

2023

## Biology News 2023

University of Northern Iowa. Department of Biology.

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# BIOLOGY NEWS

Diversity of life... diversity of opportunities

2023 EDITION

**UNI** / University of Northern Iowa.



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# GREETINGS FROM THE DEPARTMENT



**Dear Alumni and Friends,**

As we embark on a new school year, it's a good time to look back and share some of the accomplishments of the past year as well as some news about our future. The Department of Biology continues to be the vibrant place we hope you fondly remember. All of the faculty and staff in the Department of Biology have had a busy year! If you are a recent graduate, you can catch up on individual news on our [Faculty/Staff webpage](#).

We relish our mission of preparing the next generation of highly qualified graduates for opportunities in the life sciences -- readying them for careers in health science, natural resource management, education, scientific research, and more. We always love hearing from our alumni and friends and knowing where your UNI degree has taken you. You can contact us at [biology@uni.edu](mailto:biology@uni.edu).

Regards,  
Theresa Spradling  
Head, Department of Biology



# PASSION FOR TEACHING

The Department of Biology remains a place where faculty are passionate about teaching. We continue to advance a student-centered curriculum, where first-year students are designing their own experiments and using case studies in classes and second-year students have an entire semester devoted to fostering critical thinking by honing their skills to find information, deconstruct arguments, and communicate about complex topics in biology.

Faculty continue to develop and modernize every lab and lecture class in the department, creating excellent experiential learning opportunities and hands-on experiences in our laboratories. This year, **Sheree Harper** (Adjunct Instructor) won United Faculty's Above and Beyond Award for her outstanding contributions, including overseeing

multiple sections of BIOL 2052 (Cell Structure & Function) lab. Sheree has developed and implemented new curriculum for the lab, including developing a beautiful, active-learning lab manual full of fresh, modern content and calls for students to think critically about real-world problems. **Dr. Jesse Wilcox** (Assistant Professor of Biology specializing in Science Education), won the 2023 Excellence in Science Teaching Award from Iowa Academy of Sciences in recognition of his long history of excellence in teaching and his scholarship in the area. Jesse has been a valuable member of the team implementing new educational modules in BIOL 2051 (Organismal Diversity) lab. **Dr. Peter Berendzen** led a Study Abroad class to the Galapagos Islands and Ecuadorian highlands for a cultural learning experience that they will never forget.

# DEDICATION TO SCHOLARSHIP

Our faculty deeply value the scientific endeavor and sharing a love of science with our students. Past reviewers of our program have highlighted what an exceptionally strong research record we and our students have as a department. This coming academic year, we will have student researchers participating in several federally- and state-funded conservation projects, including **Dr. Jeff Tamplin's** work on habitat requirements of Wood Turtles, **Dr. Pete Berendzen's** work on the genetics of Bluegill, and **Dr. Kenneth Elgersma** and **Dr. Ai Wen's** work on Conservation Reserve Program (CRP) lands. **Dr. Wilcox** received state funding to support work with his students to develop astronomy STEM units for middle-school science students. Together, these federal and state funds have supported numerous graduate and undergraduate student opportunities. **Dr. Nilda Rodriguez**

spent summer 2023 at the University of Iowa's FUTURE in Biomedicine program, developing her studies of Leishmaniasis; her research and Cell Biology students will benefit from her new skills and knowledge this year. In addition, the Summer Undergraduate Research Program (SURP) supported seven full-time and two part-time students through the generosity of our alumni donors and faculty who gave their time freely during their unpaid summers. SURP faculty for 2023 were **Dr. Tilahun Abebe, Dr. Kenneth Elgersma, Dr. Jerreme Jackson, and Dr. Ai Wen.**

These are but a few examples of the kind of scholarship our faculty engage students with. In all, about 40% of UNI Biology students take advantage of at least one special opportunity to perform research or independent study with a faculty member.

# CONGRATULATIONS DR. STEVE O'KANE!

Dr. Steve O'Kane served the Department of Biology from 1996-2023. Dr. O'Kane taught the inaugural class of Evolution, Ecology, and the Nature of Science, a class he taught regularly until his retirement. He also taught Plant Systematics, Evolutionary Biology, Bioscientific Terminology, Ecology, Life: The Natural World, and Biogeography & the Origins of Diversity. Students resoundingly praised his teaching in all arenas, and we are grateful for the impact he had on the department as a devoted educator and scholar.

# MEET A FEW OF OUR RECENT GRADUATES

Congratulations to all of our December 2022 and May 2023 graduates! We love hearing their parting words about their experiences at UNI as they head off into their new lives. See our Facebook page for even more students' reactions.



## Joseph Correa

During my undergraduate career, I really liked and appreciated the opportunities made available to me. I was able to take classes that interested me and start doing research after my first year. These experiences really helped me develop my desire to enter into a research field. In the fall, I will start my PhD of Pharmaceuticals at the University of Iowa.



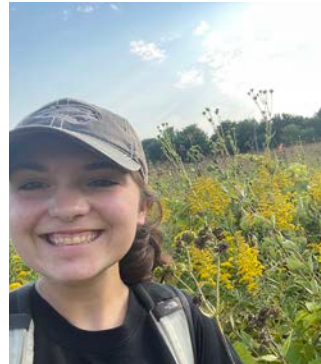
## Abby Riley

My time at UNI has been amazing. I am so sad to be leaving Cedar Falls, but UNI has prepared me incredibly well to take this next step. This Fall I will be attending the Medical College of Wisconsin to pursue a Master of Science in Genetic Counseling, and I couldn't have done it without the biology department's wonderful staff. Go Cats!



## Hunter Mennenga

I'd like to thank Professor(s) Nilda Rodriguez, Mary McDade, Ira Simet, Nathan Bird, and Jeff Tamplin for shaping me into the student and person I am today. All of your classes and advice gave me knowledge and insight that I will take with me for the rest of my life. I most enjoyed taking A&P with Mary McDade and all of the hours spent doing research with Dr. Rodriguez. I also really enjoyed guiding underclassmen as the president of the pre-med club. I am currently going through the process of applying to medical school. In the meantime, I will be moving to Iowa City and working at Stead's Family Children's Hospital conducting research on Pediatric Leukemia. My advice to incoming biology students is: It's important that you try to do your best at everything you do, but it's equally as important to realize you won't always be the best. Learn from your mistakes and let them make you a better person.



## Liz Wilgenbusch

When I graduated from high school, I never pictured myself as a Biology student, but now four years later, I couldn't picture choosing anything else! I loved taking field trips to look at wildlife in Field Zoology or catching insects in Entomology. I truly found my career passion through my time in Biology. Advice I would give to future Biology students is to get involved in research and get to know other students in your class. Do not be afraid to ask a professor in a discipline that you are interested in about research opportunities. It might seem intimidating but I promise you it will open up so many doors that you didn't even know were there. After graduation, I will be working as a Wild Bee Field Technician for the University of Massachusetts and US Forest service, conducting bee surveys in National Forests in MO, IN, and IL.

# BOTANICAL CENTER UPDATE:



The Botanical Center is open to the public in accordance with the UNI academic calendar. Six unique greenhouse spaces offer inspiration through exploration of various biomes. Guests are encouraged to photograph plants, draw, paint, learn or just hang out and have fun in the bright environment! Guests are welcome **most Mondays through Fridays from 8 a.m. to 4 p.m.** Visiting hours change to reflect the UNI academic calendar during breaks and holidays as well as some required Friday closures. Call 319-273-2247 for up to the minute visiting hours.

On **Friday, September 1**, the Botanical Center will host International Coffee Hour, a collaboration with the International Engagement Office, and visiting hours will be extended until 5:00 pm. All visitors are welcome to explore the greenhouses until 5:00 p.m. and enjoy lawn games outdoors on the South Lawn. Coffee and cookies will be provided from **4:00 p.m.-5:00 p.m.**

As always, the Botanical Center will be open for **Family Weekend from 10:00 a.m. to 1:00 p.m. on Saturday, September 30** for all visitors to enjoy the tropical plant collection.

The Botanical Center held its first ever haunted greenhouse “BOOtanical Center of Horrors” last October. Participants experienced the Classroom of Creepy Curiosities with hands-on activities procured from our very own Biology lab materials before being led through the greenhouses at night. This event was so wildly popular that the Botanical Center staff will be hosting the event this year, on **October 27th, 4:30 to 8:00 p.m.** Visitors are welcome! Caution is recommended, as there will be flashing lights, uneven pathways, loud noises and disturbing images throughout. All ages are welcomed. Children 16 and younger must be accompanied by a parent or guardian. Parental discretion advised.

The 2023 Bootanical Center of Horrors event is being held at the same time as the UNI Department of Chemistry & Biochemistry’s annual “Halloween House” event, which takes place on the second floor of McCollum Science Hall. Visit both for a festive experience!

# WELCOME TO OUR NEWEST STAFF MEMBER:



**Jordan Wolff** is our new part-time office coordinator (shared with the Department of Physics), working side-by-side in Biology with Shelly Frein. Jordan is from Waterloo, IA and graduated from UNI with a bachelor’s degree in Business Administration. She has a husband (Luke), two step sons (Tristyn & Aaryn), a German Shepherd (Sam), and a cat (Milly). Her hobbies include anything outside - kayaking, fishing, etc. and hanging out with family and friends. She is a great asset to our department already!

# FLORAL MACROPHOTOGRAPHY:

Trading in her microscope and lab coat for a camera and lighting equipment, UNI biology student Bethany Van Dusseldorp tackled a unique research project that meets at the intersection of art and science.

Using a special macrophotography camera, Van Dusseldorp spent countless hours photographing different flowers and analyzing their unique structures as part of her senior thesis research project. The goal of the work is aimed at examining plant and pollinator interaction to determine how certain plants have adapted for certain pollinators, while also collecting better photography for study.

The project was a new one for Van Dusseldorp, a biology: pre-physical therapy major who plans to attend graduate school for physical therapy at the University of Minnesota in the fall.

"Most of my experience before this was looking at human anatomy and physiology, so it was new for me to be researching plants and plant structures," she said. "But I really learned a lot and valued the chance to get out of my comfort zone and gain some new skills."

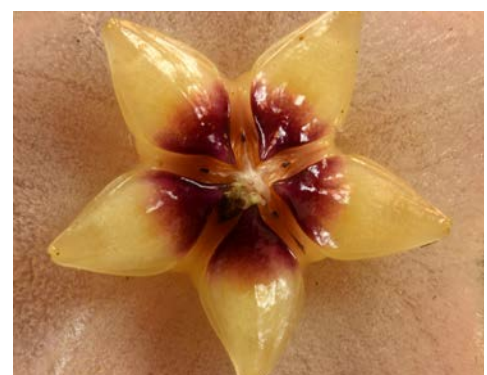
Van Dusseldorp first got involved in the research after reaching out to biology professor David Saunders, who recruited her to be a part of the project.

"We wanted to see if we could find similarities in the anatomical structure of flowers that have the same or similar pollinators and determine if there is an ideal floral design that best matches the flower to its pollinator, thereby creating the best success for pollination," Saunders said. "To date, we have far too few specimens to make any solid conclusions, but Bethany's work has set the stage for additional work to be done."

An additional desire for the project was to show flowers and floral structures in a way that most people have not seen. Using ultra-macro photography, Van Dusseldorp and Saunders were able to magnify the floral structures while stacking multiple photographs to create rich and unique depth of focus.

"There is also an artistic component of these images and we wanted that to come through," Saunders said. "The floral structures of flowers are often colorful and delicate; beautiful and almost alien-like and otherworldly when viewed at magnifications beyond what the normal human eye can see."

Photo credit to **Dr. David Saunders** and **Bethany Van Dusseldorp** who used macrophotography photo-stacking techniques to take the photos above. For more information, and to read the full story, see our "In Case You Missed It" section of this newsletter.



# ANNOUNCING THE NEW FLOYD RESEARCH FELLOWSHIP:

Thanks to a generous donation from UNI alumni **Dr. Gary Floyd (1962)** and **Myrna Spurling Floyd (1963)**, we were able to establish a new "Floyd Research Scholars Program". One Biology major per year is awarded this prestigious scholarship, with sophomore Pat Hurd receiving the first award to support the next two and a half years of scholarships and research supplies for his continued work on the gut microbiome of fall armyworm caterpillars in the lab of Dr. Jerreme Jackson. Pat's research will culminate in a senior thesis, providing him with a full experience as a scientist, developing a long-term project, collecting and analyzing data, and presenting the results formally in writing.

His application statement, excerpted below, shows the importance of research opportunities to our students:

"At the end of the Fall 2022 semester, I decided to pursue undergraduate research opportunities. I asked Dr. Jackson, my Cell Structure and Function professor, about his research program. I had done well in his class and enjoyed the content. Dr. Jackson's profile on the UNI Biology department website indicated that his research foci included the physiology of bacteria stably colonized in the caterpillar gut. As a Pre-med student. I was aware of an increased focus on

the gut microbiome as an overall indicator for human health. However, all I understood up to that point was that people drink kombucha and eat yogurt to support a healthy gut. Dr. Jackson offered me a spot in his research lab beginning in the spring semester, at the end of our discussion, and I jumped at the opportunity to begin doing "real science" in a research laboratory. During my first day in the lab, Dr. Jackson and I decided that I would focus on the impact of the alkaline conditions of the caterpillar gut on bacterial colonization. Specifically, I would be tasked with knocking out the *ntpj* gene in the host strain, *Enterococcus faecalis*. The *ntpj* gene encodes a proton-transporting ATP-ase, and its role during colonization of alkaline environments, such as the caterpillar gut, has not been determined. On that first day, Dr. Jackson entrusted me to design primers for knocking out *ntpj* in *E. faecalis* using an allelic replacement protocol. Since then, I have learned sterile technique, prepared antibiotic stock solutions, performed bacterial DNA extractions (minipreps), run single and double restriction enzyme digestions, run agarose gels to analyze restriction digests results, and contributed to all aspects of insect rearing. ...furthering my engagement with hands-on research is going to enhance my understanding of the interwoven aspects of research and medicine and enable me to be a better scientist or physician in the future."

## UNI NURSING:

The Department of Biology has been asked to play an important role in UNI's upcoming Fall 2024 BSN program. We will expand our dedication to nursing by providing additional science classes for the UNI BSN program. While doing that, we will continue to maintain our very successful Biology 3+1 agreement in which students complete three years of a biology major and 1 year of accelerated training in nursing at Allen to receive both a BA Biology degree and a BSN. Biology faculty members, **Dr. Nathan Bird**, **Sheree Harper**, **Mary McDade**, and **Dr. Nilda Rodriguez** have all been instrumental in these curricular developments.

## IN CASE YOU MISSED IT:

- [Unique research project gives UNI biology student a new perspective on plant life](#)
- [Biology graduate student journeys 7,200 miles across rural Iowa to help expand natural vegetation](#)
- [UNI is first in the world with newest synthetic human anatomy models, offering students opportunities for hands-on learning](#)
- [WATCH: See how a pre-dental degree from UNI prepares you for dental school](#)
- [Visit the Biology Preserves! Our Preserves Committee has created a new signage and a new website, complete with trails maps and welcoming information for visitors](#)



# SUPPORT THE PROGRAMS THAT MEAN THE MOST TO YOU

Financial barriers for students who want to attend college are greater than ever before. Students often make their choice of college based on where they can get the most scholarship support. We greatly appreciate the way our supporters help us make the UNI experience available to more students. You can help by donating to one of the funds below using [this link](#).

## **Biology Department Fund:**

Compliments scholarships by providing support for more general needs of all students of the department (221607)

## **Biology Undergraduate Research Fund:**

Supports doing undergraduate research projects (222596)

## **Biological Preserves Fund:**

Supports the biology nature preserves used for teaching, research and public enjoyment (220162)

## **Botanical Center Fund for Excellence:**

Supports outreach programs, community engagement & special events

## ALUMNI INFORMATION REQUEST

**Let us know what you have been up to! You can email us at:** [biology@uni.edu](mailto:biology@uni.edu)

### **Contact info:**

Dr. Theresa Spradling, Department Head  
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McCollum Science Hall 144  
Cedar Falls, IA 50614-0421  
319-273-2456  
[biology.uni.edu](http://biology.uni.edu)



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# BIOLOGY NEWS

Diversity of life... diversity of opportunities

## Would you like to support a Biology student and/or the Biology Department?

If so, please follow [this link](#) or print and fill out the form below. Form may be returned to:

UNI Foundation Financial Services  
121 Commons  
Cedar Falls, IA 50614-0239

If you would like to start your own scholarship, contact Cassie Luze: [cassie.luze@uni.edu](mailto:cassie.luze@uni.edu) / 319-273-6360

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Address \_\_\_\_\_

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Email \_\_\_\_\_ Preferred Phone \_\_\_\_\_

Please check if new address, phone or email

### I/we would like to support the following fund(s):

\$\_\_\_\_\_ Biology Department Fund, Compliments scholarships by providing support for more general needs of all students of the department (221607)

\$\_\_\_\_\_ Biology Undergraduate Research Fund, Supports doing undergraduate research projects (222596)

\$\_\_\_\_\_ Biology Department Fund, Compliments scholarships by providing support for more general needs of all students of the department (221607)

\$\_\_\_\_\_ Botanical Center Fund for Excellence, Supports outreach programs, community engagement & special events

**Online**.....Go to the online pledge form at [foundation.uni.edu/give](http://foundation.uni.edu/give). You will need to enter the specific name(s) of the Biology projects in the "Other" box.

**Matching Gifts**.... My (or my spouse's) company, \_\_\_\_\_ (name) will match my gift. Please contact your HR office for details and the matching gift form to be submitted with your payment.

**Check**.....Check enclosed, payable to the UNI Foundation.

**Credit Card**.....Please charge my card \$ \_\_\_\_\_ beginning (mo/yr) \_\_\_\_/\_\_\_\_ (Credit Card information will not be kept on file.)

Please charge my: Visa / MasterCard / Discover / American Express (please circle one)

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