

BioNews

DEPARTMENT OF BIOLOGY NEWSLETTER

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CHAIR'S CORNER



Dr. Mark Bolyard

What a crazy time it has been since we last sent out a newsletter! We were starting to assemble materials for our Spring '20 Newsletter when Covid-19 brought things to a screeching halt and we all had to re-group, as I'm sure you did wherever you are. When we returned from Spring Break, we were all online. That was a big adjustment for most of us, but with help from the online experts in our department, we had a "new normal" within a couple of weeks, and we finished the semester strong. In the midst of that, I was part of a Task Team that developed new university-wide awards for the Faculty Researcher of the Year, and Student Researchers of the Year. We returned to

campus in the Fall, fully masked and with smaller class sizes. That went well and continued until mid-April, 2021, when masks became optional. We are excited to have made it through this Covid-modified school year!

That doesn't mean that we were standing still! First, Dr. Jeremy Blaschke was named Union's Faculty of the Year, and received the Newell Innovative Teaching Award. Congrats, Jeremy! He is doing a fantastic job with his teaching, and with leading his students in their research projects. In addition, Biology students won three of the four Student Research awards for the College of Arts and Sciences! Congrats to graduate student Emilee Atkins and undergraduates Dylan Parmely and Darius Mullin.

Our Graduate program continues to go well. We recently graduated six M.S. in Biology students, and our first M.S. in Conservation Biology student successfully defended her thesis last Fall. Also, the Master of Science and Faith in Genetic Counseling program was approved by the greater faculty in February. I am the Acting Director, and am currently looking for prayer and financial support (uu.edu/msfgc). If you are interested in more information, please contact me!

Finally, we are saying goodbye to four beloved members of our department! Mrs. Cathy Huggins and Dr. Lisa Conway have retired (in this issue), and Dr. Hannah Henson and Ms. Julie Cobb are moving on to bigger and better things (next issue). We will miss them but we also welcome new members to our department, including Mrs. Meg Nethery (who replaces Mrs. Huggins), Mrs. Heather Hetrick (who replaced Dr. Mahan in Germantown), and Mrs. Susan Leviticus (who replaces Julie Cobb in Hendersonville; next issue). We also want to welcome our new departmental secretary, Laura Hailey, who is doing a great job!

Our plan at this point is to scale back to one newsletter per year, but hopefully this will continue to inform you of what is going on in the Department of Biology at Union.

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UNION UNIVERSITY

Department of Biology



RETIRING FACULTY: MRS. CATHY HUGGINS AND DR. LISA CONWAY

By Lauren Gaggley



Our department is saying goodbye to four beloved members: Retirees Dr. Lisa Conway and Mrs. Cathy Huggins, as well as Dr. Hannah Henson and Ms. Julie Cobb, who are moving on to new adventures.

Mrs. Cathy Huggins officially retired in August 2020, after teaching 10 years as a Laboratory Specialist and 2 years as an adjunct professor. Mrs. Huggins received her Bachelor of Science in Biology from Arkansas State University and her Master of Business Administration from Union. Mrs. Huggins began at Union in 2010, teaching labs for Microbiology, Anatomy and Physiology, Global Biology, and Biology 100. Mrs. Huggins said that her favorite part of being a Biology professor "is that moment when the student has that a-ha moment - you can see the light bulb come on and you know they get it."

Retirement will include spending more time for God with her church and outreach, as well as her hobbies of jewelry and t-shirt making. She expressed her fondness for her time at Union stating, "My husband and I have loved Union and it has been a huge part of our life. We will always love and support God's university."

Dr. Lisa Conway retired from Union in August of 2020 after teaching 8 1/2 years, having joined Union in February of 2012. Dr. Conway received her Bachelor of Science and Doctorate of Veterinary Medicine from Texas A&M University. She taught a variety of classes, such as the Human Gross Anatomy Lab, Anatomy and Physiology I and II, Pathophysiology, Microbiology, undergraduate Gross Anatomy, Vertebrate Zoology Lab, and General Biology Lab. Dr. Conway also taught the upper level Advanced Human Gross Anatomy for Pharmacy and graduate Biology students.

Dr. Conway said her favorite thing about teaching at Union was "getting to know my students and watch them

grow and come to understand and master subjects in their chosen fields. I was continually inspired by their faith, their work ethic, their sense of fun, and even by their struggles. Year after year I was blessed to work with exceptional individuals." Dr. Conway hopes she showed her students how the human body was fearfully and wonderfully made. She is incredibly grateful for her years spent at Union and said it has been one of the greatest blessings in her life. Dr. Conway stated that while she doesn't have any set plans for retirement, she is looking forward to spending more time with her family and has hopes of being able to travel more as COVID decreases.

Thank you, Mrs. Huggins and Dr. Conway, for your years of dedication to Union's Biology Department, and we pray you are blessed in your retirement.



UNION'S TEACHING GARDENS

By Leigh Walker

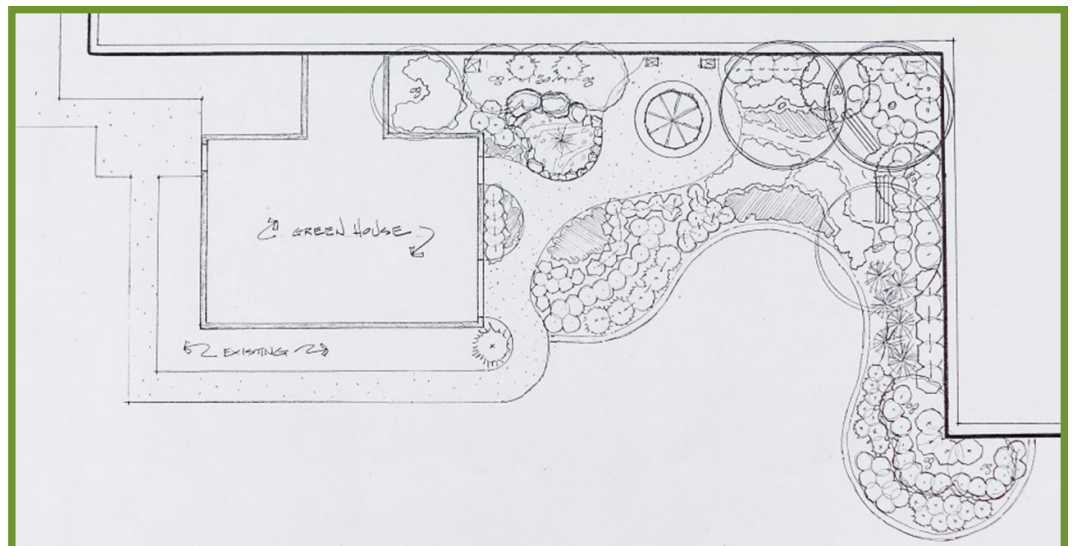
The Biology Department has approval to move forward with a Teaching Garden as part of the new Campus Master Plan. Ideas for this have been in the works for more than 9 years. The goal is to use the space between the greenhouse and White Hall as an area where people might go to relax and reflect. The garden is also aimed at expanding learning opportunities for our students related to plant sciences, such as attracting pollinators that could be studied in a variety of courses.

The teaching garden may include a water feature with aquatic plants, different levels of elevation, walking paths, as well as ornamental plants that appeal to the senses. Other ideas include an area for a raptor from the Wildlife Rehabilitation Center and perhaps a memorial to individuals who have donated their bodies to the cadaver

program. It may include benches and tables, and a sidewalk around the side of the building. While details of the garden have not been finalized, an initial map has been developed.

Completion of the project depends on funds and the number of hands that contribute to the project.

The development and construction of the garden will be carried out by the Biology Department with the assistance of Facilities Management, but additional assistance is welcome. The hope is that this teaching garden will benefit everyone who visits the area.



NEW FACULTY: MRS. HEATHER HETRICK AND MRS. MEG NETHERY

By Lauren Gaggley



In the fall of 2019 Mrs. Heather Hetrick joined the Biology Department at the Germantown campus as a Laboratory Specialist. She is also working towards her Masters of Science in Biology after previously obtaining a Bachelor of Science in Biology (doing her research with Dr. Schiebout) and a Master of Urban Education from Union University. At the Germantown campus, she primarily teaches Human Anatomy and Physiology I and II, Gross Anatomy Lab for the nursing program, and the Scientific Reasoning class at the Memphis College of Urban and Theological Studies. She said she hopes her students “gain an appreciation for God’s wisdom, beauty,

and creativity as they study the human body.”

Mrs. Hetrick’s husband, JonMark, is also an alumnus of Union University. They have two children, Elijah (3) and Susannah, who is nine months old. Mrs. Hetrick enjoys going for walks and hikes with her family, as well as reading, listening to audio books, watching movies, baking, and drinking tea.

In the fall of 2020, the Biology Department welcomed a new Laboratory Specialist, Mrs. Meg Nethery. She obtained her Bachelor of Science at Union in 2000. As a Lady Bulldog, she played on the 1998 team that won the NAIA National Championship. In 2003 Mrs. Nethery obtained her Master of Physical Therapy at the University of Tennessee Health Science Center, Memphis. She brings 17 years of clinical experience as an outpatient orthopedic physical therapist to the classroom.

Mrs. Nethery is teaching the labs for Survey of Biological Concepts, Human Anatomy and Physiology, and Gross Anatomy for undergraduate nursing students. When asked what she wanted her students to gain from time spent in her lab she said, “I pray students see the Lord as Creator when learning

about human anatomy and biological concepts and that they desire more of Him as a result. My desire is that students grow in their passion for Him and caring for His people when entering the healthcare industry.” Mrs. Nethery spends her free time with her husband, Damien, and three daughters, Kate (14), Ellie (11) and Halle (7). Her family enjoys spending time together through church, hiking, biking, playing board games, as well as watching and playing sports.

We welcome Mrs. Hetrick and Mrs. Nethery and look forward to the learning experiences they bring to Union’s Biology Department.



UNION BIOLOGY DEPARTMENT TACKLES COVID-19

By Grant Jacobs

On March 12, 2020, Union’s staff and student body were notified that they would be transitioning to online coursework. As the lights flipped off across campus, professors learned how to host video meetings while students adjusted their study methods accordingly. The spring passed and fall came back to Union, along with its students and professors alike. Their return also meant the return of potential COVID-19 carriers, and new challenges not yet seen by the Biology Department. I interviewed Dr. Hannah Henson, Dr. William Thierfelder, and Junior Biology major Nick Lewis to learn how COVID has affected them personally, as well as the Biology Department as a whole.

When asked if the transition to online courses changed their perception of COVID, Dr. Thierfelder explained how he felt reservation in realizing COVID as an actual threat to our community’s

health. It is important to note the relatively low number of cases in the United States during this early time period. Nick said, “(COVID) seemed so far off, like it wouldn’t reach us. When we went online, that’s when it felt like this was actually happening.” Dr. Henson, on the other hand, did not feel surprised when Union transitioned to online courses. She said that reality had slowly been creeping in as other schools closed throughout the country. She cited making exams on canvas as a source of frustration. Dr. Thierfelder stated, “Some people had steeper learning curves because they tried more difficult things, but the key was the university and my colleagues’ support. I had at least twenty-five (students) in one class, and they didn’t stop working. This was encouraging.” Nick said that his major challenge was



self-discipline, citing the need to put in just as much time and effort from the confines of his apartment as when he’s on campus.

They all agreed that seeing people’s faces was what they missed most about life before COVID. Nick Lewis added, “it’s almost as if there’s a wall between you and the people around you.” I believe that bringing down that wall can serve as ample motivation to continue the fight against transmission.

BIOLOGY DEPARTMENT CURRENT RESEARCH PROJECTS

By Alexis Tinsley



Luke Spivey examining PCR products on a gel.

The faculty of the Biology Department engage in a variety of faculty-student research projects. Here is a summary of their most recent research endeavors.

Dr. Bolyard is continuing to work on projects related to plant tissue culture, focusing on the impact of tissue culture on secondary metabolite production in southern wormwood. He also continues to work on tissue culture of endangered trees.

Dr. Henson worked on investigating the effects of pesticides on brain development, specifically, the chemical glyphosate (found in Roundup) on specific genes in Zebrafish. Lisa Hamilton examined its effects on the *shank3* gene (associated with autism) and Callie Brasher is researching its effects on a gene called *pax6* (essential for eye development). Charley Kate Barcroft is examining the effects of glyphosate exposure on neural development.

Dr. Choi is currently looking at the inhibition of *Staphylococcus epidermidis* 1457 biofilm using a cell-free supernatant (CFS) of *Pseudomonas fluorescens*. They are using the CFS of *P. fluorescens* to determine the inhibitory effect of quorum sensing molecules. The findings demonstrate that these molecules are an effective inhibitor of biofilm formation of *S. epidermidis*. This may be useful as a treatment for *S. epidermidis*-mediated infection associated with many implanted medical devices.

Dr. Zamamiri-Davis' research uses adult zebrafish to study the role of stress and nutritional supplementation on the expression of deiodinase enzymes that convert inactive T4 to the active hormone, T3. One project involves a review of maternal influences on fetal, neonatal and childhood thyroid disease, while the other investigates short term, excess estrogen exposure on key hormone markers.

Dr. Lockett is looking at effects of coagulation on wound healing. Specifically, he is trying to develop assays to quantify the effects of thrombin on collagen production and fibroblast migration. He stated, "This effect presumably involves a receptor called PAR-1. In the future I would like to extend this work to include other coagulation proteases or inhibitors."

Dr. Wamble discussed "the addition of a new room temperature Impregnation Chamber that will enable us to plastinate feathered and hair covered specimens. We have several specimens online now and should have our first specimens in silicone by April." An article was recently published in regard to staining of specimens to give them a more natural appearance. This lab has completed 3 Biology research projects and 4 CRNA doctoral projects in the past 24 months.

Drs. Fern and Thierfelder have been working with Dylan Parmely and Kristen Bukowsky on using environmental DNA (eDNA) to detect the presence of 2 turtle species and the American alligator from aquaria water samples. Organisms shed cellular material into their environments which can then be sampled and monitored using current molecular methods.

Dr. Thierfelder is also conducting research on how "inflammation influences the transcription of genes involved in thyroid hormone regulation and cancer. Thyroid hormone (TH) levels are controlled by deiodinases (DIOs), and inflammation can affect TH levels by changing expression of the DIO genes. We are also using the gene editing technique CRISPR to knock out genes involved in the regulation of DIOs to elucidate the molecular mechanisms controlling DIO expression under various conditions, including inflammation."

Dr. Blaschke and his research students have been working on the biology and systematics of the cricket-assassin wasps in the family Rhopalosomatidae. Some students are working to identify a newly

discovered species from Cypress Grove Nature Park, some are creating a family-level molecular phylogeny including specimens from around the world, and other students are investigating the natural history of these unusual parasitoids--how they find mates, locate hosts, and oviposit.

Drs. Schiebout and Kerfoot are "investigating the growth and distribution of *Thalassia testudinum* (turtle grass)." It is being conducted in Puerto Rico, Florida, and Union's lab. This research has involved our first Master's Thesis Student in Conservation Biology (Olivia Olson) and three current undergraduate students." Sea grasses provide sediment stabilization, critical habitats, and a food source. "As we collect data at these sites, our goal is to create a broader picture of the turtle grass' condition and develop models that aim to address the conservation of this once prominent seagrass."



Amber Rhodes measuring environmental conditions in cultured turtlegrass

Dr. Madison is "working with Tayler Schudel, a Conservation Biology graduate student, who is comparing different methods of counting wild turkeys to determine which is most effective at helping set harvest quotas." His two undergraduate students are cataloging the bird community present on a mitigation site near Rossville, TN and at a site owned by Union University.



UNION UNIVERSITY
Department of Biology

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