

Department of Biology Updates

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A Message from the Chair

Dear Alumni and Friends of the Biology Department,

Welcome to our latest issue of the Biology Department newsletter. We have 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 (BiologyDept@luc.edu). Thank you to the alumni that have contacted us.

This past academic year was very unsettling because of the pandemic. We have all learned to lecture and take courses online and to craft exams that can be taken online in a secure fashion, but we are still learning. Additionally, faculty research efforts were hit hard by the university closure and the lack of undergraduates allowed in research labs until mid-summer. I know I missed the personal contact and immediate feedback from students in my lab and courses. Our plan is to be fully in person in Fall 2021. Everyone will be required to be vaccinated except in special cases. I hope you, our alumni, have been able to take care of this responsibility in your own life.

After the low enrollments last fall, especially among freshmen, it looks like enrollment has bounced back even higher than it was before. We are expecting a record freshman class that will fill our classrooms this Fall. We are all looking forward to it.

Last summer we were unable to award our Biology Summer Research Fellowships because of the pandemic. We are still working to increase undergraduate research opportunities. We have awarded 10 summer fellowships, lower than previously because of pandemic-related budget issues. Even so, alumni have helped with their donations so that the research stipends will be increased by 50% this year from \$2,000 to \$3,000.

We have also hired two new faculty who will start in the next academic year. Dr. Jary Delgado comes to us from the University of Chicago and will be studying synapse formation and function. We now have 6 tenure-track Neuroscientists on our faculty contributing to the Neuroscience Interdisciplinary Program's teaching



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and research. We are currently searching for a new Lecturer in Neuroscience as well. Dr. Sara Lipschutz will arrive from Indiana University where she has been expanding her work on genetics of bird behavior and brain function. She will interact with the other geneticists and neuroscientists in the department linking two of our strongest research groups.

Department faculty members continue being very successful in obtaining extramural support for their research, making the Biology Department one of the top units in terms of grant productivity at Loyola. We currently hold grants totaling more than \$5 million dollars. These funds make for even more active research for our students to participate in.

Dr. Bill Kroll retired this past December. He served at Loyola University for nearly 40 years. He taught classes in Ecology, General Biology, and Animal Behavior. We are very grateful for his service in teaching and mentoring undergraduates over so many decades.

We are anxiously awaiting our return to the classroom this Fall and hope that you and yours have been able to navigate the pandemic safely. Please drop us a line and let us know what you are doing.

Best wishes,

Jim Cheverud


Masters of Arts in Medical Sciences (MAMS) Class of 2021: Still a MAMily!


Greetings to all our alumni from the Loyola MAMS faculty and staff! Despite a pandemic during the medical school admissions cycle, there is much good news! A proud shout-out to the class of 2020 for hundreds of medical school interviews completed! We are also proud to share that one of the class was offered a full, 4-year scholarship to Geisinger School of Medicine! MAMS is also proud of alumnus Enock Adjei, whose residency will be at Vanderbilt in cardiothoracic surgery. Finally, thank you to the MAMS alumni from ALL classes for never failing to answer the call of current MAMSers who seeks your advice and wisdom. The MAMily is real. The MAMily is here for you



societyofbas



Society of Black Academic Surgeons Surgeon Shoutout 



Enock Adjei, MS4
#SBASSurgeonShoutout

Student doctor Enock Adjei is a fourth-year medical student at the University of Washington School of Medicine.

Enock began his studies at Catholic University College of Ghana and subsequently immigrated to the United States, where he graduated from Loyola University in Chicago, Illinois with first a Bachelors degree, followed by a Masters of Arts in Medical Sciences.

After working for a year with AmeriCorps, Enock enrolled in the University of Washington School of Medicine. He has performed admirably, receiving honors in his General Surgery Core Clerkship and General Surgery Sub-I, where he was considered to be "one of the best" students to rotate all year, performing at the level of an intern early on in the rotation.

Congratulations to all the Biology students and their mentors who participated in the 2021 Undergraduate Research and Engagement Symposium!

The symposium, which took place from April 23-30, was held virtually and students uploaded their posters and presentations for viewing. Presentations from the Biology Department included:

- *The role of caffeine, nicotine and theobromine in the biodiversity and function of the human gut microbiome* by Thomas Stanila (mentored by Dr. Michael Burns)
- *Effects of treatment for invasive *Elodea canadensis* on aquatic insect communities of the Copper River Delta, Alaska* by Christina Mangano (mentored by Dr. Martin Berg)
- *Cell Death Facilitated by Photodynamic Therapy* by Mary S. Woloszyn (mentored by Dr. Stefan Kanzok)
- *Survival of the Fittest in the Long-Term Evolution Experiment* by Alexa Nicholson (mentored by Dr. Caroline Turner)
- *Proteome Association Studies in Populations of Diverse Ancestries* by Isabelle Gregga, Elyse Geoffroy, and Ryan Shubert (mentored by Dr. Heather Wheeler)
- *Synthesis of a Folate-Mediated Photodynamic Therapy Agent and Application in Zebrafish Embryos* by Aishah Kothawala, Allison Monterastelli, and Phuong Pham (mentored by Dr. Rodney Dale)
- *Anagenetic Speciation and Sexual Dimorphism in Fossil Samples of Threespine Stickleback Fish* by Allison Ozark and Raheyma Siddiqui (mentored by Dr. Yoel Stuart)
- *Annotation in the Insulin Signaling Pathway Across *Drosophila* Species* by Karolina Senkow (mentored by Dr. Jennifer Mlerisch)
- *Assessing the Genetic Basis of Hindlimb and Pelvic Reduction in Squamate Reptiles* by Ethan Elazagui (mentored by Dr. Yoel Stuart)
- *Bacteriophage Characterization of Isolates from the Human Urinary Microbiome* by Zubia Merchant (mentored by Dr. Catherine Putonti)
- *Brain Development of *Anolis sagrei** by Alexandra Turnquist, Hannah Maher, and Lilian Anraoudoff (mentored by Dr. Thomas Sanger)
- *Characterizing the Inducible I-Cysteine Peroxiredoxin Promoter in *Plasmodium berghei** by Lara Ladney (mentored by Dr. Stefan Kanzok)
- *Effects of Common Chemotherapy Drugs on the Human Gut Microbiome* by Emma Streveler, and Moonis Nadeem (mentored by Dr. Michael Burns)
- *Elucidating the Function of an Evolutionarily Conserved Embryonic Splice Variant of Type II Collagen During Vertebrate Development* by Hind Mothana and Mayar Azar (mentored by Dr. Rodney Dale)
- *Expression of mRNA of the *col2a1b* gene during zebrafish embryogenesis* by Arturo Gutiu, Timoteea Saities, Vanessa Pahlow, and Austin Runde (mentored by Dr. Rodney Dale)

- *Gene annotation of Heterochromatic DNA across D. ananassae Species* by Trisha Patel (mentored by Dr. Jennifer Mierisch)
- *Gene Annotation of the Insulin Signaling Pathway Across Drosophila Species* by Christine Severude (mentored by Dr. Jennifer Mierisch)
- *Gene Annotation of wbd Across Drosophila Species* by Masha Bandoil (mentored by Dr. Jennifer Mierisch)
- *Gene Annotation of wdb in Drosophila simulans* by Anjali Parikh (mentored by Dr. Jennifer Mierisch)
- *Genetic Basis of Partner Specificity In Medicago truncatual-Ensifer meliloti Mutualism* by Akankhya Behera, and Roberto Flores (mentored by Dr. Michael Grillo)
- *Genetic Dissection of the Contribution of Central and Peripheral Circadian Clocks to Drosophila Feeding Rhythms* by Anita Nasser (mentored by Dr. Daniel Cavanaugh)
- *Evaluating the Role of Pesticides on Amphibian Fitness* by Courtney Malnowski (Mentor by Dr. Joseph Milanovich)
- *Genome Annotation of Contig 1 in Drosophila ananassae* by Victoria Hodkiewicz (mentored by Dr. Jennifer Mierisch)
- *Genome Annotation of LTR Retrotransposons in Trifolium repens* by Henry Wittich (mentored by Dr. Howard Laten)
- *Genomic Insights into Lactobacillus gasseri in the Urinary Tract* by Adriana Ene (mentored by Dr. Catherine Putonti)
- *Improving Extracellular Recording Technology with Suction Electrodes* by Justin Domacena (mentored by Dr. Hui Ye)
- *Investigation of a Plasmodium line lacking the MAP6-related SAXO-1 gene* by Siwia Balata (mentored by Dr. Stefan Kanzok)
- *Shared Stem Cells in the Zebrafish Caudal Body and Fin* by Thomas Scott, Maya Roytman, Grace Manske, Jelle Robinson, Shepherd Yancey, Sydni Hall, Adian Keserovic, Emma Loftesnes, Shireen Baig, Max McDonnell, Mirza Baig, and Paula Miartin (mentored by Dr. Fred Picket)
- *Stream Water Quality Assessment Using Benthic Macroinvertebrates in Ashwaubenon and Dutchman's Creek, WI* by Jack Liang, (mentored by Dr. Marting Berg)
- *Synthesis of a Folate-Mediated Photodynamic Therapy Agent and Application in Zebrafish Embryos* by Aishah Kothawala, Allison Noterastelli, and Phoung Pham (mentored by Dr. Rodney Dale and Dr. Ken Olsen)
- *Temporal Stability in a Marine-Freshwater Stickleback Cline* by Rebecca Sullivan (mentored by Dr. Yoel Stuart)
- *The Effects of Selective Serotonin Reuptake Inhibitors on the Human Gut Microbiome* by Sarah Syed (mentored by Dr. Michael Burns)
- *The Role of trc in the Development of Glia in the Nervous System* by Andrea Kirincic (mentored by Dr. Jennifer Mierisch)



Dr. Lodolce Co-Authors Becker's World of the Cell

Becker's World of the Cell was first written and developed by Wayne Becker, who taught cell biology at the University of Wisconsin-Madison for 30 years. The first edition was published in 1986. The earlier editions focused on Wayne's expertise in plant biology and biochemistry. Over the years, the emphasis has shifted to animal cells and molecular biology. When two of the three authors of the 9th edition retired, James Lodolce was contacted by Pearson to submit an audition packet and was eventually selected to co-author the 10th edition with Jeff Hardin. Jeff was a colleague of Wayne's at the University of Wisconsin-Madison for several years, and has co-authored the text since its fourth edition. The strength of the World of the Cell lies in its easy-to-read and conversational tone, coverage of fundamental principles of cell biology, and manageable length. It is designed for majors in the biological sciences at the sophomore/junior level. Several of the Loyola faculty have adopted this text to use in teaching BIOL 251, a survey of Cell Biology required for all majors within the Biology Department. Since the first edition, the popularity of Becker's World of the Cell has steadily risen to become one of the top textbooks in the field of Cell Biology, and is widely used across the nation.



James Lodolce and the 9th edition of Becker's World of the Cell.

Recent Publications from the Wheeler Computational Genomics Lab



Wheeler Lab Members attending a Zoom lab meeting in Spring 2021. Left to right, starting at top: Daniel Araújo, Dr. Heather Wheeler, Isabelle Gregga, Elyse Geoffroy, Henry Wittich, Rhea Prag, Ryan Schubert, Ashley Mulford, Chris Nguyen.

The Wheeler Lab's broad goal is to better understand how genetic variation leads to phenotypic variation for complex traits including disease susceptibility and drug response. Their work aims to include analyses in populations underrepresented in human genomics and reduce the contribution of the field to health disparities. Highlights of their work the past year include three peer-reviewed publications, each led by a different thesis-track MS student from Loyola's Bioinformatics Program. One study, led by Elyse Geoffroy with contributions from undergraduate Biology major Isabelle Gregga, demonstrated that population-matched transcriptome prediction increases both discovery of gene-phenotype associations and, more importantly, replication rate (Geoffroy et al. 2020, *iScience*). Another study, led by Paul Okoro with contributions from lab bioinformatician Ryan Schubert, compared machine learning models for transcriptome prediction across populations (Okoro et al. 2021, *Human Genetics and Genomics Advances*). A third study led by Ashley Mulford demonstrated how genetically regulated gene expression underlies cellular sensitivity to chemotherapy drugs in diverse populations. Specifically, the study demonstrated for the first time how decreased expression of the gene *STARD5* in a cancer cell line results in decreased sensitivity to the drug etoposide as was predicted by her computational modeling (Mulford et al. 2021, *Human Molecular Genetics*).

9th Annual Beauty in Biology Art Competition



First place winner Brooke Boxrud's work: "A Stitch in Time."

This year we were able to run the 9th annual Beauty in Biology art competition. Last year, we had a record 27 entries, but had to cancel; this year's 20 was still a solid turnout. First place went to Brooke Boxrud for her work entitled "A Stitch in Time." She took the unique approach of using embroidery to capture the power of diffusion tensor imaging. This method allows the observer to infer the magnitude and direction of the diffusion of water in tissue, which is typically encoded by intensity and color, respectively. Because of its superior capability to detect white matter and even gray matter lesions or defects, it opens the door to early detection, which makes possible earlier therapeutic intervention. This is the first submission for this contest that focused on a technological advance, but given that nearly all biological discoveries depend on technical advances, it is highly appropriate for our competition. Congratulations, Brooke! Second place went to Amrita Rehal for "Pandemania," and third place went to Alexandra Webster for "Spillover." Thank you to this year's ad hoc judges: Diane Jokinen, Wendy Gruhl, and Dan Cavanaugh.

Biology and Philosophy Faculty Receive Grant to Fund Interdisciplinary Curriculum Across Departments

Drs. Michael Burns (Biology) and Joseph Vukov (Philosophy) were awarded a seed grant from the Mellon Philosophy as a Way of Life Project for 2021-2022 to design and implement a set of interdisciplinary courses, collectively entitled, "Biology and philosophy of the Future." Over the summer, the grant will support the training of undergraduate students in peer-led discussion best-practices. These students will then facilitate discussion groups within two new courses being taught in the Fall of 2021. This pair of courses are being co-taught between the Biology and Philosophy departments and will cover the science behind climate change, human genetic engineering, the neuroscience of consciousness, abiogenesis and extraterrestrial life, artificial intelligence, and the biological underpinnings of pandemics, among other content. The students will master the scientific underpinnings of this content while also actively engaging with the normative ethical and religious frameworks related to them – for instance, what does it mean to be human? What are our ethical responsibilities to future generations? When (if at all) is it ethically justified to genetically modify ourselves? The students in these courses will finish the course with a final project that tasks them with bringing these discussions out to community groups (church groups, social clubs, student groups, etc.) to encourage good-faith dialogue and well-reasoned argumentation. Moving forward, the hope for this seed grant and pilot course set is to provide a model of productive interdisciplinary education that explicitly ties together the hard facts of science with the sound reasoning and ethical considerations provided by the humanities.



Joe Vukov is an Assistant Professor of Philosophy whose work focuses on philosophy of mind and neuroethics.



Michael Burns is an Assistant Professor of Biology whose research focuses on cancer and the microbiome.

News from the Biology Department Faculty

Promotions

This year, two Biology faculty have been recognized for their work in their field of research and teaching and have been promoted to the next academic rank. Dr. Daniel Cavanaugh has been promoted to Associate Professor with Tenure and Dr. Jennifer Zitzner has been promoted to Senior Lecturer. The new promotions take effect on July 1, 2021.

Congratulations to Drs. Cavanaugh and Zitzner on your promotions!

Awards

Each year, Loyola University Chicago and the Sujack Family present awards to faculty who have demonstrated excellence in teaching as well as faculty who have excelled in research and scholarship outside of the classroom. This year, Dr. Rodney Dale, Associate Professor in Biology, received the 2021 Sujack Family Award for Teaching Excellence and Dr. Joseph Milanovich, Associate Professor in Biology received the 2021 Sujack Master Researcher Award.

Dr. Rodney Dale was also awarded the 2021 Alice B. Hayes Award for Advising and Mentoring as well as the 2021 Langerbeck Award for Undergraduate Research Mentoring. Both of these awards highlight Dr. Dale's outstanding ability to mentor students to "discover their passions, develop a dedication to life-long learning, and guiding students' intellectual, personal, social and spiritual growth" and to "provide intensive individual research experiences for undergraduate students."

Congratulations to Drs. Dale and Milanovich on their achievements in and out of the classroom!

Department Farewells

As we close out the 2020-2021 academic year, we say farewell to Lecturer Dr. Diana Kim. Dr. Kim has taught in the Human Structure and Function undergraduate courses as well as undergraduate and Masters neuroscience courses.

Thank you for your service to Loyola University Chicago – you will be missed!



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ABOUT THIS NEWSLETTER

This newsletter was compiled by Dr. Jen Beshel and Mercedes Mac Laughlin and edited by Drs. Jim Cheverud, Jennifer Zitzner, Michael Burns, and Caroline Turner for the purpose of keeping our departmental alumni abreast of new developments, programs, and events.

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:

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