AVAILABLE

Our annual magazine Biomarker is now available and has a beautiful cover illustrated by Owen Davey, which highlights exciting discoveries made at the IGB this year and the diverse viewpoints within our community. To read these stories and learn how the IGB is working towards creating a more inclusive and welcoming community, download your copy at https://go.igb.illinois.edu/BiomarkerVol15.

DRUG DISCOVERY

ATOMIC STRUCTURE OF ANTIFUNGAL DRUG CONFIRMS UNUSUAL MECHANISM

Advanced molecular imaging technology has now mapped the structure of a drug widely used to treat fungal infections but whose workings have mystified researchers and physicians for nearly 70 years.

In a new study, researchers at the University of Illinois Urbana-Champaign, the University of Wisconsin, Madison and the National Institutes of Health described in atomistic detail the structure of the drug amphotericin B, a powerful but toxic antifungal agent.

Seeing the structure provides illumination in the researchers' quest to formulate less-toxic AmB derivatives, said Dr. Martin D. Burke (MMG) a professor of chemistry at Illinois and a member of the Carle Illinois College of Medicine, as well as a medical doctor. Burke co-led the study with Chad Rienstra, a Wisconsin professor of biochemistry, and Taras Pogorelov, an Illinois research professor of chemistry. The researchers reported their findings in the journal Nature Structural & Molecular Biology.

"It's like we were driving in the dark at night, and all of a sudden we were able to put the lights on. With the clarity of this structure, we can see where we need to go to reach our goal of a less-toxic antifungal drug," Burke said.

Previously, researchers and physicians thought that AmB killed fungal cells by forming channels in the cell membrane, the outer envelope that encases the cell. However, in 2014, while Rienstra was a professor at Illinois, Burke and Rienstra's group found that amphotericin primarily kills cells by robbing the membrane of sterol molecules – cholesterol in human cells and ergosterol in fungal cells. Individual amphotericin molecules aggregated into a larger structure that absorbed sterol molecules out of cell membranes like a sponge, causing the cells to die. Read the full story here.

DEPARTMENT ANNOUNCEMENTS

HR

HOLIDAY BREAK REDUCED SERVICE DAYS

As we approach the holiday season we are providing a reminder of the upcoming holiday schedule and the accompanying gift days.

Friday, December 24, 2021
½ Gift Day (from President & Chancellor) and ½ Excused Day p.m.

Monday, December 27, 2021 - Christmas Day Holiday Observed

Tuesday, December 28, 2021 - Day After Christmas Holiday (Designated Holiday)

Wednesday, December 29, 2021 - Gift Day**

Thursday, December 30, 2021 - Gift Day**

Friday, December 31, 2021 - Gift Day**

Monday, January 3, 2022 - New Year's Day Holiday Observed

Tuesday, January 4, 2022 - Gift Day**

Reduced Service Days
As in the past, IGB will be closed starting December 24, 2021, thru January 4, 2022, and most employees will not be working those three days.

Please note the three gift days must be used December 29, 30, 31, and January 4, they cannot be "saved" to use at another point in time.

Questions regarding reduced service days, please contact Jacinda King at 244-2276 or jkking@illinois.edu. ■

OTM

PROOF OF CONCEPT (IPOC) PROGRAM

The Office of Technology Management is opening a new round of funding through our Illinois Proof of Concept (IPOC) program. The IPOC program awards funding to development projects that move UIUC innovations closer to licensing and commercial or public use. IPOC bridges the funding "gap" between the government-supported innovations that result from UIUC research and private sector translation of those innovations into products and services.

We are seeking proposals that represent the breadth and depth of campus research and that have the potential for positive societal impact across a variety of areas. Awards can be up to $50,000.

The application deadline is December 17, 2021. The application consists of some basic information and a short project description (up to 3 pages). Applications will be reviewed by an internal committee. Finalists will be invited to present to an external committee. We anticipate awardees will be announced in early spring 2022.

Program website with more information & the application:
https://otm.illinois.edu/IPOC ■

O&F

IGB HOLIDAY SCHEDULE AND BUILDING INFORMATION

Christmas & New Year's Day Holiday
December 24-January 4

The IGB building, which includes administrative offices, purchasing, shipping and receiving, and Array Café, will be closed. Full services will resume on Wednesday, January 5.

- All exterior doors will continue to be locked, and card access doors only accessible with a valid IGB prox card.
- Check your i-Card expiration date
- Access is automatically deactivated if your i-Card expires on or before December 31, 2021. You must renew your i-Card at the i-Card Center prior to December 20, 2021.
- Do not place orders for packages for delivery December 24-January 4. No packages or mail will be received or sent during this time by IGB Shipping and Receiving. Questions related to shipping, receiving, or email should be directed to receiving@igb.illinois.edu.
- Questions related to purchasing should be directed to the IGB Business Office at purchasing@igb.illinois.edu.
- Turn off all lights when you leave your area.
- If you notice any urgent building issues (water leaks, CT room temperature problems, etc.) call the Public Safety Dispatch Office at 217-333-0340 for off-hours assistance.
- During holiday break, emails sent to facilities@igb.illinois.edu will not be immediately addressed.
- "No parking" and permit only parking areas are still enforced. IGB bagged meters on Mathews and IGB dock parking spaces are available by permit only. Ticketing/towing may occur at vehicle owner's expense if parked in non-assigned space without permit.

Security Reminders

- Take extra care when entering the IGB both via the exterior doors during off-hours and doors leading into secured spaces within the IGB.
- Do not let unknown people into the IGB or secured spaces.
- Anyone needing access should be directed to IGB Operations and Facilities for prox card or key access permissions during regular business hours.
- Be aware of people loitering around doors and grabbing the door before closing behind you to gain access.
- Absolutely NO doors should be propped open to compromise IGB security.
- Be observant of your surroundings and immediately report any suspicious behavior by calling 9-911 from a campus phone.

Safety

- Be aware of the potential for ice forming on streets, sidewalks, parking lots, and the IGB plaza.
- Using customary winter caution is the most important means of protection. Frequently or continuously looks at the walkway in front of you, especially if you suspect slick spots.
- To report persistent areas of ice accumulation, contact the Service Office at 217-333-0340.
- The University of Illinois Public Safety website has helpful information regarding personal safety, as well as other topics of interest: http://www.dps.uiuc.edu/universitypolice/campussafety.html ■

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.

Park, I., Lim, J., You, S., Hwang, M. T., Kwon, J., Koprowski, K., Kim, S., Heredia, J., Stewart De Ramirez, S. A., Valera, E., & Bashir, R. (Accepted/ In press). Detection of SARS-CoV-2 Virus Amplification Using a Crumpled Graphene Field-Effect Transistor Biosensor. *ACS Sensors*. https://doi.org/10.1021/acssensors.1c01937

Shah, M. M., Ren, W., Irudayaraj, J., Sajini, A. A., Ali, M. I., & Ahmad, B. (2021). Colorimetric Detection of Organophosphate Pesticides Based on Acetylcholinesterase and Cysteamine Capped Gold Nanoparticles as Nanozyme. *Sensors*, 21(23), [8050]. https://doi.org/10.3390/s21238050

Žurauskas, M., Alex, A., Park, J., Hood, S. R., & Boppart, S. A. (2021). Fluorescent nanodiamonds for characterization of nonlinear microscopy systems. *Photonics Research*, 9(12), 2309-2318. https://doi.org/10.1364/PRJ.434236

Shinn, L. M., & Holscher, H. D. (2021). Personalized Nutrition and Multiomics Analyses: A Guide for Nutritionists. *Nutrition Today*, 56(6), 270-278. https://doi.org/10.1097/NT.0000000000000513

Yang, P., Cai, X., Leibensperger, C., & Khanna, M. (2021). Adoption of perennial energy crops in the US Midwest: Causal and heterogeneous determinants. *Biomass and Bioenergy*, 155, [106275]. https://doi.org/10.1016/j.biombioe.2021.106275

Auerbach, B. D., Manohar, S., Radziwon, K., & Salvi, R. (2021). Auditory hypersensitivity and processing deficits in a rat model of fragile X syndrome. *Neurobiology of Disease*, 161, [105541]. https://doi.org/10.1016/j.nbd.2021.105541

Varshney, L. R., & Barbey, A. K. (2021). Beyond IQ: The Importance of Metacognition for the Promotion of Global Wellbeing. *Journal of Intelligence*, 9(4), [54]. https://doi.org/10.3390/jintelligence9040054

Gomez-Perez, S. L., Zhang, Y., Mourtzakis, M., Tussing-Humphreys, L., Ridlon, J., Gaskins, H. R., & Mutlu, E. (2021). Comparison between handheld ultrasound and regional and whole-body dual energy x-ray absorptiometry (DXA) for body fat assessment. *Clinical Nutrition ESPEN*, 46, 386-393. https://doi.org/10.1016/j.clnesp.2021.08.038

Ahmed, A. E., Allen, J. M., Bhat, T., Burra, P., Fliege, C. E., Hart, S. N., Heldenbrand, J. R., Hudson, M. E., Istanto, D. D., Kalmbach, M. T., Kapraun, G. D., Kendig, K. I., Kendzior, M. C., Klee, E. W., Mattson, N., Ross, C. A., Sharif, S. M., Venkatakrishnan, R., Fadlelmola, F. M., & Mainzer, L. S. (2021). Design considerations for workflow management systems use in production genomics research and the clinic. *Scientific reports*, 11(1), [21680]. https://doi.org/10.1038/s41598-021-99288-8

Zhang, X., Naughton, N., Parthasarathy, T., & Gazzola, M. (2021). Friction modulation in limbless, three-dimensional gaits and heterogeneous terrains. *Nature communications*, 12(1), [6076]. https://doi.org/10.1038/s41467-021-26276-x

Lewandowska, A., Soutar, C. P., Greenwood, A. I., Nimerovsky, E., De Lio, A. M., Holler, J. T., Hisao, G. S., Khandelwal, A., Zhang, J., Santamaria, A. M., Schwieters, C. D., Pogorelov, T. V., Burke, M. D., & Rienstra, C. M. (2021). Fungicidal amphotericin B sponges are assemblies of staggered asymmetric homodimers encasing large void volumes. *Nature Structural Biology*, 28(12), 972-981. https://doi.org/10.1038/s41594-021-00685-4

Zhou, J., Zhang, L., Zeng, L., Yu, L., Duan, Y., Shen, S., Hu, J., Zhang, P., Song, W., Ruan, X., Jiang, J., Zhang, Y., Zhou, L., Jia, J., Hang, X., Tian, C., Lin, H., Chen, H. Z., Cronan, J. E., ... Zhang, L. (2021). Helicobacter pylori FabX contains a [4Fe-4S] cluster essential for unsaturated fatty acid synthesis. *Nature communications*, 12(1), [6932]. https://doi.org/10.1038/s41467-021-27148-0

Dariotis, J. K., Sloane, S. M., & Smith, R. L. (2021). "I took it off most of the time 'cause I felt comfortable": unmasking, trusted others, and lessons learned from a coronavirus disease 2019 reinfection: a case report. *Journal of Medical Case Reports*, 15(1), [557]. https://doi.org/10.1186/s13256-021-03033-8

Watzek, J., Hauber, M. E., Jack, K. M., Murrell, J. R., Tecot, S. R., & Brosnan, S. F. (2021). Modelling collective decision-making: Insights into collective anti-predator behaviors from an agent-based approach. *Behavioural Processes*, 193, [104530]. https://doi.org/10.1016/j.beproc.2021.104530

Pandey, N., & Ming, R. (2021). The SAGA of pineapple: genome-wide identification and tissue-specific expression of Spt-Ada-Gcn5-acetyltransferase (SAGA) complex. *Euphytica*, 217(12), [210]. https://doi.org/10.1007/s10681-021-02945-2

Párraga Solórzano, P. K., Shupe, A. C., & Kehl-Fie, T. E. (2021). The sensor histidine kinase ArlS is necessary for staphylococcus aureus to activate ArlR in response to nutrient availability. *Journal of bacteriology*, 203(24), [e00422-21]. https://doi.org/10.1128/JB.00422-21

Ahmed, R., Augustine, R., Valera, E., Ganguli, A., Mesaeli, N., Ahmad, I. S., Bashir, R., & Hasan, A. (2021). Spatial mapping of cancer tissues by OMICS technologies. *Biochimica et Biophysica Acta - Reviews on Cancer*, 188663. https://doi.org/10.1016/j.bbcan.2021.188663

Morzy, D., Joshi, H., Sandler, S. E., Aksimentiev, A., & Keyser, U. F. (2021). Membrane Activity of a DNA-Based Ion Channel Depends on the Stability of Its Double-Stranded Structure. *Nano letters*, 21(22), 9789-9796. https://doi.org/10.1021/acs.nanolett.1c03791

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