

# Biology AT IOWA

## 2023 NEWSLETTER

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# IOWA

Department of Biology

### *Dear Alumni and Friends,*

Greetings from the Department of Biology! In this newsletter, you will see highlights about our undergraduate programs, undergraduate student successes and research experiences, graduate student and faculty accomplishments, and updates on alumni. As I started as the Chair of the department in July 2023, I want to take this opportunity to talk about my vision for the department.

Biology's mission is to provide broad and rigorous training in biological sciences to our undergraduate and graduate students, and to lead cutting-edge biological research. To support this mission, two of our departmental goals are to modify our undergraduate curriculum to improve student success and expand our iBio Graduate Program. We are also expanding our faculty. Currently, we are actively recruiting for two tenure-track assistant professors in the areas of cell biology and neurobiology, and anticipate additional hires across the scope of biology in the coming years. This growth is critical to maintain the breadth of biological research and education in the department. We are also working to invigorate our external seminar series, which brings in world-renowned scholars to talk about their research. This seminar series is a key component of the department, fostering new collaborations and research directions and providing important networking and education to our graduate trainees.

Thus, it is an exciting time in the Department of Biology! I look forward to sharing our successes in these and other areas in the coming years.

*Tina Tootle, Ph.D.*

Professor and Chair, Department of Biology



**Tina Tootle**



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## Welcome Tootle Lab!

**Lab Members Pictured Above:** (L to R) Asha Alla, Ashley Goll, Danielle Talbot, Ellie Nacino, Hunter Brown, Israel Wipf, Jie Li, Kaden Bex, Michelle Giedt, Samuel Mellentine, Sofia Gomez

The Tootle Lab uses fruit fly oogenesis or egg development to study how aspirin works at the cellular level. Aspirin inhibits the production of lipid signals called prostaglandins. Prostaglandin signaling controls pain/inflammation, mediates heart health and disease, plays critical roles in fertility and development, and promotes cancer development and progression. While it is understood how prostaglandins are made and signal and what their physiological outcomes are, it remains unclear how prostaglandin production is regulated and what the cellular targets are that mediate the outcomes of prostaglandin signaling. One key target of prostaglandin signaling is actin. Actin forms the cytoskeleton, mediating cell shape changes and cell migration. Actin also localizes to and functions in the nucleus.

Using the model of *Drosophila* oogenesis, the lab found prostaglandins are critical regulators of the actin cytoskeleton, mediating both collective cell migration and developmental events necessary for producing a high-quality egg. The lab discovered prostaglandins also regulate nuclear actin to control nucleolar activities. Finally, the Tootle Lab recently found that lipid droplets, which accumulate during oogenesis, act as a source of substrate for prostaglandin production necessary for driving actin remodeling. As prostaglandins, actin, and lipid droplets, and the processes they regulate, are highly conserved, the Tootle Lab's studies using the simple fruit fly shed light on their roles in development, fertility, wound healing, and cancer.

## Funding Highlights

**Lori Adams**, Associate Professor of Instruction in Biology and Director of the Iowa Sciences Academy; along with Vincent Rodgers, Department of Physics and Astronomy; and Saba Ali, College of Education: \$495,000 for a five-year subaward from Iowa State University for "Iowa-Illinois-Nebraska LSAMP IINSPIRE: A STEM Partnership for Innovation in Research and Education," part of an award through the National Science Foundation.

Dr. Adams was also named a Co-Investigator on three awards from the National Institutes of Health (NIH). She is part of a team of investigators in the Institute for Clinical and Translational Science (ICTS) at the University of Iowa, headed by Patricia Winokur, Department of Internal Medicine; and Marlan Hansen, Department of Otolaryngology. The team received a seven-year, \$28 million Clinical and Translational Science Award (CTSA) focused on extending the reach and benefit of clinical and translational research into communities across Iowa by fostering multidisciplinary collaboration across the university and the state. In addition, Dr. Adams is on an award for five years in the amount of \$3,774,000 for the CTSA K12 Program at the University of Iowa directed by Polly Ferguson and Alexander Bassuk, both in the Stead Family Department of Pediatrics. Dr. Adams is also on the "Beginning and Early Stage Translational (BEST) Researchers" award for \$540,000 over five years under Principal Investigator Donna Santillan, Department of Obstetrics and Gynecology.

**The Roy J. Carver Center for Genomics (CCG):** \$355,779 from the Roy J. Carver Charitable Trust for the "Acquisition of Instrumentation for Studies of Biological Resilience" to purchase equipment for functional and comparative genomics research.

**Liping Liu**, Postdoctoral Research Scholar (Malkova Lab): \$61,800 from the UI Environmental Health Sciences Research Center for her one-year pilot grant entitled, "Investigation of the impact of pesticide exposure on genomic integrity."

**Ana Llopart**, Associate Professor of Biology, received a P3 (Public-Private-Partnership) Post-Tenure Faculty Support Program award in the amount of \$29,950 from the UI Office of the Executive Vice President and Provost. This award supports faculty excellence and retention efforts by providing select mid-career tenured associate professors with tailored career development support to propel them toward promotion to full professor.

**Chun-Fang Wu**, Professor of Biology and Co-Investigator, along with collaborator Toshihiro Kitamoto, Department of Anesthesia: \$101,090 over three years from the National Institutes of Health for their grant entitled, "Roles of hemocytes and bioactive lipids in the modulation of neuronal excitability and seizure behavior in *Drosophila* voltage-gated sodium channel mutants."

**Anna Malkova**, Professor of Biology: \$2,204,350 over five years from the National Institutes of Health for the renewal of her grant entitled, "Double strand break repair maelstrom: causes, mechanisms and genome destabilizing consequences."

**Bryan Phillips** and **Jan Fassler**, both Professors of Biology: \$775,000 for three years from the National Science Foundation for their grant entitled, "Animal Disaggregases and Amyloid Contributions to Early Development."

The following faculty in Biology received a one-time "Investment in Strategic Priorities" individual award up to \$5,000 in May 2023 to help bring research/scholarly projects to closure. The funding was provided through the UI Office of the Executive Vice President and Provost.

**Michael Dailey, Amr El Zawily, Albert Erives, Jan Fassler, Bin He, John Manak, Chris Stipp, and Chun-Fang Wu.**

\*Covers internal and external sources of funds from February 2022 through December 2023 with a Department of Biology faculty or staff member as the Principal Investigator or Co-Investigator.

## CLAS GRANT SUPPORT OFFICE

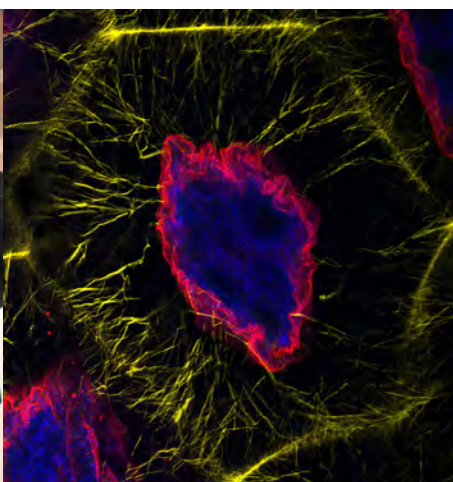
The Grant Support Office (GSO) is the primary point of contact and partner for College of Liberal Arts and Sciences (CLAS) researchers pursuing externally funded awards. The GSO's professional staff are dedicated to excellent customer service and furthering the research success and visibility of CLAS. The team covers a full range of support from seeking funding opportunities to managing complex funding portfolios. The team includes two main areas of expertise: pre-award support and post-award support. **Molly Buhrow** (Pre-Award) and **Isabelle Hardy** (Post-Award) are the primary grant support contacts in the Department of Biology. Molly and Isabelle joined CLAS GSO as Research Support Managers in January 2019 and December 2022, respectively. Molly was appointed an Associate Director in March 2023.



**Molly Buhrow**



**Isabelle Hardy**







## Biology Core Facilities Updates

### CARVER CENTER FOR GENOMICS (CCG)

Written by **Christine Kondratick**, CCG Manager



**Christine Kondratick**

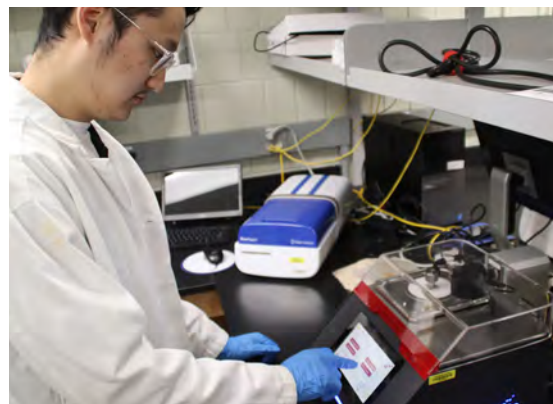
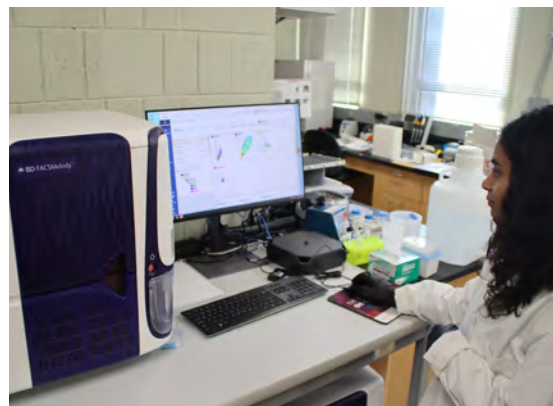
This past year the Roy J. Carver Charitable Trust supported the Department of Biology's research programs with a grant for new equipment to be added to the Roy J. Carver Center for Genomics (CCG). The funding was used to acquire two new pieces of equipment, the BD FACSMelody™ Cell Sorter and Diagenode Bioruptor® Pico II sonicator, thereby expanding the center's capabilities in molecular and cellular analyses addressing the biological resilience of organisms.

The Bioruptor® Pico II sonicator is an essential tool in gene expression studies and is used for sonicating multiple samples at the same time. The device is used to shear chromatin, DNA, and RNA prior to further analysis by next-generation sequencing (NGS). This machine complements current instruments in the CCG, including the Agilent BioAnalyzer 2100 and the Illumina iSeq 100 machine used for NGS applications. In addition to gene expression studies, the Bioruptor® can be utilized to extract proteins from cells and tissues as well as separating cells from tissue prior to cell sorting. This aspect of the machine allows for the development of comprehensive research experiments that involve both genomics and protein expression.

The BD FACSMelody™ is a fluorescence-activated cell sorting (FACS) instrument that allows researchers to sort individual cells based on different fluorescent cell markers. These cell markers can be cell size, DNA content, and specific gene or protein expression profiles. The sorted cells can be used for further genomic analyses, protein expression monitoring, or microscopic imaging.

In addition to new equipment, the CCG has recruited Dr. Christine Kondratick as the new director of the facility. Dr. Kondratick comes to the department with over 20 years of research experience ranging from cellular and molecular biology to protein biochemistry. She was previously a research scientist in the Department of Biochemistry and Molecular Biology doing research on DNA repair mechanisms. Over the past year, Dr. Kondratick has assisted in training students to use the CCG equipment, implemented a CCG newsletter, promoted the CCG at university-wide research fairs, contributed to grant submissions, and launched a research applications seminar series.

For more information about the CCG and available equipment, visit [biology.uiowa.edu/ccg](http://biology.uiowa.edu/ccg)



# CARVER CENTER FOR IMAGING (CCI)

Written by **Michael Dailey**, Associate Professor of Biology; Director, Carver Center for Imaging

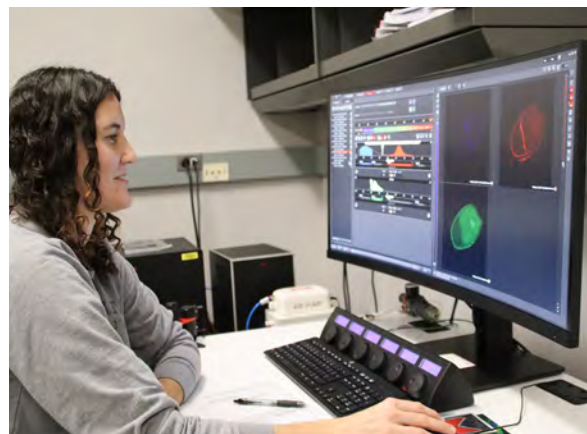


**Michael Dailey**

The Roy J. Carver Center for Imaging (CCI), located in the basement of Biology Building East, plays a crucial role in advancing the research and teaching missions of the Department of Biology through its state-of-the-art light microscopy and imaging resources. Originating in the mid-1990s with a generous gift from the Roy J. Carver Charitable Trust, the CCI started with the acquisition of widefield fluorescence light microscopes. Over the years, strategic investments from National Institutes of Health grants and institutional funds have continuously enhanced the CCI's capabilities in response to evolving imaging technologies.



Presently, the CCI houses three advanced imaging systems, including an upright Leica SP5 confocal/multiphoton microscope and an inverted Leica SP8 confocal system. A recent addition, made possible by resources from the College of Liberal Arts and Sciences (CLAS), is the Leica STELLARIS 8 confocal microscope, which was installed during the summer of 2023. This cutting-edge system is equipped with specialized detectors and a pulsed white light laser, providing the system with excitation over a wider spectrum from the UV (405 nm) to infrared (790 nm). In combination with lifetime-based analysis of fluorescent signals (TauSense), the pulsed laser technology provides new capabilities for separating overlapping fluorescent signals or detecting changes in physiological states of live cells. Furthermore, the integrated hardware and deconvolution software (Lightening) pushes the resolution to an impressive 120 nm. Thus, the addition of the STELLARIS 8 system significantly broadens the scope of confocal applications, providing cutting-edge capabilities that enable use of a wider range of fluorescent probes at very high spatial resolution and under different physiological states.



In addition to supporting faculty research programs, the CCI provides invaluable opportunities for training graduate students and affording collection of critical data for their thesis work within the department. The CCI has trained students from many Biology faculty laboratories including those of Professors Dailey, Eberl, He, Manak, Phillips, Smolikove, Summers, and Tootle. Moreover, undergraduate students enrolled in upper-level laboratory courses (such as the Cell Biology Lab and Neurobiology Lab) are gaining hands-on experience with state-of-the-art biological imaging under the expert guidance of faculty members.

For more information about the CCI and available equipment, visit [biology.uiowa.edu/ci](http://biology.uiowa.edu/ci)

**BIOLOGY ITS** is at your service for your computer and technology needs. Biology faculty, staff, and graduate students in the Biology Building and Biology Building East can get computer support and answers to their questions from the Biology ITS staff. IT services include individual computer support, printer setup and troubleshooting, classroom technology support, and ordering of computers and other related technology. The College of Liberal Arts and Sciences has two full-time IT support consultants assigned to support the Department of Biology. Erik Billeci has been with the University of Iowa since 2019. He came to the Department of Biology in July 2020. We welcomed Jordan Shebek to the Department of Biology in February 2023.

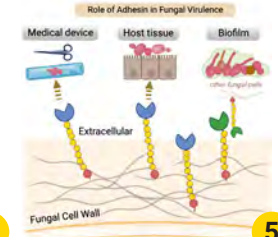
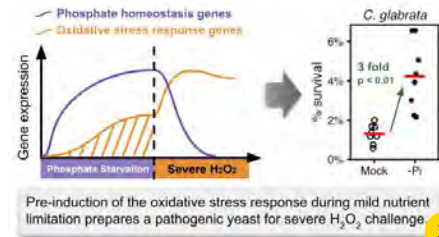


**Erik Billeci**



**Jordan Shebek**





Department of Biology faculty, staff, and students had over 30 papers published in 2023. Featured below are selected publications in 2023 with current or recent graduate students and postdoctoral research scholars in the department as first author or co-first author.

**1. Michelle Giedt (Tootle Lab, Assistant Research Scientist, former Postdoctoral Research Scholar)**

**Giedt, Michelle**, et al. Adipose triglyceride lipase promotes prostaglandin-dependent actin remodeling by regulating substrate release from lipid droplets. *Development*. 2023 October 15, Volume 150 (Issue 20).

**2. Rosemary Lee (Malkova Lab, Ph.D. in Integrated Biology, 2023)**

**Lee, Rosemary**, et al. Identification of the nuclear localization signal in the *Saccharomyces cerevisiae* Pif1 DNA helicase. *PLOS Genetics*. 2023 July 24, Volume 19 (Issue 7).

**3. Jinye Liang (He Lab, Integrated Biology Ph.D. student)**

**Liang, Jinye**, et al. Divergence of TORC1-mediated stress response leads to novel acquired stress resistance in a pathogenic yeast. *PLOS Pathogens*. 2023 October 23, Volume 19 (Issue 10).

**4. Krishna Nukala (Manak Lab, Ph.D. in Integrated Biology, 2022)**

**Nukala, Krishna**, et al. Downregulation of oxidative stress-mediated glial innate immune response suppresses seizures in a fly epilepsy model. *Cell Reports*. 2023 January 31, Volume 42 (Issue 1).

**5. Lindsey Snyder (He Lab, Genetics Ph.D. student)**

Smoak, Rachel, **Snyder, Lindsey**, et al. Parallel expansion and divergence of an adhesin family in pathogenic yeasts. *Genetics*. 2023 April, Volume 223 (Issue 4).

**6. David Steffen (Weiner Lab, Ph.D. in Integrated Biology, 2022)**

**Steffen, David**, et al. A Unique Role for Protocadherin  $\gamma$ C3 in Promoting Dendrite Arborization through an Axin1-Dependent Mechanism. *The Journal of Neuroscience*. 2023 February 8, Volume 43 (Issue 6).

**7. Danielle Talbot (Tootle Lab, Cell and Developmental Biology Ph.D. student)**

**Talbot, Danielle**, Vormezele, Bailey, et al. Prostaglandins limit nuclear actin to control nucleolar function during oogenesis. *Frontiers in Cell and Developmental Biology*. 2023 February 17, Volume 11.

**8. Emma Thornburg-Suresh (Summers Lab, Neuroscience Ph.D. student)**

**Thornburg-Suresh, Emma**, et al. The Stathmin-2 membrane-targeting domain is required for axon protection and regulated degradation by DLK signaling. *Journal of Biological Chemistry*. 2023 July, Volume 299 (Issue 7).

**9, 10. Kelley Withers (Cheng Lab, Integrated Biology Ph.D. student)**

**Withers, Kelley**, et al. A Ceratopteris EXCESS MICROSPOROCTES1 suppresses reproductive transition in the fern vegetative leaves. *Plant Science*. 2023 October, Volume 335.

**Withers, Kelley**, et al. Auxin Involvement in Ceratopteris Gametophyte Meristem Regeneration. *International Journal of Molecular Sciences*. 2023 October 31, Volume 24 (Issue 21).

## KEY GENES DRIVING CLEFT LIP AND PALATE IDENTIFIED BY UI BIOLOGY RESEARCHERS

In a new study led by the **Manak Lab** in the Department of Biology, the research team identified three genes that when deleted cause cleft lip and/or palate, a facial deformation that occurs in about 1 in every 1,600 babies born in the United States, according to the U.S. Centers for Disease Control and Prevention.

The research team discovered the genes by a high-resolution search through the genomes of over 1,000 patients with cleft lip and/or palate, a repository resulting from a long-term involvement by Dr. Jeff Murray, professor in the Stead Family Department of Pediatrics, and colleagues in studying cleft lip and/or palate disorder worldwide.



**John Manak**

Cleft lip and/or palate are birth defects that occur when a baby's facial structures associated with the mouth do not develop normally during pregnancy. Children with a cleft lip and/or palate often have problems with feeding and speaking clearly and are more prone to ear infections and other debilitating conditions.

The causes of orofacial clefts among most infants are unknown but are thought to arise from changes in genes and perhaps outside factors.

"We've found, and validated in experiments with vertebrates, three genes (*COBLL1*, *RIC1*, and *ARHGEF38*) that are directly associated with this disorder," says **John Manak**, Professor of Biology and the study's corresponding author. "It's going to take a long time before we can do anything about it in humans, but now we've added several key genes driving the disorder. Eventually, if you know the genetics behind cleft lip and palate, and the step-by-step process of how you build a face, then you might figure out how to intervene to prevent the defect."

The researchers analyzed DNA from patients with clefting in the United States and the Philippines. With DNA from those patients, Dr. Manak utilized a technique known as comparative genomic hybridization to look for deleted portions of the DNA in the patient pool with the disorder compared with a control group that did not have clefting. From there, he searched to find deleted genes that were so rare in the clefting group that less than 1% of the 1,102 patients surveyed had them. "I wanted to identify those incredibly rare mutations that are driving this disorder, because mutations that do bad things are reduced in frequency in the population. This was a novel strategy in the copy number variation field, which usually looks for more common deletions or duplications that contribute less significantly to a disease process," says Dr. Manak, who is also affiliated with the Stead Family Department of Pediatrics and the Interdisciplinary Graduate Program in Genetics at the University of Iowa.

Dr. Manak is also excited because the genes likely play a significant role in facial development in general. "There are multiple pathways and genes and interactions between many different cell types, so we need to identify all these components in order to understand how a face gets put together," says Dr. Manak.

The study's first author, **Lisa Lansdon**, who received her Ph.D. in Genetics from the University of Iowa in 2018 and was mentored by Dr. Manak, says the research was the primary focus of her thesis. She also oversaw a group of undergraduate students who assisted with the analysis. Dr. Lansdon is currently a Clinical Assistant Professor at the University of Missouri-Kansas City School of Medicine.

The study, "Genome-wide analysis of copy-number variation in humans with cleft lip and/or cleft palate identifies *COBLL1*, *RIC1*, and *ARHGEF38* as clefting genes," was published on January 5, 2023, in *The American Journal of Human Genetics*.

Source: *Iowa Now* (January 10, 2023). Written by: Richard C. Lewis, Senior Writer/Editor, UI Office of Strategic Communication.

**THE DEVELOPMENTAL STUDIES HYBRIDOMA BANK (DSHB)**, a national resource by the National Institutes of Health (NIH) and housed in the Department of Biology, has been actively distributing hybridomas and monoclonal antibodies (mAbs) to companies and research institutions worldwide since 1986. The DSHB Collection is rapidly expanding to over 5000 monoclonal antibodies. **Douglas Houston**, Professor of Biology, has been the director of the DSHB since 2021.

### Website Revamp & Beta Testing

In addition to revamping their website ([dshb.biology.uiowa.edu](https://dshb.biology.uiowa.edu)), including the launch of a new logo (see below), the DSHB is embarking on an exciting collaboration with CiteAb, a company that powers a specialized search engine for researchers and offers data-syncing services for reagent suppliers. The DSHB is beta testing a widget that will collect citation data including validation, appropriate applications, and article figures and images for each of the DSHB's antibodies.

### Deposits

The DSHB made several fabulous new antibodies available for purchase in October 2023, including anti-PSMA muJ591. Cited in over 3,500 studies since 1998, this high-affinity antibody is the gold standard against prostate-specific membrane antigens in prostate cancer research and therapeutics.

The DSHB is also preparing to release the first 10 antibodies from their forthcoming collection of 300+ mAbs from the National Institutes of Health's Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative – Cell Census Network (BICCN). The BICCN project plans to identify and catalog all neural cell types by visualizing cellular interactions in three-dimensional preparations using cell type-specific monoclonal antibodies in duplex staining.

### Conference Sponsorships & Support

The DSHB participated in the Trainee Professional Development Award Program at the Society for Neuroscience's (SfN's) Annual Meeting held in Washington, D.C., November 11-15, 2023. The DSHB sponsored three attendees – one undergraduate and two graduate students.

In partnership with YcharOS, an open science company with the mission of characterizing commercially available reagent antibodies for every human protein, the DSHB sponsored a mini symposium at the ASCB/EMBO Cell Bio 2023 meeting held in Boston, December 2-6, 2023. Dr. Houston joined YcharOS representatives to discuss the emergent issue of antibody validation – how to ensure the quality and reliability of reagents amidst the current antibody “gold rush” boom. The DSHB is also collaborating directly with YcharOS to characterize 10+ of their antibodies in the coming months.

### New Staff

New staff at the DSHB includes **Gemma Kerr**, Business & Marketing Manager; and **Karen Thompson**, a part-time Assistant Research Scientist.



## DSHB STANDS READY TO FIGHT THE NEXT PANDEMIC

Monoclonal antibodies are used in the diagnosis and treatment of many diseases, including some types of cancer, inflammatory and autoimmune disorders, osteoporosis, and migraines. With its vast library of monoclonal antibodies against known and unknown disease-related molecules, the DSHB can serve as a vital resource for researchers trying to find ways to study these unique disease processes when new outbreaks arise.

We know there will be other COVID-like events in the future, but we don't know what will be needed to stop them. What the DSHB team is certain of, however, is that its bank of nuanced biological information holds thousands of answers to questions yet to be asked.



Scan the QR code to the left (or visit the link below) to learn more about the DSHB and its resources in an article featured in the *Iowa Magazine* on 05-26-2023 by Jennifer New entitled, “Iowa Antibody Bank Stands Ready to Fight the Next Pandemic.”

<https://magazine.foriowa.org/story.php?ed=true&storyid=2331>

Photos by John Emigh.







## Faculty and Staff Updates

### NEW FACULTY AND STAFF

**Kaylyn Connolly:** Neuroscience and Biology Undergraduate Academic Advisor

**Brandon Waltz:** Lecturer for Diversity of Form and Function course

**Jeannette Welder:** Lecturer, Greenhouse Manager

#### Faculty and Staff Pictured Above:

(L to R) Kaylyn Connolly, Brandon Waltz, Jeannette Welder, Andrew Forbes, Bryan Phillips, Sarit Smolikove

### FACULTY PROMOTIONS

**Andrew Forbes, Bryan Phillips, and Sarit Smolikove** were promoted to full professors effective July 1, 2023.

Dr. Forbes joined the Department of Biology in 2010. He is known for his extensive research on the ecology and evolution of parasitic wasps. Parasitic wasps form a diverse group of insects that wield significant ecological influence, often by regulating the populations of other species within ecosystems. Dr. Forbes' work has been featured in the *New York Times*, *The Atlantic*, and *Smithsonian Magazine*, and on NPR's *Weekend Edition*.

Complementing his research pursuits, Dr. Forbes is recognized for his teaching and mentoring activities. His teaching roles in the department include Entomology Lab and Ecology. He has mentored 15 graduate students and more than 50 undergraduate students and runs a Research Experiences for Undergraduates (REU) program that brings ten students from across the U.S. to campus each summer. He currently serves as the Program Director of the Environmental Sciences Program and the Faculty Chair of the curriculum committee for the University of Iowa's General Education program.

Dr. Phillips joined the Department of Biology in 2009. His research focuses on mechanisms by which cell fate is determined. Specifically, his lab investigates novel beta-catenin regulatory mechanisms in *C. elegans* asymmetric cell divisions and the contributions of animal disaggregases and amyloids to early animal development. Since 2011, his lab has been continuously funded by external granting agencies such as the American Cancer Society, March of Dimes, Carver Charitable Trust, National Science Foundation, and the National Institutes of Health. Dr. Phillips has graduated 6 Ph.D. students from his lab and provided research opportunities for 15 undergraduates.

At the professional level, Dr. Phillips is currently serving as associate editor of the *Proceedings of the Royal Society B:*

*Biological Sciences* and has participated on grant panels for the National Science Foundation. Dr. Phillips is very involved in departmental governance and has served as the Director of Graduate Studies for the Integrated Biology Graduate Program in the Department of Biology since 2019. He also chaired the Cell Biology faculty search committee in 2022. Dr. Phillips has been an active member of the Genetics Ph.D. Program and was appointed Associate Director of the program in 2023. He also gives generously of his time to the College of Liberal Arts and Sciences and is currently serving terms as an elected member of the Graduate Educational Policy Committee.

Dr. Smolikove joined the department in 2009. Her lab studies the molecular processes that control meiosis, a key process in genetics that ensures genetic diversity in sexually reproducing organisms. Errors in this process in humans can result in extra or missing chromosomes in egg or sperm cells, which leads to birth defects such as Down syndrome. Using the small worm *C. elegans*, she has identified key steps in how chromosomes are paired up during meiosis, an essential first step before their distribution into the egg or sperm. Also, she has uncovered new mechanisms for how the chromosomal DNA is cut and then repaired to control the pairing and subsequent distribution of the chromosomes, a counterintuitive process that is not well understood. Dr. Smolikove has also developed and shared a number of novel genetic tools to study DNA damage in worms. Her lab has been continuously funded by external granting agencies since 2011 by the National Science Foundation and the National Institutes of Health. In the department, Professor Smolikove is a dedicated mentor and teacher. She has mentored 9 graduate students and over 35 undergraduate students. She teaches two courses on Genetics and previously served as the chair of the Graduate Recruiting and Admissions Committee (GRAC).

## Faculty and Staff Highlights

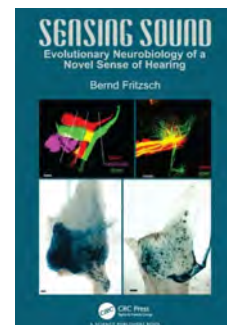
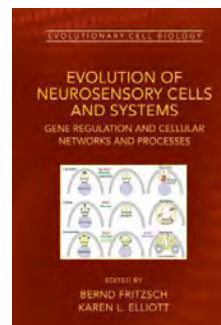
**Lori Adams**, Associate Professor of Instruction and Director of the Iowa Sciences Academy, organized a Science Educator Regional Professional Learning Workshop entitled, "How does heat stress impact health," for area K-12 science teachers on September 25, 2023. **Bryan Phillips**, Professor of Biology, **Ryan Pellow**, Integrated Biology Ph.D. student, and **Laura Dean**, a Postdoctoral Research Fellow in the Department of Occupational and Environmental Health, also gave presentations during the workshop. The workshop was offered as part of a \$500,000 Interdisciplinary Scholars award received in 2022 from the UI Office of the Vice President for Research to begin work on a new project at the intersection of climate, the environment, and health. Dr. Adams, along with Biology professors **Josep Comeron** and **Anna Malkova**, and researchers from the College of Public Health and the Carver College of Medicine, are members of the team.

Dr. Adams also gave a presentation entitled, "Virtual Summer Experience for Early Research (VSEER) Program: A Pandemic Collaboration to Broaden Participation," at the National Conference on Undergraduate Research (NCUR) held in Eau Claire, Wisconsin, on April 13-15, 2023. In addition, Dr. Adams, a National Research Mentoring Network master facilitator, co-facilitated a Summer 2023 Research Mentor Training seminar series for graduate students and post-doctoral fellows that was sponsored by the Institute for Clinical and Translational Science (ICTS) in partnership with the Iowa Mentoring Academy.

**Daniel Eberl**, Professor of Biology, with the backing of a Professional Development Award, conducted research on mosquito hearing in Professor Azusa Kamikouchi's lab at Nagoya University, Japan, from September 2022 through June 2023 in the pursuit of advancing knowledge and fostering international collaboration. In addition to learning how to culture and care for mosquitoes, he helped the lab establish mosquito transgenic techniques. Dr. Eberl employed laser vibrometry to precisely measure movements of the antenna, which serves as the auditory organ in both mosquitoes and flies. He introduced electrophysiological analysis to the host lab and developed acquisition and analysis scripts to understand auditory responses in relation to antennal movements. Collaborating with the mosquito team in Nagoya, he investigated the regulation of auditory sensitivity by efferent neuron signals from the brain. Recognition and support from the Nagoya University International Principal Investigator Invitation Program, a Japan Society for the Promotion of Science fellowship, and a Nagoya University Neuroscience Institute fellowship enabled Dr. Eberl to extend his development award to two semesters.

During Dr. Eberl's time in Japan, he presented at the Symposium for Sensory and Circadian Biology hosted by the National Health Research Institutes held in Taipei, Taiwan, on March 9-10, 2023. In addition, Dr. Eberl and **Mei-ling Joiner**, Assistant Research Scientist (Eberl/Kay Labs), presented at the 18th International Meeting of Invertebrate Sound and Vibration held in Lincoln, United Kingdom, July 23-26, 2023. Both conference presentations by Dr. Eberl were on the topic of the neurotransmitter effects on mosquito hearing. Dr. Joiner's presentation described her work on the fluorescent potassium sensor GINKO2 developed in collaboration with Drs. Eberl and **Alan Kay**, Professor of Biology.

**Bernd Fritzs**, Professor Emeritus, is the author of the book, *Sensing Sound: Evolutionary Neurobiology of a Novel Sense of Hearing*, published in December 2023. The loss of hearing with age is expected to reach 2.6 billion people by 2050. As such, the book explains and reviews hearing loss at the molecular level to the behavioral level and provides suggestions to manage the loss. Drs. Fritzs and **Karen Thompson (Elliott) (Biology PhD, 2013)**, Assistant Research Scientist, are editors of the book, *Evolution of Neurosensory Cells and Systems: Gene Regulation and Cellular Networks and Processes*, which gives an overview of the primary sensory maps of vertebrates, characterized by continuous and discrete properties. The book also provides a short overview for all eight sensory senses and presents through evolution and gene regulatory networks the molecular cues needed for sensory processing. The book was published in 2022.



**Andrew Forbes**, Professor of Biology, completed his second year co-chairing the Faculty Learning Community (FLC), “Assessing Assessment for Equity and Student Motivation,” through the UI Center for Teaching. This FLC explores strategies for ensuring equity in assessment and helping students move away from grade-centered motivations. The committee wrote new guidelines for grading in the College of Liberal Arts and Sciences (CLAS), which led to changes to student grading practices in CLAS, including offering faculty more freedom to explore equitable assessment and the move away from norm-based grading. An FLC is a group of faculty members, including instructional staff, who convene to explore a specific pedagogical topic.

**Michelle Giedt**, Assistant Research Scientist (Tootle Lab), received the 2023 Award for Superior Achievement in Postdoctoral Research given to a Department of Anatomy and Cell Biology postdoctoral fellow in recognition of outstanding research achievement in the past year. Dr. Giedt also presented at the Gordon Research Conference on Molecular and Cellular Biology of Lipids held in Waterville Valley, New Hampshire, on July 23-28, 2023. The title of her talk was, “Prostaglandins and lipid droplet-associated proteins work together and separately to promote actin remodeling during *Drosophila* Oogenesis.” Dr. Giedt also was a recipient of an Image of Distinction award in the 2022 Nikon Small World Photomicrography Competition.

**Anna Malkova**, the Roy J. Carver Professor of Biology, was elected as a Fellow to the American Academy of Microbiology, the honorific leadership group within the American Society for Microbiology (ASM). The Academy recognizes excellence, originality, service, and leadership in the microbial sciences. Dr. Malkova was one of 65 new fellows elected to the Class of 2023.

**Maurine Neiman**, Professor of Biology, co-hosted a *Proceedings of the Royal Society B: Biological Sciences* Cassyni Research Seminar on July 18, 2023, on the topic, “The power of peer networking for improving STEM faculty job applications: a successful pilot programme.” Dr. Neiman was also a featured speaker for a Community Call on August 25, 2022, hosted by ASAPbio, entitled: “Promoting equity in visibility, curation and evaluation of preprints.”

**Sarit Smolikove**, Professor of Biology, was selected as the recipient of the 2023 Honors Mentoring Award from the University of Iowa Honors Program. This award acknowledges the central and critical role that mentors perform in guiding Honors Program students. Whether the mentoring is through an honors thesis or other project, in coursework, or in career and professional development, our students benefit from mentors’ time and commitment. Because of that commitment, the Honors Program bestows special recognition each year on an individual mentor. The award nominations come from honors students who have worked with these outstanding mentors.

Dr. Smolikove earned her bachelor’s, master’s, and doctoral degrees from Tel-Aviv University followed by post-doctoral training at Harvard Medical School in Boston, Massachusetts. Dr. Smolikove teaches in the field of Genetics. Her research focuses on the mechanisms of repair of DNA damage in the germline, which ensure that chromosomes are transmitted to the embryo without any mutations and structural defects. For her studies, she is using the model system *Caenorhabditis elegans*.

**Christopher Stipp**, Associate Professor of Biology, gave a talk on “Cytoskeletal signaling proteins in acquired resistance to BRAF-targeted therapy in melanoma” in March 2023 at the University of California, Irvine, in the Department of Developmental and Cell Biology. Members of the Stipp Lab, including Dr. Stipp, **Eric Anderson** (Integrated Biology Ph.D. student), and Sarina Murray, presented posters at The 20th International Congress of The Society for Melanoma Research held on November 6-9, 2023, in Philadelphia, PA.

**Tina Tootle**, Professor and Chair in the Department of Biology, received the 2022 Faculty Service Award given annually to acknowledge a faculty member who has made a significant and sustained contribution to the College of Medicine in the area of service.

**Atsushi Ueda** (Wu Lab), received a promotion to Associate Research Scientist in November 2023.



**THE DEPARTMENT OF BIOLOGY RECEIVED A CAREER IMPACT AWARD** in the category of Highly Engaged Academic Department from the UI Pomerantz Career Center. The Career Center selected top employers, academic departments, programs, and other campus partners to be recognized at the inaugural Career Impact Awards ceremony held on May 2, 2023, at the Levitt Center for UI Advancement. Recipients of the Highly Engaged Academic Department Award have a higher percentage of engaged students who are making appointments with career coaches, attending career fairs and employer networking events, and are using Handshake to seek jobs and internships at a higher rate when compared to students in most other academic disciplines. Additionally, recognized departments routinely collaborate with Pomerantz Career Center team members to embed career development in their units and courses.

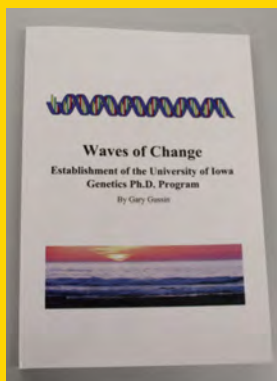


## GENETICS GRADUATE PROGRAM CHANGES LEADERSHIP

Transitioning from his role as Director of the Interdisciplinary Graduate Program in Genetics, a position he held since January 2009, **Daniel Eberl**, Professor of Biology, recognized the need for new leadership to further enhance the program. Because of the demands of the position, he advocated to Graduate Dean Amanda Thein to establish a Director and an Associate Director. Professor Lori Wallrath of the Department of Biochemistry and Molecular Biology has been appointed as Director, while our own Professor **Bryan Phillips** will serve as the Associate Director. Dr. Eberl will continue in his role as the Principal Investigator (PI) of the long-standing National Institutes of Health (NIH) T32 Training Grant in Genetics. During his almost 15 years in this position, Dr. Eberl oversaw the training of over 90 PhD students in the program. Through his leadership, the program significantly reduced the average

completion time of students in the program. Recognized with the 2012 Diversity Catalyst Award for his efforts in recruiting and training diverse students, he forged partnerships with primarily undergraduate universities with underrepresented student cohorts. To enhance student training and success, Dr. Eberl collaborated with other T32 programs on campus in developing a graduate science communication course and implemented various initiatives for career development. Dr. Eberl's commitment to mentorship was evident through faculty mentor training and workshops with the Iowa Mentoring Academy. As the training grant PI, he secured over \$3.8M in NIH T32 funding over 15 years, increasing the funded training slots from six to seven in the current grant. Dr. Eberl looks forward to engaging more deeply in his research, training students, and teaching.

## BOOK AVAILABLE ON THE HISTORY OF THE GENETICS GRADUATE PROGRAM



**Gary Gussin**, Professor Emeritus, published a book entitled, *Waves of Change: Establishment of the University of Iowa Genetics Ph.D. Program*. Dr. Gussin was instrumental in the establishment of the Interdisciplinary Graduate Program in Genetics during the 1960s and was elected as the first Chairperson of the program in 1975. The book recounts the early years of the program and the successes, struggles, and contributions by the many faculty and administrators that helped develop the program. The book was published in 2021 and is on file in the University of Iowa Library Special Collections and Archives. Copies can be obtained in exchange for a donation to the Genetics Program.

Individuals interested in purchasing a copy can contact Rob DuBay ([robert-dubay@uiowa.edu](mailto:robert-dubay@uiowa.edu)) in the Genetics Program Office.



## YEARS OF SERVICE

### 5 Years

**Bin He** – Assistant Professor

**Christine Kondratick\*** – Carver Center for Genomics (CCG)  
Manager

### 10 Years

**Anna Malkova** – Roy J. Carver Professor

**Karen Thompson** (DSHB) – Assistant Research Scientist

### 15 Years

**John Manak** – Professor

**Olga Miakotina** – Instructional Services Specialist

**Maurine Neiman** – Professor

### 20 Years

**Paul Clark** (Fly Kitchen) – Research Assistant

**Catherine Kane** (Green Lab) – Research Associate

**Rebecca Kick\*** – Department Administrator

**John Logsdon** – Associate Professor

**Christopher Stipp** – Associate Professor

### 25 Years

**Daniel Eberl** – Professor

### 35 Years

**Bruce Ritchie** – Facility Coordinator

\*Years of service includes number of years an individual has been employed at the University of Iowa, not only the time spent in the Department of Biology.

## Retirement



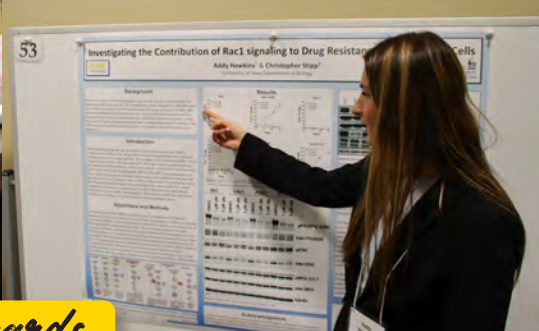
Written by **Erin Irish**, Associate Professor of Biology

**RAY TALLENT** has been in various positions since joining the Department of Biology in 2001, including serving as an Assistant in Instruction and an assistant in the Greenhouse. Early in his career, Ray worked with Professor Diane Horton on bryophyte curation for the Herbarium and Professor Jeffry Schabillion on invasive species control at Woods Preserve. He helped with labs in a number of courses over the years. His favorite teaching assistant assignment was in the lab section of Dr. Schabillion's course, Plant Diversity and Evolution, utilizing fossil and extant plant materials.

In October 2023, Ray retired as the Greenhouse Manager, a job he took over from Ken Snyder in 2014. Ray maintained a wonderful and diverse collection of plants used in research and teaching. Visitors were always encouraged and school groups, in particular, were made welcome through the generous time Ray spent showing students the many different kinds of plants and the adaptations that allow them to thrive in different environments. The favorite environment, for many visitors, was the conservatory room with a fern-laden wet wall, goldfish pond, and a park bench for reading or simply immersing oneself in greenery. His hospitality encouraged the enjoyment of this hidden gem on campus.

As a caretaker of research species, Ray was always ready to facilitate experiments and keep good growing conditions. A memorable example was a polar vortex, when a glazing panel had come loose in a research bay and discovered late at night. Ray was there to move all the plants to a warm bay and then patch the open panel. Not a single leaf was lost! The Greenhouse was not a one-person operation, and it was much enhanced by the efforts of several very skilled assistants who helped Ray throughout the years including former students Andrew Hirst, Majd Moubarak, among others; numerous talented volunteers; and lab coordinators Stephanie Haase and Erin Edgar.

In addition to his care of the Greenhouse, Ray taught two non-majors courses – Introduction to Botany and Plants and Human Affairs. Both courses were extremely popular, enjoying full enrollment and most positive teaching evaluations. Ray combined his extensive knowledge of plant diversity with a deep appreciation of the natural world. His contributions to the teaching mission of the Department of Biology and the College of Liberal Arts and Sciences will be sorely missed. We wish him a happy and fulfilling retirement!



## Biology Graduate Awards

### Michael J. Dykstra Graduate Scholarship Fund



Brady Williquett

The **Michael J. Dykstra Graduate Scholarship Fund** provides scholarship support for a graduate student in the Integrated Biology (iBio) Graduate Program. **Brady Williquett** (Manak Lab) was the recipient of this award for Summer 2023. Brady is a Ph.D. student in the lab of Biology Professor **John Manak**, and he is studying the effect of innate immunity on learning ability in a *Drosophila* model for autism spectrum disorder. The award has allowed Brady to refine his method for quantifying learning ability and begin to analyze how preventing an immune response in the lab's flies affects their learning. Additionally, Brady is passionate about mentoring high school and undergraduate students to help further their careers as scientists.

Dykstra, who earned both his B.A. (1969) and M.S. (1971) in Botany at the University of Iowa, believes strongly in higher education and hopes that his gift will provide educational support for future leaders in scientific research and teaching.

### Carol B. and Robert G. Lynch Department of Biology Graduate Fund

The **Carol B. and Robert G. Lynch Department of Biology Graduate Fund** is intended to support graduate students as they receive a combination of didactic training, research exposure, and tailored mentoring. The fund will also support career development in the form of graduate student travel to scientific meetings and publication costs. **Emily Hirsch** (Phillips Lab) was the recipient of this award for Summer 2023. Emily is an Integrated Biology (iBio) Ph.D. student in the lab of Biology Professor **Bryan Phillips**, and she is studying amyloid protein aggregation and the role it plays in proper development. This award provided her the opportunity to investigate the role of the HSP110/70/40 chaperone complex as a developmental disaggregase involved in maintaining proper material state of proteins in early development of *C. elegans*.



Emily Hirsch

The Lynchs received their PhDs in Zoology from the University of Iowa — the late Carol in 1971 and Robert (Bob) in 1972. Their bequest to the iBio Graduate Program is in honor of their advisers, Hugh Dingle and Joe Hegmann.

## Additional Graduate Awards

### College of Liberal Arts and Sciences (CLAS) Dissertation Writing Fellowship

**Tara Hicks** (Smolikove Lab) – Summer 2023 and Fall 2023

Project: "The Role of R-Loops and Temporally Regulated DSB Repair in Germline Genomic Stability"

### Predoctoral Training Grants

**Baylee Bruce\*** (He Lab) – Interdisciplinary Graduate Program in Genetics Predoctoral Training Grant for Fall 2023 and Spring 2024

\*PhD student in the Interdisciplinary Graduate Program in Genetics

**Israel Wipf\*** (Tootle Lab) – Predoctoral Training Grant in the Pharmacological Sciences for Fall 2022 through Spring 2024

\*PhD student in the Cell and Developmental Biology Graduate Program



**Samuel Mellentine**, an Interdisciplinary Graduate Program in Genetics Ph.D. student in the lab of **Tina Tootle**, received the 2022 Award for Superior Achievement in Student Teaching. This accolade is given to a graduate student in the Department of Anatomy and Cell Biology whose teaching performance is judged outstanding by the course directors in the department. Sam also received the 2nd Place prize in the Student Oral Presentations at the Interdisciplinary Graduate Program in Genetics 2022 Student Retreat for his talk, "Defining the Role of Prostaglandins in Collective Cell Migration."

**Ryan Pellow**, an Integrated Biology (iBio) Ph.D. student in the lab of **Josep Comeron**, was chosen to give an oral presentation at the prestigious Keystone Symposium "Epigenetics, Chromatin, Development and Disease," held in Victoria, British Columbia, Canada, on March 12-15, 2023. The title of Ryan's presentation was "New Biological Insights of the 3D Nuclear Architecture using WaveTAD, a Probabilistic, Resolution-free, and Hierarchical TAD Caller."

**Danielle Talbot**, a Ph.D. student in the Cell and Developmental Graduate Program in the lab of **Tina Tootle**, received the 2023 Mary J.C. Hendrix Graduate Leadership Award. This award is given to a senior graduate student in the Department of Anatomy and Cell Biology for exceptional contributions to the department and to students over a sustained period of time. Said contributions include excellence and devotion to teaching, leadership in student governance and promotion of student and faculty goodwill, all coupled with outstanding personal performance in research. Danielle also received a 2023 Trainee Scholar Award from the University of Iowa Carver College of Medicine to support costs associated with participation in both on-site and online educational events (up to \$500). In addition, Danielle presented at the 2023 Department of Anatomy and Cell Biology Research Retreat held on April 21-22, 2023, and at the 2022 Midwest Drosophila Conference held on October 22-23, 2022, in Monticello, Illinois. The title of her talk was, "Prostaglandins Limit Nuclear Actin to Control Nucleolar Activity During Oogenesis."



**Pictured Above:** (L to R) Tara Hicks; Baylee Bruce; Israel Wipf; Dr. Charles Yeaman presents the Award for Superior Achievement in Student Teaching to Samuel Mellentine; Ryan Pellow; Dr. Charles Yeaman presents the Mary J.C. Hendrix Graduate Leadership Award to Danielle Talbot.

## UI GRADUATE COLLEGE FELLOWSHIPS

Fellowship recipients below are Integrated Biology (iBio) Graduate Program students (unless otherwise indicated).

### Ballard and Seashore Dissertation Fellowship

**Rosemary Lee** (Malkova Lab) – Spring 2023

**Samuel Mellentine\*\*\*** (Tootle Lab) – Spring 2023

**Ryan Pellow** (Comeron Lab) – Fall 2023

### Post-Comprehensive Research Fellowship

**Adrianna Caro** (Green Lab) – Spring 2023

**Ashley Goll\*** (Tootle Lab) – Fall 2023

**Shulin Liu** (Fassler Lab) – Fall 2023

**Hui (Thea) Tian** (Smolikove Lab) – Fall 2023

**Jerzy Twarowski** (Malkova Lab) – Spring 2023

### Summer Fellowship (Summer 2023)

**Sydney Arlis** (Manak Lab)

**Richard Bowman** (Smolikove Lab)

**Camille Hanes\*\*** (Weiner/Dailey Labs)

**Matthew Koenig\*\*\*** (Summers Lab)

**Lindsey Snyder\*\*\*** (He Lab)

**Danielle Talbot\*** (Tootle Lab)

**Kelley Withers** (Cheng Lab)

\*Cell and Developmental Biology Graduate Program

\*\*Interdisciplinary Graduate Program in Neuroscience

\*\*\*Interdisciplinary Graduate Program in Genetics

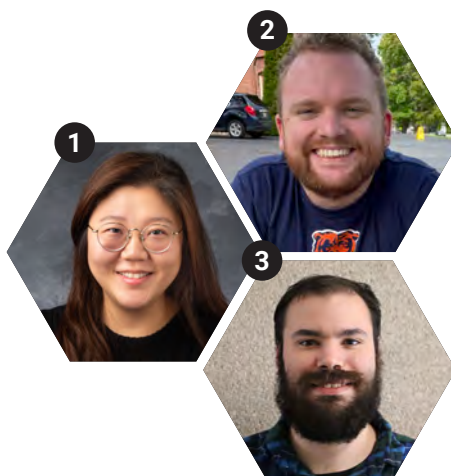
## New Graduate Students and Postdocs

The Department of Biology welcomed the following graduate students into the Integrated Biology (iBio) Graduate Program and postdoctoral research scholars in 2023.



### iBio Ph.D. Graduate Students

1. Tim Emagbetere (Malkova Lab)
2. Romisa Ghaffari (Comeron Lab)
3. Justin Lee (Malkova Lab)
4. Clare Mulcahy (Neiman Lab)
5. Daniela Santos Da Mata (Phillips Lab)
6. Varshu Saravanakumar (He Lab)
7. MaKella Steffensen (Forbes Lab)



### iBio Master's Graduate Students

1. Kieran Coffey (Green Lab)
2. Mattie Gose (Forbes Lab)
3. Wyatt Hindle

### Postdoctoral Research Scholars

1. Rosemary Lee (Malkova Lab)
2. Samuel Mellentine (Tootie Lab)
3. Anthony Pannullo (He Lab)

## Congratulations Graduates!

### Integrated Biology (iBio) Graduate Program

#### Doctor of Philosophy (Ph.D.)

**Richard Bowman** (Smolikove Lab), Summer 2023  
Thesis: "Investigation of Meiotic Double-Strand Break Formation Through Epitope-Tagged SPO-11 and the Study of Its Novel Regulator, and the Recruitment of Early Repair Proteins as Function of Age and Sex of *C. elegans*"

**Alaine Hippee** (Forbes Lab), Summer 2023  
Thesis: "Host Plant Association and Evolution in a Genus of Specialist Fruit Flies"

**Joseph Jalinsky** (Logsdon/Neiman Labs), Fall 2022  
Thesis: "Genome Evolution and Consequences of Transitions to Asexuality"

**Anthony Lilienthal** (Manak Lab), Spring 2023  
Thesis: "Isolating the Neural Circuitry of Prickle-Mediated Epilepsy"

**Krishna Nukala** (Manak Lab), Fall 2022  
Thesis: "Investigating the Role of the Innate Immune System, Oxidative Stress, and Cell Death in a *Drosophila* Model of Epilepsy"

## Master of Science (M.S.)

**John Atagozli** (Comeron Lab), Summer 2023

Thesis: "Genomic and Fitness Consequences of Heat Stress-Induced Transposon Mobilization in *Drosophila*"

**Wren Renquist** (Forbes Lab), Spring 2023

Thesis: "Does the Genome of a Putatively Specialist Moth (*Schinia gracilenta*) Contain a Signal of the Indigenous Cultivation of Its Host Plant (*Iva annua*)?"

**Grace Sack** (Neiman Lab), Spring 2023

Non-thesis

## Interdisciplinary Ph.D. Graduate Program

**Ryan Betters** (Hefti and Dailey Labs), Neuroscience Program, Summer 2023

Thesis: "Rethinking the Relationship Between Tau and Alzheimer's Disease with Insights from the Developing Brain"

## Fall 2022 and Spring 2023 Undergraduate Honors Students

Listed below are undergraduate students who graduated with honors in the major. Students who graduate with honors in the major must fulfill the regular requirements for a Bachelor of Arts (BA) or Bachelor of Science (BS) degree and maintain a grade point average of at least 3.33 (overall and in the major). Students must also conduct research in the laboratory of a faculty member, write an honors thesis, and give a brief oral presentation of their research findings, among other requirements.

**Grace Chesner** (Smolikove Lab\*), B.S. in Biology (Genetics and Biotechnology), Spring 2023

**Joseph Danos** (Summers Lab\*), B.S. in Biology (Neurobiology), Spring 2023

**Anika DeWald** (Cheng Lab\*), B.S. in Biology (Genetics and Biotechnology), Fall 2022

**Amanda Dougherty** (Young Lab), B.S. in Biomedical Sciences with Highest Distinction, Spring 2023

**Thomas Duong** (Russo Lab), B.S. in Biomedical Sciences, Spring 2023

**Allison Eagen** (Janouschek Lab), B.S. in Biomedical Sciences, Spring 2023

**Daniel Fu** (Fisher Lab), B.S. in Biomedical Sciences with Highest Distinction, Spring 2023

**Hope Fury** (Ince Lab), B.S. in Biomedical Sciences with Highest Distinction, Spring 2023

**Noah Gilkes** (Newell Lab), B.S. in Neuroscience, Spring 2023

**Bryan Guevara** (Neiman Lab\*), B.S. in Biology (Genetics and Biotechnology), Spring 2023

**Preston Johnson** (McCleery Lab), B.S. in Neuroscience with Highest Distinction, Spring 2023

**Lucy Kim** (Imai Lab), B.S. in Biomedical Sciences with Highest Distinction, Spring 2023

**Elizabeth Martin** (Dailey Lab\*), B.A. in Biology, Spring 2023

**Caleb McCabe** (Smolikove Lab\*), B.S. in Biomedical Sciences with High Distinction, Spring 2023

**Devanshee Patel** (Boudreau Lab), B.S. in Neuroscience, Fall 2022

**McKade Poirier** (Slusarski Lab\*), B.S. in Biomedical Sciences, Spring 2023

**Kartik Sivakumar** (Narayanan Lab), B.S. in Neuroscience with Highest Distinction, Fall 2022

**William Slawson** (Hazeltine Lab), B.S. in Neuroscience with Highest Distinction, Spring 2023

**Ryan Staub** (Pierce Lab), B.S. in Biomedical Sciences with Highest Distinction, Spring 2023

**Trevor Viohl** (Boes Lab), B.S. in Neuroscience, Fall 2022

**Rachael Volkman** (Narayanan Lab), B.S. in Neuroscience with Highest Distinction, Spring 2023

\*Denotes a lab in the Department of Biology





# LINDA AND RICK MAXSON UNDERGRADUATE RESEARCH AWARD

The **Linda and Rick Maxson Undergraduate Research Award** supports undergraduate research in individual faculty labs in the Department of Biology. Since its establishment in 2020, over 55 undergraduate students have benefited from hands-on research opportunities provided by the award. **Grace Pierce** (Fassler Lab), a Biomedical Sciences major and recipient of the award says, "I would like to thank the Maxsons for their kind gift. It provides me the opportunity to investigate the role of metabolic fluctuations in neurodegenerative disease using yeast as a model system."

Biology student, **Jacob Roling** (Phillips Lab), also a recipient of the award, adds, "I'm thankful to the Maxsons for their part in making my experiences in research possible. While studying the role of protein aggregation in the development of the *C. elegans* model organism, I've been given the chance to put many of the scientific methods I've learned in my courses, like confocal microscopy and antibody staining, to real-world use. Having the chance to connect with those more experienced than I within research has also offered me invaluable insight into careers, which has helped me decide my future aspirations."

The Department of Biology is most grateful for Linda and Rick Maxsons' philanthropy. Their contributions over the past three years have greatly enhanced the undergraduate research experience in Biology. Dr. Linda Maxson served as Dean of the University of Iowa College of Liberal Arts and Sciences for 15 years, stepping down from that position on June 30, 2012, when she joined the Department of Biology faculty. She officially retired on June 30, 2018.



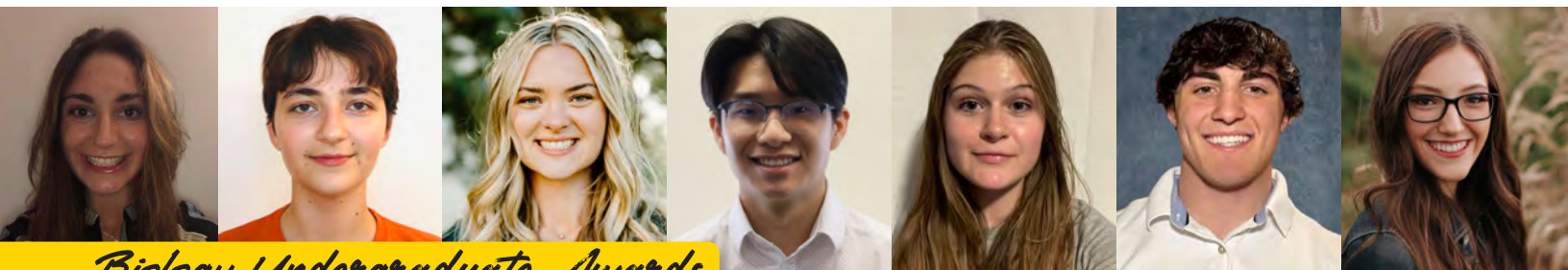
Grace Pierce



Jacob Roling



Linda and Rick Maxson



As a result of the generosity of our scholarship donors, the Department of Biology provided the following awards during the 2022-2023 academic year (unless otherwise indicated).

## Arthur J. and Flora D. Levin Excellence in Undergraduate Teaching Award

**Gianna Sagona** (nominated by Amr El Zawily and Alexys McGuire for Teaching Internship in Biology – Foundations of Biology for Spring 2023).

## Avis Cone Undergraduate Research Fellowship

**Rebekah Yarvis** (Cheng Lab) – Summer 2023

## Clifford W. Hesseltine Award for Academic Excellence

**Kalynn Culver**  
**Daniel Fu**

## Evelyn Hart Watson Undergraduate Research Fellowship

**Winnie Gavin** (Neiman Lab) – Summer 2023  
**Deven Strief** (Dailey Lab) – Academic Year 2023-2024

## Lowden Prize for Outreach and Engagement in Biology\*

**Hannah Smith**

\*This scholarship is awarded through the College of Liberal Arts and Sciences.

**Award Recipients Pictured Above:** (L to R) Gianna Sagona, Rebekah Yarvis, Kalynn Culver, Daniel Fu, Winnie Gavin, Deven Strief, Hannah Smith

## Additional Undergraduate Awards

### Iowa Neuroscience Institute (INI) Summer 2023 Scholars

**Nicole Boodhoo** (Biomedical Sciences)

**Alexis Olson** (Neuroscience)

**Deven Strief** (Biomedical Sciences/Dailey Lab)

### 2023-2024 Fulbright Award

**Laura Evans** (B.S. in Neuroscience, Spring 2022)

**Ashley Lie-Atjam** (B.S. in Neuroscience, Spring 2023)



## Biology Course Provides Students Opportunity to Investigate Cancer Cells

Written by **Christopher Stipp**, Associate Professor of Biology

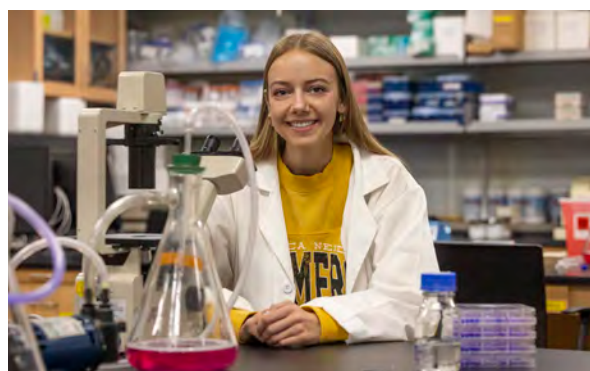
When my colleague, **Michael Dailey**, Associate Professor of Biology, and other individuals in the department, including **Jim Lin**, former Professor of Biology, developed the Cell Biology Lab course and first offered it in the fall of 1999, a key objective was to give every student who took the class access to research grade microscopes and biotechnology as part of a genuine research experience. I have had the opportunity to contribute to the lab class since 2007 as a teaching partner, becoming the course director in 2022. As my role in the class has grown over the years, my goals have been to keep Dr. Dailey's original vision for class front and center, and to bring my own professional experience as a cancer researcher to the students in the lab. A key component of the lab class is providing students with the opportunity to perform real experiments with unknown outcomes, just like the kind of experiments they could contribute to in a nationally-funded cancer biology research laboratory. This means that troubleshooting, technical difficulties, and unexpected results can all be part of the mix. Instead of predetermined lab exercises with "correct" outcomes, the lab class focuses on hypothesis-driven, genuine experiments. In the process, students learn microscopy, protein biochemistry, and cell-based assays of tumor cell proliferation and survival, all the while investigating and exploring potentially important molecular differences between metastatic versus non-metastatic cancer cells.

Students who have taken the course over the years have had positive experiences.

The 4 semester hours course is currently offered every fall semester with a 3-hour lab and 1-hour lecture each week. The course had 30 students enrolled in the Fall 2023 semester with two sections of 15 students. **Angie Cordle**, Instructional Services Specialist, and **Emily Hirsch**, a Teaching Assistant and Ph.D. student (Phillips Lab) in the Integrated Biology Graduate Program, assisted with the course in the Fall 2023 semester.

"The Cell Biology Lab has been one of the most hands-on learning classes I have taken at the University of Iowa. Lab classes are usually my favorites and this one did not disappoint. Professors Dailey and Stipp made the class interesting and broke the concepts down in ways that were easy to comprehend. I ended the class truly understanding the topics covered, including those that I had troubles with in previous classes. Not only did I learn a lot in this lab, but I looked forward to spending time in the fun atmosphere created by my peers, professors, and lab coordinators."

**Chloe Schipper**, a senior majoring in Biology who completed the course in the Fall 2023 semester.



**Chloe Schipper**

Photo provided by Jill Tobin





## Highlighted Undergraduate Alumni

**1 TIM FUQUA** graduated from the University of Iowa in the spring of 2017 with a Bachelor of Science in Biology on the Genetics and Biotechnology track; he also received both Honors in the Major and University Honors. Following graduation, Tim spent the first four months of his Ph.D. at the Janelia Research Campus in Ashburn, Virginia, before moving to Heidelberg, Germany, and finishing his Ph.D. at the renowned European Molecular Biology Laboratory (EMBL) under the guidance of doctoral advisor Justin Crocker. While at EMBL, Tim had the incredible honor of being published in *Nature* as first author of the paper, "Dense and pleiotropic regulatory information in a developmental enhancer." Since completing his Ph.D. in 2021, Tim has continued to contribute to the scientific community as a postdoctoral researcher in Zurich, Switzerland, working under the mentorship of Andreas Wagner. Tim has expressed deep gratitude for having the opportunity to collaborate with such a prominent evolutionary biologist. He expects to finish his postdoc in August 2025, after which he aspires to become a professor.

Tim's introduction to the world of research began in the lab of **Albert Erives**, UI Associate Professor of Biology. While working in the Erives Lab, Tim wrote an undergraduate thesis on *Drosophila* enhancers of gene expression, a topic that eventually became the focus of his Ph.D. He said that this experience of working on his own research project, in addition to the invaluable techniques and programming he learned as an undergraduate researcher in the Erives Lab, gave him an edge at EMBL. "Everything I learned in [Albert's] lab I used at some point during my Ph.D." Tim's research now centers around answering the question of how DNA regulatory sequences evolve.

Reflecting on his time at the University of Iowa, Tim acknowledged the institution not only for providing him with valuable research experience but also a strong professional network. He even met his future Ph.D. advisor when he presented at an Iowa Biosciences Academy-sponsored (now renamed to Iowa Sciences Academy) research conference as an undergraduate student.

When asked if he had any advice for students, Tim stressed the importance of getting involved and building connections within your department. While at the University of Iowa, Tim embraced any opportunity that came his way and this helped him feel like he belonged to the UI Department of Biology.

Tim would like to extend thanks to key individuals who have supported him along his academic journey, including Lori Adams, Albert Erives, Elizabeth Stroebele, Meaghan Rowe-Johnson, Brinda Shetty, Anna Gaw, and Steve Kehoe. He would also like to acknowledge the Iowa Sciences Academy for helping him through the graduate school application process, as well as the University of Iowa for serving as the catalyst that helped him discover his passion for scientific research.





**2 HANNAH LANGENFELD** has always had a passion for both math and science. With the help of her parents, she recognized she could integrate these two interests into a cohesive career and chose to pursue a path in biostatistics. Hannah now works as a Statistical Programmer in the Department of Quantitative Health Sciences at Mayo Clinic in Rochester, Minnesota. Since September 2020, she has worked on rheumatology research and cancer-related clinical trials, providing data management and analysis to the principal investigators of a multitude of studies. Her exceptional teamwork skills and compassion have been recognized through multiple awards from the Mayo Clinic Above and Beyond Recognition Program. When she's not at work, Hannah loves reading, hiking, knitting, running, and spending time with her dog, Lucy.

Hannah earned a Bachelor of Science in Biology on the Plant Biology track and a minor in Spanish in the spring of 2018. Her interest in plant biology was sparked by **Erin Irish**, an Associate Professor in the UI Department of Biology, who also served as Hannah's undergraduate advisor. As an undergraduate student, she was selected to be a student ambassador for the Department of Biology, and she holds fond memories of giving tours of the department's facilities and sharing her positive experience at Iowa with prospective students. Hannah also worked as a research assistant in Dr. Craig Just's (UI Department of Civil and Environmental Engineering) laboratory for four years. It was here that she honed her programming skills in R. When asked what she most enjoyed about her time at the University of Iowa, Hannah said she enjoyed the friendships she formed through study groups. She also loved being a member of the UIBIO student organization (now known as BIO) and spending time in the Greenhouse in Biology Building East, as well as studying abroad in Costa Rica for a month during winter break.

Continuing her academic journey, Hannah then attended the University of Oklahoma Health Sciences Center Hudson College of Public Health where she earned a Master of Public Health degree with a concentration in biostatistics, as well as a Certificate of Public Health. She stated that her background in biology played a pivotal role in her acceptance into the program, providing her with a comprehensive understanding of diseases and healthcare topics that she wouldn't have had with a degree in math or statistics. Throughout her graduate studies, Hannah worked as a graduate research assistant.

Her advice to current students is to follow their passions; even if they don't appear to align with their major, they may ultimately lead to a fulfilling and successful career.

## *Graduate Alumni Updates*

**3 RAJULA ELANGO**, who earned her Ph.D. in Integrated Biology in 2017, accepted an offer to join the Genome Integrity and Structural Biology Laboratory in the National Institute of Environmental Health Sciences (NIEHS) in January 2024 as an Earl Stadtman Tenure-Track Investigator. The Elango Lab will focus on studying DNA damage and repair pathways and how environmental stressors impact these processes. Her lab will use various cutting-edge techniques including CRISPR/Cas9 mediated gene-engineering and high-throughput sequencing with the goal of developing a promising new target for therapy against human cancers. Dr. Elango previously was a Postdoctoral Research Fellow in the lab of Dr. Ralph Scully at Harvard Medical School. While at Iowa, she studied under the direction of **Anna Malkova**, the Roy J. Carver Professor of Biology.

**4 BETH OSIA**, an alumna of the Integrated Biology (iBio) Graduate Program, received an F32 Award from the National Cancer Institute (NCI). The NCI Ruth L. Kirschstein National Research Service Award (NRSA) for Individual Postdoctoral Fellows F32 Award supports promising postdoctoral applicants who have the potential to become productive and successful independent cancer research investigators.

Dr. Osia completed her Integrated Biology Ph.D. in 2020 under the direction of **Anna Malkova**, the Roy J. Carver Professor of Biology. She is currently a Postdoctoral Research Fellow at City of Hope studying Rad52 synthetic lethal interactions.

**5 UKPONG EYO**, who earned his Ph.D. in Biology in 2012, was featured in an article in *Nature Neuroscience* that was published in December 2023. The journal celebrated its 25th anniversary by interviewing established leaders in the neuroscience field and those earlier in their careers to discuss how the field has evolved and where it is heading. Dr. Eyo was mentored by **Michael Dailey**, Associate Professor of Biology. For the full interview, visit the link below or the QR code to the right.

<https://www.nature.com/articles/s41593-023-01532-z>



**THE IOWA SCIENCES ACADEMY (ISA)**, formerly known as the Iowa Biosciences Academy (IBA), serves as an umbrella for a range of programs that support the success of qualified University of Iowa undergraduate students interested in scientific research and communication. ISA supports freshman and sophomore students in research labs through the Science Alliance program, encourages and supports transfer students to participate in research through the Louis Stokes Alliance for Minority Participation (LSAMP) program, and provides NIH-funded fellowships for junior and senior researchers through the Maximizing Access to Research Careers (MARC) grant. Additionally, ISA offers the Latham Science Engagement Fellowship for students interested in science communication. Students in the Latham Fellows program complete two courses and design and implement capstone projects that are presented at the year-end Latham Showcase public event. All programs affiliated with ISA hold diversity and inclusion as core values. Across all programs, ISA supported 50 students during the fall semester of 2023.

ISA also offers a range of affiliated courses, professional development activities, and responsible conduct of research training, as well as a Peer Mentoring Program. Students in ISA programs have unique access to hands-on research, mentoring, professional development, and scientific outreach opportunities, recognizing that the role of one-on-one mentoring is critical. **Maurine Neiman**, Professor of Biology, has mentored multiple students across all ISA programs.

Dr. Neiman says, "I am very fortunate to partner with ISA as a mentor. ISA provides a unique mechanism to connect with and support early-career scientists. The individuals I have mentored have consistently enriched my research program and my life."

To support the ISA programs, the College of Liberal Arts and Sciences (CLAS) awarded three half-time Graduate Assistantships in 2023 as part of a pilot program supporting assistantships in writing, editing, and community engagement. The supported graduate students are **Briante Najev**, a Ph.D. candidate in the Integrated Biology (iBio) Graduate Program; **Hailey Kingsbury**, a student in the Communication Sciences and Disorders Graduate Program; and **Jacob Payne**, a teaching assistant in the Physics and Astronomy Graduate Program. A fourth graduate student, **Jahnvi Pandya**, a research assistant in the Psychological and Quantitative Foundations Graduate Program, is funded by MARC and serves as the ISA Career Counselor.

ISA would also like to welcome the new Associate Director, **Kristina Venzke**, who started with ISA in January 2023, and **Joan Aune**, who joined ISA as the Administrative Services Coordinator in October 2023. **Hailey Odell**, an undergraduate student, was also hired in October 2023 to help with office administration, marketing, and communications. ISA looks forward to working with all the new staff and graduate students who joined the program this year!

ISA is administratively housed in the Department of Biology and is directed by **Lori Adams**, Associate Professor of Instruction in Biology and Director of Science Engagement with CLAS. Additional members of the leadership team include **Tori Forbes**, Professor of Chemistry and Director of the MATFab Facility and Co-Principal Investigator (PI) of MARC, and **Vincent Rodgers**, Professor of Physics and Astronomy and Co-PI of LSAMP.

For more information about ISA, visit [isa.uiowa.edu](http://isa.uiowa.edu).



Listed below is the most recent update of the names of Department of Biology alumni and friends who have passed away. Maiden name or nickname (if applicable) and deceased date are listed in parentheses. Names are listed in alphabetical order by last name.

Source: University of Iowa Center for Advancement and UI Alumni Records

<b>Baldwin, J. David</b> – Ph.D. Biology, 1986 (October 23, 2023)	<b>Gay, Don D.</b> – M.S. Botany, 1971; Ph.D. Botany, 1975 (October 4, 2022)	<b>Jayne, Eric M.</b> – B.S. Biology, 1986 (July 2, 2021)	<b>Overett, Thomas K.</b> – B.A. Zoology, 1968 (August 5, 2022)
<b>Blakley, Nigel R.</b> – B.A. Zoology, 1972; Ph.D. Zoology, 1977 (July 6, 2019)	<b>Ghoneim (Hegab), Shams M.</b> – M.S. Botany, 1977 (September 5, 2023)	<b>Koranski, David S.</b> – M.S. Botany, 1970 (October 1, 2020)	<b>Pesetsky, Irwin</b> – M.S. Zoology, 1954; Ph.D. Zoology, 1959 (January 9, 2022)
<b>Cogburn (Essock), J. Nita</b> – B.A. Botany, 1976 (March 28, 2021)	<b>Hackett, James G.</b> – B.A. Zoology, 1969 (May 16, 2022)	<b>Kuwabara, Roger K.</b> – B.A. Zoology, 1955 (May 13, 2022)	<b>Peters (Jensen), Karen L.</b> – B.A. Zoology, 1966 (August 26, 2021)
<b>Easterly, Nathan W.</b> – M.S. Botany, 1951 (October 26, 2018)	<b>Haug (Uber), Virginia M.</b> – M.S. Zoology, 1952 (January 13, 2019)	<b>Marinos, Milton G.</b> – B.A. Botany, 1954 (April 17, 2020)	<b>Race, James</b> – Ph.D. Zoology, 1960 (July 8, 2021)
<b>Ellis, John J.</b> – M.S. Botany, 1956; Ph.D. Botany, 1959 (January 12, 2023)	<b>Hjertos, Beth E.</b> – M.S. Biology, 2002 (April 19, 2020)	<b>McMahon (Colflesh), Martha C.</b> – B.A. Zoology, 1947 (March 5, 2023)	<b>Soldatenkov, Aleksey</b> – B.S. Biology, 2015 (July 9, 2021)
<b>Ernst (Warner), Jackie A.</b> – B.S. Biology, 1990 (August 31, 2020)	<b>Howell, Elizabeth</b> – M.S. Botany, 1964 (February 24, 2020)	<b>Nelson, Richard F.</b> – Ph.D. Botany, 1960 (June 21, 2021)	<b>VanBruggen, Theodore</b> – Ph.D. Botany, 1958 (July 29, 2023)
<b>Estes, Zane E.</b> – M.S. Zoology, 1957 (October 20, 2022)	<b>Hoyt, John A.</b> – B.A. Biology, 2006 (May 20, 2023)	<b>Norman (Rook), Linda (Kay)</b> – M.S. Zoology, 1966 (March 9, 2023)	<b>Williams, Gordon D.</b> – B.A. Zoology, 1968 (February 17, 2023)
<b>Frankel (Koopmans), Anne</b> – Ph.D. Zoology, 1969 (September 28, 2023)	<b>Jack, Richard D.</b> – M.S. Zoology, 1953 (May 23, 2019)	<b>Opitz, John M.</b> – B.A. Zoology, 1956 (August 31, 2023)	<b>Zietlow, Kenneth G.</b> – M.S. Botany, 1954 (October 24, 2022)



**Caroline Dieterle**

**CAROLINE DIETERLE**, 85, of Iowa City, Iowa, passed away on August 10, 2023. Caroline was a former teaching associate for the Department of Botany. She was also the former spouse of Botany/Biology faculty member, Robert (Bob) Embree.

**REBECCA REITER**, 84, of Iowa City, Iowa, passed away on May 9, 2023. Rebecca (Becky) earned a Master of Science in Zoology degree in 1964 from the University of Iowa and spent 38 years as a researcher in the Department of Biological Sciences. She was a skilled and valued member of several research labs and co-authored 46 peer-reviewed scientific papers. Her contributions included training and mentoring dozens of graduate students and postdoctoral researchers throughout her career.



**Rebecca Reiter**



# IOWA

Department of Biology

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Private funding is critical for our department's continued success as we seek to support student research, invest in state-of-the-art equipment, fund seminar series and lectureships, and attract and retain outstanding faculty members. To learn how monetary gifts can make a difference, please visit [www.givetoiowa.org/biology](http://www.givetoiowa.org/biology) or contact **Susan Horan** at the UI Center for Advancement at [Susan.Horan@uiowa.edu](mailto:Susan.Horan@uiowa.edu), 319-467-3407. We appreciate your support!



### *Alumni and Friends of Biology.*

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<https://biology.uiowa.edu/about/newsletters>

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