

UNIVERSITY OF ROCHESTER DEPARTMENT OF

BIOLOGY

Newsletter 2023

Research Assistant Professor of Biology Floria Mora-Kepfer Uy collects Northern paper wasps (*Polistes fuscatus*), a native wasp species, in Robert H. Treman State Park in Ithaca, NY June 14, 2022. Uy studies *p. fuscatus* that host the parasite *Xenos vesparum* to explore the effects of the parasite on the brain of the social hosts.

University of Rochester photo / J. Adam Fenster



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ARTS & SCIENCES
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Members of Rochester's iGEM team at the 2022 iGEM competition in Paris, France. The team was nominated for best hardware, best composite part, and best measurement awards and won a gold medal, making them the second-most-awarded iGEM team in North America.

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Gifts to the biology department help create academic and research opportunities for students and faculty that will have a profound effect on human health. To make your gift or discuss opportunities to support the department, please contact

Ashley Smith

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A Message from the Chair

Dear friends of the Department of Biology,



Michael Welte

One of the defining features of our department is that research and teaching are deeply intertwined, with each endeavor benefiting from the other. As a result, our undergraduate students often get hands-on experience participating in cutting-edge research. Such

experiences not only reinforce the concepts learned in the classroom, but they also provide a wonderful opportunity to foster a love for biology. In fact, over half of the students majoring in biology perform independent research, rubbing shoulders with graduate students, postdoctoral fellows, and professors and experiencing the thrill of generating new knowledge.

Our department has a long history of this successful integration of research and teaching, and our faculty continually innovate to offer more experiential research experiences. Last fall, we inaugurated a study-abroad program on the Galápagos Islands that provides an opportunity for hands-on field research coupled with formal courses in ecology, evolution, and conservation. This ROC Galápagos program was twice postponed because of the COVID pandemic, but we were finally able to launch it in 2022. This newsletter features a first-hand account of one of the students who participated in this opportunity. Based on its success, this program will become a staple of our offerings for our undergraduates.

Another recent experiential learning opportunity is our two-semester iGEM research course in which students develop innovative biological solutions to real world problems. In 2022, the team from the University of Rochester presented their project at the International Genetically Engineered Machine (iGEM) competition in Paris, France, and won multiple awards. Learn more about this exciting combination of teaching and research later in the newsletter.

Our commitment to excellence in both teaching and research was also recognized by the university with three teaching awards to biology department researchers. Associate Professor Dragony Fu was honored with the Edward Peck Curtis Award for Excellence in Undergraduate Teaching. And biology graduate students Lynn Sidor and Jeremy Summers received the [Edward Peck Curtis Award for Excellence in Teaching by a Graduate Student](#). We are exceedingly proud of these individuals. Research and teaching indeed go hand-in-hand in our department.

Finally, I would like to highlight one more department member who is a prime example of successfully combining the role of teacher and researcher. Professor Al Uy is an internationally recognized scholar who studies the origin and maintenance of biological diversity. He addresses these issues with a remarkably integrative approach that includes molecular/genomic/proteomic techniques as well as traditional field observations of populations in the tropics. Prior to arriving at the University of Rochester in 2020, he had been at the University of Miami, where he held an endowed Chair, the Aresty Chair in Tropical Biology. Professor Uy also is a committed teacher and has an impressive track record in teaching and mentoring. For example, he has organized and led summer research experiences for undergraduates in the Solomon Islands. Professor Uy thus perfectly embodies the synergy between research and teaching which is a hallmark of our department.

As of July 2023, Professor Uy is also the new chair of our Department. I am thrilled that he has taken on this responsibility. Not only does he excel in research and teaching, but he is also very community minded and cares deeply about the success of students and faculty. He is thus well positioned to make our department ever better. Look for more exciting updates on the life of the department in future newsletters.

Michael Welte

New Department Chair

Dear friends of Biology,



AI Uy

despite the lockdown, the entire department was extremely welcoming, allowing for a quick integration to my new community. The pandemic presented unprecedented challenges to our department that necessitated enacting creative ways to continue our research activities while remaining engaged with our students. Now, as we emerge from the restrictions of the pandemic, our department's goal is not to simply return to normal, but to also reimagine and expand on our department's strengths in research, education and community outreach. With these opportunities in mind, and nearly four years after

I am a (relatively) recent arrival to the Department of Biology, having moved from the University of Miami in 2020. My move immediately preceded the start of the global pandemic, which meant limited interactions with colleagues and students. However,

joining the department, I am honored to have been asked to serve as the new chair of Biology.

Biology is one of the largest majors in the college, and so we are central to the success of U of R's mission of "ever better." As Michael detailed above, we are proud of our strength in organically combining research with education, providing our undergraduate students with unique research experiences that will prepare them for diverse careers in science. However, because science has become increasingly interdisciplinary, we are also expanding these successful research and teaching initiatives by strengthening the bridge between the Department of Biology and other programs across the university, including the Goergen Institute for Data Science, Institute of Optics, and various initiatives in the medical campus. In this newsletter, I hope you can get a sense of some of the engaging and integrative programs that we have developed and will continue to expand, embracing the university's strategic plan of "boundless possibility". It is an exciting time to be a biologist.

Cheers,
AI Uy

Faculty Press Releases

Dragony Fu explains the future of mRNA (October 3, 2023)

"If we are currently witnessing mRNA vaccine 1.0 for COVID-19, then 2.0 will address two further categories of disease," says Dragony Fu, an associate professor of biology. "One is pathogens, like SARS, but you can apply this technology to other foreign invaders such as HIV. Already before COVID, companies were in development making mRNA vaccines against HIV. The other category is autoimmune diseases," he says. "That is intriguing because it's verging beyond the very strict definition of a vaccine."

Read more: <https://www.bbc.com/future/article/20211122-could-mrna-make-us-superhuman>

Welte and Kilwein crack the code of nutrient segregation (August 31, 2023)

It is well known in developmental biology that a mother's egg provides abundant nutrients that are essential for an embryo to develop. But does it matter where in the developing embryo the nutrients are stored?

Read more: <https://www.rochester.edu/newscenter/nutrient-segregation-embryo-development-566052/>

Gorbunova and Seluanov explain how longevity gene from naked mole rats extends lifespan of mice (August 23, 2023)

In a groundbreaking endeavor, researchers at the [University of Rochester](https://www.rochester.edu) have successfully transferred a longevity gene from naked mole rats to mice, resulting in improved health and an extension of the mouse's lifespan.

Read more: <https://www.rochester.edu/newscenter/gene-transfer-hmw-ha-naked-mole-rats-extends-mice-lifespan-565032/>

Michael Welte explains the hidden role of lipid droplets in fertility and beyond (June 20, 2023)

Within our cells are structures called lipid droplets that serve as storage units for energy in the form of lipids or fats. Because fat is an important energy source for cells and organisms, scientists had long assumed that lipid droplets had a straightforward role during egg production, as energy providers for the developing embryo.

Read more: <https://www.rochester.edu/newscenter/lipid-droplets-fertility-egg-development-561592/>

Anne S. Meyer to create first ocean-friendly bioplastics (November 16, 2022)

Associate Professor in the Department of Biology Anne S. Meyer is collaborating with Marine Microbiologist Alyson Santoro, Oceanographer Melisa Omand, Ecologist Ryan Freedman, and biodegradable polymers producer [Mango Materials](https://www.mangomaterials.com) to develop a new bioplastic that can decompose in aquatic environments.

Read more: <https://blogs.rochester.edu/thegreendandelion/2022/11/rochester-professor-to-create-first-ocean-friendly-bioplastics/>

Floria Uy shows undergrads what paper wasps can tell us about evolution, aging, and group living (September 23, 2022)

Wasps are social insects that work together to benefit their hive. When a parasitic insect called *Xenos peckii* infects certain species of paper wasps, however, something incredible happens: the parasite manipulates the wasp's brain so the wasp loses its social instincts and abandons its colony. The parasite also manipulates the wasp's genes to increase the wasp's lifespan.

Read more: <https://www.rochester.edu/newscenter/european-northern-paper-wasps-nest-parasites-534182/>

Presgraves and Larracuenta use population genomics to study a selfish 'supergene' that skews genetic inheritance (July 12, 2022)

The human genome is littered with "selfish genetic elements," which do not seem to benefit their hosts, but instead seek only to propagate themselves.

Read more: <https://www.rochester.edu/newscenter/selfish-genetic-element-segregation-distorter-supergene-525992/>

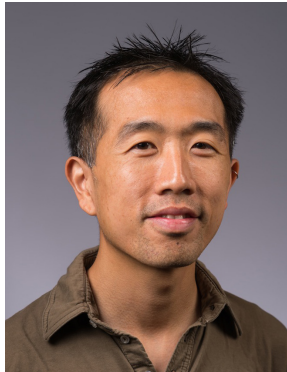
Nancy Chen elected to 2022 American Ornithological Society Council (June 23, 2022)

The Council is the American Ornithological Society's governing body, made up of member volunteers who oversee the Society's strategic direction, policies, budget, and organizational planning. Voting Councilors include four officers (President, President-Elect, Treasurer, and Secretary), twelve Elective Councilors, and three Past Presidents.

AOS members also elected five new Elective Councilors, who will also begin their terms at the close of the Annual Meeting. Nancy Chen was elected to the 2025 class of Elective Councilors to serve three-year terms as Elective Councilors. As part of her role, she is currently leading a small team to develop a sustainable DEI training plan for society leadership.

Read more: <https://americanornithology.org/welcome-to-our-new-members-aos-council-2022/>

Faculty Awards



Dragony Fu awarded the Edward Peck Curtis Award for Excellence in Undergraduate Teaching

This award recognizes a record of distinguished undergraduate teaching, typically developed over at least eight years. Recipients also have demonstrated readiness to help less experienced faculty colleagues or teaching assistants master their craft.

Winners of the Edward Peck Curtis Award for Excellence in Undergraduate Teaching are honored with a citation at commencement, and also receive a monetary award.



Do you have fond memories of a University of Rochester professor?

Help support our faculty: endowed professorships help to attract and retain faculty of the exceptional talent. They are also visible honors recognized across the University and by other top institutions. An endowed professorship can link your—or your loved one's—name to academic excellence and innovation.

Graduate Student & Postdoc News

Shailee Shah awarded an NSF Postdoctoral Fellowship

Shailee Shah (Chen Lab) was awarded an [NSF Postdoctoral Fellowship](#) for 2023. This fellowship supports postdoctoral fellows in selected areas of the life sciences who focus on broadening participation of underrepresented groups in biology; studying the rules governing interactions between genomes, environments and phenotypes; or studying plant genomes.

Shailee was also a finalist for the [Life Sciences Research Fellowship](#).

Read more: <https://new.nsf.gov/funding/opportunities/postdoctoral-research-fellowships-biology-prfb>

Maria Castano won the best graduate student poster prize at GLAM (Great Lakes Annual Meeting) EvoGen at Cornell (August 2023)

Maria Castano received an international fellowship from the American Association of University Women (June 2022)

Maria Castano received an international fellowship that supported more than half of her stipend for the academic year. The program provides support for women pursuing full-time graduate or postdoctoral study in the United States to women who are not U.S. citizens or permanent residents, and who intend to return to their home country to pursue a professional career. She also obtained two research grants in March & April of 2023 from the Animal Behavior Society and the American Museum of Natural History to support her fieldwork.

Faye Romero awarded an NSF Graduate Research Fellowship

The [National Science Foundation \(NSF\) Graduate Research Fellowship Program](#) (GRFP) supports outstanding students who are pursuing research-based master's and doctoral degrees

at accredited US institutions. The federally sponsored program provides up to three years of graduate study support for US students who demonstrate outstanding scholarly promise and leadership potential. Students apply for the fellowship either the year before entering graduate school or during the first or second year of their graduate degree programs.

Read more: <https://www.nsfgrfp.org/>

Faye Romero featured by Science Corps as part of Filipinas in STEM series (June 13, 2023)

Faye Romero is a Filipino-American evolutionary biologist. She grew up in Sugar Land, Texas and earned her bachelor's degree in molecular biology at UC Berkeley, where she used museum specimens to determine how hummingbirds have responded to human-induced environmental change. Currently, she's pursuing a PhD in Ecology and Evolutionary Biology at the University of Rochester, New York in Dr. Nancy Chen's lab, where she is using genetics and computational biology to better understand the decline of endangered species, like the Florida Scrub-Jay. She plans to use her role as a scientist and communicator to increase the representation of Filipinos, Filipino-Americans, and other historically marginalized groups in evolutionary biology.

Read more: <https://science-corps.org/filipinas-in-stem-series-launch/>

Department of Biology members win awards at Genetics Day 2023 (May 11, 2023)

One of the most popular activities during Genetics Day is the poster session. Postdocs, graduate students, and undergraduates are invited to enter their poster, and each is evaluated by a panel of judges. This year, judges gave out six poster prizes, four in the grad student category, one in the postdoc category, and one in the undergraduate category.

Read more: https://www.sas.rochester.edu/bio/news-events/2023_05_11_simone.html

Jeremy Summers awarded Edward Peck Curtis Award for graduate student teaching (April 14, 2023)

Graduate student, Jeremy Summers, has been awarded a 2023 Edward Peck Curtis Award for graduate student teaching, given to a small number of full-time graduate students who have a role in undergraduate education. Recipients have assisted in undergraduate instruction, and have had significant face-to-face interactions with undergraduates in the classroom or laboratory. [Meet the recipients.](#)

Read more: https://www.sas.rochester.edu/bio/news-events/2023_04_14_summers_teaching.html

PhD student Maria Castaño analyzes tanager bird feathers to explore how species evolve over time (November 17, 2022)

Maria Castaño, a third-year PhD student at the [University of Rochester](#) in the lab of [Al Uy](#), a professor of [biology](#), studies populations of birds to understand the processes that lead to the creation of new species.

Read more: <https://www.rochester.edu/newscenter/birds-of-a-feather-flock-together-541722/>

Lynn Sidor honored with Edward Peck Curtis Award (April 19, 2022)

Eleven University students have been selected as recipients of the [Edward Peck Curtis Award for Excellence in Teaching by a Graduate Student](#). This award was established by former life trustee Edward Peck Curtis in 1984 and

recognizes graduate students who excel in advancing the teaching mission of the University by providing highly skilled and innovative instruction to Rochester's undergraduates. This year's recipients are Shoeib Ahmed Chowdhury (mechanical engineering), Zach Barber (philosophy), Michael Chavrimootoo (computer science), Dillion Dzikowicz (nursing), Andrew Hahn (electrical engineering), Marianne Kupin-Lisbin (history), Ying Lin (brain and cognitive sciences), Kevin Ling (biomedical engineering), Derek Myler (music theory), Lynn Sidor (biology), and Neal Shah (neuroscience).

Read more: https://www.sas.rochester.edu/bio/news-events/2022_04_19_lynnsidor.html

Lynn Sidor awarded the DoD NDSEG fellowship (April 5, 2022)

Graduate student Lynn Sidor has been awarded a fellowship from the National Defense Science and Engineering Graduate Fellowship Program.

Read more: https://www.sas.rochester.edu/bio/news-events/2022_04_05_lynnsidor.html

Maria Castano wins the Best Poster award for the Natural Sciences at ASE Graduate Research Symposium (March 25, 2022)

Congratulations to Maria Castano (Uy Lab) for winning the "Best Poster" award for Natural Sciences at the [AS&E Graduate Research Symposium](#). There were over 50 students presenting their incredible research across disciplines and the judges had a tough time deciding who to give the \$300 prizes to.

Read more: https://www.sas.rochester.edu/bio/news-events/2022_03_24_castano_poster.html

Consider a Gift that Keeps on Giving—Support Graduate Education

Are you more interested in our PhD program? Create or contribute to a **graduate scholarship**. Competitive graduate fellowships and stipends help us to attract the most qualified students.

Check out some of the [existing Graduate Fellowships and Awards](#): sas.rochester.edu/bio/graduate/fellowships.html

Spotlight on New Staff

The Department of Biology has welcomed several new administrative staff to our team! Each of them has contributed quickly and in countless ways and we take a moment here to highlight them.



Marlie Augustin
Data Entry Clerk, Started
November 2023

I was born and raised in Brooklyn, New York in a family of Haitian immigrants and later moved to Rochester for college. I identify as non-binary and

prefer they/them pronouns. After graduating from the University of Rochester with a degree in computer science, I chose to stay as I find this city lovely and peaceful. Outside of work, I'm a big music fan and love to attend concerts and build up my album collection. I'm a sibling to two brothers and the proud parent of a sweet but sassy pit bull named Cody. I recently joined the biology department this November and am excited to get to know and connect with everyone!



Rebecca Gourdain
Stockroom Clerk, Started
December 2022



Elizabeth Phelps
Stockroom Clerk, Started
November 2022

Caroline Fratianni



UPBM Program Manager,
Started July 2023

I was born and raised in the Rochester area but moved to Albany, NY after graduating from college. I lived in the Capital Region for over 25 years, and moved back to Rochester 2 years ago to

be closer to my parents as well as my brother and sister and their families. My husband and I will be married for 30 years this October, and we have 2 amazing sons. Daniel is 25 and after graduating from college, got his real estate license and currently works for a property management company in the city of Rochester. Simon, who is on the spectrum, is 21 and just completed his education in June at Monroe 2 — Orleans BOCES. In my spare time I love to read, write, take horseback riding lessons with Simon, watch Daniel play competitive baseball in an adult league, and enjoy the outdoors with my family and my dog. I am so happy to be working in the Department of Biology's UPBM office. I have met such wonderful people who have all made me feel very welcome — thank you so much and I look forward to having all of the Biol class names and numbers memorized!



Erin VanDeMar,
Senior Accountant, Started
May 2022

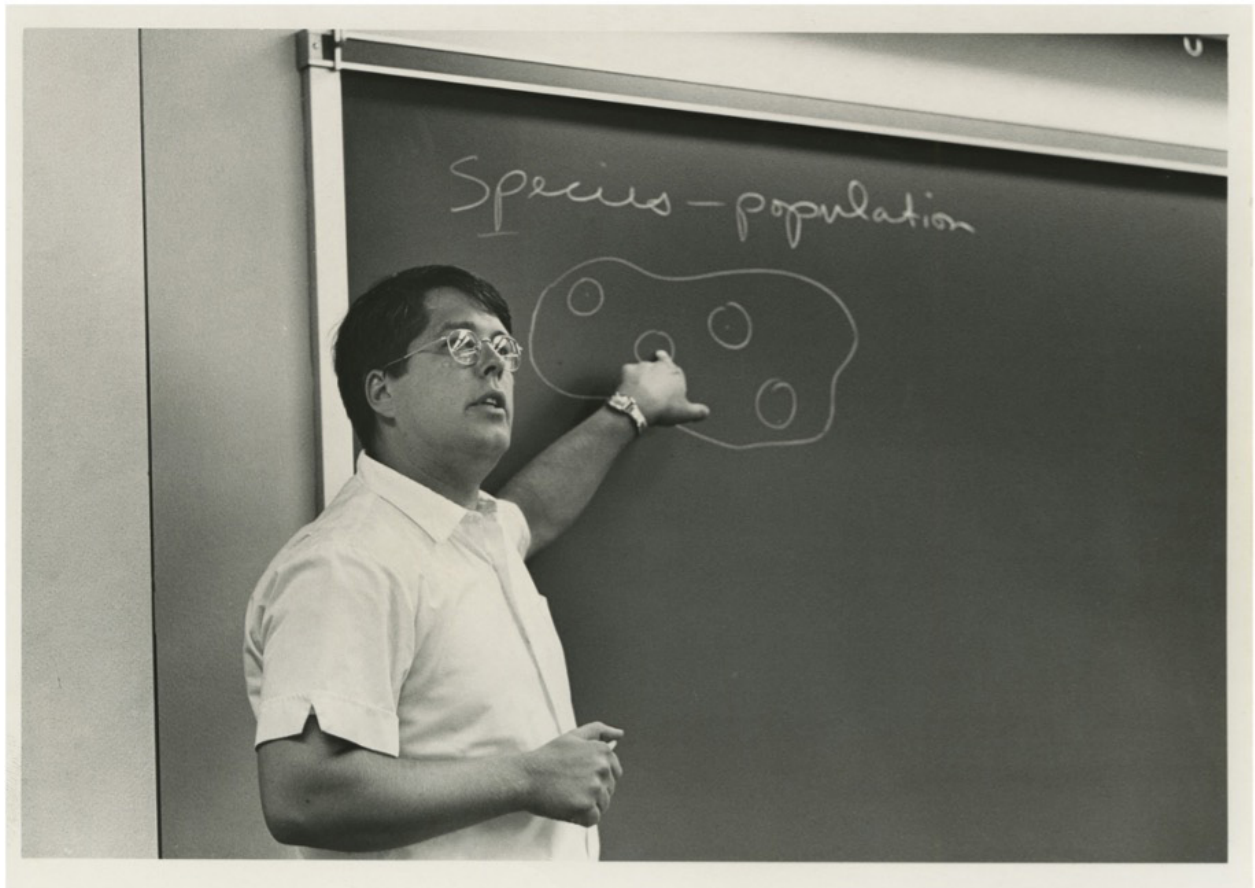
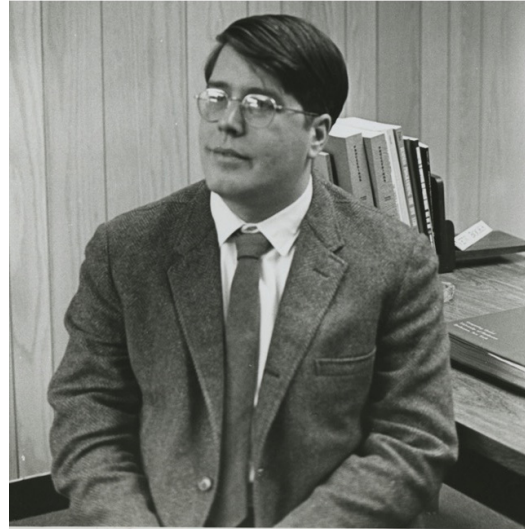
I was born and raised in Buffalo, NY and moved to the Rochester area 22 years ago. I am married and have a 21-year-old daughter and 12-year-old son. I started at

the University as the Senior Accountant in biology in May of 2022. Everyone in the Department has been so welcoming and kind. I truly enjoy the people and the culture of our department.

Prior to working at the university, I worked in for-profit accounting, so taking this job was a big change for me. In my free time, I enjoy reading and spending time with my friends and family. I am a lifelong fan of the Buffalo Bills and this year I even got season tickets! I look forward to continuing my work with all the great staff, faculty and students in biology.

Remembering Dr. Conrad Istock

Conrad Istock, a member of the Department of Biology from 1965 to 1985, died peacefully on March 8, 2023 in Ithaca. After getting his PhD at the University of Michigan and doing a one-year stint as a faculty member at the University of Illinois, Conrad moved to Rochester. While here, his research focused primarily on life history variation and evolution, combining field, laboratory, and theoretical approaches to the subject. His favorite organism was the pitcher plant mosquito (*Wyeomyia smithii*), which he studied in Kennedy Bog in Mendon Ponds Park. In 1985, Conrad moved to the University of Arizona as head of their Department of Ecology & Evolutionary Biology. After retiring from Arizona, Conrad and his wife Nancy moved back to upstate New York, settling down in Ithaca. During his time at Rochester, Conrad was the most sociable of the EEB faculty members and was a perennial favorite among the EEB grad students, post-docs, and undergrads. Those who knew him have nothing but fond memories of Conrad.



Alumni News

Jenna Lentini and Ethan Walker win 2023 JBC Herbert Tabor Early Career Investigator Awards (March 2, 2023)

Former graduate students Jenna Lentini and Ethan Walker have been given the [2023 JBC Herbert Tabor Early Career Investigator Awards](https://www.sas.rochester.edu/bio/news-events/2023_03_02_lentini_walker.html). Named for the late editor-in-chief of the JBC, these awards recognize early-career scientists for their standout first-author papers published in the past year. Winners will be giving oral presentations at this year's annual ASBMB meeting, Discover BMB 2023, in Seattle from March 25 to 28, 2023.

Read more: https://www.sas.rochester.edu/bio/news-events/2023_03_02_lentini_walker.html

<https://www.asbmb.org/asbmb-today/people/031523/a-family-history-of-alzheimer-s-sparks-interest-in>

<https://www.asbmb.org/asbmb-today/people/030723/puzzling-out-science>

Dr. Glenn Stambo

Dr. Glenn Stambo (1986) is happy to share that he has been an interventional radiologist for 25 years and was inducted into the Fellowship of the Society of Interventional Radiology (FSIR) on March 22, 2022, and was inducted in Boston at the annual meeting in June of 2022. This is a very prestigious award particularly for private practice physicians involved in interventional radiology and Glenn feels very fortunate to have received this honor.

Cara Brand and Adam Johnson welcome a new F1 (June 16, 2022)

Adam Johnson (Lambert Lab) and Cara Brand (Presgraves lab) announced that they made their very own F1. In 2021, they welcomed Leo Brand Johnson to the world. He's currently a very busy and curious toddler that keeps Cara and Adam on their toes. Perhaps one day Leo may be a Rochester biology student just like they were. Cara and Adam send everyone their best wishes!



Biology iGEM Team Created New Tools to Reduce Waste in the Maple Syrup Industry

By Lindsey Valich and Anne S. Meyer



Members of Rochester's iGEM team at the 2022 iGEM competition in Paris, France. The team was nominated for best hardware, best composite part, and best measurement awards and won a gold medal, making them the second-most-awarded iGEM team in North America.

In New York state, nearly 1 million gallons of maple syrup are produced every year, but one gallon of syrup is wasted for every 20 gallons produced, resulting in wasted energy, food, and resources, plus lost profits for sugar-makers.

To address these problems, the Department of Biology's team of 12 University of Rochester undergraduate students developed methods to detect and repurpose defective sap and syrup. Called "Team Saptasense" with the motto "saving syrup," the students created new tools, including several novel biosensors and a glucometer, to help reduce waste in the maple syrup industry. "Our team was inspired to find solutions to local problems," says Carly Blair '23, a molecular genetics major and member of the iGEM team. "New York State is the second largest maple producer in the United States, behind Vermont, so developing solutions to help maple sugar-makers seemed like a natural choice for our project."

The team entered their research in the 2022 International Genetically Engineered Machine (iGEM) competition, where it was nominated for best hardware, best composite part, and best measurement awards and won a gold medal, making the team the second-most-awarded iGEM team in North America. The team competed against 356 other teams from six continents.

The buddy syrup problem

Maple syrup is produced by extracting sap from maple trees in specific weather conditions and boiling it down to a sticky and sweet syrup. But it takes an incredibly large amount of sap to produce syrup: approximately 40 gallons of sap yield only one gallon of syrup.

As temperatures start to rise in the spring, maple trees begin to bud. The result is sap that has higher amounts of certain small molecules. If this "buddy sap" is boiled down to make syrup, the small molecules are more concentrated and the syrup has an unpleasant, cabbage-like flavor, rendering the syrup unsaleable. Unfortunately, maple syrup producers do not have a way to detect buddy sap until they have already used copious resources to process the sap into syrup.

"Currently the only thing producers can do to try to avoid producing buddy syrup is to pull their tree taps early, which can result in missed profits and is difficult for sugar-makers who tend large forests that are spread out across several climate regions," Anne Meyer says.



The team tested their Saptameter prototype with maple sugar makers at Whispering Brook Farms in Gainesville, New York. (University of Rochester photo / Rochester iGEM team)

(University of Rochester photo / Rochester iGEM team)

The ropy syrup problem

A second area the team addressed was the problem of “ropy” syrup. Normal syrup is viscous and forms droplets when it is pulled. When bacteria contaminate the syrup, however, the syrup can instead have a stringy, ropy texture. Ropy syrup is inedible and must be discarded.

Team Saptasense developed a new way for sugar-makers to convert their once-useless ropy syrup into a valuable product. Ropy syrup has its distinct stringy texture because the contaminating bacteria have converted the sucrose in the syrup into polysaccharides called dextrans. The team members demonstrated that dextrans can be purified from ropy syrup. They developed a new method to then turn the purified dextran into a robust, water-absorbent hydrogel that farmers can use to germinate seeds, while conserving water. Dextrans are also widely used in the medical field to treat hemorrhages and burns and aid in drug delivery and radiological imaging.



The team developed the Saptameter, a cost-effective, hand-held biosensor that can detect invert sugar levels in maple syrup. It includes a printed circuit board modified to detect different molecules in syrup. (University of Rochester photo / Rochester iGEM team)

The invert sugar-level problem

Finally, while the iGEM team members were talking to sugar-makers about their project, they learned about another concern in the maple sugar industry. Many sugar-makers turn their sap and maple sugar into products such as maple candies and creams. Making these products requires precise measurements of the concentrations of glucose and fructose, collectively known as

invert sugars. Because invert sugar levels affect the texture and flavor of maple products, sugar-makers need an accurate way to measure the concentration of invert sugars.

Sugar-makers typically measure invert sugar levels using commercial glucometers, which are designed to measure glucose levels in human blood that are much lower than the glucose levels in maple syrup. As a result, sugar-makers need to dilute their syrup to read it in the glucometer. Diluting maple syrup is a challenge because syrup is thick and sticky, making it difficult to accurately measure its volume.

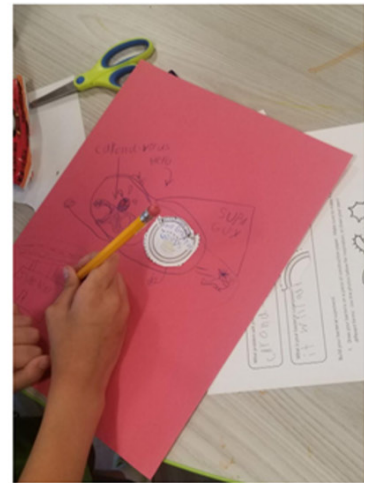
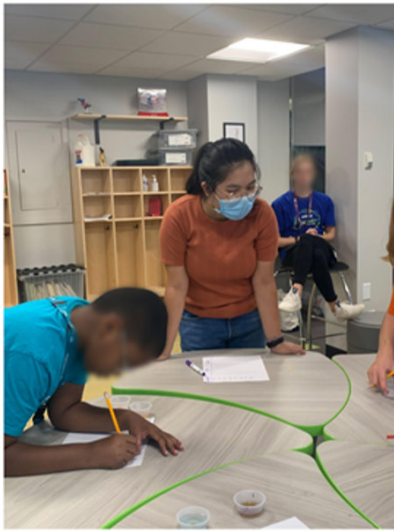
To help sugar-makers measure the levels of invert sugar in their syrup, Team Saptasense developed a new glucometer that they call the Saptameter, which has an increased detection range to measure invert sugar levels in undiluted maple syrup.

“This new piece of hardware will remove the tricky dilution step for sugar-makers, so they can make maple sugars and candies with the right texture and flavor every time, reducing food waste in the maple syrup industry,” Meyer says.

Community outreach

Outside the lab, Team Saptasense educated the community about synthetic biology through partnerships with local and national organizations including Rochester Museum and Science Center, Westside Farmers Market, Tutors For Change, and the Highlands at Pittsford. In addition to designing engaging activities and experiments for K-12 students across the country, the team collaborated with other iGEM teams to author a children’s book about biology. The team also spearheaded inclusivity initiatives to promote disability justice in STEM, including a series of informative webinars and an accessibility self-evaluation form for professors at the University of Rochester.

“There are opportunities to further refine the research and development of the biosensors and functionality of the Saptameter in order to make the final product more accessible for sugar-makers,” Blair says. “Additionally, research into optimal storage conditions and shelf life of the biosensor strips would be necessary before the product could hit the market. We hope future groups will be inspired to build upon our research and conduct other research projects that aid the maple industry.”



Saptasense members teach students at the Rochester Museum and Science Center about various synthetic biology topics. (University of Rochester photo/ Rochester iGEM team)

Interested in directly affecting the experience of our undergrads?

- Help move the **lab experience** to the next level by providing resources to support people and state-of-the-art equipment and facilities.
- Contribute funds to enhance the **innovative workshop program** that enables peer-to-peer learning and one-to-one interactions for students, teaching assistants, and professors—even in large lecture classes.
- Help to fund the department's **community outreach program** (sas.rochester.edu/bio/about/outreach.html) or **essential instrumentation** that makes computational biology and bioinformatics possible and keeps Rochester competitive.

Of Finches and Frigatebirds: Studying Abroad in the Galápagos Islands

By Joseph Krell, Class of 2024



In August of 2022, I traveled to Quito, Ecuador and began my semester abroad. A participant of the NSF-funded International Research Experience for Students (IRES) program, the inaugural trip out of the University of Rochester allowed me to spend two months in the Galápagos Islands. I cannot describe the experience of first walking on a beach crowded with sea lions and marine iguanas, and I could go on for pages about my enjoyment and frustration when differentiating between beak shapes of Darwin's finches. Regardless of my own adoration for the islands, the program was an extraordinary opportunity for me and 10



others to study the principles of evolution and ecology in a place famed for its many endemic species. There is appreciation for this branch of biology that escapes the classroom, and significant opportunity in the union of classroom and outdoor learning. These islands represent both inspiration and destruction of the natural world, humans having devastated parts of the islands through urbanization and introduced species. NSF funding permitted a field survey of invasive, *Ophiocordyceps*-infected “zombie” wasps on the islands, program director Dr. Floria Uy leading the group in collecting data that we analyzed during the following semester. The project served as a valuable introduction to field work, with the imprint of humans on the islands unfortunately being inescapable. One cannot reasonably study evolutionary biology without first having an appreciation for the beauty of nature, and I believe that making conservation a priority in my life is a responsibility as a student of biology. The program was exceptional, and — in a time when studying the natural world often feels grim — inspiring.



Unexpected, Unprecedented, and Unstoppable: The Story of UR Biology Spring 2022

By Emery Longan

Edited by Brenna Rybak



Team captain Emery “Speedy Corgi” kicks the ball down the third base line.

The Kickball League of Rochester has played host to adult kickball fun in the Rochester area since 2007. For the uninitiated, kickball is a sport much like baseball, and it makes for a roaring good time when played with friends and colleagues after a long day of experiments. In 2018, the biology department at the University of Rochester began their foray into this athletic endeavor and ever since, has fielded a team in the summer. Coming off of three consecutive seasons with losing records, the Spring 2022 UR Biology kickball team sought redemption, but more importantly the team sought to have a whole lot of fun! This is the story of the 2022 season: Week one saw the return of many of the most seasoned kickball veterans the biology department has ever seen. After a stellar defensive season, Hayley “MVP” Wnuk reprised her role as second basewoman. Following a strong summer in 2021, Roger “Mr. Push-ups” White took to the mound and Omid “No Shoes” Ziabari ran out to catch pop-flys in the outfield. UR Biology also added a few free agents to their roster that had been scouted and recruited in the previous year. Brian “The Best” Hopkins took over at first base, Joseph “Soccer Ball” Irvin took his place at shortstop, Alexandra “Alex the Great” Strohm came in as a utility player, and Cailin “Chaos” Leo took to left field.

After a rough first inning which saw the opposing team scoring 6 runs, UR Biology bounced back with a few quick runs in the first inning. The rest of the game UR Biology held steadfast on the

defensive side and our score slowly crept up on the offensive side. Of note, Justin “Spider Monkey” Fay made two pivotal catches in the outfield and Emery “Speedy Corgi” Longan made three outs with throws from third base to first base on ground balls. Brian “The Best” Hopkins not only caught all of these throw-outs but also caught many tricky pop-flys. It was truly a team effort on defense. In the bottom of the sixth UR Biology took the lead with some great kicking from Lynn “Blondie” Sidor and others. In the top of the seventh, UR Biology held strong on defense and won the game 8-6. This was the first ever time in recorded UR Biology kickball history the team won the season opener. Due to his strong kicking and reliable play at first base, the team broke it down with a chant of “1,2,3, BRIAN!”.

Week two saw many other firsts for UR Biology. Namely, we scored 20 runs and we actually mercy-ruled our opponent! In kickball, if a team leads by over ten runs after five innings, the game is over! In actuality, the score was 20-3 after three innings, and the other team forfeited. The game could have been said to have been a flawless performance except team captain Emery “Speedy Corgi” Longan struck out with the bases loaded in the third. However, in an unprecedented string of success, UR Biology moved to 2-0 and claimed our first ever win streak in the long and storied history of UR Biology grad students playing kickball. Despite his absence the team still commended the previous week’s MVP with a chant of “1,2,3, BRIAN!!!”.

In week three, UR Biology set out to set three all-time records for kickball: 1) Most amount of fun had in a single week, 2) Most wins ever in a



Omid “No Shoes” Ziabari (pictured with shoes) rounding third after a booming kick.



Eric "The Purple Blur" Cefaloni kicking the ball to the moon!

season, and 3) Longest win streak ever. After quickly rounding all four bases, team captain Emery "Speedy Corgi" Longan brought the score to 1-0. After a few innings UR Biology had managed to score some more runs including a two-run home run from Justin "Spider Monkey" Fay. On the defensive end, Hayley "MVP" Wnuk, Eric "The Purple Blur" Cefaloni, and "Mr. Birds" Mike made awesome catches that held the opposing team to 5 runs after 7 innings. As a piece of context, earlier in the game UR Biology challenged a call. "Speedy Corgi" lost this challenge, which was a footrace, leading everyone to question his nickname. After seven innings the score was 5-5 and the teams were faced with a fateful choice. Accept the score and leave with a tie or do one more challenge for all the marbles. This time the challenge was a relay footrace. One woman and one man from each team was selected. For UR Biology, these champions were "MVP" Wnuk and "Speedy Corgi". Wnuk started the race strong and was able to give "Speedy Corgi" a full step advantage over his adversary. With a legion of biologists cheering him on, "Speedy Corgi" was able to redeem himself and crossed the finish line first. In an unprecedented start to a kickball season, UR Biology moved to an UNDEFEATED 3-0. In keeping with superstition at this point, the team broke it down with a chant of "1,2,3, BRIAN!!!".

In the fourth week UR Biology came up against the pink team. Despite strong kicking in the first inning from the adversary, UR Biology held strong on the defensive end, only giving up one run. The rest of the game saw extremely consistent offense and (mostly) smart baserunning from the whole team. Lauren "Texas" Gregory made an excellent account of herself at the plate, and Pakinee "Sake Sorceress" Phromsiri showed a lot of heart and effort, scoring several times diving (or maybe falling?) into home plate for her team.

On the defensive end, Roger "Mr. Push-ups" White made the most outs and directed traffic from the pitcher's mound. A few solid line drives were also caught by "Speedy Corgi" Longan at third base. Ram "The Rebel" Gona also made some nice kicks and defensive efforts. "Texas" Gregory was quoted as saying "This here defense is strong enough to tip a cow", which was both complimentary and confusing. The defensive highlight of the day was undoubtedly performed by Marcus "Four-eyed Phenom" Kilwein. At shortstop, and facing the sun, a ball was kicked into the air and approached Marcus as the sun came out from behind a cloud. However, our four-eyed phenom had a secret weapon, transition lenses! He made the catch and said, "The sun came out, but I was fine!" After 7 innings, UR Biology handily defeated the pink team and, because she was so darn cute the whole time, UR Biology chanted the name of their beloved dog mascot that week: "1,2,3, MADDIE!!".



The terrifying perspective faced by the opposition with ace "Mr. Push-ups" about to roll the ball and defensive superstar second basewoman Hayley "MVP" Wnuk awaiting the kick.

In the fifth week UR Biology came up against the stripe pink team. This team was an all-women team that really had some skill! On the offensive side, UR Biology was only able to manage a single run the whole game when "Speedy Corgi" was kicked in by "Sake Sorceress" in the first inning. Other than that, UR Biology had excellent kicking, but the stripe pink team made even better throws and catches for the whole duration. One highlight of the game came when "Mr. Push-ups" was forced into a bocci challenge due to a dispute over a call at first base. "Mr. Push-ups" put a little too much muscle behind his throw and we lost the challenge. The final score was 11-1 and UR Biology moved to 4-1. Despite this minor setback, the team chalked the loss up to our chant for Maddie in the previous week. Returning to form, "1,2,3, BRIAN" was audible throughout the whole park.

In the sixth week UR biology had our closest game yet! However, it did not start off that way. The opposition quickly jumped out to a 6-1 lead, but we mounted a serious comeback and won 15-12. In a true team effort including exceptional running on the basepaths from Cecile “Crash” Courret. “No Shoes” Ziabari also had a crucial home run, and “Four-eyed Phenom” went 3/3 with all of his hits coming in clutch! Joseph “Soccer Ball” Irvin ended the game with a nice double play and UR Biology moved to 5-1! This game was proof that this team possessed the heart of a champion. After so many losing seasons, UR biology was enjoying so much success! Exemplifying the spirit of UR Biology grad students, Lauren “Texas” Gregory was quoted as saying, “We here are grad students fellers. We eat failure for breakfast and always eventually calf rope success and carry it out of the rodeo.” Stunned into confused silence by this deep insight, the team barely mustered their ceremonial chant of “1,2,3 Brain!!!” to cap off the week.

In week seven, UR Biology was able to add another win to their record moving to 6-1. Some highlights included Lynn “Blondie” Sidor going 3/3 and scoring 3 runs. Additionally, team captain “Speedy Corgi” Longan took a comical spill when running from first to second and got covered in dirt. Brian “The Best” Hopkins also made an amazing catch at first base. Madison “The Magician” Williams also turned a crucial double play. “Alex the Great” Strohm also made excellent efforts on the basepaths, and “Sake Sorceress” Phromsiri also made a great account of herself at the plate.

In week eight UR Biology came up against the team that was, on paper, the best team in the league. The opposition was 7-0 with a massive +58 score differential. Unphased, UR Biology came to bat first with “Speedy Corgi” and “Mr. Push-ups” scoring two quick runs in the first thanks to a nice kick by Cheyenne “Wildcat” Thomas. However, the opposition replied with a massive onslaught of offense. Despite their skills, this opponent’s sportsmanship was lacking. An opposing player slid into second basewoman “MVP” Wnuk and many of the opposing players chose to argue with the umpire over a few calls! “Wildcat” Thomas led some spirited, (though



**UR Biology Kickball Spring 2022.
6-2 record.**

tasteful) trash talk in the outfield to retaliate to this behavior. Marcus “Four-eyed Phenom” Kilwein really got the UR Biology team chanting and cheering loudly when he refused to kick seven pitches in a row because they were bad or too bouncy. The disdain for these pitches could be felt in the air and seen behind Kilwein’s transition lenses. As the game progressed, UR Biology noticed something about the other team: Their captain was yelling at his players over and over... but they were having tremendous success. “MVP” Wnuk was quoted as saying to team captain Longan, “Maybe if you yelled at us more, we would be better.” Emery “Speedy Corgi” replied wholesomely, “Fun and friends is what matters”. Thus, despite being mercy-ruled in short order, UR Biology unanimously agreed that the real winners were the team that had the most fun, which was surely us. In fact, the team agreed to have an intra-team game following the main game which saw some great kicks from “No Shoes” Ziabari and “The Purple Blur” Cefaloni. Some players even tried their hands at pitching, including “Blondie” Sidor and “MVP” Wnuk.

Overall, at the conclusion of the spring season. UR Biology finished with a 6-2 record. This incredible season saw UR Biology accomplish many firsts including going on a win streak, and having a season with more than two wins! Everyone who participated contributed in a meaningful way to at least one of those wins. The collaborative instincts of UR Biologists seemingly cannot be turned off!

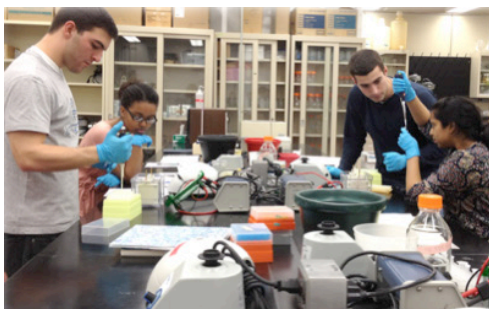
Hopefully, the rich tradition of kickball among biologists at the University of Rochester will prove successful for many more seasons to come.

The RollerBladingGirls Club: A Community-Engagement Paradigm (March 29, 2023)

An aspiration within our Community Engagement Committee is for our undergraduates, those who experience training and opportunities in engagement while at the University of Rochester, to continue these activities throughout their lives. This is the story of one student whose post-graduate activities model our aspiration.

Read more: <https://www.sas.rochester.edu/bio/news-events/outreach/2023-03-29-rollerbladinggirls-club.html>





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