GETTYSBURG COLLEGE DEPARTMENT OF

BIOLOGY Newsletter

SPRING 2020 http://www.gettysburg.edu/academics/biology/

FROM THE CHAIR

Greetings from Gettysburg Biology! There's lots of news to report since our last newsletter, a year and a half ago or so. We've welcomed a new President, **Bob Iuliano**, to campus; we've continued to productively engage lots of eager students in our classrooms and research projects; we've earned grants and published papers; we've launched a couple of new courses and have plans in the works for a few more; and we've welcomed new faculty and bid farewell to others. And, of course, like everyone else, we've had to adapt to the COVID-19 outbreak since March – see more on how the College and the Biology Department have reacted below.

In January of 2019, I returned to serving as Chair upon my return from a rewarding sabbatical year spent teaching at the University of Malawi, in Zomba, Malawi, in southern Africa (see more below). I, and the rest of the department, wish a heartfelt thank you to **Kazuo Hiraizumi**, who served as Interim Chair in my absence, keeping a firm and experienced hand on the tiller.

Between May and December of 2019, we graduated a fantastic group of 31 Biology majors, with another 38 resilient members of the class of 2020 joining them this May. We honored 26 of these distinguished students at our spring honors ceremonies in 2019 and 2020, including our Barnes and Darrah award winners. The Barnes award – established by Dr. and Mrs. Rodger W. Baier P'79 in honor of Betty Barnes, a long-serving member of the faculty - is awarded annually to a senior "of high academic ability … preparing for a career in biology." In 2019, **Leah Gulyas** received the Barnes award, and in 2020, the award was split between three richly deserving students: **Cailin Casey, Rachel Loney, and Megan Zierold**. The Darrah award was established in 1980 through the generosity of the family of Biology Professors William C. and Helen H. Darrah, and is awarded annually to a student who has performed exemplary service to the biology community here at Gettysburg. The 2019 Darrah award went to **Dorothy Vosik and Kyle Woodley**, and the 2020 award to **San Luc and Madeleine Miller**. Our Honors Day speaker in 2019 was **Dr. Brett Forshey ('97)**, who currently leads vector-borne disease surveillance for the Department of Defense's Global Emerging Infections Surveillance program. Dr. Forshey gave a highly topical, and perhaps foresighted, talk on his work, entitled *"Emerging Mosquito-borne Viruses: Preparing for the Next Outbreak (or even Pandemic)."* After the talk we celebrated our student honorees for dinner at the Mason Dixon Restaurant, enabled by a generous donation by **Madonna and John Vitarello**, parents of **John Vitarello ('13)**. Our traditional Honors Day ceremony in 2020 was, as you might guess, disrupted by COVID-19, and we celebrated our honorees in a virtual Zoom gathering on May 14th.

We've produced tons of excellent research this past year with our students, as highlighted throughout this newsletter. Our summer Cross-Disciplinary Science Institute at Gettysburg (X-SIG) is going strong, providing research opportunities for many students each summer, though we've had to suspend the program this current summer with the exception of a few projects that can be conducted remotely. Members of the Department have received a number of impressive grants in the past year to support their research with students: **Michael Caldwell** received a Research Opportunity Award from the National Science Foundation for $26,000 for research projects on vibratory communication in frogs; **Jen Powell** also received a grant from NSF, for $266,000 to fund her work on interactions between the immune system and oxidative stress. **Véronique Delesalle and Ryan Kerney** are both hard at work with their students on ongoing projects funded by, respectively, the Pittsburgh Foundation and the Gordon and Betty Moore Foundation. See more about these research projects below.

Two members of the Department have departed since we last wrote: **Zakiya Whatley**, who started with us as a Gondwe Scholar in the fall of 2014, and moved into a tenure-track Assistant Professor position in the fall of 2016, left in May of 2018 to become Program Manager for the Biological Sciences Graduate Program at the University of Maryland. **Nikki Shariat**, who started as Assistant Professor in the fall of 2015 moved in February of 2019 to the University of Georgia, where she is now an Assistant Professor in the College of Veterinary Medicine. Both Zakiya and Nikki made excellent contributions to the Department and to their students during their time at Gettysburg, and we wish them all the best in their future endeavors.

We have also welcomed two new members of the Department, Drs. **Jerrod Hunter** and **Lauren Klabonski**. Both Jerrod and Lauren are serving as Visiting Assistant Professors; Jerrod teaches Cell Biology and Immunobiology, and Lauren is teaching Microbiology, one of our non-majors biology courses, and is developing a new research-intensive course on the Biology of Aging.

We are also pleased to announce the new $100,000 **Bruce R. Roberts Endowed Fund** for Student Faculty Research in Biology. Dr. Roberts was a 1965 graduate of Gettysburg, and went on to earn a Master's degree and PhD from Duke University. He has taught for years in the Department of Botany and Microbiology at Ohio Wesleyan University. The earnings from this endowment will support a student working each summer as part of our X-SIG summer research program. We – and the future student beneficiaries – are tremendously grateful for Dr. Roberts' generosity.

Most recently, the COVID-19 outbreak has challenged all of us – as I'm sure it has you – to continue to do our best to educate Gettysburg's Biology students in this unique environment. We're tremendously impressed with how well our students managed, with grace and resilience, the transition this spring to online learning. We've also been similarly impressed with the stories we have received from and about many of our alumni, who have stepped up their work in research labs, medical centers, and their communities around the country to help out during this crisis. Gettysburg has, like many other institutions, taken a significant financial hit from the situation, which will undoubtedly impact the academic mission of the Biology Department in years to come. We know that many of you are likely also suffering the financial impacts of the outbreak, and we know that considering a donation at this moment in time may not be an option. But for those of you who may have the wherewithal, this would be a great time to consider a donation to the College. If you want your donation to specifically help the Biology Department, be sure to designate it for "Biology Special Gifts." Thank you so much for all you do to help the next generation of Gettysburg students. We hope you and your families are doing as well as possible.

All the best,
Matt Kittelberger, Chair of Biology

BIOLOGY DEPARTMENT MISSION STATEMENT

The Biology Department has adopted a new Mission Statement, which we developed this spring: **"In a world with increasingly complex medical and ecological challenges, our students become well-rounded, compassionate, global citizens who use the power of science to effect positive change."**

This statement seems eerily timely, but in fact, department members were working on drafting this well before the COVID-19 outbreak! We are proud of present students and alumni who are indeed using the power of science to effect change, and some examples are below.

COVID-19 RESPONSE

In mid-March, the Biology Department joined the rest of the College in transitioning to online learning for the final 7 weeks of the spring semester, in response to the global COVID-19 pandemic. Professors rapidly re-tooled their courses to creatively, effectively, and engagingly deliver virtual lab and lecture experiences. Some courses made use of simulated data and lots of online discussion to continue teaching students how to analyze data and interpret it in the context of the scientific literature. Others, including Ryan Kerney's Developmental Biology, and Véronique Delesalle's Molecular and Genome Evolution, used freely available online databases to explore new projects. In Bio 102 for non-majors, Steve James devoted the remote portion of the course to COVID-19, teaching about the virus genetics, infection process, epidemiology, drug treatments and vaccine development, cytokine storms and the immune system; and finished with a study of the five diseases of civilization that are also the five major risk factors for hospitalization and death from COVID-19. In May, Steve recorded a podcast about Coronavirus biology and disease mechanism with our president, Bob Iuliano. You can listen here: https://www.gettysburg.edu/offices/president/podcast/biology-genetics-covid-19-steve-james.

And we all spent WAY too much time on Zoom!

The Department donated 10,000 gloves from our reserve lab supplies to Adams County Emergency Services on May 7th. These lab gloves were distributed to EMS workers throughout the county, and some may be distributed to local police departments. A photo of the donation (below) appeared in the Gettysburg Times.

We've also heard a ton of stories of Gettysburg Biology and BMB students and alumni *Doing Great Work* in their communities in these crazy times. These include:

- Hannah Sheffer (BMB, 2020), who spent the spring semester not only finishing up her BMB degree, but also working 2-3 overnight shifts each week in the COVID-19 ward at Hanover Hospital.
- Julia Palmucci (BIO, 2018) currently a graduate student at Duke, started an initiative to recruit shoppers for local seniors. Her initiative was featured in an article in the Raleigh News and Observer.
- Hamasa Ebadi (BIO, 2016) has been helping fundraise in Los Angeles for food and supplies to those disproportionately affected by the pandemic, when she's not busy working in a neurobiology lab at UCLA.
- Huanjia Zhang (BIO, 2017) - Works at Children's Hospital of Philadelphia. His lab has entirely shifted focus to work on coronavirus (see photo below)
- Brian Ruether (BIO, 2019) works at the Delaware Public Health Laboratory, the main coronavirus testing site for Delaware. (See photo below).
- Kristy Bialas (BIO, 2008) is a reviewer for the respiratory virology branch at FDA, with a direct role in the current outbreak. Her team has been working days and nights with big manufacturing companies and small labs around the country evaluating their SARS-CoV-2 tests.
- Greg Brittingham (BMB, 2014) is a PhD student at New York University. He tells us he's been working on a couple of Covid19 related things since his lab has shut down, one of which has been to help organize an effort to 3D print reusable face shields for medical professionals on the front lines of COVID-19 in NYC. Shields were being delivered to NYU Langone, Mt. Sinai, Elmhurst, SUNY Downstate and Montefiore Hospitals so far.
- Dina Mohamed-Aly (2015) volunteers as a lab assistant/preparator for COVID testing through RUCDR Infinite Biologics through Rutgers University.

We're so proud of the work all of these alumni are doing – please share your own stories of how you're helping your communities!

Warren Bladen, Adams County Director of Emergency Services, accepts a donation of 10,000 lab gloves from the Biology Department.

Huanjia Zhang (BIO, 2017) in full PPE!

Brian Ruether (BIO, 2019) in the lab.

A medical team at SUNY Downstate wearing reusable face shields printed by a group organized by Greg Brittingham (BMB, 2014).

JENNIFER COOPER, MD
Class of 2010, Biology and Chemistry Majors

I am currently an attending internal medicine physician at Penn State Health Medical Center in Hershey, PA where I practice both primary care and hospital medicine. During the COVID-19 pandemic, I have been rotating on our "TURF" (The Undifferentiated Respiratory Failure) team where we admit and care for patients with confirmed and suspected COVID-19 in special isolation units within the hospital, with dedicated staffing and full PPE. In consultation with our infectious disease specialists, I weigh the risks and benefits of trialing various treatment options for each patient based on the limited available evidence. In the clinic, I am working closely with a group of resident physicians to screen and follow patients who report symptoms concerning for COVID-19. By telephone, we assess patient risk factors, decide on coronavirus testing, provide education and treatment recommendations, and monitor patients through daily follow up calls until symptoms improve. I am so thankful for the experiences and training that led me to this profession - what a time to be a doctor!

X-SIG SUMMER RESEARCH 2019

The Cross-Disciplinary Science Institute at Gettysburg College (X-SIG) concluded the seventh year of its summer research program in late July 2019 with nine Biology faculty and 24 students participating. The program also involved faculty and students from Chemistry, Environmental Studies, Health Sciences, Mathematics, Physics and Psychology, making for lively weekly brown-bag lunches! In addition, some X-SIG students had the opportunity to do research in Panama with Drs. Caldwell and Trillo. We are 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 has allowed this program to continue after our grant from the Howard Hughes Medical Institute ended. We are also pleased that our new College President, Bob Iuliano joined us us for a brown-bag lunch on his second day on the job and got a taste of the research we do with students. If you are interested in helping us continue these initiatives, do let us know. In particular, we have very limited funds to take our students to present at national meetings or do research abroad. For example, with registration, travel and hotel, attending a meeting can cost more than $1000 per student!

All of our summer students contributed to the X-SIG Summer Research Blog. These are great entries with lively writing and super photos. Check it out at: https://xsigsummer.wordpress.com/
You can stay updated about activities associated with our X-SIG program at our web site: http://www.gettysburg.edu/about/offices/provost/hhmi/

Véronique A. Delesalle, X-SIG Board Member

KITTELBERGER SABBATICAL WORK IN MALAWI

In January of 2019, **Matt Kittelberger** returned to the Department after completing a year teaching aspiring secondary school teachers at the University of Malawi, in southern Africa, on a Fulbright grant. In the early 90's, Matt had served as a Peace Corps volunteer teaching secondary school science and math in Malawi. That experience first sparked his lifelong passion for science education, and Matt had been hoping to someday return to Malawi to pay back the favor. Coincidentally, one of his former Gettysburg students, **Christine Serwan ('13)** also served as a Peace Corps volunteer secondary school teacher in Malawi from 2013-2016. A series of productive conversations between the two about the state of Malawi's secondary science education, and ways it might be improved, helped germinate Matt's Fulbright application, focused on improving science teacher education. While in Malawi, Matt designed and implemented a series of inquiry-based biochemistry and animal physiology labs. A small grant from the Grass Foundation supported the purchase of 60 small amplifiers suitable for electrophysiological recordings from insect neurons, or even plants (see photo; yes, some plants have action potentials!). Data from these amplifiers can be recorded and analyzed on a cell phone, making them ideal for use in low resource environments. Half of the amplifiers were donated to the University of Malawi, for future use in animal physiology classes; the other half were donated to three different students continuing on to become secondary school science teachers, for use in their own teaching. Another Gettysburg alum, **Ally Siegel ('16)**, who is herself considering a career in education, came over to Malawi to help Matt design and implement these new labs. And Christine also came over for a visit to see first-hand the results of her ideas, and to visit some Malawian friends from her time in Peace Corps. A highlight – or perhaps a lowlight, depending on your perspective – of Christine's visit involved a tire blow out in the middle of a herd of elephants, which imparted an important lesson about the value of keeping your spare tire inflated when driving on your own in an African game reserve.

Animal Physiology students dissecting a goat heart, purchased at the local market on butchering day.

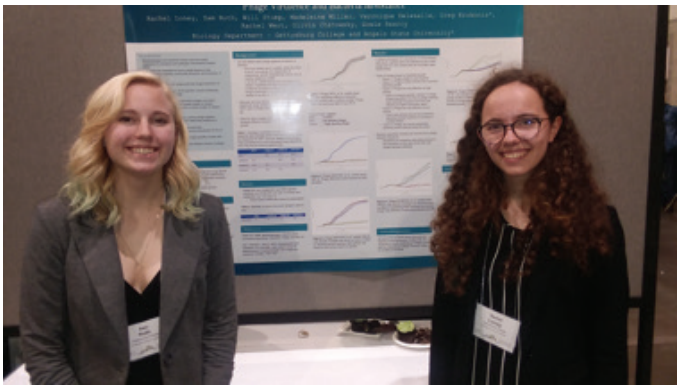
Recording action potentials from a sensitive mimosa plant found outside the classroom, using amplifiers purchased with a grant from the Grass Foundation.

DELESALLE LAB, 2019-20

The Delesalle lab, also known (only by us) as the Phages Rock lab, had a record number of research students this past year. A total of 21 students were involved in my lab either during the academic year or the summer, including 13 First year students who completed a total of eight phage genome annotations (identifying genes found in a phage genome and their putative functions.)

Last August (2018), Professor Delesalle was awarded a grant from the Pittsburgh Foundation to examine the genetic and ecological factors that determine the evolutionary path of phages as they adapt to various strains of the bacterial host, *Bacillus subtilis*. This grant allowed her to buy some big shaking incubators (that's us in front of them in summer 19 lab photo) for a multi-week evolution experiment conducted with five students this past summer. Our sequencing data will allow us to compare the genomes of the evolved phages (after seven weeks of evolution) to their initial/ancestral genomes and determine how they evolved (what genes and mutations allowed the phages to adapt to their host). We did this work with eight different combinations of phage and bacteria!

So, this summer was a busy summer with seven students staying on campus. The returning members of the lab took on various projects: Rachel Loney'20 and Madeleine Miller'20 took the lead on the above evolution experiment, Will Stump'20 explored the role of biofilm formation in phage-bacteria interactions, while Sam Roth'21 focused on the role of phage density in controlling bacteria populations. New members of the lab, Rachel Wert'21, Leigh Magness'22 and Matt Weller'22, learned the ropes by helping with these projects and worked on isolating their own phages.



Rachel and Sam SSE

In June 2019, I took two students, Rachel Loney'20 and Sam Roth'21, to each present a poster at the meetings of the Society for the Study of Evolution in Providence, RI. These posters focused on various aspects of the ecology and evolution of bacteriophages. The other students in the lab stayed behind to take care of our evolution experiment.

Finally, I have a manuscript in revision on some of our previously isolated phages. The manuscript has eight students co-authors, one current lab member and seven previous ones, all in graduate schools (Cornell, Delaware, Maryland, UNC, Penn, Drexel, and Yale). It is tons of fun to stay in touch with the past members of the lab in this way and they also bring new tools to the lab from their graduate experiences. It's a win-win situation!

I am looking forward to another busy and productive year.

Lab Summer 2019
Back row: Dr. Delesalle, Madeleine Miller, Sam Roth, Matt Weller
Front row: Rachel Wert, Leigh Magness, Rachel Loney, Will Stump

CALDWELL LAB, 2019-20

The Caldwell lab expanded their research on vibrational communication between frogs to include frog-eating snakes as well. Holly Wentworth ('20) traveled with Dr. Caldwell to the Smithsonian Tropical Research Institute in Panama for this work. She and two other Gettysburg students from the Trillo lab recorded plant vibrations produced by calling treefrogs and played these vibrations to wild snakes to determine whether those snakes use vibrations to find their prey. The idea that this sensitivity might be important while searching for prey had never been previously tested.

While in Panama, Holly and her fellow Gettysburg students also used auditory brainstem response measurements to investigate the physiological sensitives of frogs and snakes to substrate vibrations. Investigating the relationship between which vibrations maximally stimulate the sensory systems of female frogs and which maximally stimulate foraging snake predators will help to better describe the selective pressure shaping the evolution of frog calls.

Dr. Caldwell received a Research Opportunity Award from the National Science Foundation to help jumpstart this new line of research, a collaboration with researchers at Boston University, the UC Berkeley, and the Smithsonian Institution.

Prof. Alex Trillo, with her Tropical Terrestrial Biology class, explains how termites contribute to nutrient cycling in lowland Amazonian forests. Students pictured, from left to right: Lindsey Ukishima, Rachel Wert, Lidia Molina Serpas, Samantha Pfeffer, Olivia Lambert, Joe Hadley, Mike Karchner, and Tiffany Lam. (Caleb Hellman, Elli Vickers, and Laura Gustafson are out of frame to the left)

The Tropical Terrestrial Biology class poses among the roots of a strangler fig

A pygmy marmoset, the world's smallest monkey, clings to a liana near the Cocha Cashu biological station

Prof. Michael Caldwell introduces Holly Wentworth ('20) to their study species, the chunk-headed snake (Imantodes inornatus)

FONG LAB, 2018-19

In 2018, Professor Fong's research on disruption of frog development by the antifouling chemical medetomidine, resulted in two student co-authored papers in the journal Environmental Science and Pollution Research (ESPR). The first paper was co-authored by students Janine Barr (Biology-ES '14), Julia Palmucci (Biology '18), and Olivia Lambert (Biology '19). The second paper was co-authored by students Olivia Lambert, Margot Hoagland (HS '19), and Emily Kurtz (ES '20).

During the summer of 2018, Professor Fong and his students Kelsey DiPenta (Biology '21), Sarahrose (SayRo) Jonik (Biology '20), and Courtney Ward (Biology '20) studied the effects of several tricyclic antidepressant drugs on righting behavior of marine and freshwater snails. After 8 weeks of collecting (which included a trip to Lewes, Delaware), maintaining, and then drugging their snails, the snail people (collectively known as "Sneople") completed their experiments and were co-authors on a paper that was published in the journal ESPR in 2019.

In the summer of 2019, Courtney and SayRo returned to the lab and were joined by ES major Hayden Dubniczki '22. The focus of their research was disruption of crayfish behaviors with the pesticides methoxychlor and imidacloprid. These crayfish students (collectively known as "Creople") spent many hours in Marsh Creek and Willoughby Run collecting crayfish and even more in the lab measuring various behaviors in pesticide-exposed animals. They found that methoxychlor caused behavioral alterations with seemingly uncontrollable muscle contractions being the most common.

Professor Fong's Summer 2018 students hard at work. Kelsey DiPenta'21 (left), Sarahrose Jonik'20 (holding notebook) and Courtney Ward'20 (right)

Summer '19 students Sarahrose Jonik '20 (with cap), Hayden Dubniczki '22 (center), and Courtney Ward '20 (right) after a crayfish collecting trip at Willoughby Run.

KERNEY LAB, 2018-2019

Students in the Kerney lab have spent the past two summers working on a range of topics. In 2018 Yan Zhou ('20) used qPCR to quantify algal cells and analyzed time-lapse recordings of embryonic development taken with James Puckett in physics; Evan Czulada ('21) worked on antibody staining of embryos; Maggie DeBell ('19) built a high resolution episcopic microscope. In 2019 Yan continued her qPCR work while three new members joined the fun. River Larson-Pollock ('21) and Elliana Vickers ('20) worked together on algal phylogenetics and microbial community dynamics while Matthew Urbano ('21) mastered the QIIME2 pipeline for amplicon sequence analysis.

Dr. Ryan Kerney with Yan Zhou ('20), Mathew Urbano ('21), River Larson-Pollock ('21), and Eliana Vickers (F '20)

Our lab continues to focus on the intersection of development, evolution and ecology using amphibian models and has been collaborating with terrific researchers at Columbia University, Harvard University, Stony Brook University, and the University of North Carolina Wilmington.

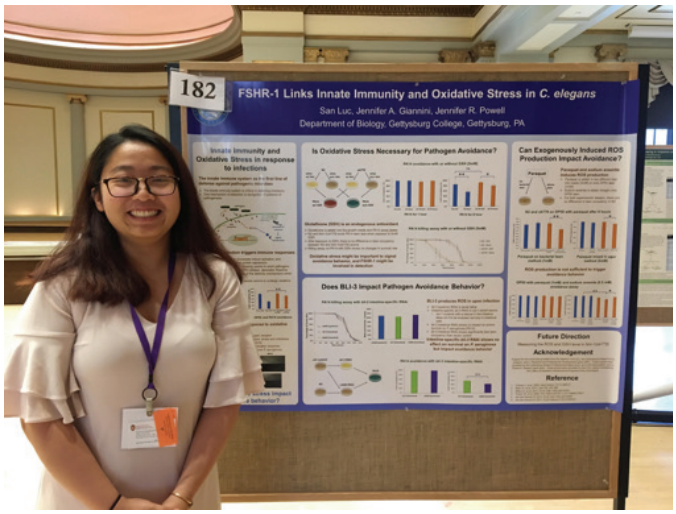
Field trip with Yan Zhou ('20) Margaret DeBell ('19), and Evan Czulada ('20)

POWELL LAB, 2018-19

San Luc '20 presented her research at the *C. elegans* Stress and Pathogenesis conference in Madison, WI in July 2018. Leah Gulyas '19 attended her second International *C. elegans* Meeting in Los Angeles in June 2019, where she won second place in the poster competition. Leah graduated as the Salutatorian of the Class of 2019 and is attending a PhD program at the University of California at Berkeley.

Gulyas '19 and Powell recently published "Predicting the Future: Parental Progeny Investment in Response to Environmental Stress Cues." This mini-review article arose from an independent study conducted by Leah and Jennifer during Leah's senior year.

Jennifer Powell was awarded a grant from the National Science Foundation, which will support her research with students to explore the integration of the innate immune and oxidative stress responses. The award includes support for the course-based research experience that Jennifer has developed for Bio 211 Genetics. Over the three years of the award, the grant will fund nearly 100 undergraduates as they do research as part of this course or in the Powell Lab.



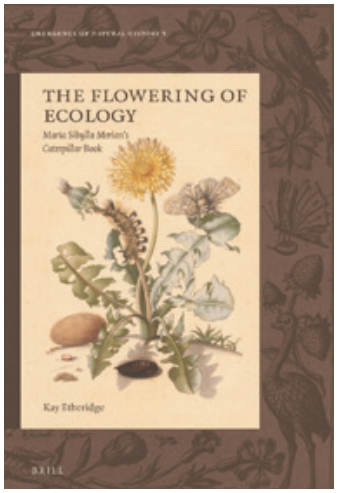
San Luc ('20) presenting her research at the 2018 C. elegans *Stress and Pathogenesis Meeting*

Joe Robinson ('15), Dr. Jen Powell, and Leah Gulyas ('19) at the 2019 International C. elegans *Meeting*

ART AND SCIENCE

In the fall of 2019 Professor Kay Etheridge worked with Professor Felicia Else of the Visual Arts Department and Gettysburg students, Emily Roush ’21 and Shannon Zeltmann ’21 to curate an exhibition on biological art. Roush and Zeltman had been students in Etheridge’s First Year Seminar class. See excerpts of the exhibition at https://wonder-cabinet.sites.gettysburg.edu/artful-nature/

This fall Etheridge’s book on Maria Sibylla Merian will be in print. The *Flowering of Ecology* presents an English translation of Merian’s 1679 ‘caterpillar’ book, *Der Raupen wunderbare Verwandelung und sonderbare Blumen–Nahrung*. Merian (German, 1647-1717) raised insects for five decades, recording the food plants, behavior and ecology of roughly 300 species. Her most influential invention was an “ecological” composition, where the metamorphic cycles of insects (usually moths and butterflies) were arrayed around plants that served as food for the caterpillars. Etheridge analyses the 1679 caterpillar book from the viewpoint of a biologist, arguing that that Merian’s study of insect interactions with plants, the first of its kind, were a formative contribution to natural history. Several Gettysburg students contributed background research from the modern literature for various species of moths and butterflies featured in the book, and Etheridge used some of this material to show how Merian was centuries ahead of her time in the study of these insects. Student assistant researchers on the project included Alyse Yeager 12’ Katie Hammer 14’, Emily Garrigan 18’, and Chataki McDonald 19.’ Etheridgecurrent research information on the species



Etheridge book being published by Brill this fall.

RIP Herbert the turtle

We regretfully announce the passing this spring of our turtle **Herbert**, a red-eared slider who had lived in the department, most recently in a large display tank in the lobby, for perhaps as long as 20 years. We know that many of you will remember Herbert fondly. You’ll be happy to know that Herbert’s tank-mate **Attila** is still going strong; we haven’t noticed any obvious signs of mourning.

NEWS FROM ALUMS

Matt Denholtz, Class of 2005 BMB major

Following undergraduate research experiences at Carnegie Mellon University and in Dr. Steve James’ lab at Gettysburg College, I spent two years working as a research assistant in the HIV pathogenesis and vaccine development lab of Dr. Dan Barouch at Beth Israel Deaconess Medical Center in Boston, MA.

A conversation with Dr. Barouch about the molecular processes in the cell nucleus that control the immune response led me to the department of Biological Chemistry at the University of California, Los Angeles, and Dr. Kathrin Plath’s lab. There I pursued my PhD in molecular biology with a focus on the regulation of gene expression. Around this time new technologies had emerged allowing mapping of the spatial organization of DNA within a cell’s nucleus, the “3D genome”. During the course of my PhD, colleagues and I applied these new technologies and associated computational methods to mouse stem cells and demonstrated a role for key epigenetic regulators of embryo development in maintaining the 3D organization of stem cell genomes.

Upon completion of my PhD, a desire to return to human immunology led me to Dr. Cornelis Murre’s lab at UC San Diego where I pursued post-doctoral research on control of gene expression during human neutrophil encounters with bacteria. We found that proteins regulating the 3D genome were recruited to important immune response genes upon bacterial encounter, allowing their rapid activation. This work was recently published in *Genes and Development* and was featured on the cover of the February, 2020 issue, my first and presumably last piece of published artwork.
http://genesdev.cshlp.org/content/34/3-4/149.short?rss=1

The skills I gained during my years in academia have served me well in my current role as a Scientist at Fate Therapeutics in San Diego, CA. In this role I manage the day-to-day operations of the genomics core, including genomics assay support for company-wide R&D, onboarding of new genomics technologies, data analysis, and molecular characterization of our cell therapy product candidates, all in pursuit of bringing novel cancer cell therapies to market. When I’m not at work I can usually be found exploring the beaches, parks, and museums of San Diego with my wife and kids.

My scientific career has been extraordinarily rewarding, and would have been impossible without the strong start I received in the Biochemistry and Molecular Biology program at Gettysburg College.

Family photo with wife Peggy, and son Corbin. Daughter Cora was born this spring and is doing great.

Gettysburg COLLEGE

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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!