

Biology Department Newsletter Summer 2011

From the Chair

Building on our strengths - that is what comes to mind when I think about this past academic year. The arrival of a new Provost provided an opportunity for us to reflect on our goals as a Department. I think we provide a rigorous curriculum in a supportive environment, which sometimes – or is it often? - means challenging our students to push themselves harder. And, given what I heard at our Homecoming reception last October, that was true twenty, thirty and forty years ago. And we want to make sure that our current graduates feel the same way in twenty, thirty or forty years! As you can read below, the class of 2011 was another great group.

In the next few years, we will be hiring two new colleagues in Biology. One of the challenges we face will be to provide them with remodeled research space that will allow collaborative work with students. The Science Center is wonderful, but only four Biology faculty are housed there. The rest of us are still in McCreary, which has not been fully renovated since the 1970's. Happily, major renovations on McCreary will begin in the summer 2012 that will result in the renovation of a number of research and teaching laboratories. The discussions with engineers and an architect have begun, and we are excited about the potential impact of this project. When you receive your newsletter next year, we will be in the middle of that work.

Sometimes, opportunities come out of left field. We have news to share about two such opportunities, which will benefit our incoming students. So, continue reading!

Virus Hunting Comes to Gettysburg College

Next fall, we will be offering a yearlong research experience for first-year students. This project, a collaboration with the Howard Hughes Medical Institute's Science Education Alliance, will involve students in a nation-wide research project focused on discovering and describing the phages (viruses) that infect a particular species of bacteria. Gettysburg College is one of 26 new schools joining HHMI's SEA, which already includes 36 other schools.

Phages are some of the most diverse life forms, but they are poorly characterized. They are critical to understanding bacteria population dynamics and can be used to control bacterial pathogens. In the fall semester (BIO 113), students will learn how to isolate and purify phages, describe the growth characteristics of their phage, characterize its morphology via electron microscopy, and isolate and purify their phage DNA to have it

sequenced. In the spring semester (BIO 114), students will use bioinformatics techniques to analyze the viral genome and will identify genes in the sequence. Gettysburg students may even discover and name new genes. They will compare their phage genome to a database that contains over 160 sequenced phage genomes and propose hypotheses to explain the differences and similarities they observe by comparing genomes.

The Virus Hunting research experience has garnered quite a bit of national press (google phage hunting course to check it out), so we are thrilled to be able to bring this type of experience to GC. This project will be open to a limited number (16) of students. In this first year, 41 incoming students have applied to be part of this course/research experience. If this has the transformative impact we expect, we hope to be able to offer more courses like this in the next few years.

The Randall S. Alberte Research Fund

We were saddened by the loss of one of our alumni last fall. Randall S. Alberte '69 passed away on Oct. 4, 2010. Soon afterwards, we found out that Randy had made us – the Biology Department – one of the beneficiaries of his estate. We are humbled both by his generosity and the impact his gift will have on our Department. We are using Randy's gift to establish a fund to support student-faculty research collaboration. Given Randy's career, we know that he would be pleased with this use of his gift (and we have the support of his family and friends with this decision).



(photo of Randy Alberte '69)

At this Spring's Honors Day, Randy was posthumously awarded the Distinguished Alumni Award. Randy graduated with honors in Biology in 1969 and went on to an extraordinarily diverse career that encompassed academic teaching and research, government research and development, and consumer biotechnology. In an age of specialists, his work was deeply interdisciplinary, incorporating plant physiology, marine biology, biochemistry, microbiology, and biotechnology. In the course of his career, his work garnered funding from federal and international sources, including the National Institutes of Health, National Science Foundation, NASA, NOAA, the U.S. Department of

Agriculture, and the Department of Defense. A fellow of the American Association for the Advancement of Science, his professional service includes a lengthy list of advisory and editorial boards. From 1999 until his death in 2009, Dr. Alberte led research and development and intellectual property initiatives at cutting-edge biotechnology firms. He is listed as primary or sole inventor on more than 90 issued or pending patents.

Starting in summer 2013, the Alberte fund will allow us to support at least five additional student researchers. Our current campus summer program involves eight to twelve students every year, and with the addition of new colleagues, we expect that in the next five years we will have a vibrant summer research program that could easily involve twenty students.

Supporting the Biology Department.

Any gifts that you make to the Gettysburg Fund indirectly support the work that we do in the Biology Department. If, in addition, you want to support the Biology Department directly, you can now do that in one of two ways:

Donations to the “**Alberte Fund**” will allow us to grow that resource and to support more summer student researchers.

Donations to the “**Biology Special Gifts**” fund will be used to support new teaching initiatives and to buy small pieces of equipment for particular research projects.

Homecoming 2010

The October 1st reception honoring retirees Ralph Cavaliere and Sherm Hendrix was well attended by a number of alumni as well as current members of the College community. Carol Hendrix is pictured with Sherm, and Diann Cooper, our extraordinary departmental assistant is pictured with Ralph.



Alumni seminar speakers

On honors day we welcomed back Dr. Louis Kunkel '71 to give the Robert D. Barnes Memorial Lecture, and he discussed *Muscular Dystrophy: from Gene Discovery to Therapy*. Early in the spring semester Jessica Mong '91 presented some of her research on *Hormonal Modulation of Sleep*. Jessica is assisted in her lab at the University of Maryland by a more recent alum, Shaun Viechweg '08.

Fossil Collection

Recently, the Biology Department was the recipient of the generosity of the estate of Dr. Patricia McLaughlin '56. Through the dedicated efforts of her friend Mrs. Ruth Goen, the college received Dr. McLaughlin's fossil and marine-shells collections, which include fossils ranging from a whale vertebra collected in Iceland to fossilized Pectinidae bivalves from the famous Calvert cliffs on the western shores of Chesapeake Bay in Maryland. In addition, Mrs. Goen has also kindly donated a number of vertebrate and invertebrate fossils from her own personal collection to the department. The fossils will be incorporated into the teaching and demonstration collection used in the new Paleobiology course offered by Dr. Istvan Urcuyo.

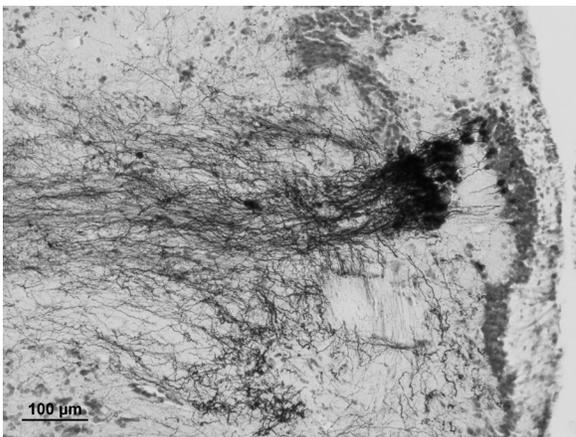
From Micro to Macro

Beauty in natural forms can be seen on many scales, as represented by our 210 gallon marine aquarium in the departmental lounge, and photos of neurons captured using our new Nikon Eclipse 90i microscope.

Over the last five years the aquarium has become a highlight of campus tours and a delight for students, faculty, staff and visitors. The aquarium originally began with a 75 gallon set up as a Pacific Reef community. About a year later, the larger aquarium and associated hardware was kindly donated by Tim and Ceil Wagaman from Fayetteville, PA. At a later time, the aquarium caught the attention of Paul and Monica Geppert (Harrisburg, PA) and they decided to donate their 135 gallon marine aquarium to the department; this donation included a number of very colorful and expensive corals and fishes. Big thanks to all the wonderful donors for their generosity as well as to the past and present students who have provided significant help with the setup and daily care of the aquarium display over the years. This list includes Andy Kough, Kevin Hagerty, Danielle Rubinstein, Christian Neumann and Ankit Aryal. Currently we have over 25 different species of hard corals, soft corals, echinoderms and fish. Young visitors particularly seem to enjoy the presence of the Royal Blue Tang ("Dori") and two clown fishes ("Marlin" and "Nemo", of course). We hope that when you next visit campus, you can stop by the lounge and enjoy the aquarium. Maybe you will get lucky and visit during feeding time!



High-resolution photomicroscopy tools, such as the state-of-the-art digital Nikon fluorescent microscope, are essential for exploring relationships between structure and function. This photo shows dopamine-containing neurons and axons in the brain of a midshipman fish. These fish neurons are homologous with mammalian midbrain dopamine neurons in the substantia nigra and ventral tegmental area, which are involved in motor coordination, motivation, and appetitive reward. Using fish as a model system, Dr. Matt Kittelberger and students such as Alexander Allen '11 hope to better understand the brain mechanisms by which these neurons regulate social behavior. Indeed, the neurons shown here connect to other parts of the brain known to drive vocal communication used in social interactions in these fish. The neurons shown here have been stained using an antibody against the enzyme tyrosine hydroxylase, which synthesizes dopamine.



The Class of 2011

Another exceptional class graduated with degrees in Biology or BMB this year; thirteen received honors in Biology (Amanda Black, Alexander Allen, Alexandra Henning, Jordann Smak, John Bostrom, Alyssa Cecchetelli, Kathleen Clay, Suzanne Ramazani, Stephen Stopenski, Autumn Hynson, Brenda Kelly, Kerri Norris, and Margaret Ewen) and six in BMB (Matthew Brady, Christina Kelliher, Amrit Khalsa, Julie Kobie, Nicole Meredyth, and Stacy Taylor). Eight Gettysburg students have been accepted to medical schools this year. Hanna Anthony received an honorable mention for the prestigious Goldwater scholarship, and along with Jordann Smak, is presenting her research on the FSHR-1 transcriptional target gene in *C. elegans* at international meetings in Los Angeles this summer. Both students worked with Dr. Jennifer Powell, as did Shannon Hartley. The topics of student capstone projects this year were as diverse as ever, including for example research on factors affecting oocyte maturation in mammals, gene structure and expression in a variety of organisms, the evolution of plant reproductive systems, the ecology of box turtles, and stress hormone levels in dogs.

Until the next Newsletter

Please visit the departmental website at www.gettysburg.edu/academics/biology/ for more stories about student and faculty research, and current information about the department. And remember- we always love to hear from our alums!