



DEPARTMENT of BIOLOGY
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DEPARTMENT OF BIOLOGY NEWSLETTER

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CHAIR'S CORNER



Dr. Mark Bolyard

Greetings! We continue to be busy here with new projects and challenges around each corner as the Spring, 2010, semester recently has come to an end. Where to begin? Well, our two new faculty members already have made a big impact and are fitting in nicely. Dr. JR Kerfoot, whom you met in our fall newsletter, celebrated the completion of his PhD in December by offering Marine Biology (as a joint course with Ornithology, offered by Dr. Andy Madison). Drs. Kerfoot and Madison covered a lot of ground, taking their classes to Georgia and Florida. Please visit our Flickr site at www.flickr.com to view photos! Dr. Jennifer Gruenke is making her presence felt as well. She recently was installed as the Director of the Hammons Center for Scientific Studies. Read more about Dr. Gruenke in our "Faculty Profile" section.

Next, let me update you on our greenhouse. In our Fall issue, I indicated that we were moving toward a greenhouse, and we now have received permission to begin the "fund-raising" portion of the project. We almost are finished developing

a promotional brochure to provide information for those interested in contributing toward greenhouse construction. Please contact me (mbolyard@uu.edu) if you would like a brochure when they are available.

In addition to making progress toward a greenhouse, we also have purchased a fluorescence microscope (see photo). This microscope was installed in January and is already being used in several classes and for student research projects. We also have purchased a bio safety cabinet to be used for projects involving bacteria and fungi that will be useful for several projects and courses as well.

While we are excited about adding these new resources to our department, we're also excited about the prospect of adding faculty. Read more about this process in our article on the addition of new faculty.

Finally, please continue to pray for Bill and Elsie Smith. Two years have passed since Mr. Smith's stroke. He seems to make slow progress, and we want to continue to lift them up in prayer.

Please feel free to stop by if you are in the area or to send an email to let us know what is happening. We appreciate your prayers and support in our work here to God's Glory!



Fluorescence Microscope

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HOMECOMING 2010

Saturday, November 6
10:30 a.m.

Biology Department
Interactive Tour and Raptor
Exhibit, Part of the Arts in the
Park on the Great Lawn.

HONORS PROGRAM

Union University's General Honors Program is a freshman-sophomore program. It involves cutting-edge teaching with Union's best professors and best students pursuing big questions in small classes. In addition to the General Honors Program, beginning in the fall of 2010, Discipline-Specific Honors (DSH) will be offered to juniors and seniors. An element of the DSH program provides an opportunity to pursue high level, funded research under the direct supervision of a faculty mentor in the student's major. It is designed to challenge students who are looking to be challenged academically. Students interested in Discipline-Specific Honors typically will apply at the end of their sophomore year, and an honors contract will be developed. Eligible students must have an overall cumulative GPA of 3.5 and meet any additional department-specific

requirements. The Biology Department requires one to have at least a 3.5 GPA in science and math classes. A one-time, one semester probation will be allowed, after which a student will be dismissed if the GPA remains under 3.5. To graduate with Discipline-Specific Honors, students must attend at least four honors colloquia during their junior and senior years. The Biology Department proposes that a specific journal club style colloquium be developed that the students would be required to attend once each semester. The other three colloquia would be from campus-wide offerings. The Biology colloquium would be open to all, but would cater specifically to Biology interests. Discipline-Specific Honors students also must complete 12 hours of honors contract courses in the major. The Biology Department proposes that any three 4-hour 300 level courses could be

chosen for contracts. An honors project/thesis in the student's major also must be produced. This project will be defined by a Biology mentor and two other faculty members. The criteria for the project are yet to be delineated by Biology faculty, but one of the criteria could be potential for publication. Any other requirements established by the department must be fulfilled as well. Students already admitted into Discipline-Specific Honors may apply for research and travel funds. The Honors Community Leadership Committee anticipates having 3 or 4 departments ready to offer DSH this fall. The majority of departments should be ready by fall of 2011, with the rest coming alongside them in fall 2012. Currently, the Biology Department is planning on offering the honors program beginning Fall 2011.

FACULTY PROFILE

by Beth Lee

DR. JENNIFER GRUENKE IS ONE OF the new faces in the Biology Department this year, and she brings a new personality to White Hall as well. Walking into her office for the interview, I could smell the scent of her African Red herbal tea drifting from her door. An avid health nut, Dr. Gruenke works out for 40 minutes every day, takes a load of vitamins, and only eats nutritious food. In her words, "We are Biologists! We need to take care of ourselves because that's what we study!"

Dr. Gruenke spent her undergraduate years as a Biology major at Bryan College in Virginia. One of only six students in the Biology program, she received a very personal education. From there, she went on to pursue her doctoral degree in Cell Biology at the University of Virginia, where Dr. Gruenke worked on a thesis concerning the influenza virus and the protein hemagglutinin. Art work related to her research appeared on the cover of the Journal of Virology.

After considering a career in research, Dr. Gruenke decided she preferred the teaching environment to that of a lab. Her first job was as Assistant Professor of Biology at Patrick Henry College in Virginia, and, after five years there, she taught at Bluefield College in Virginia for two years. From there, she came to Union University, and is now an Associate Professor of Biology, specializing in Immunology. She is fast becoming a very active part of the Biology department, taking over the position as director of the Hammons center, and beginning a long-term research project with T-cells.

Dr. Gruenke's research will consist of studies of certain regulatory T-cells and their effects on the body. These particular T-cells are involved in protecting the human body and tissues against its own immune system. However, these cells also protect tumors from the immune system, creating a safe environment for cancer growth. The key to this research is finding the right balance of T-cells that will allow for cancer treatment as well as auto-immune protection. Students



Dr. Jennifer Gruenke

are signing up to work with Dr. Gruenke on this project, and she is looking forward to working with them in the following semesters.

Dr. Gruenke is a great addition to the Union University Biology department, and, if you ever need to ask her a question, get health advice, or see a smiling face on a long day in White Hall, her door is always open.

ALUMNI PROFILE

by Nathan Chatham



Jill Konkol

AFTER GRADUATING FROM UNION in 2007, Jill Konkol was accepted to Wake Forest University School of Medicine. Currently starting her fourth year, Jill already has enjoyed a wide variety of experiences in the

medical field. While her first two years of medical school focused on medical education, Jill is spending the second two years involved in direct patient care at Wake Forest University Baptist Medical Center. Medical students have the opportunity to experience areas of medicine such as Pediatrics, Surgery, OB/Gyn, and Internal Medicine.

At the moment, Jill is serving with the Geriatric unit of the medical center and is enjoying the time she is able to spend with patients. Jill feels that the daily

challenges of patient care thoroughly test both her medical knowledge and ethical standards. These challenges are a huge part of medical education and are a major component of preparing students for the medical field. While medical schools allow students to experience a wide range of specialties, Jill's current goal is to become a primary care physician. Jill hopes to be able to see patients frequently enough to build close relationships with them and aid them in maintaining long term health. She also is thinking of working to serve one of the many underserved areas in our country. The potential shortage of primary care physicians in the near future is another driving factor in her decision.

Jill feels that her time at Union aided her in her preparation for medical school in many different ways. The classes offered at Union provided valuable base knowledge that made the daunting amount of required medical information easier to handle. Jill also credits a number of professors for their hand in her preparation. Because Gross Anatomy is

one of the first courses taken by medical students, Dr. Huggins' Gross Anatomy course was invaluable to Jill's medical education. Dr. Weaver's Genetics, Dr. Wofford's Developmental Biology, and Mrs. Smith's Immunology courses were all important and provided relevant information to her medical education. Classes with Dr. McMahan prepared her for the attention to detail that is required of medical students. Also, her time with the cross-country team prepared her for enduring long work shifts with little rest.

When asked if she had any advice for current Union students, Jill emphasized the importance of having a well-rounded life. She encourages students to enjoy activities outside of school and work. Take breaks and enjoy life, or you will burn yourself out before you reach your goal. Jill is thankful to everyone who aided her in her journey at Union and wishes current students the best of luck in reaching their goals.

ADDITION OF NEW FACULTY

AS YOU MAY HAVE NOTICED, THE Department of Biology has been growing quite a bit lately, and we are going to continue to grow. There are several reasons for this growth. First, the University itself is growing for a variety of reasons, not the least of which has been the response of the University community, particularly the students, to the February, 2008, tornado. Second, the programs that Biology supports, such as Nursing, Pharmacy, Athletic Training, and other health-care related fields, are growing, which has led to growth in our courses (along with some adjustments to our curriculum, including the collaborative research experience course, described elsewhere in this issue). Third, more students are coming to be part of our department for a variety of reasons,

including the opportunity to work with our growing and diverse group of faculty, including new faculty, Dr. JR Kerfoot (whom you met in our fall newsletter) and Dr. Jennifer Gruenke (article in this issue).

This past academic year, we conducted searches to hire two additional faculty members, but neither search was successful. We will begin the hiring process again in the fall.

So, what are the specialties of the people we are hiring? First, we are hiring someone to teach human gross anatomy and other related courses. The demand for gross anatomy courses continues to grow, as the courses are taken not only by biology majors, but also by nursing, pharmacy, and athletic training students.

We are looking forward to hiring someone who not only can teach these courses, but also can provide new opportunities for student research projects. We also are searching for a plant scientist to teach our current plant courses, (botany and plant taxonomy) develop new ones, (particularly plant physiology), help supervise a future greenhouse (see our Fall, 2009 issue), and work with students on research projects.

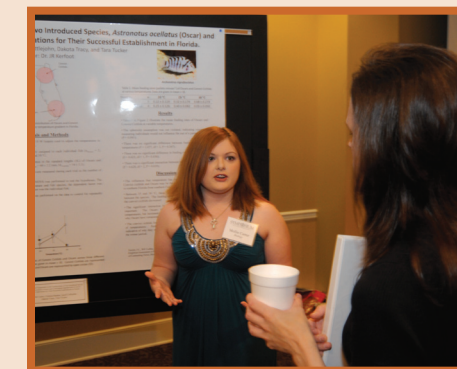
One of our biggest challenges in hiring new faculty is where to put them. Fortunately, this summer our storage room will be remodeled into two new offices. We are looking forward to having these new colleagues join our department!

COLLABORATIVE RESEARCH EXPERIENCE

IF YOU MENTION THE WORDS "Scientific Research" or "Scientific Inquiry," most people cringe! However, to students training in the biological sciences, research should be viewed as an opportunity to acquire the tools needed to be successful. Historically, Junior/Senior-level biology students have been required to develop, implement, and present original research to fulfill graduation requirements. For some students, the thought of having to do an individual senior research project is intimidating, and, for others, such as those pursuing the 3+1 pre-pharmacy option, it simply will not fit into their schedule. Enter the Collaborative Research Experience course. This semester-long course is designed to expand students' familiarity with the scientific method as well as enable them to develop a research project, acquire data, and present their findings while working in small groups. Beginning with recapping the scientific method, the course immediately shifts to brainstorming ideas and developing testable research questions and hypotheses.

This past spring semester, the course was offered for the first time under the direction of Dr. JR Kerfoot. The inaugural five students worked together to develop a project that sought to investigate the physiological mechanisms that provide

non-native (invasive) fish species with the ability to assimilate successfully into new habitats. More specifically, their research investigated the influence of temperature on the feeding rates of two non-native species that were introduced into Florida waters. The students noticed, from literature reviews, that not all non-native species introduced into Florida waters



were successful, and, for those that were, some expanded their range faster and to a greater extent than others. The students proposed the following question: if water temperature influences the feeding rate of two invasive species differently, then this may be part of the explanation as to why one species is located only in the water of south Florida whereas the other is found all

over the state. They met during and outside of class to set up aquaria and experimental systems to house the fish. Some of the fish were acquired from the local pet store whereas others were captured successfully out of the large display aquarium located in White Hall. Several trials were run, allowing students to document the feeding rates at various temperatures for the two non-native fishes. After the data were collected, statistical analyses were run and results discussed. Each student had the opportunity to lead throughout different portions of the project. This group then presented a poster detailing their research project and hard work at Union University's Scholarship Symposium. They fielded questions from the audience and seemed to have a good time, feeding off of each other's energy during the presentation.

As no man is an island, such is research. In a real-world context, the Biology department at Union University has developed the Collaborative Research Experience to allow student researchers to collaborate on research projects and work together in approaching scientific inquiry. Whether it is studies documenting the influence of temperatures on the feeding rates of fish or cutting-edge cancer research, collaboration in the scientific community is key to reaching the overall goal of science, to pursue truth and document God's glory.