Dear Alumni and Friends of the Biology Department,

I’d like to welcome you to our new series of departmental newsletters. We currently plan two issues per year, Spring and Fall, in which we hope to keep you up-to-date on departmental activities and achievements. In turn, I encourage you to drop us an e-mail and let us know about any news and developments in your life and career. Most of you will not know me as I am a relative newcomer to the department. I arrived at Loyola in the summer of 2013 as chair of the department after 24 years at Washington University in St. Louis and 10 years before that at Northwestern University. Over that period I taught freshman medical students Human Gross Anatomy and courses on evolution and genetics to undergraduate and graduate students. My own research is quite varied but centers on the genetics and evolution of complex traits including morphology and complex diseases, such as obesity, diabetes, osteoporosis, congenital heart disease and wound healing.

We have had a banner year in the department, with numerous undergraduate, graduate, and faculty achievements through the year. We continue to serve the largest major at Loyola with 1600 students, graduating 450 seniors this year. Over 70 undergraduates presented their biology research at the Weekend of Excellence and Biology Poster Day and we have had over 140 students working in our research labs this year. With four new research faculty we hope to expand this number by 20% next year and to increase student access to research and internship opportunities outside of the department. Our faculty have also developed several new, innovative courses for juniors and seniors.

I look forward to communicating with you over the next years and hearing from you about your life and successes.

Best wishes,

Jim Cheverud
Congratulations to our Graduating Seniors!

The Biology Department would like to congratulate the 450 Biology Majors who graduated this May. Biology Majors receiving Honors and High Honors were recognized at the Biology Honors and Awards Ceremony held on May 12th, 2016. Additionally, the John W. Hudson-Boris E.N. Spiroff Award for an outstanding Biology graduate excelling in academics and service to the college was awarded to Katie Bruder. The Edward E. Palincsar Service Award for providing outstanding service to the Department of Biology, its sponsored organizations and clubs and its faculty was awarded to Magdalena (Maggie) Bednarz.

Frontiers in Science Symposium with Nobel Laureate Dr. Martin Chalfie

By Jennifer Zitzner

The Biology Department’s Annual Frontiers in Science Symposium was highlighted by a Keynote Address from Nobel Laureate Dr. Martin Chalfie. Dr. Chalfie was awarded the Nobel Prize in Chemistry in 2008 along with Osamu Shimomura and Roger Y. Tsien for the discovery and development of the green fluorescent protein, GFP. Dr. Chalfie is currently a University Professor at Columbia University.

The topic of Dr. Chalfie's talk was "GFP: Lighting Up Life" which not only described the discovery and applications of GFP, but also reflected on Dr. Chalfie’s path in science – both his misconceptions of what science was in his childhood to his current understanding of the importance of basic science research in society. The Keynote address not only attracted Loyola University Chicago faculty, staff, and students, but also drew a large audience from the surrounding academic university communities.

The Frontiers in Science Symposium was held Thursday, April 14, 2016 and also included a student poster session and several opportunities for Loyola University Chicago students to meet with Dr. Chalfie to discuss their research and future plans.
Weekend of Excellence Recognizes the Efforts of Biology Students and Faculty

By Jessica Brann

Each year, undergraduate Biology students collaborate with department faculty to conduct original research. Many of these students obtain competitive fellowship support from the Loyola Undergraduate Research Opportunities Program (LUROP) via the Center for Experiential Learning. These fellowships, funded in part, from donations provided to the Biology Gift Fund, provide a stipend and research budget to students for a sum- mer, academic year, or longer. On April 16, 2016, students presented the results of their research conducted over the previous year in the annual Undergraduate Research and Engagement Symposium during the Weekend of Excellence held on the Lakeshore campus of Loyola University Chicago. In addition to many wonderful poster and platform presentations, several notable Biology students and faculty were recognized for their work this year in an Awards Ceremony.

Overview of Undergraduate Research and Engagement Symposium poster session (photo credit: Natalie Battaglia, LUC)

Langerbeck Award for Undergraduate Research Mentoring
Joseph Milanovich (awardee)
John Kelly (nominee)

Hayes Award for Advising and Mentoring
Timothy Hoellein (nominee)
Joseph Milanovich (nominee)
Bryan Pickett (nominee)

Graduate Student Mentor Award
Kaitlyn Kiernan, Kanzok Lab

Outstanding Loyola Undergraduate Research Award
Ashley Iannantone, Brann Lab
Wasif Osmani, Brann Lab
Rabab Zaidi, Cheverud Lab

Loyola University Libraries Undergraduate Research Paper Award
Matthew Davis, Mierisch Lab

Wasif Osmani presents his research to an attendee of the Undergraduate Research and Engagement Symposium. Wasif conducted research in the Brann Lab and will graduate this Spring. (photo credit: Natalie Battaglia, LUC)
Loyola Retreat and Ecology Campus (LUREC) allows students to study nature in nature

By Bobbi Lammers-Campbell and edited by Shanna Yetman

What was your General Biology Lab experience like? It’s likely it was held in a sterile laboratory without windows on a city campus with no access to the nature you were about to dissect or examine. Now, imagine taking this same lab at a field station where you collect the materials you’ll study. This is the plan for a cohort of freshmen next fall, and it will happen on a Loyola campus 60 miles northwest of Chicago called LUREC.

Loyola purchased LUREC in the summer of 2010. This 98-acre facility between Woodstock and Crystal Lake, IL, was initially St. Joseph’s Seminary and then Resurrection Retreat Center. The building can house 200 people and includes meeting rooms, a large lecture hall, an instructional kitchen, and two wet labs. Outdoors there are high and low ropes challenge courses as well as an organic garden on site. The University uses much of this space to host ministry retreats, team-building activities and the Institute of Environmental Sustainability holds summer session and J-Term ecology and biology classes there as well.

Ecologically LUREC is diverse. It sits atop the Woodstock Moraine. The back yard slopes steeply down to a wetland (calcareous fen). There’s an artificial pond that was dug in the late 1950’s that we will decommission soon. Invasive buckthorn shrubs have been removed from twenty acres of fen, and classes and interns are in the process of restoring it. The wetland is a piece of a larger basin that includes Parker Fen, an Illinois Nature Preserve. The degraded oak-hickory woodland on LUREC connects with woodland on neighboring properties surrounding the entire basin. In addition there is a constructed prairie/savanna from which seed is collected and utilized in restoration projects elsewhere on campus. A restoration workday takes place every month on the second Saturday. To participate in these workdays, please email Shanna Yetman at syetman@luc.edu.

Next fall’s General Biology Lab will be based on a model that was used successfully for Wetland Ecology. The lab will meet every other Saturday at LUREC instead of during the week on Lake Shore Campus. Students will be bussed out Friday evening so they can start fresh on Saturday morning. They will do one lab Saturday morning and another in the af-
ternoon before being bussed back to Lake Shore. The lab will be taught by Laurel Nida, a veteran laboratory instructor. Whenever possible, they will collect their study materials on the LUREC grounds.

We hope that this lab will help students interested in an Ecology concentration solidify their interests as well as provide a way for them to meet each other. There will be no additional expense for the students registering for this special section. However we are looking for private donors willing to help cover the expense of housing them at LUREC. For more information on this – or other aspects of LUREC – please contact Dr. Roberta Lammers-Campbell (rlammer@luc.edu). For more information on LUREC, go to LUC.edu/retreatcampus.

An update from Alumnus Lucas Klemm

As an undergraduate, I conducted research with Dr. Jessica Brann in the Biology Department, and I focused on identifying gene candidates that might regulate neural stem cell activity. Since graduating with my Bachelor’s in Biology with Molecular Emphasis, I have been studying at Midwestern University for my Master of Biomedical Sciences degree. My interests include cellular functions and responses to stimuli like injury or degeneration. For my thesis research, I investigated how a type of glial cell in the brain, microglia, respond to injury with lipopolysaccharides isolated from a virulent bacterium found in warm water environments. To do this I learned a variety of experimental techniques and methods including cell culture, immunological, and biochemical assays. I also established a proteomics protocol to characterize the inflammatory mediators released by microglia treated with lipopolysaccharides.

The collaborative environment, and exposure to diverse techniques, at Midwestern University have afforded me great opportunities. One opportunity in particular was being able to present my research as a poster at the 55th Annual Society of Toxicology Meeting in New Orleans, Louisiana. Due to my excellent training and experiences at Loyola University Chicago and Midwestern University, I was invited to interview at several schools for PhD programs including University of Madison-Wisconsin, University of Chicago, University of Illinois at Chicago, and Loyola University Chicago.

I will be pursuing my Ph.D. at University of Wisconsin-Madison in the Molecular and Cellular Pharmacology Graduate Training Program where I can explore my interests in inflammation, cellular signaling and transduction, and potentially macrophages. I love what I am doing, as research is an extremely rewarding experience for me, and it has also brought me to interact with some truly amazing people. In the future I hope to run a laboratory of my own to perform meaningful research and give back to the scientific community.
Dedication of Permanent Public Artwork in the Third Floor Atrium of Quinlan Life Sciences Building

The initiative to grow and improve its Lakeshore campus took another step forward recently when Loyola University Chicago acquired a new work of permanent public art for its Quinlan Life Sciences Education and Research Center. The multi-media work created by artist and scientist Hunter Cole is located in the center’s third floor 2-story atrium, which overlooks the newly landscaped West Quad. A formal dedication was held on Thursday, April 7, 2016. Faculty from many departments attended the dedication including Biology, Psychology, IES, and Performing Arts. James Cheverud, Biology Department Chair, Chancellor Michael Garanzini, and Hunter Cole, Artist and Scientist, gave presentations at the dedication.

Entitled, *Biological Domains*, the art is comprised of 14 oil paintings, six of which depict specific areas in biology. The installation incorporates LED lighting timed to create changing effects in the overall appearance of the installation throughout the day. Paintings making up the installation incorporate biological topics including: animal organ systems, plant development, stem cell research, neurology, cell and molecular biology, invasive species, malaria, bacteria, HIV, and evolutionary themes. You are welcome to come see the installation anytime the building is open. *Biological Domains* was commissioned by Chancellor Michael J. Garanzini, S.J., who served as Loyola president from 2001-2015. The Biology Department also provided funds to help install the art. For an explanation of the paintings click [here](#).

A Chicago-based artist, Cole, who holds a PhD in genetics, is known for her work that reinterprets science through art. Cole’s art includes paintings, photography, digital art, and living art using bioluminescent bacteria. She is a member of the faculty in the Biology Department at Loyola University where she teaches biology and genetics labs.

Left: James Cheverud, Biology Department Chair; Middle: Hunter Cole, Artist and Scientist; Right: Chancellor Michael Garanzini"Biological Domains," 14 oil paintings and LED lights (15’x13’) Hunter Cole, 2016. Photo Credit: Loyola University Chicago, Mark Patton
Dedication of Permanent Public Artwork in the Third Floor Atrium of Quinlan Life Sciences Building (cont.)

Cole holds a Ph.D. and Master’s degree in Genetics from the University of Wisconsin-Madison, and a Bachelor of Science from the University of California-Berkeley. At Loyola University Chicago Cole created a course, *Biology through Art*, where students work to create art in a biology laboratory. For a more extensive biography on Hunter Cole click [here](#).

"Biological Domains," 14 oil paintings and LED lights (15’x13’)  
Photo Credit: Loyola University Chicago, Natalie Battaglia

Faculty Updates

**Faculty Awards**

**Dr. Bryan Pickett**—Ignatius Loyola Award

**Dr. Timothy Hoellein**—2016 Sujack Family Award for Faculty Research Excellence

Dr. James LoDolce—2016 Sujack Master Teacher

**Dr. Joseph Milanovich**—Mary Therese Langerback Award for Undergraduate Research Mentoring

Dr. Patrick Duffie—FCIP Teaching and Assessment Spotlight

**Promotions**

**Dr. Timothy Hoellein**  
– Awarded Tenure and Promotion to Associate Professor

**Dr. Sushma Reddy**  
– Awarded Tenure and Promotion to Associate Professor

Dr. Megan Helfgott, who has played a critical role in our freshman biology curriculum, has joined the faculty as a Lecturer.

**Bidding Farewell**

The Biology Department bids farewell to two long-serving faculty—Dr. Kim Williamson and Dr. Arden Davidson. We wish both all the best in their new adventures!
What’s new in the Master of Arts in Medical Sciences (MAMS) program?

By Dawn Franks

Longtime MAMS Director Bryan Pickett stepped down in 2014 in order to turn his attention to his first love – research. He continues to teach classes in the program and advise students. Dr. Dawn Franks accepted the Directorship and organized the incoming students into groups that are assigned one of the MAMS faculty for more personal academic advising. This has given the MAMS students even more face time with faculty, significantly adding to the strong personal touch for which MAMS is renowned. Dr. Franks has set aside funds for outings with the students so you may see the faculty and their advisees at pizza or coffee shops around the Rogers Park area – say hello if you do!

The program continues its fantastic record for matriculation to medical schools across the United States (a three year average of 95%). We have recently had two classes in which 100% of the graduates got into the medical school of their choice! Last year MAMS saw its first student matriculate to an MD/PhD program – check out our website for details (http://luc.edu/biology/mainmedicalsciences/). Our graduates continue to serve in the healthcare field during their gap years by Scribe-ing in hospitals all over America, operating ambulances as EMTs, clinical and bench research, and international medical internships.

The program has recently welcomed new faculty to the MAMS team. Dr. James Cheverud joined the Biology Department as Chairman in 2013 and began teaching Advanced Anatomy for the MAMS program in 2014. His 25 years of teaching Human Anatomy at Washington University in St. Louis School of Medicine meant the MAMS students had to be on their phalanges! Drs. Alfred Diggs, Pamela Osenkowski, and Xiao Tang either teach or are serving as MAMS committee members to assist with admissions and program management. Soon MAMS will release its updated website, the result of a year-long project led by Dr. Osenkowski.

Program Advisor, Sally Fell continues her 12 year tradition of serving the MAMS students. Last year a student said he thought she was an “angel.” Although fully human, she continues to give her heart and soul to the MAMS students by reading and advising thousands of personal statements, secondary applications, performing mock interviews and helping alumni find employment.

We have expanded our MAMS Workshops to include a Director’s Workshop Series. Our guests have included Dr. Frederick Merkel who performed the first kidney-pancreas double transplant to cure diabetes, The Center for Human Rights of Children for human trafficking workshops designed to help health care professionals spot human trafficking in a clinical setting, Dr. Arthur Lurigio to discuss the History of Psychiatry, Dr. John Hardt (Vice Pres. For Mission Integration at SSOM) speaking on Maintaining Focus While in Medical School, and Dr. Aana Vigen (Ethics professor at LUC) on Equity in Healthcare in America. All of our Workshop guests have extended offers to the MAMS students to serve as mentors as they develop their careers.

As always, MAMS welcomes its alumni as guest speakers and as mentors to our current class!
Welcome to our New Tenure-Track Biology Faculty Members

Dr. Daniel Cavanaugh joins us from his post-doc at the University of Pennsylvania. Dr. Cavanaugh received his Ph.D. from the University of California, San Francisco. The major interest of his laboratory is understanding the neurobiological basis of circadian rhythms. Dr. Cavanaugh is excited to join the Loyola Biology Department faculty as “The Loyola Biology Department offers a unique balance between research and teaching. They offer support and resources to conduct cutting-edge research and understand that being an effective teacher takes a significant commitment from the faculty.” More information on Dr. Cavanaugh’s lab can be found at http://cavanaughlab.weebly.com/

Dr. Thomas Sanger joins us most recently from University of Florida Molecular Genetics and Microbiology Department. Dr. Sanger received his Ph.D. from Washighiton University in St. Louis and Bachelor's degree from Cornell University, both in Ecology and Evolution. The focus of Dr. Sanger’s Lab is Evolutionary Biology and Development. He is excited to incorporate undergraduate research students into his lab. More information on Dr. Sanger’s lab can be found at http://anolisevodevo.com/

Dr Heather Wheeler joins us most recently from The University of Chicago. Dr. Wheeler received her Ph.D. in Genetics from Stanford University. The broad goal of Dr. Wheeler's laboratory is to better understand how genetic variation leads to phenotypic variation for complex traits including disease susceptibility and drug response. We develop systems approaches to complex trait prediction by building computational models that leverage and integrate similarity in genetic, transcriptomic or other omics-level data. “I am excited to be a part of Loyola’s growing Bioinformatics Program and to introduce my students to computational genomics research methods. I’m looking forward to making new tools and discoveries together—and high fives when our code does what it’s supposed to do!” More information on Dr. Wheeler’s lab can be found at http://hewlab.org

Dr. Wei-Ming Yu joins us from Harvard Medical School where he was a post-doctoral fellow in Neurobiology. Dr. Yu received his Ph.D. in Neurobiology from The Rockefeller University in New York City, MS in Biochemistry and Bachelor in Veterinary Medicine from National Taiwan University. The major interest of his lab is development of the auditory neural circuit. Dr. Yu is excited to be part of the Loyola Department Faculty as “Senior Faculty members are very supportive and helpful and I get the opportunity to work with superb undergraduate students.” More information on Dr. Yu's lab can be found at http://weimingyulab.weebly.com/
This past semester, Jennifer Zitzner, PhD, from the Department of Biology mixed her personal life with her teaching life and was rewarded with a heartwarming surprise from her students.

While Zitzner’s mother was battling uterine cancer, she decided to use her mother’s experiences as a teachable moment for the Marcella Niehoff School of Nursing students in a Clinical Microbiology class. “As her cancer has related to the immune system and microorganisms, I have shared some of her journey with the students,” Zitzner said. “For me, this was nothing out of the ordinary since I often share stories of my family. However, the nursing students took it to heart.”

Zitzner’s commitment to wanting to see her students succeed in what is traditionally a challenging course made them want to do something special for her and her family.

“Zitzner’s class has been different from other classes because she has specifically catered the class to our interests and future profession,” said Christine Wimberly, a sophomore nursing major and president of the Nursing Student Council. “This is one of the first ‘nursing’ classes undergrads are exposed to. Zitzner specifically constructed microbiology around the diseases and microbes we would be encountering in hospital settings and the treatment and prevention we would be expected to perform.”

Near the end of the semester, the class presented her with 41 handwritten notes of support and encouragement to be given to Zitzner’s mother. The unexpected gesture brought Zitzner to tears. She said it helped her mother’s outlook on her radiation treatment.

“I have tried my best every lecture to give each of my students the education they need to be successful nurses” Zitzner said. “What they have done for me and my family has taken the expansion of knowledge that Loyola strives to provide and transformed it into the care for others that I believe Loyola means when it describes a ‘transformative education.’ They are not yet practicing nurses, but the care and compassion they have exhibited makes them the embodiment of the Loyola experience.” They also told her that they will walk in honor of Zitzner’s mother in the 2016 Relay for Life in April in the Gentile Arena. Her students also dedicated a luminary in her honor, a paper bag containing votive candles that feature the honoree and are lit after dark at the Relay for Life event.

Before their final exam, Zitzner wanted to be the one to surprise her class. Normally, to ease her students’ nerves, she would play a stress reliever video of her children having fun. This time, it was a video of her mother thanking her class for their support and sharing that she would be there to meet them at Relay for Life. Zitzner and her mother also stated they would like to be in the audience for their nursing school graduation in 2018 to support the students along with their friends and family.

“After reading the handwritten notes, she decided to make the video, picked out her best hat and best shirt, put on a little bit of makeup—and felt good,” Zitzner said. “When I played the video there were few dry eyes in the house.”
New Tenure-Track Faculty Spotlight—
Dr. Heather Wheeler

I began thinking about a career in science, specifically forensic science, when I was a teenager growing up in rural Minnesota. I loved reading gory crime novels centered on forensics by authors like Patricia Cornwell, Jeffery Deaver, and, of course, Sir Arthur Conan Doyle. As an undergraduate at Hamline University, I worked at the Minnesota state crime lab in the DNA unit. While it was amazing that you could use DNA as a fingerprint to identify someone, I realized I was more interested in how the DNA variation we were measuring led to differences among people. My undergraduate advisor encouraged me to go to graduate school and I went to Stanford University and got a PhD in genetics and did postdoctoral research in genomics at The University of Chicago. Along the way, I picked up programming and data analysis skills to further my research. I was often the first person to put all the data that had been collected in the clinic and DNA sequencing centers together, run the analysis pipeline that I built, and visualize the results. I found data analysis to be very exciting, especially when I discovered something new because I was the first to see the result!

“I found data analysis to be very exciting, especially when I discovered something new because I was the first to see the result!”

I became an assistant professor at Loyola in Fall 2015 and will now get to pass on the thrill of discovery to my students. Our lab develops systems approaches to complex trait prediction by building computational models that leverage and integrate similarity in genome-wide genotype, gene expression, and other omics-level data. We are a dry lab, which means our scientific tools are powerful computers, we leave the pipettes and test tubes to others. We want to better understand how genetic variation leads to phenotypic variation for complex traits like disease susceptibility and drug response. The human genome is composed of a vast array of 3 billion bases, yet less than 2% of these bases encode proteins. What is the rest of the genome doing? Some of the non-coding regions are involved in gene regulation, controlling whether a gene is on or off and how much of it is expressed. Differences in DNA sequence among individuals can lead to differences in gene expression levels, which in turn can lead to trait differences. We have developed a method that harnesses these DNA differences to predict gene expression levels, which are then tested for correlation with a disease or other trait of interest to identify potential underlying biological mechanisms. My group will continue to develop innovative models to optimize prediction of gene expression and other complex traits using statistical machine learning approaches. We plan to apply and extend methods we have developed using genome-wide datasets from both collaborators and publicly-accessible databases. Many funding sources require database deposition of genome-wide datasets and thus the amount of data available to mine will continue to grow and allow us to learn more about the genetic architecture of complex traits. More information about Dr. Wheeler and her lab can be found at: http://hewlab.org.

Dr. Wheeler teaches her Computational Biology Class. Students L to R: Virginia Saulnier, Shyam Shah, Jeffrey Ng, Alexa Badalamenti. (photo by Natalie Battaglia)
We would love to hear from you!

If you know someone whom you would like to see featured in the Faculty or Alumni Spotlight section, or have ideas about things you would like to see in future newsletters, please send an email to: biologydept@luc.edu

Also, we here in the Loyola Biology Department just love hearing from our alums. So don’t be a stranger! Please email us at biologydept@luc.edu, let us know where you are, what you’re doing, and send us pictures if you have them!

Alumni Support

The University and the Department of Biology are extremely grateful for the generosity of all our donors. Donations in any amount from one to thousands of dollars are appreciated and help the department serve our students. Your support of the Biology Department permits us to continue many programs and services including:

- Student research fellowships
- Travel funds for students to attend local and national meetings
- Professional development opportunities for Biology Faculty
- Equipment for teaching and research laboratories

If you would like to make a gift to the Biology Department Gift fund, you may do so in two ways:

Online: Click here to be directed to the secure donations website

Mail: Please mail checks to:

Loyola University Chicago
Biology Department
c/o Stephanie Tomakowski
820 N. Michigan Avenue, Ste. 1721
Chicago, Illinois 60611

Please include in the memo line: Biology Department Gift Fund

ABOUT THIS NEWSLETTER

This newsletter was compiled by Dr. Jennifer Zitzner and edited by Drs. Jessica Brann, Jim Cheverud, Jeff Doering, and Robert Morgan for the purpose of keeping our departmental alumni abreast of new developments, programs, and events.