

BIOLOGYCURRENTS

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Student Highlights 2021

We are pleased to report on the special honors earned by Biology Department students and their other accomplishments despite the shutdown. The List of Graduates section lists those who received college honors for achieving excellent grade point averages. In this section, we highlight Biology Department and college-wide awards received at graduation and over the course of their college careers as well as the award-winning research work carried out by our graduates. We also report on honors and awards received by masters and doctoral students doing thesis research with biology faculty members as well as by other undergraduate and graduate students who distinguished themselves this year. Our students at all levels work hard to advance their education and careers. The rigorous research and academic environment engendered by the department's faculty encourages their progress and successes. Your donations offer significant support for these activities. Thank you!

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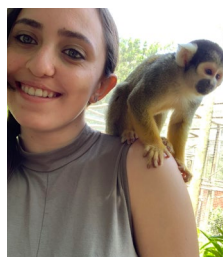


7 Faculty Notes

BACHELOR OF ARTS CLASS OF 2020–2021 GRADUATION HONORS:

JANINE ALKALAY received the Biology Department's Charles Darwin Prize. Janine is applying to genetic counseling graduate or certificate programs.

SAYEED ALI received the Biology Department's Donald E. Lancefield Award. Sayeed shared this award with two of his fellow graduating seniors.



Angelinna Bradfield

ANGELINNA BRADFIELD received the Laura H. and Arthur L. Colwin Prize. As an undergraduate, Angelinna was a student in the Macaulay Honors College. Her honors thesis was titled "Predictors of mammalian diversity, coyote occupancy, and coyote detection probability in the New York metropolitan area." She worked on this with David Lahti's postdoctoral student Bobby Habig. Angelinna is now a master's student in the Lahti lab, working on mammalian diversity and occupancy in dozens of parks in the New York City metropolitan area, in collaboration with Bobby Habig of Mercy College, and the Gotham Coyote Project.



Moshe Bendelstein

MOSHE BENDELSTEIN is one of three winners of the Muriel and Philip Feigelson Award. Moshe conducted research with Cathy Savage-Dunn on the role of the DBL-1/BMP pathway in the innate immune response of *Caenorhabditis elegans*. He presented his research in a poster at the 23rd International *C. elegans* Conference on June 21. Moshe is continuing his research as a postbac student as he prepares medical school applications.

AASTHA BUDHATHOKI received the Pearl Foster MD Scholarship Fund, which is awarded to a lower junior majoring in the biological sciences. Recipients must have an outstanding academic record and be involved in community activities, particularly issues

related to women in science, women's studies or history, and/or studies related to marginalized communities.

GEORGE KOKKINOS received the Donald E. Lancefield Award. George shared this award with three of his fellow graduating seniors.



Ar Kornreich

AR KORNREICH participated in the Honors in Math & Natural Sciences (HMNS) program. She wrote her Honor's thesis on work done with David Lahti. Her work on songs of the female house finch relied on the extensive field research carried out by Biology's late Professor Paul Mundinger and was published in a highly regarded peer-reviewed journal: Kornreich, Ar^U, Mason P. Youngblood^D, Paul C. Mundinger, and David C. Lahti, 2021. Female song can be as long and complex as male song in the (*Haemorrhous mexicanus*). *Wilson Journal of Ornithology* 132:840–849. doi.org/10.1676/19-00126.

GUOSHEN LI was awarded a Pre-Med Support Award which provides a scholarship of up to \$2,000 to help defray the costs associated with applying to medical school. GuoShen was also the recipient of a Con Edison STEM Scholarship which is awarded to a graduating senior based on scholarly merit. Applicants must write about their future plans in their field and how the scholarship will help achieve their goals.

SHALINE MAHADEO was awarded the Raymond Taylor QC Scholarship. This College scholarship was established in honor of former Provost Ray Taylor upon his retirement. Shaline did research in the Holtzman lab. Her work, presented as a poster at the Queens College Virtual Symposium, was entitled, "Weak atrium /myosin heavy chain 6 (*wea*) mutation affects Cardiac Contractility and links to Cardiomyopathy in Zebrafish."

SIDDHARTH MALVIYA received the Burton L. Backner Student Affairs Leadership Award. The award is given by the members of the Office of Student Affairs in honor of the former Dean of Students to a student

who demonstrates outstanding overall commitment to student affairs and student services on campus.

REBECCA PFEIFFER received the Donald E. Lancefield Award.

JACQUELINE SARMIENTO was the recipient of a Dr. Peter Chabora Scholarship Award for a student majoring in biology and having demonstrated financial need. Jacqueline is a first-generation college student. She graduated from Queens College with a BA in biology and minors in chemistry and psychology. Before attending Queens College, Jacqueline graduated from Queensborough Community College where she received an associate degree. She continues to serve as a general biology peer mentor at Queensborough Community College where she assists in laboratory classes and holds office hours for students who need help. In addition, Jacqueline conducts clinical research on congestive heart failure and participates in patient care as a volunteer at New York Presbyterian Brooklyn Methodist Hospital. She also volunteers for "Spoons Across America" where she encourages and educates children on better food choice. Jacqueline plans to take a gap year while she applies to graduate school.

SARAH SHIMONOVA received the Donald E. Lancefield Award. Sarah shared this award with three of her fellow graduating seniors.



Gloria Stoyanova

GLORIA STOYANOVA is one of three winners of the Muriel & Philip Feigelson Award. Gloria's award-winning research was done under the mentorship of Zahra Zakeri. She worked on different projects including one on how Zika virus manipulates host cells to optimize survival. A manuscript on this work is in preparation. Gloria also studied the effect of ceramide on neural growth and cell death. A manuscript entitled, "Ceramide from sphingomyelin hydrolysis induces neuronal differentiation whereas de novo ceramide synthesis and sphingomyelin hydrolysis initiate apoptosis after NGF withdrawal in PC12 cell" has been accepted for publication in the journal

Continues on next page.

Cell Communication and Signaling.

She is currently in the PhD program in biomedical sciences at Albert Einstein College of Medicine.

YING XIANG was the recipient of an Adele Gottschalk Memorial Scholarship Endowment Fund Scholarship for students pursuing the pre-med curriculum. The scholarship is awarded in recognition of a strong academic record and demonstrated exemplary character through volunteerism or assistance in the care and nurturing others.

Ying also received college-wide awards including the Esther's Book Fund and the Beth Lieberman Pre-Med Scholarship Fund. The Lieberman Fund is awarded to students who are registered with the Health Professions Office and have maintained an excellent academic record in the sciences.

DANIEL YAKUBOV was awarded a Dr. Ronald S. Miller Memorial Scholarship. This scholarship is available to junior/senior students pursuing a career in dentistry or medicine who demonstrate academic excellence, financial need, and a commitment to helping others.

Daniel also received a Dr. Peter Chabora Scholarship for a student majoring in biology and having demonstrated financial need. Daniel graduated with a Bachelor of Arts degree in biology and biological

anthropology. While a student at Queens College, he participated in numerous campus activities and programs. He was the Student Association's chair of philanthropy (2017–18 academic year). Daniel was twice elected as student senator to the college's Academic Senate and Student Senate. He was a peer mentor for general biology in the college's Hispanic Serving Institutions–STEM grant and was a strong advocate for increased access to STEM education for underrepresented youth. As a member of this grant's workforce, Daniel revised the fetal pig dissection manual which is now used in general biology courses in the Biology Department. In addition, he did research in the Weinstein laboratory on the regulatory pathways controlling early vertebrate development. Daniel plans to pursue an MPH/MD degree.

XIN CHENG YUAN is one of three winners of the Muriel & Philip Feigelson Award. He worked with Tim Short for nearly three years, the last two of which he was a MARC scholar. Xin was cloning photoreceptor genes and recombining them into expression vectors for transformation into *Ceratopteris richardii* sporophyte callus tissue. He is currently in a PhD program at Johns Hopkins University.

GRADUATE DEGREES (2020–2021):

The department is pleased to report that participation in our master's degree programs is increasing, as is the number of degree recipients. In the 2020–2021 academic year, 25 new biology master's degree students matriculated, a record high number. Noteworthy is that most of those receiving the master's degree completed a research thesis.

SADAF ASLAM received a research master's degree. Dr. Meléndez was her Queens College advisor, but she wrote a thesis about her findings from work carried out with Dr. Adolfo Garcia-Sastre at Mount Sinai Medical School, under the supervision of Dr. Juan Ayllón. The title of her master's thesis was "Generation of a high yield vaccine backbone for influenza B virus in eggs."

Sadaf is enrolled at the Universidad de Burgos in Spain, but she is doing her thesis work at Mount Sinai, with Adolfo Garcia-Sastre and Juan Ayllón as her mentors. She is an author on three publications based on her Mount Sinai research.

LIYONG CAO received a research MA degree with Professor Tim Short as mentor. Her thesis title was, "Cloning and sequencing of the presumptive PHY4B gene from *Ceratopteris richardii*."

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BIOLOGY DEPARTMENT GRADUATION HONOREES

Donald E. Lancefield Award:

Sayed Ali, George Kokkinos, Rebecca Pfeiffer, Sarah Shimonova

Charles Darwin Prize:

Janine Alkalay

Laura A. and Arthur L. Colwin Prize:

Angelinna Bradfield

Muriel and Philip Feigelson Award:

Moshe Bendelstein, Gloria Stoyanova, Xin Cheng Yuan

Criteria of excellence recognized by the Biology Department awards:

- the Donald E. Lancefield Award, for excellence in biology, to be awarded to the biology major with the highest grade-point average;
- the Darwin Prize, for the biology major with the second highest grade point average who has demonstrated an interest in research;
- the Laura H. and Arthur L. Colwin Prize, for excellence in undergraduate research, to be awarded to a biology major who is not a pre-professional student;
- the Muriel and Philip Feigelson Award, to a graduating senior majoring in biology who has done the best undergraduate research and has also demonstrated outstanding academic achievement.

AMANDA GOLDSTEIN received a research MA degree and worked in the Lahti laboratory. Her thesis was entitled, “Predictors of avian diversity along the Bronx River.” Amanda’s thesis has been accepted for publication in a peer-reviewed journal and will appear in 2022.

During her time as a master’s student at Queens College, Amanda was an Urban Park Ranger for the NYC Department of Parks and Recreation and an educator at the Alley Pond Environmental Center. She is currently an arborist and tree inspector for Arcadis, Inc.

SIDRA JABEEN did her master’s thesis research under the mentorship of Zahra Zakeri. During her time at Queens College, she presented her research at national conferences and is an author on two publications, one of which as the first author. (Jabeen, S., J. Landazuri, S. Nagvenkar, B. Czuj, A. Maghsoudi, M. Javdan, M. Entezari, R. A. Lockshin, and **Z. Zakeri**, 2020. TLR4 sex dimorphism correlates with sex dimorphic phagocytosis in primary macrophages *Ital J Gender-Specific Med* 6(3):100-106. <http://doi:10.1723/3432.34214>). Sidra is currently enrolled in the MD/PhD program of The University of Wisconsin School of Medicine and Public Health.

MALEHA MAHMUD received a research master’s degree with David Lahti as thesis mentor. His thesis was entitled, “A longitudinal assessment of benthic macroinvertebrate diversity and water quality along the Bronx River.” During 2019–2021 in the Lahti lab, Maleha served as lab manager. Maleha is now in the PhD program in anthropology of the Graduate School of CUNY working with Professor Shahrina Choudhary at Brooklyn College on primates in Bangladesh. (Choudhary was based at Queens College as a doctoral student in the PhD program in anthropology of the Graduate School of CUNY.)

Several students in doctoral programs of the Graduate Center of CUNY carried out their thesis research with Queens College faculty members who are also on the faculty Doctoral Programs of the Graduate Center of CUNY. Their students who were awarded a PhD degree in 2021 are listed in the next column.

AISHWARYA BHATTACHARJEE received the PhD from the Doctoral Program in Biology. Her dissertation thesis is entitled, “Vertebrate Scavenger Diversity and Ecosystem Services Along an Elevational Gradient in Central Nepal.” Former Queens College Biology Professor José Anadón was her thesis mentor. After receiving her degree, Ash has worked as a consultant for the Asia-Pacific team of The Nature Conservancy.

IRENE HOXIE received her PhD from the doctoral program in Biology from the Graduate Center of CUNY with Professor John Dennehy as her mentor. Her thesis research was carried out in Dennehy’s laboratory at Queens College. The work was published: Hoxie, I. and J.J. Dennehy, 2021. Rotavirus A genome segments show distinct segregation and codon usage patterns. *Viruses* 13(8):1460. doi: 10.3390/v13081460. Irene is now a postdoctoral fellow in Florian Krammer’s lab at the Icahn School of Medicine at Mount Sinai.

SHOSHANA REICH, a doctoral student in the Weinstein laboratory, successfully defended her dissertation, entitled “Regulation of Pluripotency by Tbox Proteins.” Shoshana is a research scientist at Rumi Scientific, a spin-off venture of Rockefeller University that uses cell biology and physics cutting-edge technology for drug discovery and development of innovative treatments for human genetic diseases, particularly neurological disorders.

MASON YOUNGBLOOD received his PhD from the doctoral program in Psychology of the Graduate Center of CUNY. Mason’s thesis work was mentored by David Lahti. His thesis is titled, “From Psychology to Phylogeny: Bridging Levels of Analysis in Cultural Evolution.”

Mason’s dissertation is comprised of seven chapters, each one of which is now a published peer-reviewed journal article. Mason is now a postdoctoral research associate at the Max Planck Institute in Jena, Germany.

OTHER NOTABLE STUDENT ACTIVITIES OF 2021:

BOBBY HABIG had been an NSF postdoctoral fellow in the Lahti lab from 2018–2021. Bobby worked on function and macroevolution in African weaverbird nests with David Lahti and did field work in Ethiopia and collections work in several natural history museums. He also started the Bronx River Urban Ecology project, which is assessing water quality and the diversity of a wide variety of fungi, plants, and animals along the entire length of New York City’s only freshwater river, from its headwaters in Westchester to its mouth in the South Bronx. Two Queens College biology masters students did their theses on contributions to this project: Amanda Goldstein and Maleha Mahmud. Four other BA and masters students continue to be involved in the project.

During his postdoctoral work in the Lahti lab, Bobby published eight peer-reviewed journal articles (four as first author) in behavioral ecology and evolutionary parasitology and five in science education (four as first author). Bobby is now an assistant professor of Biology at Mercy College, in New York City.

KEVIN JHUN (Biology BA ’12) received his PhD from the Icahn School of Medicine at Mt. Sinai. He is now working as a T Cell Biologist (CART) in the Immuno-therapeutics division of Mnemo Therapeutics.

CARMEN URGILES (Biology BA ’17) took a position with Neochromosome, Inc., a biotech startup. Neo’s origin is with the Synthetic Yeast Genome Project (Sc2.0), the world’s first designed synthetic eukaryotic genome.

KATERINA YAMAMOTO, a doctoral student in the Savage-Dunn laboratory, was awarded an Early Research Initiative (ERI) Catalyst Award from the Graduate School, CUNY. The award provides short-term support for completion of her thesis research project entitled, “BMP signaling in regulation of *C. elegans* lipid homeostasis and immune tolerance.”

Joanna Coleman appointed Assistant Professor of Biology

By Uldis Roze



Joanna Coleman

Joanna Coleman joined the Queens College Biology Department in September 2021, teaching an introductory lab while working to establish her research program. Joanna's birth city is Montreal, but as for many academicians, her academic path took the shape of a globe-circling spiderweb: from Montreal to Calgary to Qatar to Singapore to New York.

Joanna's father is a lawyer; her mother came to Canada as a toddler. Her parents fled Romania after WW2 when Russia installed its Soviet regime in Bucharest. Joanna's mother completed secondary school in Montreal and did not continue to college. Joanna's intellectual path followed that of neither parent. She attended McGill University at its satellite Macdonald campus, where she earned a BSc (Ag) in 1999 and an MSc in 2002. Before continuing on to her doctorate, she worked for several years to accumulate funds for further study. In 2005, she traveled to Calgary, where she joined Robert Barclay's lab at the University of Calgary. Her thesis project explored the impact of urbanization on prairie bats, as well as their assemblage composition, parasites, prey availability, and aspects of roosting and foraging.

Bats are not intrinsically cute like puppies and kittens, and Joanna remembers going through a learning curve in coming to love her study animals. What brought about the change was her experience with "rescue" bats. Each autumn, bats that spent the summer in the city, left—most to find hibernacula in caves and mines. But some, for whatever reason, stuck around and hunkered down in buildings, where conditions were not suitable for hibernation. Eventually, some would be found by people, who then called the local "Batman," Robert Barclay. These bats, if captured, ended up overwintering in his lab, where graduate students, including Joanna, cared for them, and used them in outreach such as talks at schools and other public venues. She took the opportunity to bring the rescues to children's school classes and show them

feeding on mealworms and flexing their membranous wings.

Joanna's debt to Calgary includes more than getting the PhD degree that made her Dr. Coleman. Calgary is also the place where in 2010 she met her future husband Greg MacDonald, whose professional pursuits include graphic design, web development, music, and ownership of Morpheus Studios in Calgary. When Coleman left Calgary for her far-flung postdoctoral career, the pair kept in touch. Greg visited her in Qatar and Singapore, and the two traveled to other places together. In addition, Joanna returned to Canada several times. Joanna and Greg got married in June 2019 and are now living together in New York.

After finishing her PhD in 2010, Coleman's academic job search led her to University of Calgary in Qatar, where she had a one-year professorship teaching nursing students. This first experience living abroad in a totally different culture was transformative, so when that contract ended and she was offered a Lecturer position at the National University of Singapore, she did not hesitate. In her new home, Coleman was ecstatic to be living and working in the tropics, among a diverse community of Southeast Asians and foreigners.

Coleman was able to continue her bat research in the new setting. Work in her lab discovered that the dog-faced fruit bat (*Cynopterus brachyotus*) has a very broad diet. It consumes (and potentially disperses the seeds of) national heritage trees, such as the beautiful tembusu (*Fagraea fragrans*), as well as species considered invasive, such as the spiked pepper (*Piper aduncum*), introduced from the Americas.

She also explored the role of sodium-vapor and LED streetlights on bat foraging in the city. But most impactful was a collaboration with over 50 South East Asian researchers which led to a consensus identification of the most pressing questions for the conservation of biodiversity in Southeast Asia. The study also aimed to empower locals, whose representation in scientific journals is typically lacking.

Coleman spent nine years in Singapore before taking the job at Queens College. She confesses to feeling some homesickness for Singapore. New York City presents a culture shock to new arrivals. The aspect that has been most shocking to her is the size of the homelessness problem; it is unheard of to see people sleeping in train

stations or on trains in Singapore, and she feels overwhelmed by a sense of powerlessness to change their situation.

The most pleasant surprise is New Yorkers' forthrightness and their relative lack of inhibitions about open conversations—Joanna has had some deep and meaningful interactions with complete strangers she encountered while exploring her new home. She also loves how diverse New Yorkers are and how many people in her neighborhood of Middle Village are immigrants like her.

Coleman is gearing up to continue her research at Queens College. She has three masters students ready to start their projects. Dimitri Mimy, who grew up in Haiti, will research the pro-environmental behaviors of People of Color in Brooklyn. Michelle Mendoza will engage in another study with social science underpinnings: examining the controversy over pit bull ownership. And Megan Marchica will study the urban ecology of skunk cabbage in New York City.

Coleman also advertised for a PhD student looking to work in her lab and received a surprisingly large number of responses: 55! The applicants came from 17 different countries in North and South America, Europe, Asia, and Africa. Final choice of the graduate student will require input from the Graduate Center, but whoever joins her lab will get her help in crafting a project that will address the biodiversity crisis of this urban century. What are the biotic impacts of urbanization? What are the links between urbanization and human-nature relationships? What are the ecosystem services of the urban biota?

Joanna is also working with the International Union for Conservation of Nature (IUCN) to protect bats. With the rise of COVID-19, media coverage of the potential role of bats as the reservoir from which the coronavirus emerged, appears to have had a negative impact on public attitudes and behaviors toward bats; bats have been increasingly persecuted and killed as a result. How will this change of attitude play out in the protection of threatened bat species? This is one problem being tackled by Joanna and her fellow members of the Human Dimensions working group of the IUCN Species Survival Commission, Bat Specialist Group.

We welcome Joanna Coleman to the Biology Department and wish the highest success to her and her work.

Alumni Portrait – Steve Rodriguez (Class of 2000)

By Uldis Roze



Steve Rodriguez

Steve Rodriguez (Class of 2000) grew up in the Bronx and came to Queens College almost by accident, on the recommendation of a distant cousin. Though at his middle school Steve had been voted most likely to succeed in science, he reports it was his experience at QC that brought science alive for him. This happened by working in faculty research labs on real research. Steve worked in the chemistry lab of William Hersch on organometallic chemistry and in Tim Short's lab on plant molecular biology.

Though not a part of Honors in Math and Natural Sciences (HMNS), Steve hung around the HMNS lounge and still keeps in touch with friends he met there: Heidi Zapata (now at Yale Medical School) and Eli Ron (now a professor of chemistry at Touro College). During this time, he also remembers reading Richard Feynman's *Surely You Are Joking, Dr. Feynman!* The book reinforced the image of the world of science as a world of adventure.

Among biology faculty, Steve has warm memories of then-new faculty Tim Short and Pokay Ma. Among his course offerings, his favorite was Corinne Michel's course in molecular genetics, which opened vistas he has followed since.

Following graduation from QC, Steve went on to Cornell University in Ithaca for a PhD in genetics and development. His advisor was David Lin, and his research topic was the study of molecular mechanisms guiding neuronal connections in three dimensions in the mouse olfactory circuit. The study required ultra-fine laser dissection and genome-wide molecular analysis. Ultimately, he uncovered a unique spatial pattern of expression for a family of receptors previously only known for their role in controlling cell fate decisions. Subsequently, Steve determined that this family of genes were important for the maintenance of neurons and neuronal connections.

Following his PhD in 2007, Rodriguez went on to a post-doc position split

between the Department of Neurology at the Mass. General Hospital, and the Laboratory of Systems Pharmacology, Harvard Program in Therapeutic Science, Harvard Medical School.

At Harvard, Steve Rodriguez became involved in molecular neurology studies of mouse olfactory sensory neurons and the olfactory epithelium. A more recent focus has been the study of diseases of the human brain, such as ALS (Lou Gehrig disease), and Alzheimer's disease (AD). For all of these, the molecular basis of the disease process remains unknown, and no effective therapies are available.

In 2021, Steve was senior author of a high-impact paper in *Nature Communications** that explored a new approach to AD therapy: re-purposing drugs already approved by the FDA that show promise in the treatment of AD. Drug re-purposing has a long history in pharmacology. A classic example is Pfizer's sildenafil. The drug had been approved for treatment of high blood pressure and worked well at its task. However, nurses noticed that male patients undergoing treatment developed erections. Pfizer then re-purposed sildenafil as a treatment for erectile dysfunction. Its new name: Viagra.

Repurposing of previously approved drugs for treatment of AD is a promising path for two reasons. First, clinical trials for AD treatment are costly because Alzheimer's disease develops slowly, over a matter of years. Second, traditional drug development programs for AD have failed because very little is known about intrinsic factors driving the disease.

The *Nature* paper offered a detour around both problems. Human neural progenitor cells were grown in differentiation medium for 10 days, resulting in a mixed population of neurons, glia, and oligodendrocytes. The mixed culture was then treated with a panel of FDA-approved drugs. Each drug stimulated a characteristic library of mRNA expression. The mRNAs were extracted, sequenced, and their protein equivalents identified. This protein library was then compared by machine learning to the library of proteins expressed by neurons of early- and late-stage human brains suffering from Alzheimer's. Drugs that significantly lowered the protein signatures

of pathological brains were then nominated as candidates for repurposing.

The high-scoring AD drug candidates frequently shared a mode of action. They were protein kinase inhibitors, inhibiting kinases of a number of different families. Most of these drugs are in use as anti-cancer agents. But the top-rated drugs also modulated pathways related to interferon signaling, autophagy, and microtubule formation. None of these were previously considered as part of the AD process. As a result, the repurposing process outlined in the *Nature* paper should not only provide candidates for AD treatment but also generate insights into the molecular processes driving AD. Such insight is sorely needed. Unlike certain cancers whose threat has receded because of effective therapy, Alzheimer's disease is expanding. In the US, the disease today afflicts 5.8 million mostly elderly individuals. That number is projected to more than double, to 13.8 million by 2050.

During his tenure at Harvard, Steve rose from post-doctoral to a faculty position. In 2021 he accepted a position at Sanofi, a pharmaceutical company, where he leads a research lab. Steve is currently working on developing therapies to treat human neurodegenerative diseases, like AD, ALS, and Parkinson's. We wish him success in a project that could lift millions of end-of-life stories into serenity and light.

*Steve Rodriguez, Clemens Hug, Peter Todorov, *et al*, 2021. Machine learning identifies candidates for drug use repurposing in Alzheimer's disease. *Nature Communications* <https://doi.org/10.1038/s41467-021-21330-0>

Faculty Notes 2021

This section reviews the highlights of Biology Department faculty members, staff, and students' extracurricular scholarly activities in 2021. The links included in this section are live so readers can check out what the Biology Department faculty members are doing.



Joanna Coleman

JOANNA COLEMAN was invited to speak in November by New York Public Interest Research Group (NYPIRG) on "The Solid Waste Problem." She also participated in the Sixth International Berlin Bat Meeting, from March 22–24, 2021. Coleman was session chair of Human Dimensions of Bat Conservation in which she presented a talk entitled "Bats without Borders."



John Dennehy

JOHN DENNEHY received a research award from the New York City Department of Environmental Protection entitled "Phylogenetics of SARS-CoV-2 in NYC." Dennehy was invited to speak at a number of

national and international conferences. He spoke at the National Science Foundation Advanced Technological Education Conference on "Environmental Protection & Disease Surveillance-The Emerging Field of Wastewater Epidemiology." He gave the keynote speech on "Control of Bacteriophage Lysis Timing" at the Second International Conference on Bacteriophage Research, Society for Bacteriophage Research and Therapy. He spoke at the COVID-19 Research Registry—A Year of Progress, American Society for Microbiology's World Microbe Forum on "Evolution and Epidemiology of SARS-CoV-2."

Dennehy serves on the National Institutes of Health Microbiology and Infectious Diseases Research Study Section. His expertise in virology and epidemiology was recognized in 2021. He was quoted in a variety of media venues including the *New York Times* and *Forbes*. The links below will open each article. The final link in this group will take you to a short talk given by Dennehy.

- [Omicron Was Probably in N.Y.C. Well Before the First U.S. Case Was](#)

Detected, Wastewater Data Suggest, Emily Anthes, *New York Times*

- [How Omicron Upended What We Thought We Knew About Natural Immunity](#), Maggie Koerth, *FiveThirtyEight.com*
- [In Sewage, Clues to Omicron's Surge](#), Emily Anthes, *New York Times*
- [Antimicrobial Resistance: The Silent Pandemic](#), Danielle Gerhard, *Drug Discovery News*
- [Animal Reservoirs of Covid-19 May Trigger New Rounds of Human Disease](#), William Haseltine, *Forbes*
- [Researchers Find Signs of COVID-19 Mutations in NYC Sewage, Pointing to Possible Dog and Rat Infections](#), Jacob Geanous and Derek Kravitz, *The City*
- [For the Delta Variant - and Future Threats - Scientists Eye the Toilet](#), Adam Smith, *TheStreet.com*
- [From the Wastewater Drain, Solid Pandemic Data](#), Emily Anthes, *New York Times*, 2021/05/07
- [This Week in Virology, April 1, 2021. TWiV 737: SARS-CoV-2 in NYC wastewater.](#)
- [QC Big Ideas, February 18, 2021. Waste, Not: Sewage Holds Evidence of COVID-19.](#)



Nathalia Holtzman

NATHALIA HOLTZMAN

served as chair of Biology and head of the college's Teaching and Learning Center until end of summer 2021 when she was appointed Interim Associate

Provost for Innovation and Student Success. In this capacity, she has written numerous grants with significant success all designed to promote improvements in teaching techniques, especially virtually, and methods for fostering student learning. The titles and funding agency (in parenthesis) for grants active this year are as follows:

- [Preparing Highly Qualified STEM Teachers to Support Effective Learning in Remote, In-person, and Hybrid Learning Environments](#) and [QuID Pro: An Interdisciplinary Design Program Incorporating Design-Make-Play Methods in Undergraduate General Education](#) (National Science Foundation);

- [STEM Bridges Across Eastern Queens; Q-STEM Academy](#) (US Department of Education); [HHMI Inclusive Excellence 3](#) (Howard Hughes Medical Institute); [Women IN Technology Program](#) (Verizon Foundation);
- [Summer Youth Development Program](#) (New York City Department of Youth and Community Development);
- [Northeastern University Diagnostic Partner School](#) (North Eastern University Center for Inclusive Computing);
- [HACU Grow with Google](#) (Hispanic Association of Colleges and Universities);
- [Ithaca - Articulation of Credit Transfer](#) (Heckscher Foundation and the Petrie Foundation)

Holtzman spoke at the Society of Environmental Toxicology and Chemistry (SETAC) International Conference on "Teaching Online Labs during COVID: Lessons Learned" and at the Society for Developmental Biology 2021 conference on "Small scale interventions in Introductory Biology lead to meaningful changes in student success." Posters and others on teaching and learning were presented virtually at the Northeastern State University Transforming the Teaching and Learning Environment 2021 and at AACU Revolutionizing Education after COVID-19 with Corinna Singleman, a colleague in the college's Teaching and Learning Center and graduate of the PhD program in biology of the Graduate School of CUNY.

Holtzman also completed work on her PSC-CUNY grant entitled, "PCB exposure drives excess insulin production in zebrafish." The results of this study were presented at SETAC International conference.



David Lahti

DAVID LAHTI spoke on "Cultural Evolution" at Cambridge University and participated in a panel discussion on the topic in July 2021. He gave the keynote address at the University of Pennsylvania's Penn Symposium on Tools, Beliefs, & Behaviors in May 2021. Lahti's topic was, "The Cultural Evolution of Moral Tension."

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Alicia Meléndez

ALICIA MELÉNDEZ

was invited to speak at the University of Louisiana, Pathology Department in November on “Autophagy in Germline Development and Aging.” In April, she spoke virtually to the Amherst College Biology Department. Her topic was, “Autophagy in Germline Development and Aging.” In June, Meléndez presented a virtual poster entitled, “Autophagy in meiotic fidelity” at the 23rd *C. elegans* International Meeting.

Meléndez continues to be funded by a National Institutes of Health R15 grant entitled, “Autophagy in Germline Development” and by a grant from the United States-Israel Binational Science Foundation entitled, “A Novel Autophagy Checkpoint.” She served on the NIH DEV2 Study Section in June and, in July, she was appointed to a five-year term as a member of the NIH Cellular Mechanisms of Aging and Disease Study Section.

Meléndez is a founding member of Women in Autophagy—the late Beth Levine’s Legacy Network. She is a member of the *Caenorhabditis* Genetics Center Advisory Committee. Finally, she consulted for a story in *The Scientist*: <https://www.the-scientist.com/news-opinion/humans-can-survive-without-key-autophagy-gene-68986>.



Esther Muehlbauer

ESTHER MUEHLBAUER

hosted several guest speakers/QC alumni in her Introduction to Biology course for Non-Science Majors lecture (Biology 011). This program is organized through the Queens College Professionals on Campus program. Students heard “A Conversation with Dr. Lee Nadler ‘69, Harvard Physician/Researcher” in Fall 2021 and “Women in Science: Dr. Beth Lieberman ‘68 and Zena Kaufman ‘77” in Spring 2021.



Cathy Savage-Dunn

CATHY SAVAGE-DUNN

continues to serve as executive officer of the PhD program in Biology of the CUNY Graduate Center.

Savage-Dunn is actively involved in research. Her work is funded by a grant from the NIH entitled, “Regulation of Metabolism by *C. elegans* DBL-1/BMP Signaling”. She served on the NIH Special Emphasis Panel ZRG1 F10B (fellowship) and ZRG1 MOSS-B (R15), November 2021. She was elected Conference Co-Organizer for the FASEB Science Research Conference: The TGF- β Superfamily Conference: Signaling in Development and Disease, that was held in July.

Savage-Dunn was invited to speak at several national meetings. In February, she spoke at the *Caenorhabditis elegans* Skin Meeting “DBL-1/BMP signaling and the *C. elegans* cuticle,” and in December, she gave a talk entitled, “Crosstalk between DBL-1/BMP signaling and cuticle collagen genes in *C. elegans* body size regulation” at the ASCB EMBO meeting. She presented a poster on “Interaction of BMP and insulin signaling in *C. elegans* lipid metabolism” at the 23rd International *C. elegans* Conference in June 2021 with student co-authors.



Tim Short

TIM SHORT

was elected chair of the Biology Department in September 2021. He is completing the term of Nathalia Holtzman.



Maral Tajerian

MARAL TAJERIAN

was invited to speak at the Metropolitan Association for College and University Biologists 54th conference 2021 where she presented the work of her undergraduate research students: M. Amrami^U, J.M. Betancourt^U, **M. Tajerian**, “Alterations

in Glial Morphology in the Chronic Pain Hippocampus”; A. Maghsoudi^U and **M. Tajerian**, “The role of the Extracellular Matrix in Brain Plasticity in the Context of Pain Chronification;” and A.R. Bouda^U and **M. Tajerian**, “Microvascular Plasticity in the Chronic Pain Brain.” This was a virtual conference. She also was an invited speaker and panelist at the CUNY recovery corps meeting held at Queens College.

Tajerian’s research is funded by a PSC-CUNY Research Awards (Enhanced) grant entitled, “Circulating Autoantibodies Direct Autoimmune Mechanisms of Brain Plasticity in CRPS.” She served as a reviewer of grant applications for the Department of Defense Military Women’s Health Research Consortium (MWHRC). She is a fellow of The Faculty Fellowship Publication Program (FFPP) at CUNY.

Tajerian and her undergraduate students M. Amrami and J.M. Betancourt, presented a poster at the Annual Biomedical Research Conference for Minority Students 2021 meeting entitled, “Alterations in Glial Morphology in the Chronic Pain Hippocampus.”



John Waldman

JOHN WALDMAN

spoke on “Goldfish” in the November episode of *CUNYTV Simply Science*. <https://www.facebook.com/watch/?v=407308827602630>

Graduation Award Honorees and Degree Recipients 2020–2021

BACHELOR'S DEGREE RECIPIENTS (SUMMER 2020—SUMMER 2021)

HH – with High Honors in Biology

H – with Honors in Biology

HMNS – Honors in Math &

Natural Sciences Program member

MHC – Macaulay Honors College

CUNY graduate: *Summa Cum*

Laude (3.9 GPA), *Magna Cum*

Laude (3.75 GPA), *Cum Laude*

(3.5 GPA)

ΦBK – Phi Beta Kappa, the
national honor society.

Sundus Ahmed

Sayed Ali – HH, *Summa Cum Laude*

Shanti Alkaifi

Janine Alkalay – HH, *Magna Cum Laude*

Jada Allred

Hallah Almaroosh

Adil Ansari – HH, ΦBK, *Summa Cum*
Laude

Fraz Aslam – H

Farzana Aunamika

Huma Ayaz

Gustania Bauzile

Samantha Beckford – H, *Cum Laude*

Pishoi Bekhet

Moshe Bendelstein – HH, *Magna Cum*
Laude

Eden Benlulu – H

Aviva Berkowitz – H

Yael Berkowitz – HH, *Summa Cum Laude*

Sophia Betzios

Dominika Bielak – H

Nadia Biswas

Angelinna Bradfield – MHC, H

Aastha Budhathoki

Michael Burke

Manuel Cabrera

Theresa Cardoz

Joderick Castillo

Wally Chan – H

Salman Chouhan

Matthew Constantine – H

Sammy Dawoud

Randolph Delarosa – H, *Cum Laude*

Brittani Di Leo

Paloma Diaz – H, *Cum Laude*

Inoedril Dihayco

Andriana Drimona

Andrew Edwards

Amir Elias – *Cum Laude*

Diego Escobar

Kaunain Esmail – H

Fanny Falchettore – H

Nausheen Fathima

Matthew Frenzel

Moshe Frid – H, *Cum Laude*

Herfred Garcia

Marialis Garcia – H

Dominique Germain

Jasmine Gildon

Parthib Goswami – H

Christopher Graham

Charles Grice

Matthew Hackett

Tanjida Hanif

Cristal Hernandez

Bonnie Holder

Iftiaque Hossain

Shanna Huang

Ayo Joseph Johnson

Ebru Karakas

Marwa Karra

Gurdeep Kaur

Harvinder Kaur

Kamaljeet Kaur

Shivaani Khan-Modak

Jin Young Kim

George Kokkinos – HH, ΦBK, *Summa*
Cum Laude

Kimberly Kolsch

Diana Laukamg

Suhan Lee

Anna Li

GuoShen Li – HH, *Cum Laude*

Qing Lin

Shaline Mahadeo – MHC, HH, ΦBK,
Magna Cum Laude

Siddharth Malviya – *Magna Cum Laude*

Dimitri Mimy – HH, *Magna Cum Laude*

Gabriella Oken – H, *Cum Laude*

Katherine Orellana

Boruch Paltielov

Vivic Panan

Edmond Paris

Sarah Persaud

Rebecca Pfeiffer – HH, ΦBK, *Summa*
Cum Laude

Wutmone Phue

Daniel Pinnock

Hemraj Prashad

Ameena Rahman

Sultana Rahman

Kannan Rajendran

Jasodra Ramdihal

Shamelah Rampersad

Michael Raouf – H, *Cum Laude*

Salma Razak

Aasiyah Salehesa

Tejal Samsundar

Eduardo Sanchez

Jacqueline Sarmiento – HH, *Magna Cum*
Laude

Carol Satizabal Acosta

Alejandrina Scott

Sarah Shimonova – HH, *Magna Cum*
Laude

Javeria Siddiqui

Arpna Singh

Lovepreet Singh

Gloria Stoyanova – HH, ΦBK, *Summa*
Cum Laude

Christina Takos – H

Josua Talavera

Xinying Tang

Khristy Tapiero

Brianna Taurisani – H

Ashley Taveras

Nandane Tiwari

Yulei Tong – H

Cindy Tran

Ying Xiang – H, ΦBK, *Magna Cum Laude*

Daniel Yakubov – H, *Magna Cum Laude*

Ting Ting Yau

Xin Cheng Yuan – MHC, HH, ΦBK

Shazia Yusuf – HH, *Magna Cum Laude*

Malika Zakirova

Mingjie Zhou

Thahmena Zzaman – *Cum Laude*

MASTER'S DEGREE RECIPIENTS

Li Yong Cao

Amanda J. Goldstein

Sidra Jabeen

Maleha Mahmud

Biology Faculty Scholarship 2021

(^Ddoctoral student, ^Mmasters student,
^Uundergraduate student)

BOOK CHAPTERS, REVIEW ARTICLES:

- Dennehy, J.J.** and S.T. Abedon, 2021. Adsorption: phage acquisition of bacteria. In *Bacteriophages: Biology, Technology, Therapy*. Harper DR, Abedon ST, Burrowes B & McConville M (eds). Springer Publishing. Pp. 93-117. SBN: 978-3-319-41986-2
- Dennehy, J.J.** and S.T. Abedon, 2021. Bacteriophage ecology. In *Bacteriophages: Biology, Technology, Therapy*. Harper DR, Abedon ST, Burrowes B & McConville M (eds). Springer Publishing. Pp. 253-294. SBN: 978-3-319-41986-2
- Dennehy, J.J.** and S.T. Abedon, 2021. Phage infection and lysis. In *Bacteriophages: Biology, Technology, Therapy*. Harper DR, Abedon ST, Burrowes B & McConville M (eds). Springer Publishing. Pp. 341-383. SBN: 978-3-319-41986-2

PEER-REVIEWED PUBLICATIONS:

- Straka, T.M., **J.L. Coleman**, E.A. MacDonald, and T. Kingston, 2021. Human dimensions of bat conservation – 10 recommendations to improve and diversify studies of human-bat interactions. *Biological Conservation* 262: 109304.
- Lee, K.E.M., W.H.D. Lum, and **J.L. Coleman**, 2021. Ecological impacts of the LED-streetlight retrofit on insectivorous bats in Singapore. *PLoS ONE* 16: e0247900.
- Spagnolo, F., M. Trujillo, **J.J. Dennehy**, 2021. Why do antibiotics exist? *mBio*. 12(6):e0196621.
- Trujillo, M., K. Cheung^U, A. Gao^U, I. Hoxie^D, S. Kannoly, N. Kubota^U, K.M. San^M, D.S. Smyth, **J.J. Dennehy**, 2021. Protocol for safe, affordable, and reproducible isolation and quantitation of SARS-CoV-2 RNA from wastewater. *PLoS One* 16(9):e0257454.
- Hoxie^D, I. and **J.J. Dennehy**, 2021. Rotavirus A genome segments show

- distinct segregation and codon usage patterns. *Viruses*. 13(8):1460.
- Burckhardt, R.M., **J.J. Dennehy**, L.L.M. Poon, L.J. Saif, L.W. Enquist, 2021. Are COVID-19 vaccine boosters needed? The science behind boosters. *Journal of Virology* <https://doi.org/10.1128/JVI.01973-21>.
- Pecson, B.M., E. Darby, C.N. Haas, Y.M. Amha, M. Bartolo, R. Danielson, Y. Dearborn, G. Di Giovanni, C. Ferguson, S. Fevig, E. Gaddis, D. Gray, G. Lukasik, B. Mull, L. Olivas, A. Olivieri, Y. Qu, et al. (**J.J. Dennehy**, among many other authors), 2021. SARS-CoV-2 Interlaboratory Consortium. Reproducibility and sensitivity of 36 methods to quantify the SARS-CoV-2 genetic signal in raw wastewater: findings from an interlaboratory methods evaluation in the U.S. *Environmental Science: Water Research & Technology* 20(7):504-520.
- Dey, S., S. Kannoly, P. Bokes, **J.J. Dennehy**, and A. Singh, 2021. Feedforward genetic circuits regulate the precision of event timing. 2021 European Control Conference (ECC):2127-2132. (Peer reviewed conference paper).
- Goutte, S., J. Reyes-Velasco, **X. Freilich**, A. Kassie, and S. Boissinot, 2021. Taxonomic revision of grass frogs (Ptychadenidae, Ptychadena) endemic to the Ethiopian highlands. *ZooKeys* 1016:77–141.
- Reyes-Velasco, J., S. Goutte, **X. Freilich**, and S. Boissinot, 2021. Mitogenomics of historical type specimens clarifies the taxonomy of Ethiopian Ptychadena Boulenger, 1917 (Anura, Ptychadenidae). *ZooKeys* 1070:135–149.
- Singleman, C., and **N. G. Holtzman** “PCB and TCDD derived embryonic cardiac defects results from a novel AhR pathway.” Feb 25 (online) *Aquatic Toxicology* 231: 105794.
- Lahti, D.C.**, 2021. Analysis of egg variation and foreign egg rejection in Rüppell’s weaver (*Ploceus galbula*). *Frontiers in Ecology & Evolution* 9:734126 (23 pp).
- Kornreich, Ar^U, M.P. Youngblood^D, P.C. Munding, and **D.C. Lahti**, 2021. Female song can be as long and

- complex as male song in the house finch (*Haemorrhous mexicanus*). *Wilson Journal of Ornithology* 132:840–849.
- Galluzzi, L., Klionsky, D. J., Petroni, G., Amaravadi, R., Baehrecke, E. H., Ballabio, A., Boya, P., Bravo-San Pedro, J. M., Cadwell, K., Cecconi, F., Choi, A. M. K., Choi, M. E., Chu, C., Codogno, P., Colombo, M., Cuervo A. M., Deretic, V. J., Dikic, I., Elazar, Z., Eskelinen, E. L., Fimia, G. M., Gewirtz, D. A., Green, D. R., Hansen, M., Jäätelä, M., Johansen, T., Juhasz, G., Karantza, V., Kraft, C., Kroemer, G., Ktistakis, N.T., Kumar, S., Lopez-Otin, C., Macleod, K. F., Madeo, F., Martinez, J., **Meléndez, A.**, Mizushima, N., Münz, C., Penninger, J. M., Perera, R. M., Piacentini, M., Reggiori, F., Rubinsztein, D. C., Ryan, K., Sadoshima, J., Santambrogio, L., Scorrano, L., Simon, H.-U., Simon, A. K., Simonsen, A., Stolz, A., Tavernarakis, N., Tooze, S. A., Yoshimori, T., Yuan, J., Yue, Z., Zhong, Q. (2021) Autophagy in major human diseases. *EMBO* 40:e108863.
- Klionsky, D. et al. (**Meléndez A.**, among many other authors) (2021) Guidelines for the use and interpretation of assays for monitoring autophagy (4th Edition). *Autophagy* 17(1): pp.1-382.
- Clark, J. F. ^D, E.J. Ciccarelli^D, G. Ranepura^U, M. Hasan^U, **A. Meléndez**, and **C. Savage-Dunn**, 2021. Mechanism of interaction of BMP and insulin signaling in *C. elegans* development and homeostasis. *PLoS Genetics* 17(10):e1009836.
- Tajerian, M.** and J. Garcia^U, 2021. Garments and Footwear for Chronic Pain. *Frontiers in Pain Research* 2:e757240. <https://doi.org/10.3389/fpain.2021.757240>

Biology Alumni Fund Donations FY 2021

In fiscal year 2021, 33 of our alumni donated \$8,620. The past two years have been very difficult for everyone. Your gift has a special meaning for us. There are so many worthy charitable causes where you can contribute; we are pleased that you have made this vote of confidence in the Biology Department. Thank you, and we hope everyone is doing well.

Very special thanks go to Francine L. Reff (Class of '64) and Michael Gottlieb (Class of '65) for their very generous gifts. No matter the amount, your donations are greatly appreciated.

As in usual times, these funds support undergraduate student research, provide supplements to undergraduate student graduation awards (Lancefield Award, Darwin Prize, Colwin Prize, Feigelson Award), and support other student-centered special events. While on-campus teaching has not been fully restored, we hope to return to normal educational activities soon. In particular, we hope to be able to support student attendance at scientific conferences, an invaluable experience that has been an impossibility this year.

If you do not already contribute, please tell us what we can do to inspire you to do so. We are sincerely interested in hearing from you (corinne.michels@qc.cuny.edu).

Donors can contribute to the **Biology Alumni Fund** as well as to the **Biology Alumni Endowment Fund**. The Endowment Fund was created by the Biology Department as a relatively stable source of the department's student educational enrichment goals. Contributions to the Endowment Fund cannot be spent but earn interest that is available to be spent. The rate varies but it is currently 4.5 percent.



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