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## Greetings!

As I write this message, I know that exactly one year ago we were told by WHO that there was a pandemic underway. Little could any of us have imagined the difficult year we would have.

Even though many of us in Biology know a large amount about manipulating genetic material, few of us would have envisioned the production of mRNA-based, and other novel vaccines, that has happened so rapidly. Together the vaccines result in a very clear light at the end of this tunnel.

As luck would have it, I got my first vaccine dose today. While I ponder all that has happened this year, I wonder how those who endured the Spanish Flu epidemic and other epidemics over the centuries thought about their futures. Scientists are far from having all the answers, but this year has caused us to think about not only novel vaccines and potential future pandemics, but also about how we are largely social individuals. This pandemic has also caused us to think more than ever about fairness of access to health care, how science has, and continues to be, intertwined with all of history, and how basic research continues to be critical for our future. I believe one result is that at Lehigh we will work at integrating basic science education with a broader view of science history and its place in our society.

At Lehigh, in the Department of Biological Sciences, this year brought lots of changes, as well as more remote teaching than we ever envisioned. We have celebrated retirements, arrival of new faculty, and administrative appointments, as you can see throughout this newsletter. There is news from many of our Alums, exciting COVID-19 research, and more. While I am writing this from my home, expecting you may read it in yours, I look forward to the near future when we will be back on South Mountain.

## Biological Sciences

### 2020 - at a glance ...

- 25 faculty members
- 17 post-doctoral / research scientists
- 10 technical and 3 administrative staff
- 37 Ph.D.-level graduate students
- 44 Master's-level graduate students
- 264 Undergraduate majors:
  - 122 Biology
  - 32 Biochemistry
  - 36 Molecular Biology
  - 74 Behavioral Neuroscience



Linda Lowe-Krentz, Ph.D.  
Professor and Chair

## Faculty appointments

### Burger appointed Associate Dean for Research and Graduate Studies for Arts & Sciences

R. Michael Burger, Ph.D. was named Associate Dean for Research and Graduate Studies in 2020. Dr. Burger oversees the 12 graduate programs in the College. In addition, he is involved in developing policies to enhance the scholarly work of the College of Arts & Sciences.

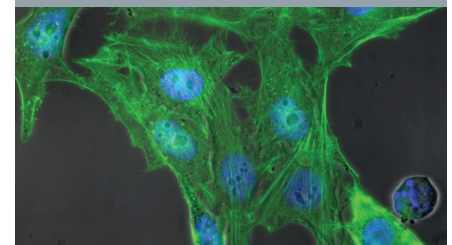


### Faculty Senate elects new chair

M. Kathryn Iovine, Ph.D. was elected chair of the Faculty Senate in 2020. The Senate strives to institutionalize shared governance among faculty, administration, and the Board of Trustees. Current goals of the Senate are to establish a Faculty Code of Ethics, to expand the categories of faculty ranks, and to continue to facilitate communication between faculty and administration around COVID-related concerns.



*Below: An apoptotic cell (bottom right) beside healthy interphase normal rat kidney (NRK) cells easily recognizable by its fragmented cell nucleus stained with DAPI (blue). Actin filaments are decorated with Alexa488-phalloidin (green). Merged fluorescence and Phase Contrast image. (BioS368 students, Fall 2020; Instructor: Prof. Matthias M. Falk)*



## Department Faculty

Explore our website: [www.lehigh.edu/~inbios](http://www.lehigh.edu/~inbios)

Volume 17 - Spring, 2021

- Daniel Babcock • Michael Behe • R. Michael Burger • Lynne Cassimeris • Matthias Falk • Ann Fink • Julie Haas • Kristen Heroy • Santiago Herrera • Wonpil Im • M. Kathryn Iovine • Michael Kuchka • Gregory Lang • Michael Layden • Linda Lowe-Krentz, Chair • Wynn Meyer • Julie Miwa • Amber Rice • Jill Schneider • Neal Simon • Robert Skibbens • Jennifer Swann • Lawrence Tartaglia • Nathan Urban • Vassie Ware • David Zappulla •

# Welcome to New Faculty

## *Kristen Heroy, Ph.D.*

Dr. Heroy joined the department in the Fall of 2020 as a Visiting Assistant Professor, teaching Evolution, Behavioral Ecology, Microbiology lab, Writing in the Biological Sciences, and a new non-majors course, Plants, People, and Agriculture. Dr. Heroy earned her B.S. in Animal Science from the University of Delaware, her M.S. in Animal Science from Angelo State University, and her Ph.D. in Wildlife Ecology from Utah State University. Prior to her arrival at Lehigh, Kristen was an adjunct professor at Cedar Crest College in Allentown.



## *Wynn Meyer, Ph.D.*

Wynn Meyer is an Assistant Professor in the department. She is an evolutionary biologist with research interests in evolutionary genetics in human populations and other animal systems. Dr. Meyer earned a B.S. in the Biology, Ecology and Evolutionary Biology track from Yale University and her Ph.D. from the University of Chicago. Wynn did her postdoctoral research at the University of California, Berkeley and at the University of Pittsburgh. Prior to her arrival at Lehigh in the Fall of 2020, Dr. Meyer spent a year as an AAAS Fellow, where she worked with the Office of Data Science Strategy at the National Institutes of Health to support data infrastructure, management, and policy and data science training.



## *Lawrence Tartaglia, Ph.D.*

Larry came to Lehigh in January, 2020 and is a Visiting Assistant Professor. He earned his B.A. in Biology and M.S. in Molecular Biology from Rutgers University, and his Ph.D. in Biochemistry & Molecular Biology from the University of Florida. Prior to his arrival at Lehigh, Dr. Tartaglia was a postdoctoral researcher at Harvard Medical School. In addition to his research at Harvard, he was an adjunct lecturer at Emmanuel College. Dr. Tartaglia has been the instructor for the department's Core I (Cell & Molecular) and Core II (Genetics) courses, as well as the Biochemistry Lab, and Virology lecture course.



## *Nathan Urban, Ph.D.*

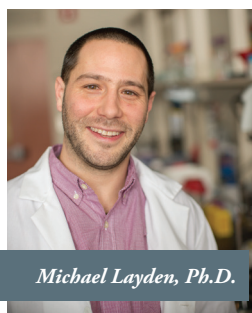
Dr. Urban was hired as Professor in the Department of Biological Sciences and Provost of Lehigh University, and began his tenure in July 2020. Beginning his career in academia at Carnegie Mellon University, where he served as head of the Department of Biological Sciences and later as Interim Provost, Dr. Urban then became a member of the faculty at University of Pittsburgh School of Medicine, where he was Vice Provost for Graduate Studies and Strategic Initiatives. Dr. Urban's research focuses on experimental and computational analysis of sensory processing by neural circuits in the mouse brain.



## Promotion awarded

*At the May, 2020 meeting of the Lehigh Board of Trustees, Michael Layden, Ph.D. was promoted to Associate Professor with Tenure.*

Layden came to Lehigh after serving as an assistant researcher at the Whitney Laboratory for Marine Bioscience at the University of Florida. Prior to this position, he was a postdoctoral researcher at the Kewalo Marine Laboratory at the University of Hawaii, Honolulu. Dr. Layden was awarded his bachelor of science degree in Cell and Developmental Biology at the University of Rochester. He then went on to earn his doctorate in Molecular Biology from the University of Oregon.



Dr. Layden has taught a variety of courses while at Lehigh, including Methods in Development, Developmental Biology, Evolution of Development, and a freshmen seminar, "Man is But a Worm." Layden is a member of the department's Graduate Committee, and has served on a number of faculty search committees.

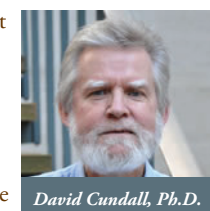
Research in the Layden Lab is focused on the neural development in the sea anemone *Nematostella vectensis*. Understanding the similarities in how developmental programs are redeployed during regeneration will provide critical clues necessary to better design regenerative therapies for biomedical applications.

Layden's research has been funded by grants from the National Institutes of Health. In addition, he was recently awarded an NSF CAREER Award.

## Faculty retirements

*In May 2020, the department gathered (virtually, of course) to pay tribute to two dedicated Lehigh professors and to wish them well in their retirement.*

**David Cundall, Ph.D.** joined Lehigh as an assistant professor in the Biology Department in 1975, and then was promoted to Associate Professor in 1980. After the disbanding of the Biology Department in 1991, he was promoted to Professor of Psychology in 1992 and joined the Department of Biological Sciences in 1995. Cundall's research focused on the functional, morphological, ecological and evolutionary foundations of some behaviors of ectothermic tetrapods, particularly legless ones, such as snakes. Cundall taught a variety of courses, including introductory biology for both majors and non-majors, Comparative Vertebrate Anatomy, Vertebrate Field Biology, Vertebrate Histology, and many more!



**Murray Itzkowitz, Ph.D.** began his career at Lehigh in 1979 when he was hired as an assistant professor in the Department of Biology. He was promoted to associate professor in 1984, and professor in 1991. Itzkowitz's research has been far-reaching over the years, but primarily studying the monogamous convict cichlid fish and several species of pupfish and beaugregory damselfish. Professor Itzkowitz's research was funded by the National Institutes of Mental Health, the National Science Foundation, and the National Institutes of Health, as well as some state and foundation funding. He taught a wide variety of courses, including Integrative Biology, Animal Behavior, and more! Dr. Itzkowitz served nine years as chair of the department.



# Graduate Student Spotlight

## Ryan Vignogna is a Ph.D. Candidate in the Biochemistry program

Ryan completed his Bachelor of Science in biochemistry & molecular biology at DeSales University. It was there Ryan conducted research on the structure of archaeal proteins in the laboratory of Julie Himmelberger, kickstarting an interest in protein structure and evolution. Following this interest, Ryan joined Greg Lang's laboratory at Lehigh in the fall of 2016.

The Lang lab studies the molecular basis of evolution using the budding yeast *Saccharomyces cerevisiae*, the same yeast used to make bread and brew beer. This simple but powerful genetic system allows for the study of evolution in real-time. Yeast populations are propagated in 96-well plates and diluted daily by a robotic liquid handler. These populations are frozen down at regular intervals, creating a frozen "fossil record." This allows one to go back in time and observe how these populations evolved over the course of an experiment. Making use of whole-genome sequencing, the Lang lab can determine what mutations arose during an evolution experiment.

Ryan's focus in the Lang lab involves studying how genes interact and how these interactions influence evolution. His current project involves studying a human metabolic disease, congenital disorders of glycosylation (CDG). The most common cause of this disease is mutations in the phosphomannomutase gene, PMM2. *S. cerevisiae* has a

nearly identical phosphomannomutase gene called SEC53. Ryan has experimentally-evolved yeast strains carrying different SEC53 alleles implicated in glycosylation disorders, and is working on identifying genetic interactions that compensate for SEC53-deficiency.

Ryan was the vice-president of the Biological Organization of Graduate Students (BOGS). During his tenure with BOGS, Ryan helped implement panels and workshops aimed at enhancing the professional skills of graduate students within the department. Ryan was also a teaching assistant for the Cold Spring Harbor Laboratories Yeast Genetics and Genomics course in 2019, helping train budding yeast geneticists. In his free time Ryan enjoys scuba diving, going to Lehigh Valley Iron Pigs & Phantoms games, and spending time with his dog, Decaf.

*The research in the Lang Lab is funded by a grant from the National Institutes of Health.*



Ryan Vignogna

## 2020 Selected Research Publications

Bold = Faculty  
***Bold+Italics*** = Graduate Student  
*Italics* = Undergraduate Student  
\* = Former Student

**Behe, M. J.** 2020. A Mousetrap for Darwin: Michael J. Behe Answers His Critics, Discovery Institute Press, Seattle.

**Zhang, Chao**, Beebe, N.L., Schofield, B.R., Pecka, M. and **Burger, R.M.** (2021) Endogenous Cholinergic Signaling Modulates Sound-evoked Responses of the Medial Nucleus of the Trapezoid Body. The Journal of Neuroscience 41(4):674-688; DOI:<https://doi.org/10.1523/JNEUROSCI.1633-20.2020>. \*\*Highlighted as a Featured Article

**Cassimeris, L.**, Engiles, J., Galantino-Homer, H. Interleukin-17A pathway target genes are upregulated in *Equus caballus* supporting limb laminitis. 2020. PLoS ONE 15(12): e0232920. <https://journals.plos.org/plosone/article/authors?id=10.1371/journal.pone.0232920>

\***Fricker, B.**, \***Heckman, E.**, **Cunningham, P.**, Wang, H., **Haas, J.** Activity-dependent long-term potentiation of electrical synapses in the mammalian thalamus. Journal of Neurophysiology. 2020. <https://doi.org/10.1152/jn.00471.2020>

Glazier A., **S. Herrera**, A. Weinnig, M. Kurman, C. Gómez, & E. Cordes. (2020) Regulation of ion transport and energy metabolism enables certain coral genotypes to maintain calcification under experimental ocean acidification. 29(9): 1657-1673. Molecular Ecology. <https://doi.org/10.1111/mec.15439>

**Bhattacharya, S., Hyland, C., Falk, M.M., Iovine, M.K.** Connexin43 gap junctional intercellular communication inhibits evx1 expression and joint formation in regenerating fins. Development. [doi:10.1242/dev.190512](https://doi.org/10.1242/dev.190512)

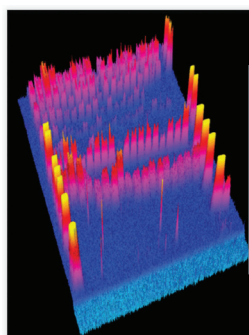
Buskirk, S., Rokes, A., **Lang, G.** Adaptive evolution of nontransitive fitness in yeast. eLife. 2020 Dec 29;9:e62238. [doi: 10.7554/eLife.62238](https://doi.org/10.7554/eLife.62238).

C. Dong, Y.K. Choi, J. Lee, X.F. Zhang, **A Honerkamp-Smith**, G. Widmalm, **L.J. Lowe-Krentz**, and **Wonpil Im**. Structure, Dynamics, and Interactions of GPI-Anchored Human Glypican-1 with Heparan Sulfates in a Membrane. Glycobiology 2020 [doi: 10.1093/glycob/cwaa092](https://doi.org/10.1093/glycob/cwaa092)

**Rice, A. M.** 2020. The overlooked influence of hybridization on cognition. Frontiers in Ecology and Evolution 8: 39. [doi: 10.3389/fevo.2020.00039](https://doi.org/10.3389/fevo.2020.00039) (invited contribution to research topic "Links Between Cognition and Fitness: Mechanisms and Constraints in the Wild")

**Mfarej, M.G., Skibbens, R.V.** 2020. DNA damage induces Yap5-dependent transcription of ECO1/CTF7 in *Saccharomyces cerevisiae*. [PLoS One. 2020 Dec 29; 15\(12\):e0242968.](https://doi.org/10.1371/journal.pone.0242968)

Woo, H. Park, S-J., Choi, Y.K., Park, T., Tanveer, M., Cao, Y., **Kern, N.**, Lee, J., Yeom, M.S., Croll, T., Seok, C., **Im, W.** Developing a Fully Glycosylated Full-Length SARS-CoV-2 Spike Protein Model in a Viral Membrane. Phys. Chem. B 2020, 124, 33, 7128–7137. <https://doi.org/10.1021/acs.jpcc.0c04553> [cover]



Mefford, M.A., Hass, E.P., and **Zappulla, D.C.** (2020) A 4-base pair core-enclosing helix in telomerase RNA is essential for activity and for binding to the TERT catalytic protein subunit. Molecular and Cellular Biology, 40(24), 1-13. DOI: [10.1128/MCB.00239-20](https://doi.org/10.1128/MCB.00239-20) [cover]

# How Star Trek™ created a biologist

*In many ways, Meron Mengistu grew up at Lehigh University. Dr. Mengistu earned her bachelor's degree and Ph.D. from the university, but her path was far from "normal."*

*When we approached Dr. Mengistu to consider participating in this story, she was hesitant to agree because she felt she hadn't arrived at a point in her career to deserve a spotlight. We think you will see that she was wrong!*

Meron Mengistu ('03, B.S. Molecular Biology; '08, Ph.D. in Molecular Biology) was born and raised in Ethiopia. "I grew up watching Hollywood movies that depicted American universities as the greatest institutions in the world. When it was time for me to go to university, I couldn't get into my choice school in Ethiopia. This is because all accredited universities there were public and free. Therefore, a lottery system was used to assign students to different majors. Unfortunately, I didn't get my first choice of medical school, or second choice of engineering school. Instead, I was assigned to a Teacher's Education College in the southern part of the country. It was at this point that I decided to explore schools in the United States."



Meron Mengistu, Ph.D. ('03, '08G)

## Meron Mengistu

### Undergraduate Degree

2003

Bachelor of Science

Major: Molecular Biology

Minor: Applied Mathematics

### Graduate Degree

2008

Ph.D. in Molecular Biology



## The first graduate student commencement speaker

*Meron Mengistu gave the graduate student address at the 2008 commencement when she received her Ph.D. She was the first graduate student in this role. Those in following years continued the tradition she began, enriching the commencement ceremony with their insights.*

Mengistu was accepted as an undergraduate student at Moravian College. "As an international student, it is often tough to get into some of the big-name schools that were in those Hollywood movies. A few months after starting at Moravian, a friend connected me with two Ethiopian women, sisters Welela and Hiriti Hailelessie, who were attending Lehigh at the time. I was able to visit Lehigh and learned more about the school through them."

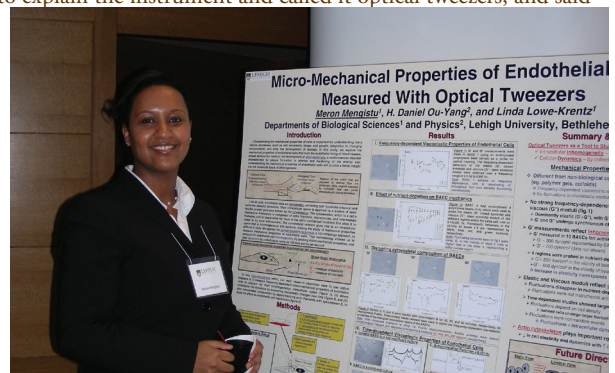
When asked to describe her experience as an international student at Lehigh, Dr. Mengistu noted that, "Being away from family and friends is extremely difficult. But I was on a mission, and I was focused on getting a good education, which made it bearable."

She also reflected on the issue of starting her time at Lehigh as a sophomore. "Starting as a sophomore AND an international student was not so easy. The UMOJA house gave me a home away from home, and my housemates played a huge role in me assimilating into the Lehigh University family."

When Mengistu began thinking about her career path, she was interested in getting a degree in Bioengineering. At the time, however, the Bioengineering program did not offer a bachelor's degree. "I was determined to make up my own major, so I made an appointment with the Dean of the College of Engineering, Dr. Mohamed El-Aaser, who told me that I could not officially get a Bioengineering degree, but he encouraged me to pursue research by connecting me with Dr. Daniel Ou-Yang, who was leading the effort in putting together this program, and he was also my physics professor."

Lehigh University is known for engaging undergraduate students in research. Dr. Ou-Yang invited a group of students, including Meron Mengistu, to visit his lab. "He showed us this table in his lab that had a whole bunch of lenses, mirrors and lasers. He asked, 'Who's a Star Trek fan?' I never watched Star Trek, but I knew it involved SciFi. He then went on to explain the instrument and called it optical tweezers, and said it was similar to the tractor beam in Star Trek. So, I started watching the episodes on television. Even though it took many months to see the tractor beam in action on the show, it was mind blowing that something futuristic was being used in a lab at Lehigh. I was hooked!"

Mengistu set up a meeting with Dr. Ou-Yang and asked how she could get involved in research. He connected Meron with Dr. Linda Lowe-Krentz, a professor in the Department of Biological Sciences, who was also a part of the Bioengineering Program. Professor Lowe-Krentz helped Meron develop a project that enabled her to work with the optical tweezers.



Meron Mengistu was selected to present her research at the research symposium of the inauguration of President Alice Gast in 2007.

*“My rigorous Lehigh education helped me to absorb new concepts very fast, and my interdisciplinary training allowed me to form new and productive collaborations everywhere I went.”*  
- Meron Mengistu, Ph.D.

“I got to use the Star Trek tractor beam to probe the mechanical properties of endothelial cells, the cells that line our blood vessels. These cells play a significant role in plaque formations that lead to atherosclerosis, partly influenced by the way they experience shear stress from the blood flow. To model this, we worked with Dr. Samir Ghadiali’s lab in the Mechanical Engineering department. So, this project was a cross-disciplinary endeavor that involved three departments.”

As all Lehigh undergrads learn, their time at Lehigh eventually comes to an end. But Mengistu wasn’t ready to stop learning from the Lehigh faculty! She decided to apply to the graduate program of the Department of Biological Sciences.

“I decided to stay at Lehigh for grad school for many reasons. First, when I reached my senior year, I had already established collaborations between the Biological Sciences, Physics and Mechanical Engineering departments, and put many things in place for an exciting project. But Dr. Lowe-Krentz was the major reason. She was an exemplary advisor and mentor. Even as an undergrad, she empowered me to be a confident scientist, but also reined in my excitable personality by framing things in terms of feasibility in a given time. When she would get an invite to present our research at different conferences, she would send me instead. She would say to me ‘You know this more than anyone, including me. You got this!’ I recognized this was a very rare quality in an advisor because I was often the only student – grad or undergrad – presenting at those meetings.”

But Dr. Lowe-Krentz wasn’t the only reason Meron decided to pursue her graduate degree from Lehigh. “Another person who played a great role in my decision was Dr. Michael Kuchka, who had been an amazing mentor to me through many ups and downs during my time at Lehigh. I am his favorite student past, present, and future, and I will not hear otherwise!”

“Another reason I wanted to stay at Lehigh was the diversity in the Biological Sciences Department, which was unique even within the university. A lot of the professors were women – and in Drs. Ware and Swann, two formidable black women, I found representation and role models that I haven’t seen in many places.”

As Meron transitioned from undergraduate to graduate student, she found herself in a reversal of roles. Instead of Mengistu’s research being mentored by a graduate student, she was now finding herself doing the mentoring. “One of my most memorable times as a graduate student was when I wrote a grant for an HHMI summer institute that had me working with five undergraduate students on different aspects of my thesis project. Getting them excited about the work, teaching them the different methods, and seeing them present their project at the end of the summer was very rewarding. One of these students even ended up being an author in one of the manuscripts we published.”

After earning her doctorate from Lehigh, Dr. Mengistu explored careers both in academia and the biotech industry. She has worked in three major disease areas – HIV, cancer, and Hepatitis B.

“My rigorous Lehigh education helped me absorb new concepts very fast, and my interdisciplinary training allowed me to form new and productive collaborations everywhere I went. I took a postdoc position at the Institute of Human Virology of the University of Maryland School of Medicine in Baltimore MD soon after I received my Ph.D. I worked on HIV vaccine projects as a way to get involved in a disease that has ravaged and continues to pose a huge problem in Africa.”

“I then transitioned to the biotech industry by becoming a Senior Scientific Researcher at Genentech, where I conducted cancer research. While there, I even re-connected with a former student of mine while I was a teaching assistant at Lehigh. Currently I am a Senior Research Scientist at Gilead, where I am on a team that is trying to cure Hepatitis B.”

**Meron Mengistu definitely “grew up” at Lehigh. In addition, she most assuredly deserved to be spotlighted for her many accomplishments.**



*Meron Mengistu and her mentor, Professor Linda Lowe-Krentz*



*I sought an education in the United States because I knew that the opportunities afforded to me here would far exceed the opportunities from my home country. My dreams became reality. I was able to carve out and define a space for myself here. It's not lost on me that as an African, studying here was made possible through the sacrifices and hard work of Black Americans in the United States. If it weren't for landmark legislation such as Brown vs Topeka Board of Education in 1954 or the Civil Rights Act of 1964, my story would be quite different. I am forever grateful for the determination and contributions of Black leaders and citizens of this country to my life and ultimately my continued success.*  
- Meron Mengistu, Ph.D.

*Wonpil Im and associates create the program where the models can be accessed.*

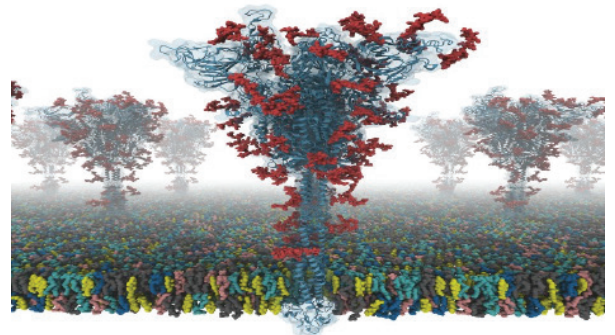
The virus SARS coronavirus 2 (SARS-CoV-2) is the known cause of coronavirus disease 2019 (COVID-19). The “spike” or S protein facilitates viral entry into host cells. Now a group of researchers from Lehigh, Seoul National University in South Korea and the University of Cambridge in the UK has worked together to produce the first open-source all-atom models of a full-length S protein. The researchers say this is of particular importance because the S protein plays a central role in viral entry into cells, making it a main target for vaccine and antiviral drug development.

[This video](#) illustrates how to build the membrane system from their SARS-CoV-2 S protein models. The model-building program is open access and can be found from the home page of [CHARMM-GUI](#) by clicking on the [COVID-19](#) Archive link, or by clicking the archive link in the header, then the COVID-19 Proteins link in the left sidebar.

Developed by Wonpil Im, a professor in Lehigh's Biological Sciences, Chemistry, and Bioengineering departments, CHARMM-GUI (GUI = graphical user interface) is a program that simulates complex biomolecular systems simply, precisely and quickly. Im describes it as a “computational microscope” that enables scientists to understand molecular-level interactions that cannot be observed any other way. More information about CHARMM-GUI can be found in this [video](#).

“Our models are the first fully-glycosylated full-length SARS-CoV-2 spike (S) protein models that are available to other scientists,” says Im. “I was fortunate to collaborate with Dr. Chaok Seok from Seoul National University in Korea and Dr. Tristan Croll from University of Cambridge in the U.K. Our team spent days and nights to build these models very carefully from the known cryo-EM structure portions. Modeling was very challenging because there were many regions where simple modeling failed to provide high-quality models.”

Scientists can use the models to conduct innovative and novel simulation research for the prevention and treatment of COVID-19, according to Im.



*A model of an S-protein  
Illustration: Dr. Yeol Kyo Choi, Im Lab, Lehigh University*

## Portraits of the Brain

*Mary Ellen Alu  
University Communications*

*How do you create an illustration of the brain that is visually appealing as well as effective in teaching students about neuroanatomy, the study of the brain's organization?*

Sarrah Hussain '21 and post-baccalaureate student Viola Yu '21 were put to the task this past summer as they created medical illustrations for online, open-access textbook chapters conceived by Jennifer Swann, professor of biological sciences at Lehigh. Swann collaborated with visiting art, architecture and design assistant professor Deirdre Murphy in mentoring the students, who were awarded fellowships from the Lehigh Humanities Lab to work on what became known as the brain visualization project.



*Post-baccalaureate student Viola Yu '21, left, and Sarrah Hussain '21 created hundreds of watercolors, cresyl stainings, digital art and ink drawings, as well as animations for use in the online chapters.*

“When you're doing a textbook, you really need illustrations to help people understand what the work is that you're referring to,” said Swann. “[It's] that picture-is-a-thousand words kind of thing, where, if I describe the phenomenon to you, you get bored halfway through this three-paragraph description, but if I show you the picture, you're with me, and then you can ask me questions.”

The student illustrators, who worked with sheep brains to better understand and conceptualize the brain, created hundreds of watercolors, cresyl stainings, digital art and ink drawings as well as animations for use in the online chapters. “They really learned how to synthesize the fine art, visual language with the scientific language to then make really compelling images and animations,” Murphy said.

The illustrated textbook chapters have their origins in a

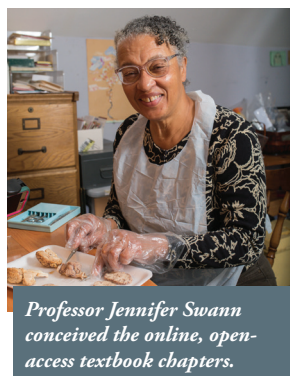
course that Swann teaches on the brain and behavior. Concerned in part by the high costs of textbooks, Swann was interested in creating chapter materials that would be available for use through an open-access network. More significantly, Swann said the textbook chapters were a teaching and learning technique, in which a core group of students extensively researched and wrote the chapters as they explored their areas of interest in neuroanatomy.

“I believe that students learn what they're interested in learning,” Swann said. “If you force something on them, they will fight with it. But

if you capture their interest, they lead you. That's always my goal. I have kind of a selfish goal in classes, which is, I want to learn as much as the students do, and so, to generate classes where I know a little bit of the material and I'm going to actually challenge myself to learn the rest of it along with the class. It's so much more fun that way, because we're all learning together. And when I can add my expertise, I do.”

The book chapters explore “Circadian Rhythms,” “Parenting” and “Neuroanatomy of Dreams: Physiological Pathways and Psychological Understanding.”

[Click here](#) to read more about this fascinating project.



*Professor Jennifer Swann conceived the online, open-access textbook chapters.*

# Ware named AAAS Fellow

Rob Nichols  
CAS Marketing Director

***Ware was recognized for her contributions to understanding ribosomes and for outstanding initiatives in undergraduate science education.***

Vassie Ware, Professor of Molecular Biology in the Department of Biological Sciences, has been named a fellow of the American Association for the Advancement of Science (AAAS), the world's largest general scientific society and the publisher of the journal *Science*.

Ware was recognized for her contributions to understanding ribosomes and for outstanding initiatives in undergraduate science education. She is among 489 members to be awarded this honor by AAAS because of their scientifically or socially distinguished efforts to advance science or its applications.

"I was excited to learn that Vassie was selected as an AAAS Fellow," said Robert Flowers, the Herbert J. and Ann L. Siegel Dean of the College of Arts and Sciences, who himself was named an AAAS Fellow in 2012. "This recognition reflects what CAS faculty have known about our colleague for years, that Vassie is a stellar scholar who is truly committed to the growth and development of young scientists. It also speaks to her leadership in the scientific community."

Ware's focus areas of research since arriving at Lehigh have included the molecular biology of ribosome biogenesis and heterogeneity in eukaryotes, tissue-specific expression and functional diversification of ribosomal protein paralogues in *Drosophila*, and phage genomics. She is the inaugural director of the Howard Hughes Medical Institute (HHMI) sponsored SEA-PHAGES program at Lehigh. Students selected for the program take part in research-focused phage genomics courses



Vassie Ware, Ph.D.

in which the genomes of novel bacteriophages (viruses that infect bacteria) that are isolated from local soil samples, are characterized by sequencing, gene annotation methods, and molecular genetic analyses. As co-director of Lehigh's HHMI Program (that includes the Rapidly Accelerated Research Experience [RARE] and BioConnect), she is part of the university's efforts to improve STEM (Science, Technology, Engineering, Mathematics) retention among student groups that are traditionally underrepresented in STEM and in the STEM population at large. She is also co-director of the department's distance education Master of Science degree program in molecular biology.

Ware's passion for research is matched by her unwavering commitment to undergraduate and graduate education. Throughout her tenure at Lehigh, she has worked tirelessly and efficiently to help science students and students from underrepresented groups reach their full potential. She has received numerous honors for those efforts, among them the Lehigh University Teaching Award, in 1989; the Lehigh University Women's Center's "25 Impressive Women Who Have Changed Lehigh" Award, in 2016; the INSIGHT Into Diversity "Inspiring Women in STEM" Award, in 2016; and also the Janice A. Lumpkin Educator of the Year Award from the National Society of Black Engineers, for 2019-2020. In December 2019, the American Society for Cell Biology selected Ware as an ASCB Fellow.

*Each year, the AAAS Council, the policymaking body of the society, elects members who have shown "scientifically or socially distinguished efforts to advance science or its applications." Fellows are nominated by their peers and undergo an extensive review process.*

## Introducing this year's Epstein Scholars ...

***Through a generous gift, Michael Epstein, Esq. ('75, B.A. Bio) established the Epstein Family Endowment for the purpose of supporting undergraduate research. All received funding for materials and supplies to complete their research.***

We are proud to introduce the newest recipients of the Epstein Family Endowment for undergraduate research. All of this year's recipients are members of the department's honors class and will be receiving their degree in 2021. They have been busy presenting their research in the Honors Class, led by Professor Michael Kuchka.

- **Grace Ciabatonni** (B.S., Molecular Biology) - Grace's research advisor is Professor Linda Lowe-Krentz. The focus of her research will provide new information on anti-inflammatory signaling.
- **Nicole Clarke** (B.S., Molecular Biology) - Nicole's research proposal is titled, "The effects of RNA interference mediated knockdown of Lynx 1 on learning." Dr. Julie Miwa is her research advisor.
- **Giorgos Hiotis** (B.S., Biochemistry) - Giorgos is doing research in the Falk Lab. His research title is, "Understanding internalization of Cx43 by linking phosphorylation and ubiquitination."



Grace Ciabatonni

Nicole Clarke

Giorgos Hiotis

## Let us know what you're doing!

***Submit your information online:***

[Click here](#) to submit your information - it is fast and easy!

***Send us an e-mail:***

Send your information to [inbios@lehigh.edu](mailto:inbios@lehigh.edu). Please include your name, year of graduation, degree, and the information you would like to share.

***Call us:***

Call the department office (610-758-3680) and give your information to Judy.

***Send us a note:***

Biological Sciences  
attn: Alumni Updates  
111 Research Dr., B217  
Bethlehem, PA 18015

# Alumni Updates

Visit our website:  
[www.lehigh.edu/~inbios](http://www.lehigh.edu/~inbios)

**Ronald Klayton** ('65, BA, Bio) earned his MD degree from the State University of New York and then went on to do his internship and residency in Internal Medicine at the University of Pittsburgh. He then did a pulmonary fellowship at UCSE, after which he served 20 years in the U.S. Navy. Following his Navy career, he spent 19 years as a pulmonologist at Kaiser Permanente in the mid-Atlantic region. Following three years of part-time consulting work, he is now fully retired and living in Oakton, Virginia.

**Kenneth Verner** ('70, BA, Bio) earned his M.S. in Marine Sciences from the University of Puerto Rico, followed by his Ph.D. in Microbiology from the University of Miami.

**George Hoskin** ('72, Ph.D. Bio) retired in 2006 as a Captain of the U.S. Public Health Service, FDA. He was the Director of the Division of Science and Applied Technology, Office of Seafood.

**Fotinos Panagakos** ('86, BA, Bio) was recently appointed dean of the West Virginia University School of Dentistry.

**Glen Miske** ('89, BS Mol Bio) ('94, BS Industrial Eng) graduated from PCOM in 1999, did his residency in Internal Medicine, a fellowship in Cardiology, and a postdoctoral fellowship in Pittsburgh. He is in private practice at Regional Cardiac Arrhythmia in Pittsburgh, and the co-author of multiple articles related to cardiac electrophysiology. Dr. Miske would like to say, "Thank you to Profs. Bean, Abel, Ware, Storere, Clark, Schray and Sturm."

**Daniel Shelly** ('91, BS, Bio) After graduating, Dan did his Masters in Biology at William and Mary, and his Ph.D. at the Florida State University. He went to the U. of Cincinnati as a Postdoctoral Fellow in the UC College of Medicine's Molecular Physiology Department where he won both the APS Fellowship in Physiological Genomics (only 2 given annually) and a NIH NRSA. Currently, he is the Vice President of Business Development and Alliances at Prescient Therapeutics. At Prescient, he is responsible for advancing the development of a next generation Chimeric Antigen Receptor T and or NK Cell therapy technology along with small molecule targeted therapies. Prior to Prescient, he was Director of Global Business Development and Strategic Partnerships for the Global non-profit organization PATH where he was involved in the identification of new and innovative partnerships for vaccine and therapeutics development applicable to low and middle income countries. He has an additional 18 years of industry experience having worked for Novozymes Biopharma and Albiomedix, Meridian Life Science and Kendle International. He has been responsible for asset in-licensing, alliances, and out-licensing of core drug

delivery technologies, biologics manufacturing, proposal writing, contract negotiations, market assessments, and clinical development/outlicensing of several vaccines. Dan maintains his connection to academia through teaching as an adjunct professor in the University of Cincinnati's Masters in Drug Development program since its inception in 2004. In 2019, Dr. Shelly won the University of Cincinnati-wide "Outstanding Adjunct Faculty Award" for vital contributions to the University Teaching mission for 2018-2019. Dan is the proud father of triplet boys (14) and is an avid mountain biker and watersports (wakeboarding) enthusiast.



*A dish with normal rat kidney (NRK) cells visible in the background that became contaminated with mold. Note the intricate structure of the hyphae of the mold colony. (Image: Spring 2020 BioS368 Cell Biology Lab students, Instructor: Prof. Matthias M. Falk)*

**Brian Calabrese** ('92, BA, BNS) is an Oncologist/Hematologist in Lancaster, PA, working for Penn State Health.

**Matthew Girady** ('92, BS, BNS) graduated in 1996 from the University of Pennsylvania School of Dental Medicine.

**Brendan Brinkman** ('97, BS, Mol Bio) spent seven years doing bench work on various kinds of stem cell research in San Diego, and four years as managing director of the Neuroscience Microscopy Shared Facility at UCSD. He then joined the Olympus Scientific Group, first in sales, then marketing, and then moved to Japan for 2.5 years as the assistant general manager for strategy. He returned to the U.S. three years ago and is now a manager for global strategy for Olympus Life Science Microscopy. He lives in Boston.

**Gabriella Dee** ('98, Ph.D., Bio) was an Environmental Science teacher at Moravian Academy for 14 years. This past fall she started a Master's degree program in Environmental Studies in Kingston, Ontario.

**Natasha Schuh-Nuhfer** ('02, BS, Mol Bio) serves as a STEM Education Coordinator for Northern Virginia Community College's STEM outreach program, NOVA SySTEMic. She leads the teacher professional development program by providing opportunities for teachers to strengthen their content knowledge in programming, cyber security, robotics and maker-space fabrication. She also supports the college's STEM outreach efforts through local STEM days robotics competitions and summer STEM camps for grades 3-12.

**Carl Tischbein** ('16, BS, Mol Bio) graduated with an MD degree in May 2020 from Drexel University College of Medicine. He is now in his residency in Anesthesiology at Walter Reed National Medical Center in Bethesda, MD.

**Ken Brill** ('17, BS, Mol Bio) is now in his residency in Internal Medicine at NYU. He is also helping with data collection for a group of studies on ICU patients with COVID-19.

*You may be interested in seeing this photo which shows four Lehigh professors in 1961, along with some graduate students. The occasion was the birth of my daughter, Angela, on March 23, 1961. I was Dr. Malsberger's first graduate student and when I returned from St. Luke's to give out cigars, Dick arranged this photo shoot in Williams Hall with whomever was around.*

*At my advanced age, I thought it prudent to start going through possessions and this photo turned up.*

*I hope you enjoy this glimpse into part of the 1961 Biology faculty. I only wish Dr. Trembley could have been there.*

--Costantino (Gus) Cerini, Ph.D. ('64G)



From left to right:

Seated: Dr. Basil Parker, Gus Cerini, Pete Wimmer

Standing: Denny Pritchard, Joe Mihursky, Dr. Saul Parker, Unknown, Dr. Brad Owen, Dr. Dick Malsberger, Chuck Coutant and Fred Midldige.