Gettysburg College Biology Department Newsletter

September 2016

Left to right – front row: Matt Kittelberter, István Urcuyo, Steve James, Kazuo Hiraizumi
Back row: Cheryl Vogel, Ralph Sorensen, Jen Powell, Jan Mikesell, Zakiya Whatley, Diann Cooper, Nikki Shariat
Missing: Véronique Delesalle, Peter Fong, Ryan Kerney, Alex Trillo

From the Chair

Greetings from Gettysburg! Wow, what a busy year of changes in the Biology Department. As many of you know, Ralph Sorensen retired after 39 years. We'll all miss his fantastic sense of humor and his thoughtful dedication to rigorous teaching. We hosted a riotous farewell bash for him in the Gladfelter Lodge after classes ended in May, and anyone returning to campus for Homecoming this fall who wants to thank Ralph for his years of service will find him in the crowd at the reception on Friday, September 30th from 5-7pm in the Jaeger Athletic Center.

Diann Cooper, our longtime Departmental Administrative Assistant, is also retiring as of September 30th. Diann arrived at Gettysburg only two years after Ralph (in 1979), and has been working for the Biology Dept. since 1999. We're all more than a little bit nervous about how we'll cope without Diann's steady hand at the tiller.

Zakiya Whatley is transitioning from a two-year position as a Gondwe Scholar into a tenure-track position. We're excited that she's sticking around! Zakiya earned her PhD in Genetics from Duke University. See more from Zakiya below about her research interests. For now, she'll be teaching Cell Biology and in our Introductory Biology sequence.

Two other relatively new members of the Department – Nikki Shariat (entering her 2nd year) and Alejandra (Alex) Trillo (entering her 3rd year) – continue to settle in. See below for more about the new research and teaching directions they are developing.

Jennifer Powell passed through the tenure process this past year with flying colors, and we're thrilled to have her energy, creativity, and dedication to teaching and mentoring continue to help our department and our students. She's introduced a full-semester research experience to the fall semester of our Genetics course in recent years, enabling students to screen for novel genes involved in the immune response in the nematode, *C. elegans*. Congratulations to Jen!

Steve James is the new Chair of the Biochemistry and Molecular Biology Program. He begins his three-year term this academic year, replacing Kazuo Hiraizumi who has completed his service in this position for the past two years. Thanks Kazuo!

We're introducing four brand new courses this year: Molecular and Genome Evolution (BIO 315), taught by Dr. Delesalle; Physiological Ecology (BIO 206), taught by Dr. Etheridge; Microbial Pathogenesis (BIO 330), taught by Dr. Shariat; and Tropical Terrestrial Biology (BIO 229) designed by Dr. Trillo. The latter course involves a field trip to the Peruvian rainforest at the end of the semester (see more below). We're excited about the diversity of new science we'll be able to expose our students to with these courses.

As always, we had a busy research summer in our labs and with our students, as Dr. Delesalle describes in her summary of the final year of our HHMI Science Education Grant. This grant has enabled us to launch some fantastic new interdisciplinary coursework and faculty-student research – initiatives that we'll be able to sustain beyond the end of the grant thanks to some generous donors (Harrison Dickson, '48, and Eric Kolbe, '65), and the support of the Provost's office.

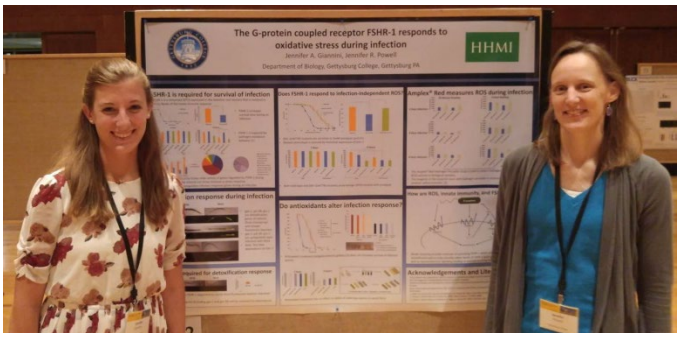
Finally, we're welcoming to campus this year 12 students supported by a National Science Foundation STEM (Science, Technology, Engineering and Math) grant providing scholarship support for students traditionally under-represented in the sciences. This grant was co-written by Istvan Urcuyo, from the Biology Dept, Darren Glass (Math) and Jackie Milingo (Physics). See more below about these new students and the program that will support their success in the sciences.

We could not, of course, continue to make these changes to enhance biology education at Gettysburg without the generous support of our alumni and friends. We thank you for that support, and look forward to hearing from you about your own lives and successes.

All Our Best,
Matt Kittelberger, Chair of Biology

Congratulations Dr. Jennifer Powell

Dr. Jennifer Powell was granted tenure in the past year and recently promoted to Associate Professor. Her research centers on innate immune responses using techniques from molecular genetics, microbiology, and the nematode *C. elegans* as a model for g host/pathogen interactions. Jen is known for her excellent mentoring of undergraduates, which she says is the favorite part of her job. She says that "I love being part of their development from novices into independent scientists. Their enthusiasm and dedication are both inspirational and contagious."



Dr. Powell is shown here with Jenny Giannini '18, who presented a poster at the International conference on Aging, Stress, and Pathogenesis in *C. elegans*. The organizers entered her poster in the graduate student poster competition and she won 3rd place in the entire meeting! In the past year she also published two papers with student authors: Miller, Elizabeth V. '13, Grandi, Leah N. '14, Giannini, Jennifer A. '18, Robinson, Joseph D. '15, and Powell, Jennifer R. "The conserved G-protein Coupled Receptor FSHR-1 regulates protective host responses to infection and oxidative stress." (2015) PLOS One 10(9): e0137403, and Robinson, Joseph D. '15 and Powell Jennifer R. "Long-term recovery from acute cold shock in Caenorhabditis elegans." (2016) BMC Cell Biology 17:2.

Year One of scholarship program to enhance diversity in the sciences

We have welcomed to campus our very first STEM Scholar student cohort! These 12 students were selected from a large pool of applicants and are now fully involved in their freshman year as science majors. Four students are interested in Biology, five in BMB, two in Physics and one in Chemistry as potential majors. Through this program, supported the National Science Foundation and scholarship and Gettysburg College, STEM Scholars receive enhanced mentoring during their crucial first two years at college. Activities include participation in a 2-day STEM-focused workshop on campus, enrollment in a new and exclusive First Year Seminar (*Stem from the Ground up: The thrills and skills of science*) taught by Dr. István Urcuyo (Program Director). Students are also mentored by STEM Faculty Liaisons from their respective science department on campus. Last but not least, generous contributions by many members of the Gettysburg College community provided each STEM Scholar student with a new laptop for their academic career at Gettysburg. Many Biology alumni and faculty in the laptop crowdfunding program, and we thank you for your continued support. We are excited to have this great group of students on campus and are already working toward the recruitment of the next cohort of STEM Scholars arriving in Fall 2017. Stay tuned!

Left to right: Nicole Linard, Emily Kurtz, Jonathan Trilleras, Aissata Samake, Tayler Rodriquez, Cindy Campoverde-Reinoso and Lidia Molina Serpas. Not pictured: Alexis Fierro, Shelby Nicolau, Alexander Paredes, Courtney Ward and Craig Cissel.

HHMI GRANT

In the last year of our HHMI grant, our science summer research program supported 54 students doing research with 23 (nine in Biology) faculty members. Last summer 19 students conducted research with Biology faculty. This summer that number was 27! In addition, many of our students were awarded off-campus summer opportunities, including four students who went to Harvard. We are very pleased with all of the opportunities this grant has created for our students. We are also grateful that a gift from the estate of Harrison Dickson '48, in conjunction with other funds such as the Randall S. Alberte '69 Research Fund will allow us to continue most (but not all) of our HHMI-funded initiatives. If you are interested in helping us continue all of these initiatives, do let us know.

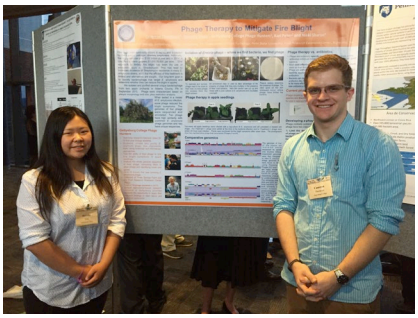
To give you a flavor of the work that was done in the Bio department this summer:
Julia Palmucci and Olivia Lambert studied how human pharmaceuticals disrupt the behavior of aquatic snails in Peter Fong's lab; in Kazuo Hiraizumi's lab, William Ueckermann continued his study of the variation in expression of the Dip-B gene in *Drosophila melanogaster*; Elizabeth Hill and Huanjia Zhang, with Ryan Kerney, studied the symbiosis between salamanders and green algae; Andrew Sydenstricker explored the neurobiology of vocalizations in midshipman fish, doing this research at Wood Hole with Matt Kittelberger; in Steve James' lab, Sarah Francisco analyzed chromatin modifications of the regulatory region of a gene involved in cell cycle regulation; Kaelea Composto and Jacob Marogi, working with Nikki Shariat, investigated the role of the CRISPR-Cas gene editing system in *Salmonella*; Meghan Brady working in Panama with Alex Trillo investigated the effects of call complexity and density on predation and parasitism risk in frogs; in Zakiya Whatley's lab, Nene Sy and Sarah DiDomenico pursued projects related to quinolone-induced double strand breaks in *Escherichia coli*; and finally in my lab Alex Agesen and Maddi Strine investigated the genomics of eight *Bacillus* bacteriophages that differ in host range. This is just a sampling of the diverse projects from our summer students – with apologies to the students not included above.

All of our summer students contributed to the X-SIG Summer Research Blog. Check out the great entries with lively writing and super photos at https://xsigsummer.wordpress.com/ and stay updated with our HHMI grant activities at http://www.gettysburg.edu/about/offices/provost/hhmi/

Véronique A. Delesalle, Gettysburg College-HHMI Program Director

Shariat Lab News

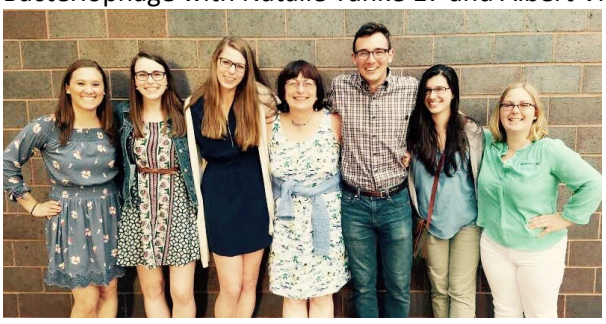
Six students performed summer research in the Shariat Lab: Kaelea Composto '19, Celine Erkey '19, Caleb Hellman '19, Jacob Marogi '19, Cameron Thompson '19 and Dorothy Vosik '19. They were funded by HHMI summer research funds, a grant from the United States Department of Agriculture, and industry funding. Cameron and Dorothy presented a poster at the 35th Summer Symposium In Molecular Biology, "Living with Our Viromes" at Penn State in May (see photo). Jake, Dorothy and Cameron also wrote an invited editorial for the Pennsylvania Fruit Times (2016 96(4)) about how the new efforts of Gettysburg College's Phage Hunters align with the local fruit growing industry.



As part of a new program developed by Dr. Shariat and Dr. Peter (Penn State Fruit Research Extension Center), "Bridging the Furrow Ag-Research Training for Under Represented Minorities," the Shariat Lab hosted a local high school student, Estefani Peña for six weeks. She examined CRISPR patterns in Salmonella isolated from songbirds across the United States.

Delesalle lab

This past year was a productive year in Dr. Veronique Delesalle's lab with twelve students involved in research during the academic year or the summer. In June, six students (Alexandra Agesen'18; Katherine Boas'16; Madison Strine'18; Natalie Tanke'17; Brianne Tomko'16; Albert Vill'16) presented five posters at the meetings of the Society for the Study of Evolution in Austin, TX on various aspects of the ecology and evolution of bacteriophages. The research from one of these posters, "Testing hypotheses for the presence of tRNA genes in mycobacteriophage genomes", was accepted for publication in the journal Bacteriophage with Natalie Tanke'17 and Albert Vill'16 as co-authors.



Natalie Tanke - Madison Strine - Alexandra Agesen - Veronique Delesalle - Albert Vill - Katherine Boas - Brianne Tomko

In other student-faculty research news Dr. Pete Fong had a recent publication in the *Environmental Toxicology and Chemistry* was co-authored by Andrea Sitton (BMB'14), Chemistry Professor Lucas Thompson, and former visiting Professor Gerardo Carfagno. The paper is entitled "Long-term exposure to gold nanoparticles accelerates larval metamorphosis without affecting mass in wood frogs (*Lithobates sylvaticus*) at environmentally relevant concentrations."

Trillo lab

Congratulations to Dr. Alex Trillo who was awarded a National Science Foundation EAGER grant as part of a multi-institution collaborative effort to conduct work on the evolution of antipredator defenses in tortoise beetles. In other research Dr. Trillo spent the past summer at the Smithsonian Tropical research Institute along with a team of three intrepid Gettysburg College students: Sarah Smith '18, Brendan Dula '17 and Meghan Brady '17 investigating the role that variation in frog calls plays in attracting unwanted attention from predatory bats and parasitic flies. This new research builds on work

she recently published in the Proceedings of the Royal Society B.


Meghan Brady and Brendan Dula on bat patrol in Panama.

More students go to meetings

An increasing number of Gettysburg students have been supported in attending and participating in research meetings in a variety of disciplines and locales. Dr. Ryan Kerney took Elizabeth Hill (’17) and Huanjia Zhang (’17) to the 8th World Congress of Herpetology in Hangzhou China, with funding from his NSF EAGER grant, the HHMI X-Sig program, and the provost office. Liz and Huanjia presented their research from the past two summers while Dr. Kerney gave an invited talk in the symposium: “Ontogeny creates phylogeny: what does herpetology gain from a developmental perspective?” These presentations were received by an international audience of researchers who study amphibians and reptiles from a variety of approaches within the life sciences. They also took time during the trip to visit Huanjia’s family in Yantai and take a day trip to Shanghai. The Zhang family were incredible hosts and the entire Gettysburg contingent made great friends and professional connections during this amazing trip to China.


Huanjia, Elizabeth and Ryan in Shanghai

Group events

The James, Kerney and Shariat Labs spent a lovely summer evening kayaking on Long Pine, courtesy of the marvelous folks at GRAB

X-SIG faculty hosted a hike for summer research students up to Chimney Rocks in Michaux State Forest

Tropical Biology in the Amazon!

The new course to be taught by Dr. Alex Trillo, Tropical Terrestrial Biology, pairs a semester class, focusing on major concepts in tropical biodiversity, community ecology, and conservation, with a field expedition deep into the Peruvian Amazon. While in Peru, students will experience firsthand the stunning diversity of primary tropical rainforest, see the complex biotic relationships they have been studying all semester, and complete independent research projects.

Macrofauna in the Amazon

The Class of 2016 and beyond

Biology graduated 39 students this year and BMB had 12 graduates. Eleven Biology majors and seven BMB majors received honors in April, and we welcomed back Gregory Lewbart V.M.D. ’81, Professor of Aquatic, Wildlife, and Zoologic Medicine at North Carolina State College of Veterinary medicine. Greg talked about his time at Gettysburg and how Dr. Robert Barnes influenced his career. He spoke about his

work with as a veterinarian specializing in aquatic animals and his ongoing Galápagos Islands research projects involving sea turtles, marine iguanas, and Galápagos sea lions.


Gregory Lewbart V.M.D. ‘81

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.
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!