

BIOLOGYCURRENTS

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Message from the Chair: Cathy Savage-Dunn



Cathy Savage-Dunn

Greetings Biology Department alumni and friends! We are pleased to bring you an update on departmental activities for the calendar year 2024. As always, we remain committed to our mission of providing rigorous and accessible education and training opportunities to all of our students.

One of the ways that we provide opportunities is by engaging students in undergraduate research. Our department is proud to lead the way in obtaining external funding for undergraduate research and participating in a variety of programs on campus. For example, you can read more about our involvement in the NIH funded U-Rise program [page 6]. In addition, Professor Alicia Melendez organized the first Borough of Queens CUNY Undergraduate Research Symposium, which was held on April 2, 2024. Nine students from the Biology Department presented posters at this event. Read more about it [page 6].

Although the hiring of full-time tenure-track faculty is currently severely limited, we are happy to announce there were some additions to our faculty and staff in 2024. First, we were fortunate to welcome back Dr. Marlen Acosta Alamo as a Substitute Lecturer. Alamo was previously a master's student in our department working with Dr. José Anadón. She went on to obtain her PhD from the CUNY Graduate Center, working with Dr. Lisa Manne at the College of Staten Island. Alamo is filling some critical gaps in the curriculum, teaching General Ecology and Biostatistics. Second, we were able to hire a

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new college lab technician (CLT), Alejandrina (Alexis) Scott, to fill one of the vacancies in the CLT staff.

We also welcome Ken Nguyen in the role of interim Core Facilities Manager. As we reported in *Currents* 2022–2023, we were honored to receive funding to purchase state-of-the-art microscopes for the Imaging Core from two awards: \$1,850,000 in Congressional Community Project Funding and \$570,000 from an NSF Major Research Instrumentation Award. It was critical to protect this investment by hiring a specialist to train new users and oversee maintenance and repairs. Using funds from indirect (F&A) costs from federal awards to Queens College, we hired Ken Nguyen. He is an expert in electron microscopy, with additional experience in confocal microscopy, and he has been invaluable in increasing user access to these instruments.

As you can see from our Faculty Notes section, our faculty remain highly active in their diverse research fields, publishing peer-reviewed and popular articles, giving talks, and serving the scientific community. I want to highlight Dr. Maral Tajerian, who was a recipient of a CUNY Academy 2024 Henry Wasser Award for Outstanding Research by Assistant Professors! Dr. Tajerian's work on chronic pain was recognized for its significance, rigor, and creativity. On a more personal note, in April I received a five-year NIH award totaling \$1,890,375 to study how cell signaling coordinates physiology and host-pathogen responses. In addition to supporting our scientific productivity, this award is currently enabling the training and mentorship of four Queens College undergraduates and two CUNY doctoral students. I look forward to their future success as alumni of our department.

We urge all of you to keep in touch with the Department. We are always happy to hear your news! I also want to acknowledge with gratitude the financial contributions of our alumni. These funds allow us to provide valuable enrichment activities for our students that cannot be funded in any other way. For example, in our Fall 2024 Colloquium series, we hosted inspiring speakers such as Dr. Vanessa Ezenwa from Yale University, who studies host-parasite interactions in wild animals; Dr. John Patton from Indiana University-Bloomington, who studies replication of the rotavirus genome; and Dr. Néva Meyer

from Clark University, a developmental biologist who spoke about “Worms do it differently: Dual autonomous and conditional neural specification in annelids.”

Once more, please keep in touch. You can contact the chair at chair.biology@qc.cuny.edu and the office at biology@qc.cuny.edu. We have initiated an Instagram account @QCBiology—please follow us as we post news of the Department! Wishing all of you success and fulfilling work.

Student Highlights



Henrik von Chrzanowski

Henrik von Chrzanowski had an unusual path to becoming a doctoral student at Queens College. The Alicia Meléndez lab had established that

autophagy, a process of cellular recycling, is of fundamental importance for development and the biology of aging. In a long-standing collaboration with Dr. Sivan Henis-Korenblit at Bar Ilan University in Israel, the two investigators have received several grants from the US-Israel Binational Science Foundation and the U.S. National Science Foundation. The goal of these studies is to investigate compensatory pathways to a form of autophagy referred to as macroautophagy. As part of this collaboration, the labs hold joint meetings by Zoom and the two PIs visit each other every other year. In October of 2023, with the beginning of the Gaza/Israel war, Henrik von Chrzanowski, an international PhD student in Dr. Henis-Korenblit's lab, was forced to leave Israel. Now without a lab, Henrik requested to continue his studies in the Meléndez lab at Queens College and Dr. Meléndez was delighted when he joined her group in December of 2023, ensuring his dissertation studies remained uninterrupted.

At the end of 2024, Henrik completed his studies and returned to his home country Germany, where he is now writing his dissertation, planning to defend his thesis in March of 2025. While in the Meléndez lab, Henrik identified new mutations in a gene that functions at the intersection of autophagy and ER stress. Henrik presented his work at the New York Area Worm Meeting in January 2024, a conference that Dr. Meléndez has been co-organizing for the last 15 years. As an

experienced student, Henrik was able to help train undergraduates and other PhD students. Dr. Meléndez found him to be a great presence in the lab and she was happy to host him, while conversely, Henrik welcomed the opportunity to live in NYC and join Queens College!



Leora Ferrari

Leora Ferrari, a master's student in David Lahti's lab published an article in *Bird Observer* on the effects of climate change on birds, based in part on her own observations on latitudinal shifts in bird distributions as a result of climate change. The paper is titled: *Birds Are Moving Toward More Northerly Latitudes*. Vol. 52, No. 5.



Michael Loccisano

Michael Loccisano received his master's degree under the guidance of John Dennehy with a project titled *Dynamics of Planktonic and Biofilm PAO1 Populations: Impact of Phage Shea in a Chemostat Environment*. They observed that forming biofilms increases bacterial resistance towards many factors, which can cause chronic infections in vulnerable patients. Exploring the difference in interaction between the biofilm and planktonic states with a newly discovered phage, named Shea, may offer further insight into developing phage therapy.

While at Queens College Loccisano received awards as an undergraduate: the Charles Darwin Prize and the Laura H. and Arthur L. Colwin Prize. Today, Loccisano is employed as an associate scientist at Pfizer.



David Molfa

David Molfa graduated *cum laude* in May 2020 with a Bachelor of Arts in Biology, and his accomplishments since then are a testament to the strong foundation he built during his time at QC. In May 2024,

David received a Juris Doctor at St. John's University School of Law. While in law school, he focused on Intellectual Property Law. His biology experience will no doubt help him navigate complex biotechnology-

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related patents. Molfa has passed both the New York State Bar Examination and the Patent Bar Examination and is currently employed at Lombard, Geliebter, Cohen LLP in New York City.

Molfa was a consistently high-achieving student during his undergraduate years. He was on the Dean's List from 2016–2017 and 2018–2020, and was awarded the Meringoff Valedictory Prize Scholarship and the Con Edison Scholarship Award for Academic Performance. He also received the QC Foundation Award for Prelaw Students, foreshadowing his future career path.

Molfa remembers his Queens College days fondly. This includes studying BIOL 106 General Biology: Life-forms and Ecosystems with Dr. George Jackman ('04). "A few weeks into taking Biology 106 with Dr. Jackman instantly made me realize that my traditional studying method of merely reading power points or listening to lectures was not going to suffice. An overhaul or refashioning of my typical studying techniques was desperately needed to survive this information-dense course. And that's what I did. I came up with one simple strategy: meticulously reading every assigned chapter at least twice no matter how time-consuming. Employing this method not only led to me highlighting every single sentence, which attracted jokes from colleagues thinking I would submerge my textbook in a pool of ink, but it also led to a lot of late nights in the halls of Kiely or the Science Building where I would often be detected by security guards and escorted out of the building. Although the initial motivating factor behind employing this strategy was to get a good grade, I learned a more valuable lesson: to never take shortcuts and appreciate the never-ending process of accumulating knowledge, because this can lead to great things."

We congratulate Molfa on his accomplishments and wish him continued success in his career! We are excited to see what he will achieve in the field of intellectual property law.

An Important Queens College Research Site: The Bronx River!

A river runs through it. The Bronx, that is. Today, the borough's Bronx River is a (recovering) ecological gem. But one that also was sundered for decades as a repository for wastes and by numerous habitat modifications. For instance, the

Bronx River has nine dams on it that hinder or prevent the upstream and downstream movements of its organisms. Though sections of it are surprisingly wild, it is the epitome of an urban river, abandoned shopping carts and all. And as the only freshwater river in New York City, one that supports a variety of life, it has begun to serve as an attractive research amenity for students—in particular Queens College students—studying various aspects of its ecological functionality.



First fish ladder in the Bronx River. To date the ladder has passed modest numbers of river herring to go upstream to spawn.

The name "Bronx River" is deceiving inasmuch as one-half of its total 24 miles flows through Westchester County before entering the Bronx, where it runs through New York City Parks land, the Bronx Botanical Gardens and the Wildlife Conservation Society (Bronx Zoo), and then through a mostly hidden portion of the South Bronx before opening more widely as an estuary where it meets the East River (actually a tidal strait).

Queens College is not the only entity to have "discovered" the Bronx River, important research has been performed by CUNY's Lehman and York Colleges and by other educational institutions. It even has a flourishing grassroots umbrella organization, The Bronx River Alliance. (Anyone wishing to experience much of the river first-hand can sign up for springtime canoe tours.)

Results from the Bronx River Ecology Project

Dr. Bobby Habig conceived and initiated the Bronx River Urban Ecology Project while an NSF postdoc in the Lahti Lab. The project has 18 focal research and monitoring sites along the river's length.

Studies In the water

The diversity of the bottom-dwelling invertebrate community is frequently used as an indicator of water quality in streams. **Maleha Mahmud's** master's research was devoted to sampling this community along the river. She used a D-frame net to drag the river bottom, bringing samples back to the lab for identification. Overall, the diversity was low, with only 2–7 families represented in each site, and 18 families represented in total. Three orders of insects are of particular interest in assessing water quality, as they are sensitive to pollution: *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies) and *Trichoptera* (caddisflies). Unfortunately, these organisms were detected at only 4 of 18 sites. On the other hand, the invasive Asian clam (*Corbicula fluminea*) has recently colonized the river and was in fact the second most dominant invertebrate sampled (after amphipods). In general, sites along the Bronx River that were surrounded by more development and that were in closer proximity to the Bronx River Parkway, harbored lower macroinvertebrate diversity and higher incidence of invasive species.

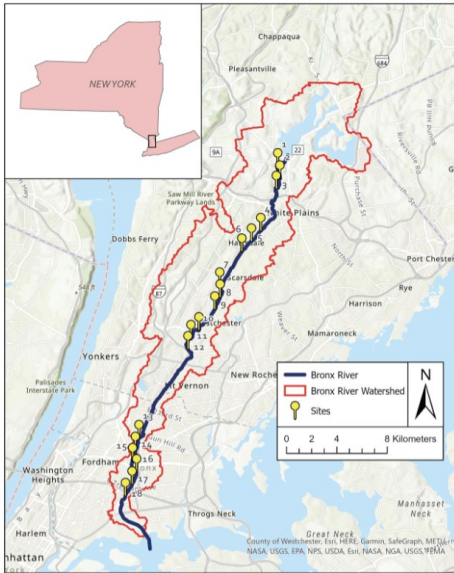


Invasive clam and crayfish found in the Bronx River.

The New York State Department of Environmental Conservation had assessed water quality along the river using macroinvertebrate diversity, yielding three other studies between 1998 and 2015. We compared our data to theirs in a longitudinal analysis and found that, despite extensive cleanup efforts in the Bronx River, the water quality has remained consistently impacted throughout this period, according to the widely used Biological Assessment Profile (BAP) score. Mayflies (*Ephemeroptera*) in particular may be in trouble, as we did not detect them despite their presence in the prior studies. Combined sewage overflows and municipal separate stormwater systems might be an important

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cause of the continuing issues, as the one site upstream of these exhibited healthier biological profiles than those downstream.



Map of Bronx River, including sampling sites

While it is well-documented that the construction of dams and other impoundments results in reduced fish diversity, what is less known is the impact of dams on other aquatic organisms, specifically benthic macroinvertebrates. Our research collaborator, **Jayda Smith**, was awarded a grant from the Hudson River Foundation to study the impact of dams on invertebrate diversity in the Bronx River. Smith, in collaboration with Queens College researchers, is testing the possibility that dams might create a mosaic of habitat patches with variable chemical and physical properties, resulting in different invertebrate communities upstream and downstream of each barrier. To examine this hypothesis, sampling was completed upstream and downstream of the nine dams situated in the Bronx River. Several physical variables, including water velocity, mean substrate size, and river depth differ between sites located upstream versus downstream of a dam. The next step is to compare aquatic invertebrate communities above and below each of the nine dams. These results will be used to inform and guide the conservation and management of aquatic invertebrates in the Bronx River.

Studies on land

The Bronx River Urban Ecology Project has to date surveyed birds and mammals in habitats alongside the Bronx River. QC Biology Master's students led these surveys: **Amanda Goldstein** made bird identifications by sight and sound along transects, and **Ritika Nath** employed motion-activated trail cameras to photo-capture mammals.

Goldstein made 1613 bird detections of 59 species along her transects during one spring migration season, of which 56 species are native. Half of the detected species were Neotropical migrants (birds that spend our winter months in South America), corroborating a longstanding recognition that the New York metropolitan area greenspaces form important stopover sites during bird migration along the Atlantic Flyway. Comparing the sites, bird abundance was higher in more developed areas, but diversity was higher near natural areas such as forestland, and lower near artificial greenspaces such as golf courses and lawns. Surprisingly, when the river was closer to the Bronx River Parkway, avian diversity was higher.

Nath's cameras were deployed over 28 consecutive months, yielding thousands of images. Aside from dogs and humans, the cameras captured 16 mammalian taxa (small rodents were grouped together). Some species, such as the eastern gray squirrel, muskrat, and raccoon were found at all sites, whereas the northern flying squirrel, groundhog, and bobcat were rarer, the latter detected at only a single site. Overall, the number of species was higher in Westchester County, with the American mink, bobcat, and flying squirrel only detected there; whereas the striped skunk was more common in the Bronx. None of the anthropogenic or ecological features measured—human population density, percentage greenspace, or habitat heterogeneity—were predictive of mammal diversity along the river. They also conducted a survey of mammal diversity in 31 greenspaces throughout the New York metropolitan area, which formed **Angelinna Bradfield**'s master's thesis. Bradfield found that diversity was higher in larger and more natural parks and lower in those that were more human-altered or surrounded by more developed areas.

The lack of such a trend along the Bronx River raises the possibility that mammals might be treating the entire stretch of river habitat as a corridor.

Patterns of free-ranging cat and coyote presence along the Bronx River yielded some interesting relationships. Cats were negatively associated with small rodents (perhaps because they were consuming them) and were more common in areas with higher human population density. Coyotes were more likely to be detected in more natural areas. Cats and coyotes were negatively associated with each other, such that where one species was found the other was less likely. These results are in accordance with those we found in the broader 31-greenspace study, in collaboration with the Gotham Coyote Project. Cats and coyotes have different levels of tolerance of human proximity, which might explain part of the negative relationship between their presence, but it does not explain the entire effect. Urban coyotes are known to eat cats, so cats may also be avoiding areas frequented by coyotes.

The Bronx River Urban Ecology Project continues, with an aim to assessing the ecological health of the river and the diversity of a broad range of taxa, including documenting changes through time. Surveys in process include herbaceous and woody land plants, and fungi, both micro- and macro-. Among the taxa we hope to survey in the future are algae and other protists, lichens, land invertebrates including insects, and herpetofauna.

Where the QC researchers are now

Angelinna Bradfield is in a Physician Associate program at Touro University; **Amanda Goldstein** is in a QC Master's program in Education and teaches in the Biology Department. **Maleha Mahmud** is a PhD student in **Shahrina Chowdhury**'s lab at Brooklyn College (Biological Anthropology). **Ritika Nath** works at the Vivarium and other live animal exhibits at the American Museum of Natural History. **Bobby Habig** is Assistant Professor of Biology at Mercy University, where he continues to lead the Bronx River Urban Ecology Project in collaboration with the Lahti Lab.

Publications Through 2024

Bradfield, A.A., C.M. Nagy, M. Weckel, D.C. Lahti & B. Habig. 2022. Predictors of mammalian diversity in the New York metropolitan area. *Frontiers in Ecology & Evolution* 10:903211. doi:10.3389/fevo.2022.903211.

Goldstein, A.J., D.C. Lahti & B. Habig. 2022. Avian diversity and land use along the Bronx River. *Urban Naturalist* 50.

Mahmud, M., D.C. Lahti, & B. Habig. 2022. A longitudinal assessment of benthic macroinvertebrate diversity and water quality along the Bronx River. *Northeastern Naturalist* 29:415-440. DOI:10.1656/045.029.0403.

Mahmud, M., D.C. Lahti & B. Habig. 2024. The impact of land use and human population density on benthic macroinvertebrate diversity in a highly urbanized river. *Cities and the Environment* 17.

Results from the Waldman Lab

Bronx River fishes

The nine dams that have sectioned the river have greatly hindered the upstream movements of organisms but, as such, they also present an opportunity for detailed study of this detrimental effect. American eels are spawned more than 1000 miles away in the depths of the Sargasso Sea. The young are carried by the Gulf Stream from which they break off and enter coastal rivers, the Bronx River included. There they change from a transparent form (aka “glass eels”) to small versions of adults (“elvers”).

Prior work had shown that some eels passed the Bronx River dams, though it is still not known how. Crawling upward on the face of a dam and adhering via surface tension is one credible theory, passing through a dam’s cracks is another. John Waldman and QC students, the Wildlife Conservation Society, and others conducted an electrofishing survey (an approach in which fish are momentarily stunned) below the dams to estimate their abundance and sizes. Eels were found at each dam, but their pattern of occurrence differed strongly. Below the first dam above tidewater eels were highly numerous but small, whereas the farthest upriver

dams held few eels, but they were large. In between, there was a continuum. These findings suggest that there is attrition of eels migrating upriver, but that those that make it to the uppermost dams flourish.

Having estimates of eel numbers and sizes in hand, we then used these data to calibrate a powerful new tool: environmental DNA analysis (eDNA). eDNA is DNA that enters the water column via excretion, respiration, loss of scales, or decay following death. Modern technology can estimate minute eDNA concentrations. However, whereas eDNA may establish the presence of a species, it alone does not yield estimates of population size.

To help address the relationship between eDNA concentrations and actual eel abundance we used data from the prior electrofishing survey to compare the two. To our surprise we found that the biomass (the mass of the eels) did not show a significant relationship with eDNA concentrations but that there was a strong relationship between abundance and eDNA. This indicates that total surface area of eels at a site is more important than total biomass, an important recognition.

We also compared species identifications made with eDNA in the Bronx River with collections made previously using standard techniques such as electrofishing and netting. There was excellent correspondence between the two approaches, lending further confidence in eDNA as a field-based analytical tool.

One more study of Bronx River fish is in the works. Alewives are a small but ecologically important fish species that migrate up rivers in spring to spawn. Attempts are being made to seed a portion of the river in the Zoo to jumpstart an alewife run that will use a “fish ladder” to scale the first dam. We are endeavoring to monitor the success of the stocking in combination with the ladder using eDNA.

Publications Through 2024

Camhi, M., M. Bednarski, J. LaBelle & J. Waldman. 2021. Abundance and distribution of American Eel in a heavily dammed urban river. *North American Journal of Fisheries Management*, DOI: 10.1002/nafm.10620.

Chin, S.C., J. Waldman, M. Bednarski, M. Camhi, J. LaBelle & S.E. Alter. 2021. Relating American eel abundance to

environmental DNA concentration in the Bronx River. *North American Journal of Fisheries Management*, DOI: 10.1002/nafm.10625

Where the QC student researchers are now

Former doctoral student Sam Chin is now a Fish Biologist with the National Oceanic & Atmospheric Administration in Long Beach, CA. Master’s student Michael Bednarski is the current Director of Freshwater Fisheries for the State of Virginia.

Faculty Notes



Joanna Coleman

In 2024 **Joanna Coleman** and colleagues made the presentations noted below: Barno, S., T.L. Rubin, S.J. Gosnell & **J.L. Coleman**. *Impacts of drones on urban bats*. American Museum of Natural History (AMNH) Student Conference on Conservation Science (SCCS) October 2024, New York, New York, USA. (Sophie Barno won the award for best student speed talk).

Krieger, O., S. Barno, B. Brozen, T.L. Rubin, P. Yahia & **J.L. Coleman**. *Skunk cabbage on an urbanizing planet*. AMNH SSCS, October 2024, New York, New York, USA.

Mimy, D., & **J.L. Coleman**. *Pro-environmental behavior and People of Color in NY - Drivers, barriers & Links*. AMNH SSCS, October 2024, New York, New York, USA.

Rubin, T.L. & **J.L. Coleman**. 2024. *Vertebrate scavengers in cities—One Health implications*. The Nature of Cities Festival, June, Berlin, Germany.

Grant Obtained: Joanna Coleman received funding from the International Union for Conservation of Nature, Species Survival Commission, for Investigating the *Kerivoula picta* supply chain in Vietnam.

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John Dennehy

John Dennehy spoke on *Genetic Diversity and Evolutionary Convergence of Cryptic SARS-Cov-2 Lineages Detected Via Wastewater Sequencing*, at the 43rd Annual Meeting of the American Society for Virology, Columbus, OH, and on *Genetic Diversity and Evolutionary Convergence of Cryptic SARS-Cov-2 Lineages Detected Via Wastewater Sequencing*. Department of Biological Sciences, University at Albany, Albany, NY.



Timothy Dubuc

Timothy Dubuc presented at the Latin American Developmental Biology Conference, with a poster titled *Cnidarian germ cell induction has bilaterian attributes*. He also spoke at Cnidofest—Biennial cnidarian conference on *Over activation of Wnt signaling drives nervous system alterations in Hydractinia*.

David Lahti gave invited talks in the U.K. on *Humans: the idealistic species*, at St. Andrews University and at the University of Edinburgh. He also spoke at Harvard University on *Why are we the way we are? A conversation about the story and significance of human origins*.



Alicia Meléndez

On April 2, **Alicia Meléndez** helped celebrate the first Borough of Queens CUNY Undergraduate Symposium organized by the Office of Undergraduate Research at Queens College. Director Alicia Meléndez, with the assistance of Ronald Nerio and Joshua Barnes at the CUNY Office of Research Programs, Undergraduate Research Council members and faculty from Queens College (QC), Queensborough Community College (QCC), La Guardia Community College (LaGCC), and York College all contributed to the success of the event. **Dr. John Dennehy** and Dr. Monica Trujillo from QCC, together with

the Associate Provost **Natalia Holtzman** and **Daniel Yabukov**, assisted with the planning of the event.

At the symposium, we welcomed two keynote speakers: Joangela Nouel, a graduate from QCC and City College, currently a PhD student at U. Pennsylvania, and Dr. Alma Rodenas-Ruano, professor in the Biology Department at Fordham University. Ms. Nouel spoke about her experience at CUNY and her career path after she arrived in the United States as a 13-year-old. Dr. Rodenas-Ruano spoke about her research in neurobiology, specifically how external cues shape the normal development of brain circuits via epigenetic mechanisms and on the impact that aberrant environments have on survival, neuronal development and behavior. Most importantly, forty-eight students presented their research. Topics of the poster presentations ranged from microbiology to biochemistry, genetics, neurobiology, chemistry, drugs and pharmaceutical, physics, clinical psychology, computational research, and social sciences. It was a successful event that is now going to be planned every year.

In December, **Dr. Meléndez** was an invited speaker at the Department of Biology, St. John's University on *Autophagy in Germline Development and Aging*. Also, with co-authors K. Kosinski, M. Raices, J. Yanowitz, Dr. Melendez spoke on *Autophagy in Meiotic Fidelity* at the Allied Genetics Conference, March 6–10, National Harbor, Washington, DC. Dr. Meléndez and colleagues also presented a poster at the Gordon Research Conference on Autophagy in Stress, Development and Disease, in March at Lucca, Italy.



Esther Muehlbauer

Esther Muehlbauer and her Bio. 11 lecture class hosted a *Professionals on Campus* event in March with guest speaker, Dr. Vilma Joseph, Professor of Anesthesiology at Albert Einstein College of Medicine/Montefiore Medical Center. Dr. Joseph discussed her pathway from Queens College Biology major (Class of '89) through medical school and residency—to

her current life as a physician, fielding questions from an enthusiastic group of Biology students.

In April, Dr. Muehlbauer and her Bio 11 lecture class hosted a second *Professionals on Campus* event, “Bridging Science and Creativity: A Discussion with Rico Viray, Chairman and CEO of the Bloc,” a leading global health-communications agency. Rico Viray, who majored in Biology at Queens College (Class of '79) encouraged the students to take diverse courses in college that will broaden their scope and elicit creativity. He described the Bloc as a place where talented people from the arts and sciences collaborate and create innovative work.



Uldiz Roze

Uldis Roze was interviewed for a podcast titled: *Porcupine Pursuits with Uldis Roze*, Kaatscast: the Catskills Podcast, December 2024.

Cathy Savage-Dunn obtained a grant from the National Institutes of Health for \$1,850,000 across five years. The project is titled: TGF- β Signaling Mechanisms in *C. elegans* Physiology and Homeostasis. She also continues (together with Drs. Dennehy, Holtzman, Meléndez, and Alvarado on an equipment grant for \$570,000 titled: Acquisition of a Zeiss LSM900 Confocal Microscope with Airyscan 2 to Accelerate Multidisciplinary Research and Training.



Cathy Savage-Dunn

Savage-Dunn also presented on *TGF- β Ligand Cross-Subfamily Interactions in the Response of C. elegans to Bacterial Pathogen*, The Allied Genetics Conference 2024; and with Katerina Yamamoto on *BMP Signaling in Co-Regulation of C. elegans Lipid Homeostasis and Immune Response*, 2024 FASEB SRC TGF- β Superfamily Conference: *Signaling in Development and Disease*. She was also a co-presenter of a poster on *BMP to TGF- β /Activin Cross-Subfamily Ligand Heterodimerization Potential in C. elegans* at the same conference.

Additionally, Savage-Dunn served as a Co-organizer of the 2024 FASEB SRC TGF- β Superfamily Conference: Signaling in Development and Disease, July 2024, held at Niagara Falls, NY.

Maral Tajerian



Maral Tajerian

The URISE at Queens College program officially launched on July 1, 2023, representing a significant milestone for the college. Funded by the National Institutes of Health (NIH) and co-directed by **Dr. Maral Tajerian** and **Dr. Sebastian Alvarado**, URISE (Undergraduate Research Training Initiative for Student Enhancement) is designed to empower undergraduate students from diverse backgrounds to successfully complete their bachelor's degrees and transition into graduate programs with a focus on biomedical research.

The program's mission is to address systemic barriers to academic and professional advancement by providing comprehensive resources, mentorship, and opportunities. Each year, URISE selects a cohort of four junior-level students, offering them a holistic support system that includes stipends for living expenses, tuition and fee coverage, funding for training-related expenses, and professional development initiatives. Participants receive hands-on research training and one-on-one mentorship from distinguished faculty, equipping them to excel in graduate programs in biomedical and behavioral sciences.

In July 2023, the program welcomed its inaugural cohort—an inspiring group of four students who have already made significant strides in research:

- **Diya Sharma**, a psychology major with a health sciences minor, conducts research on solid-phase synthesis under the guidance of **Dr. Jun Yong Choi**.
- **Victoria Bamwo**, a neuroscience major with aspirations to pursue an MD/PhD in neurology, is working under **Dr. Joshua Brumberg** to integrate clinical and research expertise.

- **Neli Kotlyar**, double majoring in neuroscience and biology with minors in environmental science and psychology, investigates sleep science under the mentorship of **Dr. Jeff Beeler**.
- **Labiba Aziz**, a neuroscience major with minors in biochemistry and anthropology, studies the biological mechanisms of psychological stress as part of the Stress in Pregnancy Lab led by **Dr. Yoko Nomura**.

The program expanded in July 2024 to welcome a second cohort of exceptional students:

- **Elijah Singh**, a psychology major on an accelerated master's track in behavioral neuroscience, conducts research on Fragile X permutation disorders under **Dr. Veronica Hinton**.
- **Da Eun Kim**, a biology major specializing in cephalopod research and synaptic labeling using transgenics, works under **Dr. Sebastian Alvarado** and is passionate about fostering inclusivity in STEM as an openly queer and nonbinary student.
- **Alan Cantos**, a biology major with a psychology minor, explores TGF- β signaling and lipid metabolism under **Dr. Cathy Savage-Dunn**.
- **Dialikatou Dia**, a neuroscience and psychology major, studies neuroplasticity in pain processing under the mentorship of **Dr. Maral Tajerian**.

URISE students begin their journey with an intensive summer workshop series that continues throughout the academic year. These workshops build essential research competencies, including:

- The scientific method, experimental design, and hypothesis development
- Statistical methods for data analysis
- Effective communication of research ethics in scientific research

Additionally, URISE scholars are encouraged to attend and present at national conferences. In 2024, five of the eight URISE scholars attended ABRCMS, with three seniors earning **Best Poster Awards** in their respective fields.

Beyond serving its own cohorts, the URISE program has emerged as a hub for promoting access to research opportunities across Queens College. The program has hosted esteemed institutions such as **Northwell Health** and the **Albert Einstein College of Medicine** for panel discussions and workshops, offering all Queens College students valuable insights into pathways for research and professional development. While URISE funding supports four students annually, these events are intentionally designed to benefit the broader student community.

In just over a year, URISE has already demonstrated its capacity to transform the academic and professional trajectories of its scholars. By cultivating future leaders in biomedical research, the program ensures that the next generation of scientists reflects the diversity, talent, and excellence of our community.

Maral Tajerian and **Sebastian Alvarado** wrote for *Policy Insights from the Behavioral and Brain Sciences* on chronic pain, a condition affecting millions but with poorly understood mechanisms. This publication highlights advancements in pain research, diagnosis, and treatment, while addressing the challenges of translating animal model findings to human applications. Their work incorporates technologies like machine learning and AI to enhance diagnosis by analyzing extensive data and discerning patterns, advocating that individualized treatment strategies are essential, taking into account socioeconomic background, race, and ethnicity. This article is particularly relevant for policymakers in the government, as it advocates for policy changes needed to implement evidence-based strategies for chronic pain management, while recognizing that standardized guidelines may not always apply to each case. See <https://www.alvaradolab.com/s/TajerianandAlvaradoPolInsights2024.pdf>

John Waldman presented a plenary address on *Restoring Atlantic Anadromous Fishes: It's Time to Seize the Day* at the Joint Meeting Mid-Atlantic Chapter and Northeast Division of American Fisheries Society. New Brunswick, NJ. October 2024.

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Faculty in the News

Sebastian Alvarado was quoted in *Inside Higher Ed* in an article titled *Students Think Faculty Should Be Mentors. What Does That Look Like?*

Joanna Coleman continued to lead the first systematic investigation of the trade in bats for ornamental purposes anywhere in the world. Many bats are threatened with extinction, and the bat trade may be exacerbating this situation. A prominent case in point is the painted woolly bat *Kerivoula picta*, a near-threatened bat species of striking orange and black appearance. Dr. Coleman and colleagues investigated the marketing of this bat on internet platforms, most notably Amazon, eBay, and Etsy. The individual sellers generally catch and kill the bats or obtain them from hunters and arrange them as ornaments for display. Although countries around the world are involved in the trade in these bats, the United States was found to be the dominant source of purchases. The main conclusion of Dr. Coleman's investigation is that this trade is extensive, unethical, and unsustainable. Dr. Coleman conceived the project and was involved in all of its phases including the investigation, analysis, visualizations, data curation, and writing.

In 2024 Dr. Coleman had considerable coverage of her bat conservation efforts in the popular press. These included:

Sierra Magazine – “Researchers Find That Decorative Bats Purchased Online Are Often Endangered Species” <https://www.sierraclub.org/sierra/researchers-find-decorative-bats-purchased-online-are-often-endangered-species>

Mongabay – “Senseless’ U.S. Trinket Trade Threatens Distinctive Asian Bat, Study Shows” <https://news.mongabay.com/2024/08/senseless-u-s-trinket-trade-threatens-distinctive-asian-bat-study-shows/>

The Week – “The ‘Frivolous’ Trade in Taxidermied Bats” <https://theweek.com/business/the-frivolous-trade-in-taxidermied-bats>

New York Times – “Bats Already Had Problems. Now, Add Taxidermy Listings on Etsy and eBay” <https://www.nytimes.com/2024/07/25/climate/taxidermy-bats-kerivoula-picta.html>

Salon – “Scientists Beg Etsy Sellers to Stop Selling Dead Bats as Ornaments” <https://www.salon.com/2024/07/23/scientists-beg-etsy-sellers-to-stop-selling-endangered-bats/>

The Verge – “Please Stop Buying Taxidermied Bats Online” <https://www.theverge.com/2024/7/18/24200842/bat-online-sale-study-etsy-ebay-amazon>

Newsweek – “Americans Harming ‘Unique’ Species By Importing Weird Dead Bat Accessories” <https://www.newsweek.com/threatened-bats-sold-online-conservation-1926319>

IFLScience – “Beautiful Orange Bat Being Sold On Etsy and eBay Faces Uncertain Future” <https://www.iflscience.com/beautiful-orange-bat-being-sold-on-etsy-and-ebay-faces-uncertain-future-75134>

Phys.org – “Online Sales of a Wild Bat Sold as Décor Threaten Species” <https://phys.org/news/2024-07-online-sales-wild-sold-dcor.html>

David Lahti was interviewed in December 2024 on “Change in mongoose mating behavior” for *The Science Show*, Australian Broadcasting Corporation. <https://www.abc.net.au/listen/programs/scienceshow/change-in-mongoose-mating-behaviour/104695660> and on the same show on weaver birds and cuckoos. <https://www.abc.net.au/listen/programs/scienceshow/weaver-birds-and-cuckoos/104725420>. Another interview was on how “Your pet’s behavior might change during the solar eclipse,” for EpicenterNYC, Interview, in April.

John Waldman was interviewed and featured in stories about river conservation, environmental recovery in New York, and climate change in *The New York Post*, *41 North*, *QNS*, *The Gothamist*, *Future Based*, *Hell Gate*, and *Ecosphere*.

Popular Articles Authored

Coleman, J.L. & C.R. Shepherd. Species Spotlight: Going to Bat for Painted Woolly Bats. *The Revelator*. 2024. <https://therevelator.org/species-spotlight-painted-woolly-bats/>

John Dennehy was quoted in “Mini-Dune! Soil viruses hitchhike on tiny worms to infect new victims,” Elizabeth Pennisi, *Science*, 2024/08/23

Nash, D., **Dennehy J.J.**, M. Trujillo & L. Silvera L. 2024. From sewage to safety: Hospital wastewater surveillance as a beacon for defense against H5N1 bird flu. Appeared in *STAT News*.

O’Keefe, J.M., **Coleman, J.L.** & N. Randhawa. 2024. A troubling trade—conducted in the open. *The Wildlife Professional* **18**(1), 42-44.

John Waldman published a Guest Essay in *The New York Times* titled *We Can Turn a River in Maine into a Paradise for Salmon*. *The New York Times*, May, 2024. <https://www.nytimes.com/2024/05/28/opinion/river-fish-salmon-dam.html>

Graduation Award Honorees and Degree Recipients

The **Donald E. Lancefield Prize**. Awarded for academic excellence in Biology and for a very high Biology Index excluding research.

Joedell Bastien

Isaac Goldenberg

The **Charles Darwin Prize**. Awarded for outstanding performance in Biology and for a very high Biology Index including research courses.

Ken Hu

Khansa Mahmood

The **Laura H. and Arthur L. Colwin Prize**. Awarded for outstanding research ability to a student who will not be going to a health professional school.

Delroy Brockett

The Muriel and Philip Feigelson Award.
Awarded for the best undergraduate research to a graduating senior who has also demonstrated significant academic achievement.

Shannon Wright

UNDERGRADUATE B.A. DEGREE RECIPIENTS

(H = Honors, HH = High Honors)

Biology BA Degrees Date Awarded

Joedell Bastien - HH	Jun-24
Krystal Aryeequaye	Sep-24
Sulaiman Bah	Jun-24
Krista Bhagwandin	Jun-24
Krista Bhagwandin	Sep-24
Moizah Bhutta - H	Sep-24
Delroy Brockett	Jan-24
Christine Cespedes	Jun-24
Lok Lam Chan	Jun-24
Michelle Chew	Jan-24
Tunazzinah Chowdhury	Jun-24
Mawasi Daniels	Jan-24
Mawasi Daniels	Jun-24
Epshita Das	Sep-24
Marisol Espinosa	Jun-24
Jaimy Galarza	Jun-24
Jaimy Galarza	Sep-24
Ravindra Gobin - H	Jun-24
Isaac Goldenberg - HH	Jun-24
Karl Emmanuel Gregana	Jan-24
Ashley Henriquez	Jun-24
Jessica Hernandez	Jan-24
Ken Hu - HH	Jun-24
Irene Hung Chen	Jun-24
Akela Islam	Sep-24
Michelle Jang	Jan-24
Peter Joseph	Jan-24
Maikel Keypour	Sep-24
Min Kyung Kim	Jan-24
Priscilla Kim - H	Jan-24
Dale Kirton	Jun-24
Corey Levy - H	Jun-24
Alexis Lewis - H	Jun-24
Marsha Lindor	Jun-24
Khansa Mahmood - HH	Jun-24
Nafisa Maisha	Jun-24
Daniel Masheyev - HH	Jun-24
Frances Massa - H	Jun-24
Anthony Mendoza	Jan-24
Anthony Mendoza	Jun-24
Cristofer Montero Velazquez	Jun-24
Fatima Morrobel	Jun-24
Gianmarco Murillo	Jun-24

Amila Osmanovic	Jan-24
Keann Ottley-Maharaj	Jan-24
Chae Eun Pak	Jan-24
Gabriel Palencia Serna	Jun-24
Gabriel Palencia Serna - H	Sep-24
Imran Patel	Jun-24
Raj Patel - H	Sep-24
Sofia Pervaz	Jun-24
Sofia Pervaz	Sep-24
Hateley Pierre	Jun-24
Leo Pinto	Jan-24
Raianul Quader	Jan-24
Sara Quiceno	Jun-24
Sara Quiceno	Sep-24
Davin Ramchand - H	Jun-24
Christine Ramlackhan	Jan-24
Aaron Rampersad - H	Jan-24
Helena Rodies - H	Jun-24
Nilsa Rodriguez	Sep-24
Paola Romero	Jun-24
Sabiba Sayed	Jun-24
Gabriella Schantz	Jun-24
Miranda Seetahal	Jun-24
Miranda Seetahal	Sep-24
Mahruxh Sohail	Jun-24
Ejla Svraka	Jun-24
Sofia Taherkhani	Jan-24
Sofia Taherkhani	Jun-24
Antonio Benjamin Tan - H	Jun-24
Shannon Wright - H	Jun-24
Jared Yadhram - H	Jun-24
Jared Yadhram - H	Sep-24
Hui Chen Yeh - H	Jan-24
John Yoon	Jan-24
John Yoon	Jun-24
John Yoon	Sep-24
Jerry Zeas - H	Jun-24
Nina Zheng - H	Jun-24
Kelly Zheng Liu	Jun-24
Aleksandra Zivkovic	Jun-24

Biology Minor Degrees

Safiya Abdali	Sep-24
Kevin Almeida Arteaga	Jun-24
Amal Bhalli	Sep-24
Joanna Halampalakis	Jun-24
Sadia Joya	Jan-24
Bavel Kagzanov	Jan-24
Wiktorja Koza	Jun-24
Edina Lleshi	Jan-24
Zackaria Mamdouh	Jun-24
Jenay Marshall Smith	Jan-24
Andrea Moreno	Jun-24
Andrea Moreno	Sep-24
Cinthia Narciso	Jan-24
Tsering Tamang	Jan-24

2024 Biology Department Journal Articles

Anadon, J.D., O. Piñeiro, A. Ruhi, J. Hornstein & J. Waldman. 2024. Decoupled shifts of dominant and rarer fish species as a response to long-term warming and extreme events in Jamaica Bay. *Ecosphere*. DOI: 10.1002/ecs2.4876

Choi, R., R. Bodkhe, B. Pees, D. Kim, M. Berg, D. Monnin, J. Cho, V., Narayan, E. Deller, **C. Savage-Dunn** & M. Shapira. An *Enterobacteriaceae* bloom in aging animals is restrained by the gut microbiome. *Aging Biology* 2024;2:20240024. doi: 10.59368/agingbio.20240024. Epub 2024 Mar 15. PMID: 38736850; PMCID: PMC11085993.

Ciccarelli, E.J., M. Bendelstein, K.K. Yamamoto, H. Reich & **C. Savage-Dunn.** BMP signaling to pharyngeal muscle in the *C. elegans* response to a bacterial pathogen regulates anti-microbial peptide expression and pharyngeal pumping. *Molecular Biology of the Cell*. 2024 Apr 1;35(4):ar52. doi: 10.1091/mbc.E23-05-0185. Epub 2024 Feb 21. PMID: 38381557; PMCID: PMC11064665

Ciccarelli, E.J., Z. Wing, M. Bendelstein, R.K. Johal, G. Singh, A. Monas & **C. Savage-Dunn** C. TGF- β ligand cross-subfamily interactions in the response of *Caenorhabditis elegans* to a bacterial pathogen. *PLoS Genetics*. 2024 Jun 14;20(6):e1011324. doi: 10.1371/journal.pgen.1011324. PMID: 38875298; PMCID: PMC11210861.

Coleman, J.L., Randhawa N., J.C. Chui-Hang, T. Kingston, P. BY-H Lee, J.M. O'Keefe, A.L. Rutrough, V.D. Thong, S.M. Tsang & C.R. Shepherd. 202. Dying for décor: Quantifying the online, ornamental trade in a distinctive bat species, *Kerivoula picta*. *European Journal of Wildlife Research*. 70, 75. <https://doi.org/10.1007/s10344-024-01829-9>

Goldblatt A, L.M.J. Loccisano, M.L. Mahe, **J.J. Dennehy** & F. Spagnolo. 2024. Risk of infection due to airborne virus in classroom environments lacking mechanical ventilation. *PLoS ONE*. <https://doi.org/10.1371/journal.>

Kearnan, K. & **J. Waldman**. 2024. Causes of shutdowns of fish lifts on U.S. East Coast hydroelectric dams. *Fisheries*. 10.1002/fsh.11107

Lahti, T.C. & C.R. Barlow. 2024. First observations of water provisioning to wild altricial nestlings: pied crow (*Corvus albus*) parents resolve a sticky situation in The Gambia. *Behaviour* 161:977-1001. DOI: 10.1163/1568539X-bja10291.

Mahmud, M. (U, G); **Lahti, D.C.** & B. Habig (U, PD). 2024. The impact of land use and human population density on benthic macroinvertebrate diversity in a highly urbanized river. *Cities and the Environment (CATE)*: Vol. 17: Iss. 1, Article 5. DOI: 10.15365/cate.2024.170105

Martashvili, S. Jedwab, L. Vij, A.Z. Kuighadush & **S.G. Alvarado**. 2024. Effects of social position on subsequent courtship and mating activity in an African cichlid. *Hydrobiologia*. <https://doi.org/10.1007/s10750-024-05733-w>

McCabe, M. P. Boya, R.-H., Chen, C.T. Chu, M.I. Colombo, L. Delgui, E.L. Eskelinen, M. Hamasaki, M. Hansen, C. He, M. Jäätelä, A. Kimchi, C. Kraft, M. Kundu, **A. Meléndez**, S. Pattingre, T. Proikas-Cezanne, S. Sebti, A.K. Simon, A. Simonsen, S.A. Tooze, M.I. Vaccaro, X. Wang, E. White, Y. Zhao & A.M. Cuervo. 2024 Women in Autophagy: an initiative to promote gender parity in science. *Nature Cell Biology* Dec 2. Doi: 10.1038/s41556-024-01566-w.

McClenachan, L., **J. Waldman**, et al. and 37 co-authors. 2024. Global research priorities for historical ecology to inform conservation. *Endangered Species Research*. DOI:10.32942/X2TK5T942
Schlitzner, C.E., **T. Dubuc** & 27 co-authors. 2024. *Genome Research*, March 2024 34:498-513

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Straka, T.M., **J.L. Coleman**, E.A. Macdonald, S. Rogge, **T. Kingston** & M.H. Jacobs. 2024. Beyond biophobia: positive appraisal of bats among German residents during the COVID-19 pandemic—with consequences for conservation intentions. *Biodiversity and Conservation* 33, 2549-2565. <https://doi.org/10.1007/s10531-024-02872-3>

Tajerian M. & S.G. Alvarado. 2024. Pain research and treatment: Policy implications. *Policy Insights from the Behavioral and Brain Sciences*. <https://doi.org/10.1177/23727322231197368>

Wirgin, I., L.Maceda, J. Stabile, M. Bednarski & **J. Waldman**. 2024. Population structure and broad-scale movements of Atlantic Sturgeon along the North American Atlantic Coast inferred from genetic analysis. *Reviews in Fisheries Science & Aquaculture*. DOI: 10.1080/23308249.2024.2383470.

Yang, F, A. Labani-Motlagh, D. Ansari, J.A.B Garzon, J.D. Moreira, S. Patel, F. Spagnolo, J. Florence, A. Vankayalapati, R. Vankayalapati, **J.J. Dennehy**, B. Samten & G. Yi. 2024. Bacteriophage therapy for the treatment of *Mycobacterium tuberculosis* infections in humanized mice. *Communications Biology* 294.

Save These Dates: Some 2025 Events Planned

- Graduation, May 29, 2025
- Biology Symposium, January 2026, TBD

Donations (FY 2022–2023)

In fiscal year 2022–2023, 35 alumni donated \$24,722.50. Your gift has a special meaning to us and is viewed as a vote of confidence in the Biology Department. Know that these donations are deeply appreciated and put to good use.

Special thanks to Elissa B. Koff for her extremely generous gift, and to Joan B. Gottlieb, Raziel S. Hakim, Kenneth L. Kobliner, Alfred M. Sils, Eric S. Treiber for their major donations. However, no matter the amount, your gifts are always appreciated.

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