

# Biology Department Newsletter 2013

## FROM THE CHAIR

This year is again a year of change. We are saying goodbye to John Winkelmann, after fifty years (yes – that is five O!) of teaching at Gettysburg College. As Kay Etheridge remarked in her valedictory (see below for excerpt), John arrived when Gettysburg was celebrating the centennial of the Battle, and is leaving during the sesquicentennial. What a way to bookend a career! But more impressive is how active John remained through five decades, taking students to do fieldwork in South Africa for most of the last six summers. We will be honoring John's contribution to teaching and scholarship at this fall's Homecoming (details below).



From left to right and back to front: Jan Mikesell, Greg Krukoni, Kazuo Hiraizumi, Matthew Kittelberger, Gerardo Carfagno, John Winkelman; next row includes Istvan Urcuyo, Kay Etheridge, Cheryl Vogel, Diann Cooper, and seated are Véronique Delesalle, Ryan Kerney and Ralph Sorensen. Missing in action for the photo were Steve James and Jennifer Powell.

This past academic year involved major renovations of McCreary. All of Biology, except the four faculty with offices in Science Center, had to pack their offices and laboratories for a summer and fall semester in trailers. We moved back into the building – and into some renovated lab spaces – in January and it is so good to be back in our building. For me, this was the third time in twenty years that I had to move out of my office and lab for at least a summer. I hope this time was the last time. The hassle was worth it. In addition to upgrading McCreary's HVAC, we took advantage of being out of the building to renovate five research laboratories. The lab used for decades for microbiology/parasitology was completely renovated with help from Alden Trust funds. The end result has been a tremendous improvement; the new lab arrangement facilitates student interaction with each other and with their lab professors, and the room is both more efficient and more flexible. This space is used by four courses (including virology and the phage course) and multiple research students. Last but not least, we created a new student lounge next to the Vertebrate Zoology lab. The building still feels like McCreary but better! Come check it out.

We have also been putting in place the various components of our Precollege and Undergraduate Science Education grant from the Howard Hughes Medical Institute (HHMI).

**Research ready-** Most of Biology's HHMI curricular initiatives are geared towards the first year. We are continuing to teach our FY research course on *Phage Biology* and next spring we will add a second FY research course on *DNA Damage and Cancer Biology*. In addition, one lecture section of our spring intro Biology will be co-taught with intro Chemistry with the goal to help students better grasp the connections between these two fields. Finally, we are including more problem-based learning in Bio 112. We will carefully assess the impact of these curricular changes and determine how to expand as appropriate.

**Research active-** A new cross-disciplinary Science Institute at Gettysburg (X-SIG) is overseeing our science summer research program, funding student participation in summer research as well as other initiatives. This summer, the X-SIG is providing partial or full funding for 34 students (12 in Biology-see below for details on three of these) doing research with 17 faculty member (six in Biology). As of June 1st, we had our first summer brown bag lunch, learning about the research taking place in Profs Funk's (Chemistry) and Stephenson's (Physics) laboratories.

This year we also saw the implementation of the **Randall S. Alberte '69 Research Fund**. Four of our Biology summer students are the first Alberte fellows, receiving their summer stipend from the fund and their research monies from our HHMI grant. In an age of specialists, Randy's work was deeply interdisciplinary, so we think he would have been pleased to know his gift was a crucial component in getting our HHMI grant.

**Research connected-** Three elements of our HHMI grant fall under this heading. We inaugurated our Interdisciplinary Seminar Series with some truly marvelous seminars. Dr. Steve Finkbeiner, Associate Director and Senior Investigator at the Gladstone Institute and Professor of Neurology and Physiology at the University of California, San Francisco, gave a fascinating lecture on Alzheimer's and Parkinson's diseases. The talk by Dr. Andy Ruina, Professor of Mechanics at Cornell University, on walking robots was another standout.

Next year we will add a peer mentoring program for introductory science courses, and inaugurate a residential Science House to enhance student sense of community while honing their leadership abilities. You can stay updated about activities associated with our HHMI grant by checking <http://www.gettysburg.edu/about/offices/provost/hhmi/>.

--Veronique Delesalle, Chair of Biology

## **HERZOG TEACHING FELLOWS**

One of the most powerful learning experiences for undergraduate students occurs when they are asked to assume the role of teacher. With support from Karl Herzog '62, nine students who demonstrated mastery of concepts in Genetics and Cell Biology and who expressed an interest in teaching served as Herzog Teaching Fellow in those courses in the past year. Recently, Karl committed to supporting this valuable program at an increased level for the next two years, for which we are very grateful.

## **New Symbiosis Course Explores the Ways We Get Along**

Our new assistant professor, Ryan Kerney, inaugurated a 200-level organismal course on symbiosis in the spring of 2013. Students learned about a variety of topics through the lens of organismal interactions with a particular emphasis on the interactions between multicellular organisms and microbes. This increasingly important topic has been the focus of many recent developments in biological research, with far-reaching implications for both agriculture and medicine. The course allowed students to explore the emerging synthesis of traditionally disparate biological disciplines such as behavior, genomics, immunology and ecology. Their work included an in-class research project on a local salamander-algal symbiosis, which resulted in an amazing time-lapse video (<http://youtu.be/79TMal2jfl8> - by the end of the short video you can see embryonic movement). Students also wrote weekly blogs that reviewed articles from the scientific literature. The sixteen students published nearly 200 blog entries on the various symbiosis-related topics over the course of the semester (see [gcsymbiosis.wordpress.com](http://gcsymbiosis.wordpress.com); you will be entertained and educated).

Dr. Kerney also has three HHMI-supported students working on various projects that deal with amphibian development and symbiosis. One student is working to generate transgenic frogs that express fluorescent proteins in bone-forming cells. This project will help reveal the stem cell lineage that gives rise to bone in the adult frog, but is developmentally inactive during the tadpole stages. Two other students are studying microbial communities that occur on the skin of lungless salamanders. Previous research has shown beneficial bacteria on particular salamanders is capable of warding off the emerging infectious disease chytridiomycosis, which is devastating amphibian populations world-wide.



Kenny Anderson measures a red-backed salamander.

## **BIOLOGY STUDENTS CONTRIBUTE TO INTERDISCIPLINARY EXHIBITION**

Six Biology majors enrolled with 11 other students in a new IDS course on Renaissance science and art taught by Professors Kay Etheridge and Felicia Else (Art History). The class mounted and curated a fascinating exhibition in Schmucker Art Gallery last fall (see [gettysburgwondercabinet.wikispaces.com](http://gettysburgwondercabinet.wikispaces.com)). The exhibition featured numerous items from the Biology department and faculty collections including several beautiful fossils from Professor Kazuo Hiraizumi, shells and corals from Professor Istvan Urcuyo, and an “antique” twin placenta from Professor Ralph Sorensen’s developmental course. If you click on the virtual panorama created by sophomore Biology major Dina Mohamed-Aly you may very well see specimens you studied in lab!

## **TENURE DECISION**

We are happy to report that Dr. Matthew Kittelberger has received tenure and will be promoted to the rank of Associate Professor starting in Fall 2013. Matt was hired as the department’s first neurobiologist in 2006, and in addition to developing and teaching that course, he teaches in the introductory courses and in Cell Biology. Matt also developed a popular FY Seminar entitled “Autism: Facts, Myths, and Controversies.” His research interests concern the neural mechanisms of behavior with a particular focus on the neurons and circuits involved in vocal communication. Matt is currently working on a species of singing toadfish called the plainfin midshipman. Studying brain circuits involved in vocalization in these fish allow him to explore questions regarding the evolution of the brain, as well as questions regarding the basic mechanisms by which animals modulate their vocal communication behaviors during social interactions.

## **RETIREMENT**



Professor John Winkelman and a fan (red bat) recently trying to visit him in McCreary.

John Winkelman's teaching career at the college began in 1963 with Comparative Anatomy offered to more than 50 students a semester Tues, Thurs and yes, Saturdays at 8 am. The laboratory met on 4<sup>th</sup> floor Glatfelter twice a week for 4-5 hours. (Those were the good old days.....) More recently John has taught introductory biology, Animal Behavior and Vertebrate Zoology. The latter is famous for its field trips, both in the Gettysburg area and to North Carolina in recent years. According to students in Vertebrate Zoology this past year it is still difficult to keep up with him in the field even after 50 years; apparently John can hike all day leaving students decades younger than him in his wake. According to the students, he has the ability to glide across the landscape without looking down for things like roots and holes. In the past John would even take students on collecting trips to Mexico, where he also did research on bats. Oddly, it is a Mexican mouse and not a bat that was named for him-- *Peromyscus winkelmanni*. After Mexico John studied bats in Papua New Guinea and then Kruger National Park in South Africa. Since 2004, he has received grants to take almost a dozen Gettysburg students to Africa.

We are planning a cocktail reception to honor John at homecoming this fall – Friday September 25 from 4-6 pm. The department welcomes donations in honor of John Winkelman's dedicated contributions to the College (please designate as Biology Special Gifts – Winkelmann); these will be used to support either Vertebrate Zoology or Animal Behavior.

### **VISITING PROFESSOR KATHRYN LORD**

Dr. Lord will be teaching Animal Behavior next year in addition to other courses. Her research involves wolves and domestication in dogs; for more on her work see <http://www.sciencedaily.com/releases/2013/01/130117152012.htm>.

### **The Class of 2013.... And beyond!**

Almost two dozen students participated in *Celebration* in May, either by oral presentations or posters on a wide range of research topics ranging including bacteriophages, DNA damage signaling, and the effects of deforestation on salamander communities. Andrew Schmucker ('14) won the college-wide Stock Writing prize for the sciences. Professor Peter Fong published a paper in *Marine Environmental Research in 2013 with* Nikolett Molnar '07. Gettysburg students also presented their research at several conferences and meetings this year. From Steve James' laboratory, three students presented their studies on cell division and DNA damage at the Pennsylvania Academy of Sciences annual meeting. From Jennifer Powell's laboratory, two students presented their work on innate immunity and stress responses at the 19<sup>th</sup> International *C. elegans* meeting and two presented at the MicroNet Undergraduate Research Symposium. Two students working on bacteriophages in collaboration with Greg Krukonis and Véronique Delesalle presented at the SEA-PHAGES 5<sup>th</sup> Annual Symposium. Eleven graduating students have reported to Diann Cooper that they have been accepted into graduate or medical school. Four Biology majors and nine BMB majors received honors this year. The traditional dinner for Honors students was supported by the Barnes fund, and next year will be supported by additional funds generously donated by the parents of John Vitarello '13. The dinner followed a seminar by James McGough, M.D '79, now at the UCLA School of Medicine, who spoke on "The Genetics of ADHD." Students who have graduated over the past few years continue to notify us of admission to graduate and medical programs and other accomplishments. We love to hear from you regardless of when you left Gettysburg, so keep those calls and emails coming.