

BioNews

DEPARTMENT OF BIOLOGY NEWSLETTER

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CHAIR'S CORNER



Dr. Mark Bolyard

Welcome to the year of transitions at Union! Lots of changes have taken place at Union over the past few months, which include having a new President (Dr. Oliver) and Provost (Dr. Mitchell). Work is also well underway on the new library, but we are also excited to let you know that construction has begun on our greenhouse! We will have a full report as soon as it is completed. Thanks again to the classes of 2009 and 2011, as their class gifts provided the lion's share of the funding. The UU Arboretum (www.uu.edu/arboretum) is also continuing to develop, as more trees are being planted and adopted. We'd love for you to adopt a tree! As an offshoot of the Arboretum project, the Campus Aesthetics Strategy Team has been formed in order to

generate an overall plan for the campus. This should help us plant trees in the most appropriate locations, as well as enable us to make the overall campus more attractive.

We have several other new initiatives that we are working on as well. First, have just submitted the paperwork to initiate two new Graduate programs in Biology, a Graduate Certificate in Pre-professional Biology, and a Masters of Science in Conservation Biology. It is our hope that the Graduate Certificate program will begin in the Fall of 2015, and the M.S. in 2016. These would be the first graduate programs within the College of Arts and Sciences at Union.

There is another initiative with which you can help. We are planning on offering a summer residential conservation camp for high school students over Summer 2015. We plan to have one week for boys and one week for girls. Current biology students would help us run these camps, and our plan is for students who attend the camp and then attend Union to receive a scholarship. If you know of any students who might be interested, would you please let them know? We'll be establishing a web page with the "particulars" on it shortly, so we'll provide you with that information.

Thanks for your continued prayers for our work here, and we look forward to seeing you the next time you are on campus!

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A framed version of this print of the Arboretum, composed by Union art student Hilary Borden, is provided as a gift to everyone who adopts a tree.

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UNION UNIVERSITY
DEPARTMENT of BIOLOGY

RESEARCH NEWS

In the past year, Drs. Gruenke and Kerfoot have published research articles with student co-authors. Dr. Gruenke's paper, "A comparison of the effect of three adjuvants on the antibody response to ovalbumin in mice," was published with former Union student Lucas Littleton in *Bios* (84:142-147, 2013). Dr. Kerfoot's paper with former Union student Micah Fern, along with Ruth Elsey (Louisiana Department of Wildlife and Fisheries) was published in *Biology* (3:724-738, 2014) and is entitled "Scaling the feeding mechanism of captive *Alligator mississippiensis* from hatchling to juvenile." Dr. Schiebout also published a paper with Dr. Scott Franklin, a former colleague, entitled "Response of steppe riparian areas to the exclusion of cattle-grazing: comparisons at different spatial and temporal scales." Congratulations to our student and faculty authors!

Also, in a last minute update, we want to congratulate Dr. Gruenke on receiving one of two PEW Research awards for her project entitled "Explaining the Brain: A Biological Argument against Reduction of the Mind to the Brain."

FACULTY PROFILE: DR. MARC LOCKETT

by Rachel Horton

Dr. Marc Lockett, Associate Professor of Biology, has been a member of the Biology Department for the past ten years. He earned both his undergraduate and master's degrees from Murray State University. His Ph.D. was completed at the University of Tennessee Health Sciences Center in Memphis. Some of the courses that Dr. Lockett teaches include Parasitology, Cell Biology, Histology, Global Biology, and Anatomy & Physiology. Dr. Lockett's research background is in blood coagulation and parasitology. During his Ph.D. research, he examined the structure/function relationships of Tissue Factor Pathway Inhibitor (TFPI). TFPI is an inhibitor of the TF/Factor VIIa/Factor Xa complex that initiates blood coagulation. His current research interests include the study of potential inhibitors of coagulation produced by hematophagous parasites, including ticks, mosquitoes, and biting flies. He is also investigating the regulation of blood coagulation. When Dr. Lockett is not teaching or working on research, he enjoys spending time with his family. He particularly enjoys coaching his sons' soccer, baseball, and basketball teams. Dr. Lockett is also a deacon at First Baptist Church Humboldt. While speaking with Dr. Lockett, he told me that interacting with the students was his favorite aspect of teaching at Union. He enjoys helping the students make the material they have learned applicable to other coursework as well as potential research. I have had the privilege of being in Dr. Lockett's classes and he exudes a great passion for both his students and teaching. The Biology Department is blessed to have such a dedicated and passionate professor.



GREENHOUSE UPDATE

by Dr. Michael Schiebout



We have been excited to see the construction of the greenhouse progress throughout the semester. Currently, the foundation, internal structure, siding, roof, and doors are in place. The watering system, electricity, lighting system, cooling system, and heating system remain to be installed. The greenhouse will enhance many courses and research opportunities at Union. Some of these courses include Botany, Taxonomy of Vascular Plants, and Plant Physiology. Having live specimens to observe and utilize will allow for greater understanding of plant relationships, plant structure, and plant function. In addition the greenhouse will help support faculty and undergraduate research. For example, Dr. Bolyard

and undergraduate research students have been working on plant culture techniques for the African Mahogany (*Khaya senegalensis*). The trees are currently housed at a greenhouse at the West Tennessee Research and Education Center. Moving these specimens to Union will better facilitate this research. In addition, Dr. Schiebout, working with a Union undergraduate student, has looked at plant interactions of the invasive plant species Japanese stiltgrass (*Microstegium vimineum*). The greenhouse will offer better space to answer these types of questions and others. We are eager to see the completion of this building project and hope to be able to start using it Spring Semester 2015.

BIOLOGY AT GERMANTOWN AND HENDERSONVILLE

by Mary Kathryn Williams



As many Unionites already know, Jackson is not the only city in Tennessee that houses a Union University campus; Germantown and Hendersonville do as well. The biology department is involved on both campuses in teaching courses for the Nursing programs, as well as for students majoring in Organizational Leadership. In addition, as has been indicated in previous articles, research projects are also underway in Germantown.

On the Germantown campus, Dr. Faith Zamamiri-Davis and Dr. Jim Mahan are working to update the lab facilities in hopes of furthering research opportunities there. Drs. Zamamiri-Davis and Mahan are collaborating with Drs. Bill Thierfelder and Lunawati Bennett (Pharmacy) from the Jackson campus. Excitingly, Union undergraduates are involved with this ongoing research project.

Specific biology courses available on both the Germantown and

Hendersonville campuses include Survey of Biological Concepts (non-majors), Survey of Microbiology, Pathophysiology, and Advanced Pathophysiology. Students on the Germantown campus can also take Anatomy and Physiology I & II. Nursing students also have the opportunity to attend gross anatomy sessions, an experience that previously would have required travel to the Jackson campus.

Just like any other campus or university, there are many different styles of learning offered in Germantown and Hendersonville. Dr. Zamamiri-Davis stated that this semester, she had the opportunity to use a fairly new online program, "Zoom", to teach Pathophysiology to students in Hendersonville from her office on the Germantown campus. She also teaches a web based Advanced Pathophysiology class for master's degree students. A blended learning format that combines a weekly on-

campus lab with online coursework and exams is offered for the Survey of Biology course and works well with the unique schedule of adult students.

At Hendersonville, things are a bit more challenging, as there are no full-time Biology faculty or instructional staff on that campus...yet. However, Drs. Marc Lockett, Bill Thierfelder, Lisa Conway, and Tony Wamble have also been heavily involved in offering courses in Hendersonville, either using ITV (closed-circuit TV), online, or driving to Hendersonville, as has been the case in offering the clinical gross anatomy experiences.

With these campuses growing as they are, biology students, past, present, and future, should celebrate these new opportunities. We praise God and ask for His good and perfect will for our University as we seek to be excellence-driven, Christ-centered, people-focused, and future-directed in all three of Union's host cities.



ALUMNI PROFILE: DR. JAMES LAYTON

by Jenna Ward

This fall semester our featured Alumnus is Dr. James Layton. James is currently a pediatric anesthesiologist at Arkansas Children's Hospital. He also is a professor at Pulaski Tech's Anesthesiology Technologist training program. After graduating from Union he attended Medical School at the



Quillen College of Medicine (ETSU) from 2004-2008, followed by an Anesthesiology Residency at the University of Alabama in Birmingham. In 2012 he was in the Pediatric Anesthesiology Fellowship Program at the University of Arkansas for Medical Sciences. James is happily married to Carlyn Layton and is the father of four beautiful children; Luther (7), Pearl (6), Calvin (4), and Knox (1).

I recently asked James about his personal experience at Union and his journey to getting where he is today.

Did you always want to do what you are currently doing now?

Not always. Science was always my favorite subject, and in grade school I thought I wanted to be an ecologist or zoologist. However, I became convicted in 9th grade that I should pursue a career that I felt would allow me to more directly help other people and further the gospel message. That is when I felt led to pursue a career as a physician. I really wasn't sure what kind, but wanted to do something that would be useful for mission work. My initial thoughts were surgeon or primary care physician. Quillen College of Medicine seemed like a good choice because one of their mission statements is to train rural primary care doctors. However, my wife and I went on a medical mission trip to Yemen the summer after we graduated from Union, and it was during this experience that I realized that of the many medical shortages that exist in underdeveloped nations, pediatric physicians were in need. I felt that

this was an experience God was using to direct my path. In my 3rd year of medical school, I was exposed to anesthesiology and knew immediately it was the field for me. I really enjoyed the hands-on procedural component of the field as well as witnessing real time physiology from medications I gave. At

this point, God willing, I planned to pursue a residency in anesthesiology and then a fellowship in pediatric anesthesiology. This path would have given me subspecialty training with an emphasis in pediatric care, which I believed would be useful in serving the Lord in overseas medical work in the future. Thus far, I have been able to stick to this plan.

Which professor had the biggest impact on your experience at Union? How?

Dr. Huggins. Few people exude the love of Christ in their speech, action and how they treat those around them as well as Dr. Huggins. It was clear from the time I met him that this man loved the Word. He used his natural inclination toward science as a platform to give glory to the true Creator of heaven and earth. He is a true Christian role model for those who desire to serve the Lord through the field of science.

What was the hardest part of getting where you are now?

There were many challenging times during my training. Most days during the first two years of medical school, I studied more hours a day than I slept. The 3rd and 4th years of medical school were the clinical years, with long clinical hours during which there was a lot of pressure to know answers that attendings would ask on ward rounds, as well as study for each specialty exam and boards. The beginning of residency was very stressful, because then I had the ability to write orders

and prescribe treatment plans. If I made a mistake that wasn't picked up by a resident or attending, it could directly harm patients. This stress was intensified when I started my anesthesiology training, when there was the added stress of becoming proficient in life saving skills and keeping patient's hemodynamically stable during surgical procedures. However, the hardest times by far were the intensive care unit experiences. There were a lot of really sick patients I was responsible for making appropriate medical decisions and performing procedures for. The hours were very long, often requiring 24-30 hours shifts, while trying to balance family life with my wife and then two small children, and be meaningfully involved in our church. I was stretched so thin that I felt like everything I did was suboptimal. Truly, I give all glory to God and his provision of an amazing wife and church family that I was able to excel in my training and finish with an intact family, which now includes four wonderful children.

Any advice for students doing their undergrad now?

Take Eccl 12:13-14 to heart and find a church that faithfully and unapologetically preaches the word of God. There are many great people and experiences I was exposed to at Union, but by far the most important aspect of my time at college was the spiritual growth that occurred in my life at Cornerstone Community Church. Whichever church you are led to, take it seriously. Truly invest in it.

Where do you see yourself in ten years? More school? A different position?

I plan to move overseas and use the knowledge and gifts God has given my family and me to serve Him faithfully. The specifics of this calling are still being worked out, but our desire is to be able to spread the kingdom of God to areas in which sharing the gospel has been difficult in the past.