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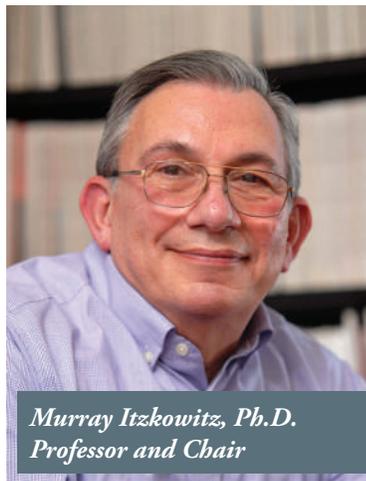
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Biological Sciences

Greetings!

It has been an honor to guide the department over the past nine years. Looking back, so many things have remained constant. Our biology undergraduates, in my opinion, are still smart, challenging, inquisitive, and fun to teach. Nearly all faculty have undergraduates in their labs doing original, often publishable research and I find it interesting that all faculty seem to enjoy teaching/mentoring these students. The faculty remain highly collaborative in their teaching and research which certainly adds to their enjoyment of being at Lehigh. In my view, alumni that return to this department will see great changes but will likely find faculty and students that resemble their own Lehigh memories.



*Murray Itzkowitz, Ph.D.
Professor and Chair*

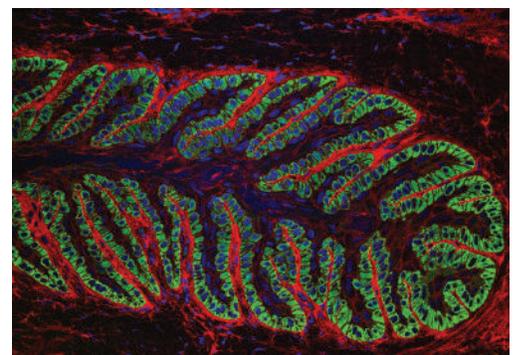
But change does happen. At the end of this academic year, Dr. Linda Lowe-Krentz will become the new chair of this department. The department has grown over these past nine years since I became chair, both in terms of faculty and undergraduate majors. The University is planning to increase the number of undergraduates and faculty and along with that there will be a surge in new buildings that will include a new wing for the continuing expansion of this department. The University is going to develop a new college, tentatively named "College of Integrated Health," which will certainly increase the educational opportunities for our undergraduates.

It is always delightful to hear from each of you who has taken the time to update us on your activities since you have left South Mountain. Please continue to keep in touch.

Perhaps it is time to visit your department so you can see for yourself how the things you loved about Lehigh have remained the same, but also to experience the excitement for the changes to come. We would love to see you.

2016 - the department at a glance ...

- 22 faculty members
- 2 visiting assistant professors
- 7 post-doctoral / research scientists
- 7 technical and 3 administrative staff
- 40 Ph.D.-level graduate students
- 29 Master's-level graduate students
- 292 Undergraduate majors:
 - 113 Biology
 - 40 Biochemistry
 - 34 Molecular Biology
 - 105 Behavioral Neuroscience



Equine hoof lamellar tissue stained for extracellular matrix (red), keratin 14 (green, marking basal epithelial cells), and nuclei (blue). Confocal image by Caitlyn Wilson, senior undergraduate; Cassimeris Lab

Department Faculty

Explore our website: www.lehigh.edu/~inbios

Volume 13 - Spring, 2017

- Daniel Babcock • Michael Behe • R. Michael Burger • Lynne Cassimeris • David Cundall • Matthias Falk • Julie Haas • Wonpil Im • M. Kathryn Iovine • Murray Itzkowitz, Chair • Michael Kuchka • Gregory Lang • Michael Layden • Linda Lowe-Krentz • Krystle McLaughlin • Julie Miwa • Amber Rice • Jill Schneider • Neal Simon • Robert Skibbens • Jennifer Swann • Vassie Ware •

Welcome to new faculty!

Daniel Babcock, Ph.D.

The department welcomed Assistant Professor Daniel Babcock as its newest tenure track faculty member in 2016. Babcock earned his bachelor of arts degree in neuroscience from the University of Delaware and his Ph.D. in neuroscience from the University of Texas Health Science Center at Houston/MD Anderson Cancer Center. Dr. Babcock did his post-doctoral work at the University of Wisconsin-Madison.

In the classroom, Dr. Babcock will be teaching Physiology along with some neuroscience-related courses involving neurodegenerative diseases.

The Babcock Lab is interested in understanding the cellular and molecular mechanisms underlying the earliest hallmarks of neurodegenerative diseases. These processes include the destruction of synapses and the cell-to-cell transmission of protein aggregates throughout the brain. Very little is known about how these processes occur and how they relate to later stages of disease progression. The Babcock Lab is also attempting to discover why certain populations of neurons are involved in a particular disease. For example: Why are Dopaminergic neurons especially vulnerable in Parkinson's Disease? The lab uses the fruit fly, *Drosophila melanogaster*, to focus its research on addressing these issues.

Dr. Babcock is an active peer reviewer for the Journal of Neurogenetics as well as Biochimica et Biophysica Acta (BBA) – Molecular Basis of Disease.

Daniel is married to his wife, Nichole, and they have an eight-year-old son, Phillip.



Daniel Babcock, Ph.D.



Wonpil Im, Ph.D.

Wonpil Im, Ph.D.

The department of biological sciences welcomes Wonpil Im, Ph.D. who was hired this past summer as the Presidential Endowed Chair in Health – Science and Engineering. Dr. Im is a professor in the department and a member of the bioengineering program.

Wonpil received his bachelor's and master's degrees from the Hanyang University in Seoul. He then earned his Ph.D. in Biochemistry from Cornell University. He did his post-doctoral research at the Scripps Research Institute in La Jolla, California. In 2005, Dr. Im was hired as an assistant professor in the Center for Computational Biology and Department of Molecular Biosciences at the University of Kansas, Lawrence. In 2011, he was promoted to associate professor and then professor in 2015.

Dr. Im recently was awarded the Friedrich Wilhelm Bessel Research Award from the Humboldt Foundation and was named a KIAS Scholar from the Korea Institute for Advanced Study. Prior to Lehigh, he was awarded the Alfred P. Sloan Research Fellowship (2007), ACS HP Outstanding Junior Faculty Award (2011), J. Michael Young Undergrad Advisor Award (2011), Meredith Docking Scholar (2013), and University Scholarly Achievement Award (2015).

Research in the Im Lab is focused on the applications of theoretical/computational methods to chemical and physical problems in biology and materials science. Specific research interests are:

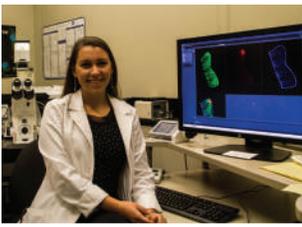
- Protein/peptide interactions with/in biological membranes
- Transmembrane-induced signaling and regulation
- NMR structure calculation & refinement
- Modeling and simulation of glycoconjugates
- Bacterial outer membranes and interactions with proteins
- Protein-ligand and protein-protein interactions

In addition, Dr. Im's research group is involved in developing the biomolecular simulation program CHARMM and its user interface CHARMM-GUI as well as ST-analyzer, a general graphical user interface toolset for simulation trajectory analysis. In the last five years, he published a total of 62 papers (47 papers as the senior author, including 7 papers with undergraduates) and his work has garnered a total of 6,948 citations (Google Scholar). Dr. Im has a long history of research support from the Human Frontier Science Program, the National Science Foundation, and the National Institutes of Health.

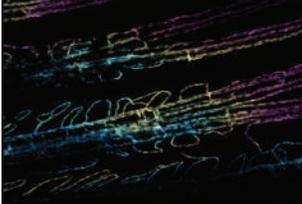
Dr. Im is married to his wife, Hyesook Cho, and they have two children - Jaeyoung and Nayoung.

Graduate Student Spotlight

Sara Lynn Farwell, Cell and Molecular Biology



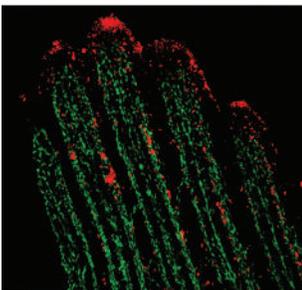
Sara Lynn Nicole Farwell came to Lehigh in 2012 after earning two Bachelor of Science degrees in Immunology and Infectious Diseases and Toxicology from the Pennsylvania State University. She was particularly interested in the vascular biology research in the laboratory of Dr. Linda Lowe-Krentz, and she joined her laboratory two short weeks after graduation from Penn State. Sara Lynn was awarded a University Fellowship for her first year and was able to devote full time to developing her thesis project.



Heparin has been used as an anticoagulant for decades as part of the prevention and treatment for increasingly prevalent cardiovascular and pulmonary diseases. Heparin also elicits potent anti-inflammatory and anti-proliferative effects on the vasculature in vitro, but the molecular mechanism(s) of these effects remain unclear. Sara Lynn's graduate work has been focused on elucidating these mechanisms using various models of endothelial cell physiology. She has found that heparin effects in endothelial cell require the recently identified heparin receptor, TMEM184A. In a [recent manuscript](#) published in the Journal of Biological Chemistry, she shows that heparin specifically binds to a novel receptor transmembrane protein 184A (TMEM184A), and TMEM184A is required for anti-proliferative effects of heparin in vascular smooth muscle cells. Sara Lynn is also first author on a [second manuscript](#) which demonstrates a mechanism by which heparin requires TMEM184A to induce anti-inflammatory signaling in endothelial cells. The lab just published a paper and a [video](#) in the Journal of Visualized Experiments which expands upon the methods she developed in the Pugh, et al paper. Sara Lynn is currently working in collaboration with Dr. Kathy Iovine to evaluate the function of TMEM184A in an animal model. She is using the zebrafish regenerating tail fin as a model for angiogenesis. She has been awarded a Marjorie Nemes Fellowship, Sigma Xi Grant-in-Aid of Research, a Phi Kappa Phi Love of Learning Award, and a Great Lakes Scholarship to provide important resources for this project.



Teaching and mentoring undergraduates has been an important part of her graduate career. Sara Lynn completed two levels of Teacher Development certification offered through Lehigh graduate school, and she learned to implement new pedagogical techniques. As a teaching assistant, Sara Lynn enjoyed designing weekly modules to engage students in experiential and active learning of statistical principles. Furthermore, the nature of the projects in the Lowe-Krentz laboratory has always made impactful research accessible to undergraduates. Sara Lynn has had the opportunity to train and mentor over twenty undergraduates, one rotating graduate student, and one Master's student in the Lowe-Krentz laboratory.



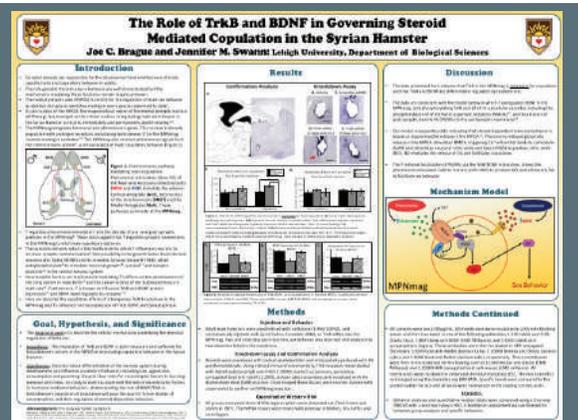
Sara Lynn was elected secretary for the Biological Organization for Graduate Students (BOGS) club in her second year. They organized several social and service events, and she was an author on the Core Competency Grant proposal application that made the first annual Biology Fair at Broughal Middle School possible. In her third year, she became the President of Lehigh University Women in Science and Engineering (WiSE) club. As President, Sara Lynn worked to obtain funding and sponsorship to make WiSE an official club. With the help of an amazing executive committee, Sara Lynn established and advanced the mission of Lehigh WiSE to provide a safe space and programming for women in STEM to share ideas and strategies on various topics. Sara Lynn was awarded a Graduate Life Leadership Award for demonstrating exemplary commitment, leadership, and service to the Lehigh graduate student community.

Sara Lynn sang in the University Choir for three and a half years and even performed at Carnegie Hall in 2014. She now sings with Dolcissimae, a select group of women graduate students, faculty, staff, and alumni who perform at Raise Your Voice, an annual celebration of women and the arts at Lehigh. Sara Lynn also sings occasionally with local jazz professionals and a small jazz band in her department. In her free time, Sara Lynn enjoys playing chess and football with her husband. They also love to discover new restaurants and hidden gems in the Lehigh Valley.

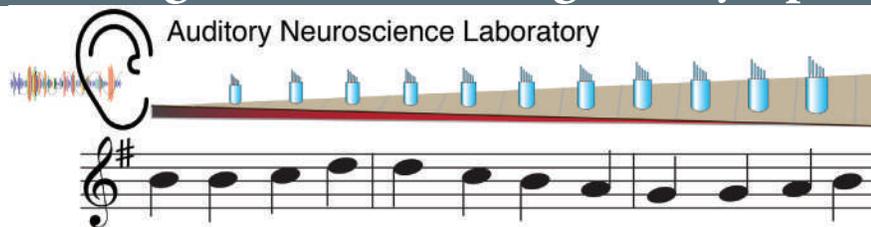
Grad student wins best poster award

Joe Brague, a Ph.D. candidate in the lab of Professor Jennifer Swann, was awarded the "Best Graduate Student Poster Award" at the Society for Behavioral Neuroscience meeting held in Montreal, Canada last summer.

Joe's research revolves around how hormones are influencing the brain and ultimately behavior. There is much evidence in support of hormones influencing behavior, but the underlying brain mechanisms behind this regulation are largely unknown. His research on neurotrophins has shed light on a possible molecular link between hormones and the behaviors they regulate.



The Burger Lab: Resolving life's symphony of sounds



Auditory Neuroscience Laboratory

The preliminary work to establish this new research program is supported by a Lehigh University Faculty Innovation Grant to Associate Professor Mike Burger.

We all understand the importance of organization in our everyday lives, and how much it helps us to make sense of, and function in our surroundings. Likewise, our brains organize neural circuits to help them sort out important information about the world around us from the myriad of stimuli that we encounter. It's known that these circuits are organized early in development and are refined with experience throughout childhood. This developmental process is still poorly understood, but fundamental to how our brains process information in a meaningful way.

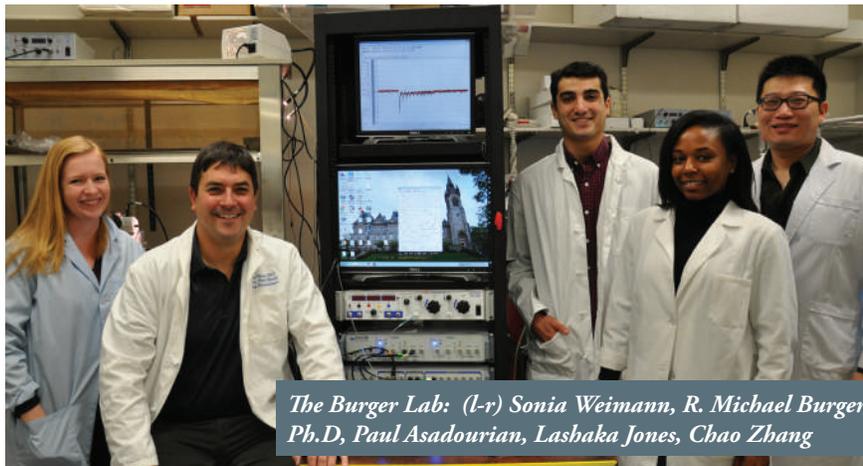
Let's take, for example, a single sensory neural circuit like the one that gives you the sense of hearing. Hearing begins in the ear where a coiled structure called 'the cochlea' is home to the cells that convert mechanical sound energy into neural activity. As sound enters the ear, hair cells located along the cochlea are displaced causing an electrical signal to be produced at the base of the hair cell and these signals are ultimately sent to the brain over thousands of nerve fibers from each ear. We listen to complex sounds every day, so it is hard to imagine how the brain manages to sort out all of this information to construct our perception of music, laughter, or language.

The key to this puzzle is that every sound frequency (experienced as pitch) is processed by different sets of neurons, each running in parallel from the ear to the brain, similar to the way channels on your radio dial are each tuned to a particular radio frequency. Thus, the main job of the cochlea is to organize frequencies and split a complex job up among different cells, each processing only a small component of the sound stimulus.

The ear further simplifies this complexity with two key strategies that are interesting from a neuroscience perspective. The first is anatomical, such that neurons are spatially ordered in the ear from high to low frequencies. This creates a topographic map of frequencies, a property referred to as 'tonotopy.' Tonotopic spatial organization persists throughout all auditory centers in the brain so that the particular location of a neuron will also indicate its preferred frequency. The second strategy is even more remarkable and depends on processing characteristics of each individual neuron. That is, these neurons physiologically (or electrically) "tune" themselves to be most responsive to a narrow range of frequencies and reject input that doesn't fit with their preferred frequency. The Burger lab demonstrated some of these properties in recent published work (Oline and Burger, 2014; Oline et al., 2016). Next, Lashaka Jones, a graduate student in the lab, is taking advantage of these findings to determine how these properties arise in the brain in the first place.

There are two compelling theories as to how these organizational strategies develop within the ear and brain. The first suggests

that the tonotopic properties first arise in the ear, and then these properties drive the frequency specific organizational development of the auditory neurons in the brain. Alternatively, it is possible that the brain's organization develops independently of the ear, instead relying on cues present in the developing brain itself to establish tonotopic patterns. The optimum way to test which theory is supported would be to disrupt tonotopic organization in the ear, without disrupting hearing. Recent breakthroughs are allowing us to do exactly that. Our collaborators in the lab of Dr. Matt Kelley at the National Institutes of Health recently demonstrated that the tonotopic organization of the inner ear of the embryonic chick can be disrupted by introducing genes into the developing ear that block the normal signaling molecules that establish tonotopy.



The Burger Lab: (l-r) Sonia Weimann, R. Michael Burger, Ph.D, Paul Asadourian, Lashaka Jones, Chao Zhang

In collaboration with the Kelley lab, Lashaka Jones and other members of the Burger lab are following this strategy to create chicks that develop with one normal and one 'disrupted' or non-tonotopic ear using a technique called *in ovo* plasmid electroporation. This technique allows us to drive expression of particular genes in the embryo's developing ear.

Following development we will then examine the impact of the "disrupted tonotopic pattern" within the ear on the maturation of auditory neurons within the brain. We are particularly interested in the chick cochlear nucleus, nucleus magno-cellularis (NM). This brain region is the first to receive input from the ear, and under normal conditions will follow the tonotopic pattern of the ear. We have fully characterized frequency-specific electrical properties that are unique to these neurons. Thus, using the newly genetically manipulated animals, we are able to resolve the degree to which the highly specialized properties of these neurons depend on normal input from the ear.

These will be the first studies to investigate the developmental dependence of brain neurons on their inputs from the ear to establish their fundamental computational properties. These studies will give us a greater understanding of the principles the brain uses to create its precise organization. It is this exquisite organization that ultimately endows each of us with the ability to resolve life's symphony of sounds.

2016 Selected Research Publications

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

Oline, S.N.*, Ashida, G., and **Burger, R.M.** (2016) Tonotopic optimization for temporal processing in the cochlear nucleus. *The Journal of Neuroscience*. 36(32):8500-8515.

Leung, J., Plooster, M., & **Cassimeris, L.** 2016. Exploring stathmin control of cell survival through negative feedback of a JNK-dependent pathway. *Matters (Zur.)*.

Cundall, D., A. Deufel*, G. MacGregor, A. Pattishall*, and M. Richter. 2016. Effects of size, condition, measurer and time on measurements of snakes. *Herpetologica* 72, 227-234.

Falk, M.M., Bell, C.L., **Kells Andrews, R.M.**, and Murray, S.A. 2016. Formation, Trafficking and Processing of Annular Gap Junctions. *BMC Cell Biology*, 17 (Suppl. 1):22.

Haas, J.S., Greenwald, C.*, and Perada, A. (2016). Activity-dependent plasticity of electrical synapses: increasing evidence for its presence and functional roles in the mammalian brain. *BMC Cell Biology*.

Dhilon S. Patel, Soohyung Park, Emilia L. Wu, Min Sun Yeom, Göran Widmalm, Jeffery B. Klauda, and **Wonpil Im**. 2016. Influence of Ganglioside GM1 Concentration on Lipid Clustering and Membrane Properties and Curvature. *Biophysical Journal* 111, 1987-1999.

Govindan, J.*, *Tun, K.M.*, **Iovine, M.K.** Cx43-Dependent Skeletal Phenotypes Are Mediated by Interactions between the Hapln1a-ECM and Sema3d during Fin Regeneration. 2016. *PLoS ONE* 11(2).

Al-Shaer, L., **Bloch, A.**, **Paciorek, T.**, *Carroll, Z.*, Black, A.*, **Itzkowitz, M.** 2016. Renovated Breeding Habitat Use in Wild & Captive-Bred Populations of an Endangered Desert Pupfish. *J. of Biodiversity & Endangered Species*, 4:156.

Pugh, R.*, Slee, J.B.*, **Farwell, S.L.N.**, **Li, Y.**, *Barthol, T.*, Patton, W.A. and **Lowe-Krentz, L.J.** 2016. Transmembrane protein 184A is a receptor required for vascular smooth muscle cell responses to heparin. *J. Biol. Chem.*291: 5326-5341.

Rice, A.M., **McQuillan, M.A.**, Seears, H. A., *Warren, J. A.* 2016. Population differentiation at a regional scale in spadefoot toads: Contributions of distance and divergent selective environments. *Current Zoology* 62: 193-206.

Skibbens R.V. (2016) Of Rings and Rods: Regulating Cohesion in Entrapment of DNA to Generate Intra- and Intermolecular Tethers. *PLoS Genet* 12(10): e1006337.

We get letters!

We are always delighted to receive letters from our former students! The following letter was sent to our director of instructional labs—STEPS, Dr. Margaret Kenna.

Dear Dr. Kenna,

I was a student at Lehigh from 2012-2014, and I was inspired to pursue research through the Biocore courses that you direct. I wanted to follow up on how you greatly influenced my research career, not only through these courses, but also when you wrote me a number of letters of recommendation as I pursued my research interests in marine biology and neurobiology in fish species.

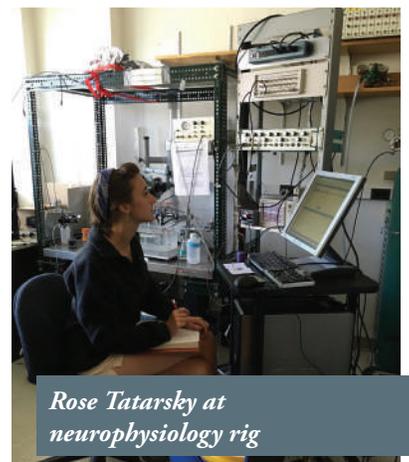
When I transferred to UW-Madison, your letter allowed me to join the lab of Dr. Grinblat, where I studied zebrafish acoustic behavior and published data on how a genetic mutation in the cilia of their inner ear dampened their natural escape response behavior. This research experience led me to apply to graduate school, and I started my PhD in Neurobiology at Cornell University this Fall. This semester I have been investigating underlying differences in the physiology and gene expression of two main motor nuclei used for sound production in fish species: the pectoral motor and vocal motor nuclei. I have really enjoyed my time so far in the lab of Andrew Bass, and the above right is a picture of me holding my current model organism, the plainfin midshipman. This species essentially sings during the summer to find love and is a well-established model for the vocalization motor pathway. The below right is a photo of me and my neurophysiology rig, looking at how glutamate affects the midshipman's vocal response, which I am recording from the occipital nerves of the fish.

When I started at Lehigh, I was mainly interested in the organismal level of biology, but through your classes I discovered the importance of the molecular mechanisms underlying their behavior. I have been able to take my experience in the Biocore labs and turn it into a meaningful research career, examining the neural mechanisms underlying communication behavior in marine teleost species, and I couldn't be happier. The Biocore lab classes at Lehigh gave me an education in not only the most relevant and modern lab techniques in research, but also greatly assisted me in scientific literacy, writing proposals, and giving scientific presentations.

Rose Tatarsky
Graduate Student, Department of Neurobiology and Behavior, Cornell University



Plainfin Midshipman



Rose Tatarsky at neurophysiology rig

We're proud of our accomplishments!

Falk promoted to professor

At their May 2016 meeting, the board of trustees granted Matthias Falk, Ph.D. a promotion to full professor. Falk came to Lehigh from the Scripps Research Institute in La Jolla, California where he served as an assistant professor.

Dr. Falk earned his doctorate in molecular biology from the University of Heidelberg (Germany) and his master's and bachelor's degrees from the University of Giessen (Germany).

Dr. Falk has taught a variety of courses while at Lehigh, including Core I: Cell & Molecular, Cell Biology Lab, and Molecular Cell Biology. Active in a variety of aspects of service to the university, Dr. Falk currently serves as department graduate program director.

Research in the Falk lab is focused on cellular gap junctions and is based on an integrated approach that combines novel high resolution and live-cell imaging techniques with molecular biology, biochemistry, immunological and functional assays. Falk research has been funded by the National Institutes of Health and he is an editor for the BMC Cell Biology Journal (Cell-Cell Contacts and Adhesion).



Professors Jennifer Swann and Vassie Ware were honored last Spring by the university's Women's Center in their celebration of 25 Women Who Are Changing Lehigh.



Jennifer Swann, Ph.D.

During Dr. Swann's 25 years at Lehigh, she has worked hard to address the cultural climate. She was part of a small but strong ad hoc group at Lehigh that met to address the falling numbers of minority students in the early part of the century. That group prompted the administration to form the Student Diversity Task Force, which is a coalition of faculty, staff, and administrators. The SDTF became the Council for Equity and Community whose goal is to increase community through dialogue and engagement. Dr. Swann also served as co-chair and founding member of the Faculty and Staff of Color Network. The FSCN serves as an important focus for our faculty and staff and has been instrumental in building community for all of Lehigh's members. By reaching out to Historically Black Colleges and Universities, Dr. Swann has recruited students of color to our graduate program. She also works closely with undergraduate students from all backgrounds, giving them direct access to our research program to increase their critical thinking and understanding of biology. In her new role as Director of Student Success in the newly created CAS Advising Center, Dr. Swann has worked closely with students, faculty, and staff to increase student awareness about courses, majors and registration. The center has increased students' satisfaction with advising in the CAS by supporting the Mentor Advisors – a group of faculty that advise and support first year students.



Vassie Ware, Ph.D.

Since the late 1980's, Professor Ware has made significant contributions that have built an interdisciplinary life sciences curriculum and fostered interdisciplinary course-based and team-based research opportunities for Lehigh undergraduates. In the last decade, her achievements have included three multi-million dollar grants from the Howard Hughes Medical Institute for Undergraduate Bioscience Education, as well as another HHMI award in 2009 that brought the SEA-PHAGES research program to Lehigh. New interdisciplinary courses include "Bioscience in the 21st century" - a web-accessible introductory course designed to introduce students to a survey of emerging bioscience-related problems and the importance of a systems-driven, multidisciplinary approach to create solutions for those problems. Recent initiatives undertaken by Professor Ware include programs that address the national need to improve retention of students in STEM fields. These include: introduction of a pre-admission-to-graduation science immersion program called RARE (Rapidly Accelerated Research Experience) that provides opportunities for students from backgrounds underrepresented in STEM fields to develop outstanding scientific and leadership skills to address complex problems in the life sciences; and the BioConnect Program that builds academic and research relationships with faculty and students at community colleges to improve STEM retention rates, with a focus on community college students who have an interest in transferring to Lehigh. The STEM Live Lehigh residential community is a recent outgrowth of initiatives by Professor Ware to integrate academic and residential life on campus.

Frederick Monson, Ph.D. (1961, B.A., Biology; 1967, M.S., Biology; 1971, Ph.D., Biology) started his career at St. Joseph's University in Philadelphia (1971-1982) in the department of biology teaching Histology, Comparative Vertebrate Anatomy, Development, and Electron Microscopy. He served as director of the EM Lab from 1982-1985 and as research professor from 1986-1997 at the Philadelphia College of Osteopathy. From 2000 to present, he has been the technical director at the Center for Microanalysis and Imaging, Research and Training at West Chester University. Dr. Monson plans to retire in June of this year.

Priscilla Crowe Burt (1966, Ph.D., Biology) taught biology at Immaculata University and is currently living in West Chester.

Joseph Luczkovich (1978, B.S., Biology) was promoted in the fall of 2016 to the rank of full professor at East Carolina University in the department of biology.

Keith Riabov, M.D. (1987, B.S., Biology) has been an Attending Anesthesiologist at Morristown Medical Center in Morristown, NJ from 1996 to the present.

Natasha Schuh-Nuhfer (2002, B.S., Molecular Biology) is director of the Center for Excellence in Education's Teacher Enrichment Program. She works to connect middle and high school science, technology, engineering, and mathematics teachers to scientists and engineers in industry, academia, and government to explore cutting edge research and development and make connections to support STEM teaching and learning. "We just introduced

TEP to Pennsylvania teachers this fall and I look forward to engaging with my alma mater on future events!"

Hillary Stires (2010, B.S., Behavioral Neuroscience) recently defended her Ph.D. dissertation from Rutgers University in Endocrinology and Animal Biosciences. She is moving to Washington, D.C. to begin a T32 post-doc in the Oncology department at Georgetown University.

Jafar Hussain (2011, B.A., Biology) graduated from the Lewis Katz School of Medicine at Temple University in May, 2016. He will be completing his internal medicine internship at Hahnemann University Hospital in Philadelphia and will begin his residency in Diagnostic Radiology in July.

Bradley Walters, Ph.D. (2011, Ph.D., Integrative Biology) joined the faculty at the University of Mississippi Medical Center as an assistant professor. Brad was a post-doc at St. Jude Children's Research Hospital.

Helenea Cheng (2014, B.S., Biology) is currently teaching biology at Emmaus High School. "After graduating from Lehigh, I taught at a project-based school in Los Angeles in 2015. My advisor at Lehigh was Dr. Lowe-Krentz."

Kyaw Min Tun (2014, B.S. Biochemistry) is a student at Touro University California – College of Osteopathic Medicine. "It is the most challenging and yet most amazing experience of my life so far. I am loving every minute of it!"

Alumnus named dean at University of Massachusetts Amherst

Tricia Serio, Ph.D. (1991, B.S., Molecular Biology) has been named dean of the College of Natural Sciences at the University of Massachusetts, Amherst. She will assume her duties in August 2017. Dr. Serio is currently the department chair and professor at the University of Arizona, where she leads a department of 20 faculty, 16 staff and almost 600 undergraduate majors, and over 30 graduate students. Serio was previously a member of the faculty in the Department of Molecular Biology, Cell Biology and Biochemistry at Brown University.

Dr. Serio was awarded her bachelor of science degree in molecular biology with departmental and high honors in 1991. She went on to do her graduate work at Yale University and received her Ph.D. in 1997. Serio's post-doctoral research was done at the University of Chicago and she was an associate research scientist at Yale University.

The impact of a great mentor

In an article published by The Chronicle of Higher Education ("The Magic Mix of Mentorship That Worked for Me," www.chroniclevitae.com, May 5, 2016), Dr. Serio spoke about how being mentored had a profound impact on her career. Professor Vassie Ware was identified by Dr. Serio as someone who helped shape her future. ([Click here](#) to read the entire article.)

When I began college, I wanted to be a dentist, and I wanted to get there by first completing a bachelor's degree in molecular biology in three years. When I explained my plan to my faculty adviser, Vassie Ware, she looked at me in wide-eyed disbelief, but instead of discouraging me, she took out a piece of paper and began to map out the daunting plan. Toward the end of my undergraduate studies, I completely changed my mind about dental school. When I went to her office to tell her that I had decided to go to graduate school instead, she threw herself backward in her chair and shrieked before bounding around her desk to hug me, saying, "I've been waiting for this day!" I had no idea that she had a bias. Unbeknownst to me, she quietly facilitated my evolution by listening to my growing interest in molecular biology and suggesting opportunities to match it – such as an undergraduate research project and a summer internship. Vassie recognized a shift before I saw it in myself, and she positioned me to move onto the next level without knowing that I would ever decide to go there.

In the inaugural issue of our annual newsletter in the Spring of 2005, we highlighted Tricia Serio, along with her academic adviser, Professor Vassie Ware. [Click here](#) to read the article.



You are invited to our annual
**Undergraduate
Research Symposium**

Thursday, April 20, 2017

4:00 to 6:00 p.m.

**Poster Presentations
by our undergraduate researchers**

Iacocca Hall, Wood Dining Room

Inaugural PA DNA Day reaches over 300

[Click here to visit our website and follow us on twitter @PADNADay.](#)



Last April, young scientist volunteers from Lehigh University participated in the inaugural Pennsylvania DNA Day. PA DNA Day is an outreach program that brings young scientists into high schools to talk about DNA, genetics and new genomics advances. With its inception, it joined the growing network of states celebrating [National DNA Day](#), held every April 25th to commemorate the discovery of DNA's double helix in 1953 and the completion of the Human Genome Project 50 years later in 2003.

Working with Angela Scott, Director for Academic Diversity and Outreach at Lehigh, Dr. Krystle McLaughlin, PA DNA Day director and Lehigh professor of practice, formed a partnership with science teachers the Bethlehem City high schools to bring young Lehigh scientists into the classroom to celebrate DNA Day. Interested young scientists who responded to the campus-wide open invitation, including undergraduates, graduate students and postdoctoral researchers, were trained to deliver a class module on genetics aimed at high school students.

A major goal of PA DNA Day is to provide an opportunity for high school students to meet and interact with a young scientist, broadening their scope of what a scientist looks like and breaking down barriers for students to follow scientific career paths, especially students from STEM underrepresented minorities. Moreover another major goal of PA DNA Day is to give early-career scientists at Lehigh the opportunity to share their passion for science with students, fostering a spirit of public engagement and interest in science outreach throughout their careers.

For this inaugural PA DNA Day, 16 Lehigh University volunteers participated: 10 undergraduates, 5 graduate students and 1 post-doctoral researcher. Combined, the volunteers taught 11 different class periods, with 5 teachers at Liberty and Freedom high schools, reaching over 300 students! In each class, Lehigh volunteers dis-

cussed with students the advances in genetics and genomics, as well as their own personal paths to science. The interactive class module involved a presentation on DNA and a short experiment to demonstrate genetic principles (such as: extracting your own DNA from saliva! Or testing if you have the PTC tasting gene!).

Feedback about the program was overwhelming positive. Teachers from the high schools praised the Lehigh volunteers. Said one teacher, "All the ambassadors were amazing, their range of experience was great to witness." Another commented on their students reactions saying, "It was a great experience for the students. They thoroughly enjoyed the activities and guest lectures. I would highly recommend this event to others."

The young scientist volunteers from Lehigh University also praised the program. "[Participating helped me] I think most importantly, being able to communicate scientific topics (various ranges of complexity) to a general population/audience is a very useful skill that I know I personally will need in my future research career."

With the success of PA DNA Day 2016, Dr. McLaughlin hopes to expand the program to nearby Lehigh Valley colleges and universities to recruit more volunteers, which will allow more high schools to be reached. PA DNA Day is based on the successful model of the North Carolina DNA Day, which has scientist volunteers from universities statewide visiting almost 100 high schools each DNA Day.

Additionally, based on requests from the Bethlehem high school teachers that participated in PA DNA Day 2016, Dr. McLaughlin is currently working with Lehigh students on creating a new DNA Day module on Genetically Modified Organisms (GMOs). This module will be presented at the high schools visited on future PA DNA Days, and will be shared with the entire national DNA Day network for use in other programs throughout the country.

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. 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 Vicki Ruggiero.

Send us a note:

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