

BIOLOGY CURRENTS

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Letter from the Editor



Corinne Michels '63

I hope all of our readers are enjoying *Biology Currents*. It is one way of keeping abreast of the activities of the Biology Department. While the others ways may be more up-to-date, *Biology Currents* endeavors

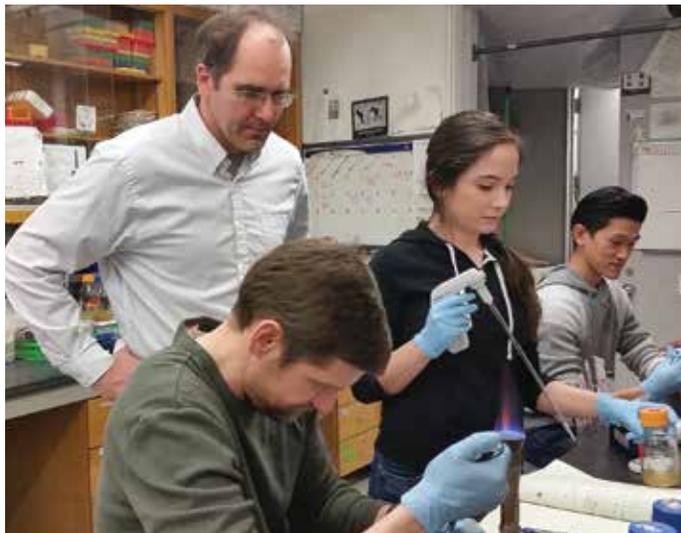
to give more of the backstory that would be hard to tease out of our online sites. Nonetheless, I encourage you to check the Department's web page at <http://biology.qc.cuny.edu/> or "Like" us on Facebook at <https://www.facebook.com/pages/Queens-College-CUNY-Biology-Department/133250930074226>.

You may note a theme to this issue—the increasing role of student research in our students' educational experience. Students at all levels are involved in faculty research, not just graduate students. This can be seen here in Dr. John Dennehy's NSF-sponsored Career Award, in "Faculty Scholarship" (page 10) that lists student authors on several published journal articles, and in "Student Highlights" (page 11) that reports presentations made and awards won. The Department also maintains several programs that focus on supporting undergraduate original research, summarized on our website under "Student Resources." In recognition of the importance of original research in quality education, the College has recently initiated a program of undergraduate research grants that provides a small amount of funding to a select few students in all fields, not just science. You should also be aware that the Biology Alumni Fund (coordinated by Dr. Esther Muehlbauer) has provided student travel awards to undergraduates to present their research at national scientific conferences and, in other ways, supports the student research effort.

Why are we putting such emphasis on undergraduate student research? Be

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John Dennehy Receives an NSF Career Award



Dr. John Dennehy with a few of his undergraduate research students.

Dr. John Dennehy received a five-year National Science Foundation Early Career Development Award for \$713,900 for his project *Population Dynamics and Evolutionary Ecology of Viral Emergence*. The CUNY NSF Career Development Award Incentive program will supplement the NSF award in the amount of \$50,000 from Vice Chancellor for Research Gillian Small.

Dennehy's proposal addresses the question of how viruses jump from host to host, which is called virus emergence. In recent years, some emerging viruses, such as HIV and West Nile, have significantly affected public health. On the other hand, other viruses, such as avian influenza and SARS, have failed to gain a foothold in human populations. Dennehy hypothesizes that fundamental differences in virus population dynamics govern whether an emerging virus is successful or not.

Since testing this hypothesis in the pathogenic viruses of animal hosts would be challenging because of time, space, and ethical constraints, Dennehy uses

bacteriophages and their bacterial hosts as a model system. These are easy to manipulate in the laboratory, and evolution experiments can be performed in weeks. Fundamentally, the population dynamics of bacteriophages is no different than eukaryotic viruses from an ecological and evolutionary perspective.

Dennehy's proposal specifically

addresses several hypotheses regarding the emergence of viruses into new host types. The first aim is to ascertain whether initial virus fitness on the novel host is positively correlated to the probability of emergence. The second aim is to determine whether virus adaptation is enhanced in mixed host communities as compared to communities containing a single host type. The third aim is to establish whether gene flow between virus populations infecting different hosts enhances adaptive evolution. The fourth aim is to investigate the significance of translational adaptation (i.e., evolution of phage codon usage to match host tRNA abundance) in viral emergence. Together these experiments constitute one of the most comprehensive experimental approaches to the study of virus emergence attempted. Successful completion of the work may allow more realistic models of virus emergence and enhance our ability to identify and counteract potentially dangerous viruses.

Undergraduate students carry out much of the research in Dennehy's laboratory. Students work during the academic year,

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Dr. Esther Muehlbauer—Naturalist and Writer Appointed Lecturer of Biology

We are very pleased to announce that Dr. Esther Muehlbauer recently became a permanent member of the Biology Department faculty following over a decade of teaching in a variety of temporary positions. But this is a kind of homecoming for her since she has been part of the Biology Department community for far longer.

Dr. Muehlbauer first arrived at Queens College as an undergraduate student and graduated with a BA degree with a major in Biology and a minor in Creative Writing. To this day, she remains active in both fields. The combination may seem unusual, but Dr. Muehlbauer tells us that she is “the daughter of two poets/writers who valued nature as both an inspiration and a mindset,” and it is from them that she developed her love of the diversity of living things and the natural environment that shaped her career.

While she grew up in an apartment in Queens, Dr. Muehlbauer spent

childhood summers in the seaside town of Cutchogue on eastern Long Island’s North Fork. With *Peterson’s Field Guides* in hand and a pair of binoculars as her equipment, she stalked the salt marsh habitat surrounding East Creek and Peconic Bay, identified everything in sight, and kept detailed lists of all sightings. Thus began Dr. Muehlbauer’s love of field study and her dedication to the living environment.

Dr. Muehlbauer fondly remembers her classes in Colwin Hall (called E Building at the time), including Dr. David Alsop’s hissing cockroaches, en masse trips to Pelham Bay Park at low tide with Dr. Jon Sperling, and Dr. Peter Chabora’s ecology course field trips to diverse spots on Long Island and the New Jersey Pine Barrens. In particular, she remembers a late night jaunt with the entire class to collect nocturnal insects. Her first exposure to laboratory research was with Dr. Chabora working on *Drosophila* parasitic wasps. She especially enjoyed

Dr. Andrew Greller’s field botany course. During trips to local parks he encouraged appreciation of the aesthetics of the parks along with plant identification. She still has the herbarium created for the class. Dr. Muehlbauer studied poetry and short-story writing with Dr. Sandra Schor, who encouraged her efforts to incorporate “organic elements” into her writing.

Dr. Muehlbauer earned the master’s/ PhD degrees from New York University, focusing her research on the salt marsh estuaries of eastern Long Island. Her master’s research was conducted at the NYU School of Environmental Medicine at Sterling Forest (Tuxedo, NY) where, under the guidance of Dr. Joseph O’Connor, she studied the growth of the salt marsh grass *Spartina alterniflora*. Dr. Herndon Dowling, a notable herpetologist (herpetology curator at the American Museum of Natural History and Bronx Zoo), was her doctoral thesis research advisor. She studied the salt marsh turtle *Malaclemys terrapin terrapin* (the



Dr. Muehlbauer on field trip with class

Diamondback Terrapin) and identified an endogenous tidal activity rhythm (namely, a biological clock in sync with the six-hour tidal cycle of the estuary). Dr. Muehlbauer continues in an advisory role in eastern Long Island salt marsh conservation efforts, working with both the Town of Southold, Long Island, and the North Fork Environmental Council.

While her four children were young, Dr. Muehlbauer spent several years away from college campuses, doing textbook writing/editing for Navta Associates/Heath Publishing Company, but she missed teaching and campus life. As her family grew older, she began teaching part-time at Barnard College/Columbia University in Manhattan, and then briefly at Queensborough Community College. Soon she decided to seek out adjunct positions within an easy commute of where her children were attending school. Queens College was the obvious choice, but it was not until 1999 that an adjunct position became available and Dr. Muehlbauer returned to her alma mater.

For over a decade, Dr. Muehlbauer played a pivotal role in the Biology Department as part of our adjunct teaching staff and later as a substitute Assistant Professor. Because of her broad-ranging expertise, the Department relied on her to teach lectures in large introductory courses and even advanced majors-level courses. She was able to take over for faculty on sabbatical and fill in for recently retired faculty. In Fall 2009, the College offered the Department a Lecturer position explicitly for Dr. Muehlbauer, in recognition of her long-term teaching efforts, and in 2014 she received tenure. During these years, Dr. Muehlbauer's primary responsibility has been as course head for Biology 011, a non-science major course entitled "An Introduction to College Biology." With Dr. Muehlbauer at the helm, the Biology Department initiated a complete restructuring of Biology 011: new texts (lecture and lab), new lecture content and emphasis, and all new laboratory exercises. This effort would not have been possible without Dr. Muehlbauer's dedication and pedagogical skills.

Biology 011 is taken by most Queens College undergraduates to fulfill the General Education science laboratory course requirement. About 1,000 students register for Biology 011 every year. As if this were not enough, Dr. Muehlbauer teaches a number of smaller seminar classes designed for the non-science major: "Evolutionary Biology" (Bio 025) and "Human Origins" (Bio 023). Over the past two years Dr. Muehlbauer has taught a course through the Macaulay Honors College on "Salt Marsh Estuaries, and the Natural History of New York City," hoping to enlighten a new generation about the important role of salt marshes in coastal ecology. Dr. Muehlbauer is increasingly involved in developing and teaching courses on evolution, utilizing Darwin's landmark texts and other important evolutionary writings. Most recently she developed "Writing in the Sciences— Evolutionary Themes," a course aimed to help students hone their skills in writing for different audiences while gaining an understanding of evolutionary principles.

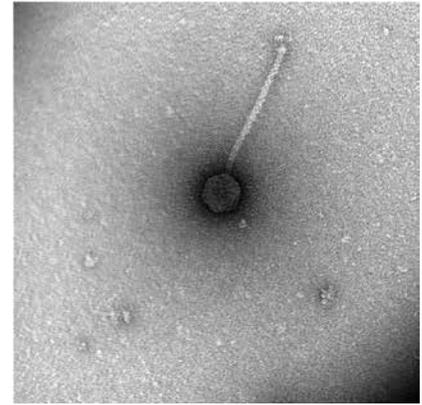
Dr. Muehlbauer has translated her talent as a writer to the College's advantage by becoming active in the Queens College Writing Across the Curriculum. She co-chairs the College's Writing Subcommittee of the Undergraduate Curriculum Committee, which oversees the writing-intensive courses offered by all departments. In addition, Dr. Muehlbauer serves on the Faculty Writing Committee that oversees the newly implemented "College Writing 2" courses (second semester of required writing). She coordinates all campus-wide writing activities and is the Division of Math & Natural Sciences' "point person" to help science/math faculty create College Writing 2 courses.

Currently, Dr. Muehlbauer is completing her own writing project: a book on the historical development of biological theory (*Plato to Darwin to DNA*) that she hopes to utilize in some of her courses. She says, "I think it is important for students to gain a historical perspective on scientific ideas, which reinforces the concept that science is an ongoing process—not a set of static facts."

DENNEHY RECEIVES NSF CAREER AWARD

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often for credit in the Department's research courses, and during the summer. Dennehy's Career Development Award will support the summer salaries of at least three undergraduate research assistants each summer for five years and provides money for supplies and equipment. It will also pay for students to attend national meetings to present their results. In addition, Dennehy acquired funding to support a *Phage Hunters*



Phage Joe Dirt, which was isolated by Dr. Dennehy's Phage Hunters class

initiative at Queens College.

"Phage Hunters" is a two-semester course in phage genomics designed to introduce undeclared freshmen non-majors to scientific research. Dennehy collaborated with the HHMI's Science Education Alliance to develop and offer the course at Queens College (see 2011 issue of *Biology Currents*). In the course, students isolate phage from local soil, extract DNA for pyrosequencing, and incorporate the resulting genomic data into a large-scale comparative genomics study sponsored by HHMI. The initial iteration of the course focused on isolating phages of *Mycobacterium smegmatis*, a close relative of *M. tuberculosis*. The goal is to identify phages and genes relevant to the control of tuberculosis.

A MONTH IN SCHOLAR'S PARADISE

This is a report from John Waldman on his 2012 Rockefeller Foundation Bellagio Fellowship.

Inspiration may mostly be perspiration—but there is no downside to working in a provocative and well-appointed setting. I had the distinct privilege in July 2012 to spend a month writing in such a place: an Italian palace courtesy of a Rockefeller Foundation Bellagio Fellowship.

The Rockefeller Foundation Bellagio Center's mission is lofty—to promote innovation and identify impact-oriented solutions to critical global problems. Its various residences offer opportunities for researchers in the humanities, natural sciences, social sciences, and other academic disciplines; artists, composers, fiction and nonfiction writers; and policymakers, nonprofit leaders, journalists, and public advocates. Indeed, this competitive fellowship may be the very best of all scholarly “retreats” available anywhere.

Bellagio Fellows overlap on their one-month visits, with a dozen or more present at one time. It's meant to be an eclectic mix; my colleagues included an Oxford professor theorizing on the nature of reality, novelists from Chile and Singapore, a New Yorker magazine writer working on a medical book, a Johns Hopkins professor writing on the emotions of touch, a Vietnamese artist crafting outdoor displays, an NYU economist developing a new model for international trade, and a Cuban artist painting from photos made by Che Guevara. Once per week the fellows dine with other participants present for weeklong topical conferences. Fellows also present an informal workshop on their project, which often benefits from the markedly non-parochial feedback.

To be among the Bellagio Fellows is to hear the word “paradise” invoked over and over again. A fellow (and



The view from Dr. Waldman's room

partner, if desired, my wife Carol enjoyed the experience immensely) arrives at the gates of the 53-acre estate named Villa Serbelloni, high on the promontory that overlooks the ancient and exquisite village of Bellagio. Fellows are assigned luxurious bedrooms and offices that overlook Lake Como or the villa's many gardens. Breakfast is informal, lunch orders are packed so that one can carry them and dine in the many gazebos, overlooks, caves, and even the ancient castle that tops the rise. And cocktail hour precedes a formal dinner, followed by aperitifs enjoyed while watching the sun settle behind the mountains.

Downtime for us was pleasurable too. This included swimming the lake, catching concerts in Bellagio and other villages, hiking down to town for gelato, riding ferries to explore the many lakeside communities, visiting villas, and making a day trip to the Swiss Alps.



Dr. Waldman on the lakeshore with the Bellagio Center in background.

The fellowship was invaluable to me. After working for five years in fits and starts on my book, *Running Silver: Restoring Atlantic Rivers and their Great Fish Migrations*, I experienced the epitome of “quality time” to move it forward, the momentum allowing me to complete the work just months after. And, while there, I fell into the classic Bellagio fellow pattern: a few light-headed days of not quite believing my good fortune, more than two weeks of phenomenally high productivity, and then some burnout and also sadness at leaving new friends and, yes—paradise.

The Fourth Annual Biology Research Symposium took place on January 25 and, as has become the tradition, a mix of both faculty and students gave presentations. The symposium is valued by all of us not only because it allows us to stay abreast of our colleagues' research activities, but also because it builds community spirit. Funds generated by the Biology Alumni Endowment Fund were used to provide a buffet lunch and refreshments for coffee breaks. Thank you, alums.

Topics ran the gamut from molecular genetics and cell biology to ecology and evolution, illustrating the diversity of research interests in the Department. A sampling of topics is given below along with a group photo of the participants.



Biology Research Symposium 2012 attendees

Xenia Freilich, whom most of you know as the Department's Chief College Lab Technician, is also a doctoral student in the Boissinot lab. She updated us on progress on her thesis research, giving a talk entitled "Hiding in the highlands: Unexpected diversity of Anurans in Ethiopia."

Sana Khan, a doctoral student in the Holtzman lab, described progress on her thesis research, "Elucidating mechanisms underlying epicardial development," a study being carried out using the genetic model *Danio rerio* (zebrafish).

Franny Gellar (Lahti lab) spoke on the work she and Dr. Lahti are doing with the late Prof. Paul Mundinger's data on house finches. Her talk was entitled "Mechanisms of cultural divergence in the eastern house finch population."

The Meléndez lab uses the genetic model *Caenorhabditis elegans* to study the role of autophagy in early development and metabolism. Two doctoral students from the Meléndez lab spoke on their thesis research.

Kristina Ames told us about the regulation of the Notch signaling pathway by autophagy and the retromer, a newly defined protein complex involved in recycling membrane proteins.

Melissa Silvestrini updated us on her research showing that "Autophagy is required for lipid storage."

Colin Grubel (master's student in the Waldman lab), whose research has been popularized in the *New York Times*, described his work on the foraging ecology of double-crested cormorants in NY harbor.

Dr. Tomomi Haremakei is a postdoctoral research associate in the Weinstein lab, which works on early development of the African claw-toed frog *Xenopus laevis*. He presented an overview of his recent research on the "Regulation of vertebrate development by the exon junction complex protein Eif4a3."

Emmanuel Datan, an outstanding undergraduate researcher from the NIH MARC U*STAR program, represented the Zakeri lab and spoke on his research on "Viral interaction with cell death machinery."

Dr. John Dennehy described his research using bacteriophage evolution, "Threshold for migration load revealed among bacteriophage populations evolving in an ecological sink."

Dr. Karl Fath described his studies on the "Development of scaffolds for tissue engineering." This work has resulted in several publications over the past few years and is being done in collaboration with researchers in the Chemistry Department of Fordham University (see "Faculty Scholarship," p. 10).

Dr. Tim Short presented an update on his studies of light-regulated growth and development in the fern *Ceratopteris richardii*.

Dr. Cathy Savage-Dunn summarized her laboratory's progress on understanding the mechanisms by which the TGF β signaling controls growth and metabolism in the genetic model *C. elegans*.

The final speaker of the day, **Dr. Mitchell Baker**, presented an overview of his research on the Colorado potato beetle and insecticide usage entitled "Behavior and evolution in agroecosystems."

FACULTY IN THE NEWS

Professor Emeritus **Andrew Greller** was featured in an article, “Nature Notes: The Riches of Point Woods,” by Larry Penny that appeared in the *East Hampton Star* on April 4, 2012. You can check it out at <http://easthamptonstar.com/Outdoors/2012404/Nature-Notes-Riches-Point-Woods>. The article describes Dr. Greller as “the living botanist most familiar with Long Island’s diverse flora and has described it in copious scientific works.” Dr. Greller takes the author on



Dr. Andrew Greller in Point Woods



Dr. Uldis Roze and Gerri Griswold, his host at White Memorial Conservation Center, with her pet porcupine Skitur

a tour of the Point Woods, a forest with a unique ecology located in Long Island’s South Fork. The article includes the photo of Dr. Greller at work in the field shown here.

Professor Emeritus **Uldis Roze** is on the public relations circuit to introduce his latest book, *Porcupines: The Animal Answer Guide* published by Johns Hopkins University Press. He spoke at the White Memorial

Conservation Center, Litchfield, CT. The text of his talk, entitled “Looking at porcupines,” and a few wonderful photos can be found at the following link: <http://www.litchfield.bz/news/prickly-talk-at-white-memorial/>. Jason Bittel entertainingly presents Dr. Roze’s extensive field studies of porcupine reproduction in an article for Slate.com entitled “How Do Porcupines Mate? Very Carefully.” With the subtitle “Their stark, night-piercing shrieks aren’t just about the quills.” It is a must-read at: http://www.slate.com/articles/health_and_science/science/2012/11/porcupine_sex_mating_behaviors_involve_quills_musk_penis_spikes_fights_and.html.

Professor **John Waldman** and his students are featured in an article entitled “Guns ’n’ Eels” that appeared on the



Dr. John Waldman, George Jackman, with colleagues, students, and French filmmaking crew in Bronx River Park.

Fordham University Press blog (<http://www.fordhamimpressions.com/?p=3808>). The article describes a field trip to River Park, a section of the Bronx River located in the West Farms area of the South Bronx. Filmmaker Mathias Frantz and his crew, who are making a documentary called *Naturopolis* that profiles the wildlife of four international cities, accompanied Dr. Waldman. Previously, they had gone fishing on the East River and Hell Gate and viewed the colony of nesting cormorants on U Thant Island. As the title of the article suggests, the group captured a few fish, mostly eels, and a 10mm Glock handgun, found by former NYC Police Lieutenant George Jackman. No, the gun was not a plant, and it turned out to have been used in a shooting the prior week. What an exciting field trip for budding naturalists! We cannot wait to see the movie.

LETTER FROM THE EDITOR

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assured, student research does in no way interfere with the rigorous requirements of the Biology major. Rather, we feel that an original research experience teaches critical thinking skills, informs students how scientific information is generated, and teaches them how to critique their own and others’ results. Developing and testing an hypothesis is the foundation of the scientific method and is an essential component of training an independent thinker, whether a scientist or not. Finally, our students are encouraged

to present their work in research reports, seminars, and posters in various public venues. These are unique experiences and develop confidence and poise that will benefit them throughout life.

Several more issues of *Biology Currents* will be published this year in order to bring the newsletter up to date by 2016. It would be great to include a feature on alumni news. Plans are in the works to report on the career progress of a few of our alums for these next issues. If you are interested

in being one of these alums, please let me know. Alternately, if you have an update that you would like included in a section entitled Alumni Updates, please send me a brief text in the body of an email that I can copy and paste. My email address is Corinne.Michels@qc.cuny.edu and use “Biology Alum” in the subject line. I look forward to hearing from you.

Regards,

Dr. Corinne A. Michels, Class of ’63
Distinguished Professor Emerita

FACULTY NOTES 2012

This section reviews some highlights of the extracurricular scholarly activities of Biology Department faculty members, staff, and students in 2012. The diversity of these activities is a clear indicator of the international recognition of our dedicated faculty. You should note the extent to which undergraduate students are integrated into their research programs.

MITCHELL BAKER's research on the "Geographic variation among Colorado potato beetle populations and its implications for managing insecticide resistance" was presented as a poster at the International



Congress of Entomology held in Daegu, South Korea by his co-author Andrei Alyokhin.

STEPHANE BOISSINOT continued work on his National Institutes of Health grant to study the "Population genomics of non-LTR retrotransposons in vertebrates." His research group's article on the antiviral gene OAS1



that appeared in the journal *Molecular Biology and Evolution* was recommended by the Faculty of 1,000, an indication of its significance in the field. Dr. Boissinot spoke on the "Mechanisms of genome size evolution in vertebrates" at Langebio, the National Laboratory of Genomics for Biodiversity of the science research center Cinvestav located in Irapuato, Mexico. He also spoke at the American Museum of Natural History on "Mechanisms of genome size evolution in vertebrates" and lectured on "Variations in the rate of DNA loss among vertebrates account for differences in genome size" at the First Joint Congress on Evolutionary Biology, Ottawa, Canada. Dr. Boissinot attended the annual meeting of the Society for Molecular Biology and Evolution, Dublin, Ireland, with his doctoral student Marc Tollis, who presented a lecture on his doctoral thesis research (see "Student Highlights," p. 11). They also presented

a poster entitled "Multi-locus phylogeography and historical demography of the green anole (*Anolis carolinensis*)." Dr. Boissinot and a number of his undergraduate and graduate research students attended the First Joint Congress on Evolutionary Biology, Ottawa, Canada, and made poster presentations of their work, including Xenia Freilich^P, Ronveer Chakraborty^U, Sela Sherr^U, Ian Fish^P, and Ioannis Demopoulos^U.

JOHN DENNEHY received a five-year National Science Foundation Faculty Early Career Award for his project entitled *Population Dynamics and Evolutionary Ecology of Virus Emergence*. The



very prestigious CAREER awards are designed to identify outstanding junior faculty to support their novel college student education programs and research. Dr. Dennehy describes the project in an article in this issue of *Biology Currents*. He spoke at the EMBO Viruses of Microbes conference, Brussels, Belgium, on "Partial characterization of *Enterococcus faecalis* bacteriophage vB-EfS-3 and *Streptococcus mitis*." He attended the First Joint Conference on Evolutionary Biology, Ottawa, Canada, and presented a poster entitled "Frequency and fitness consequences of host range expanding mutations of Bacteriophage $\phi 6$."

Dr. Dennehy, the coordinator of the Department's two-semester course "Genome Research" (Biology 034/035), and the course's graduate assistant James Carpino attended the Science Education Alliance Fourth Annual Symposium of the Howard Hughes Medical Institute held in Ashburn, VA. (The course was described in detail in *Biology Currents*

2011.) There they made two presentations: the class's results, "Isolation and annotation of *Mycobacteriophage breeni-ome*," and the work of Lauren Esposito and Lauren Mordukhaev, who carried out an independent project, "Identifying mycobacteriophage: DNA primer design for phage cluster identification." Dr. Dennehy has been extraordinarily successful at involving students in original research projects. Two high school students working under his direction were finalists at the 2012 Intel International Science and Engineering Fair in Pittsburgh, PA (see "Student Highlights," p. 11). Dr. Dennehy and several undergraduate and master's students, including Lauren Esposito and Lauren Mordukhaev, presented their research at the 2012 National Council on Undergraduate Research Annual Conference held in Ogden, UT. Also, Dr. Dennehy and his research students submitted several poster presentations at the Northeast Regional Sigma Xi meeting, Undergraduate Research and Mentoring Education, and Queens College Sigma Xi Research Symposium, all held at Queens College.

ANDREW GRELLER remains very active in studies of native flora and forests, particularly those found locally on Long Island, and educational activities on tree and forest preservation. He spoke on "Flora and Vegetation of the North Shore of Long Island," presented to the Teachers Summer Workshop of Seatuck Environmental Association, at "Greentree" in Manhasset, NY. He also presented a lecture entitled "A Botanist Looks at the Trees and Shrubs of Nassau County Streets, Parks, and Gardens" at the Nassau County Cornell University Agricultural Extension conference, *Urban Forestry Education Day: Lessons to Learn to Lessen Tree Loss*, held at Old Bethpage Village.

D = Doctoral student M = Master's student U = Undergraduate student

NATHALIA HOLTZMAN continued her research on early heart development with the support of research awards from the National Heart Institute of the NIH. She is also involved in the College's Teaching



and Learning Center and spoke of her work on "Experiential Learning in a Large Classroom Setting" as part of the Queens College-CUNY experiential learning workshop. Dr. Holtzman and her students (undergraduates Gabriella Kigler, Ariel Karp, Shoshana Reich, Jamie Estevez; master's student Diane Gutierrez; doctoral student Sana Khan; and high school student Alanna Leung) presented their work on zebrafish heart development at the following venues: the Zebrafish Development and Genetics Conference held in Madison, WI, and the Society for Developmental Biology Conference held in Montreal, Canada. All of their presentations were published as proceedings.

DAVID LAHTI maintained his collaboration with co-Principal Investigator Stefano Ghirlanda of Brooklyn College, which is funded by the National Science Foundation research grant entitled "Multi-ancestor coalescent



theory for cultural evolution." Dr. Lahti spoke in a variety of national and international venues. He gave a lecture entitled "Towards a macroevolutionary perspective on defenses against brood parasitism" at the International Symposium on Avian Brood Parasitism in Honour of Significant Brood Parasitism Scientists held in Hainan, China.

He spoke on "Naturalism and design in biology" for the Gordon College Hermann Lectures. Dr. Lahti participated in panel discussions as part of a Cambridge University Faraday Institute summer course, Cambridge, UK, where

he spoke on "The genetics of human behaviour." He also gave a talk on "Is morality adaptive?" at the Indiana University College of Arts and Sciences Themester, Bloomington, IN, and was involved in panel discussions. Dr. Lahti was invited to speak at the City University of New York Animal Behavior Initiative's First Annual Conference, New York. His topic was "How bird song has influenced human music."

Dr. Lahti is a reviewer for several journals specializing in behavior and behavioral ecology, including the *Australasian Journal of Philosophy*, *The Auk*, *Ecology Letters*, *Ethology*, *Animal Behaviour*, and *Behavioral Ecology & Sociobiology*. He also reviewed an academic book proposal for Oxford University Press and reviewed a completed textbook from John Wiley & Sons. Moreover, Dr. Lahti reviewed grant proposals from the American Philosophical Society, John Templeton Foundation, Biotechnology & Biological Sciences Research Council (UK), and Netherlands Organization for Scientific Research.

ALICIA MELÉNDEZ received a three-year NIH Area grant entitled "Genetic analysis of autophagy in *C. elegans* germline development." The goal is to define the role of autophagy (programmed cell



death) in stem cell specification and proliferation in the germ line and other early developmental processes and to identify molecular details of the process at the subcellular level. She continues to collaborate with Malene Hansen of the Sanford Burnham Medical Research Institute, La Jolla, CA, on another study entitled "Role of autophagy and lipid metabolism in organismal aging," a project funded by a research grant from the NIH National Institute on Aging. Dr. Meléndez served on the grant review panel of the NIH's National Institute of Aging: Cellular Mechanism in Aging

and Development. She also serves on the American Federation of Aging Research National Scientific Advisory Board. Dr. Meléndez was invited to speak at the Ellison Medical Foundation Colloquium on the Biology of Aging held in Woods Hole, MA. This was one of the last meetings on this topic for the Foundation, as Ellison has decided not to continue to fund research on aging. She also was invited to speak at the Gordon Research Conference on Autophagy in Stress, Development, and Disease, Ventura, CA. At both meetings she spoke about "Autophagy in *C. elegans* development and aging."

ESTHER MUEHLBAUER edited six chapters for a new edition of *Essentials of Biology Laboratory Manual* by Sylvia S. Mader (McGraw-Hill). She was an INTEL and NYSEF Research Adviser for the Forest Hills High School Science Research Program. Dr. Muehlbauer is a North Fork Environmental Council/Nature Conservancy—Estuarine/Wetlands Consultant for Eugene's Creek/Mud Creek in Cutchogue, Long Island.

CATHY SAVAGE-DUNN continued her NIH-funded research investigating the "Genetics of cell signaling in *C. elegans* growth regulation." This project studies body size control genes and TGFβ signaling in *C.*



elegans, a model for human diseases like cancer and aortic aneurysms. Dr. Savage-Dunn attended the Genetics Society of America's meeting on Model Organisms to Human Biology—Cancer Genetics in Washington, DC, where she and her doctoral student Sheng Xiong presented a poster entitled "Identification and characterization of protein phosphatases that regulate TGFβ signaling in *C. elegans*." She also spoke on her TGFβ signaling research at the College of Staten Island-CUNY.

JOHN WALDMAN was awarded the very prestigious Rockefeller Foundation Bellagio Arts and Literary Arts Residency Fellowship. This fellowship allowed him to reside in a beautiful lakeside villa



in Bellagio, Italy where he could work on his latest book while enjoying the company of other fellowship awardees (see Dr. Waldman's article "A Month in Scholar's Paradise," p. 4). During his stay at the Rockefeller Bellagio Center, he spoke on his "Running Silver Project" and the book he was working on. You can watch this 10-minute talk at <https://www.youtube.com/watch?v=nybXkD61tsw>. Dr. Waldman was also the recipient of the 2012 Marine Conservation Society Award from the Wildlife Conservation Society. Additionally, he convened a workshop for the Hudson River Foundation on "Bight of Herring: New York Region River Herring Restoration Workshop."

Dr. Waldman spoke at the Mongolian Ecological Research Symposium, Tuckerton, NJ, on his study "Estimating times of postglacial recolonization of Lake Hovsgol by fishes using mtDNA coalescent analysis." He was the plenary speaker at the Collaboration Through Fisheries Networks: Restoration of Sturgeon and Paddlefish Populations at the American Fisheries Society Annual Meeting held at St. Paul, MN, where he gave a talk entitled "Restoring an Ancient Fish in a Modern World." Dr. Waldman participated in a panel discussion on the *Culinary and Literary Importance of Oysters in New York—New Jersey Harbor*; his topic: "The Je Ne Sais Quoi of the New York Oyster." The talk was one of a series of public lectures, and was followed by a feast of raw oysters and some excellent wine. He also spoke at the Chinese American Academic and Professional Society, Flushing, NY, on "Suddenly cormorants: A curse, or a sign of a recovering New York Harbor?" and at the Hudson River Foundation, NY, on

"Genetic mixed-stock analysis of coastal American shad fisheries." His review of the book *Ecology of Estuarine Fishes: Temperate Waters of the Western North Atlantic* by Kenneth W. Able and Michael P. Fahay appeared in the *Quarterly Review of Biology*. Dr. Waldman and his master's student Colin Grubel presented reports on their "Rapid assessment of habitat and wildlife losses from Hurricane Sandy in the Hudson-Raritan estuary" to the Hudson River Foundation Board of Directors Meeting, New York, and to the National Fish & Wildlife Foundation in Washington, DC. Along with colleagues of CUNY's Institute for Sustainable Cities, Dr. Waldman presented a report to the New York City Department of Environmental Protection entitled "The feasibility of restoring salinity gradients to an isohaline urban estuary, Jamaica Bay, New York." He also co-authored a report on "Coasts and Oceans" that was presented to the U.S. National Climate Assessment and appeared in *Climate Change in the Northeast: A Sourcebook*, edited by Horton, R., W. Solecki, and C. Rosenzweig.

DANIEL WEINSTEIN presented his work on the "Role of Xtox1 (*Xenopus* Target of *Xema1*), a novel Mab-21 family protein, in vertebrate development" at the Society for Developmental Biology's 70th Annual Meeting, Chicago, IL. His research was also the subject of a poster presentation at the *30 Years of Wnt Signaling* (EMBO Conference), Egmond aan Zee, Netherlands.

ZAHRA ZAKERI's NIH-funded research



on "Characterization of flavivirus NS4A induced autophagy" continued. She was the co-organizer of a meeting of the International Cell Death Society on *Metabolism of Cell Death: Its Ramifications for Therapeutics and Drug Development* held in Singapore. She is also the director of the College's

long-standing NIH Minority Access to Research Careers (MARC) Award that encourages minority students to become involved in scientific research. Dr. Zakeri is the Queens College coordinator of a Bridges to the Baccalaureate Program, a grant administered by Queensborough Community College. She serves on the editorial board of the following journals: *Apoptosis*, *Cell Death and Disease*, and *Gastroenterology and Hepatology from Bed to Bench*.

Dr. Zakeri was invited to chair a session at the *Death, Danger, Inflammation and Immunity Conference* held at the Institute Pasteur, Paris, France, and at the 20th Euroconference on Apoptosis, *From Death to Eternity*, held in Rome, Italy. She was also invited to speak about her research on viral manipulation of cell death machinery at several national and international academic venues, including the Department of Microbiology/ Division of Infectious Diseases Seminar Series of Boston University's School of Medicine; Mount St. Mary's University in Los Angeles, CA; the *Programmed Cell Death in Biology and Medicine Conference* at Moscow State University, Moscow, Russia; the University of Malay, Department of Medicine, Kuala Lumpur, Malaysia; and for the Department of Biology, University of Cork, Cork, Ireland. Dr. Zakeri was a member of the grant review committees of the Belgium Cancer Society, the international unit of the National Research Foundation South Africa, and the Associazione Italiana per la Ricerca sul Cancro (AIRC) of Italy.

PSC-CUNY RESEARCH AWARDS

WERE RECEIVED BY:

Stephane Boissinot
John Dennehy
Cathy Savage-Dunn
Timothy Short
John Waldman

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D = Doctoral student M = Master's student U = Undergraduate student HS = high school

BOOKS

Roze, U. (2012). *Porcupines: The Animal Answer Guide*. Johns Hopkins University Press, Baltimore, MD. 203 Pages.

BOOK CHAPTERS AND REVIEW ARTICLES:

Tollis^P, M. and **S. Boissinot** (2012). The Evolutionary Dynamics of Transposable Elements in Eukaryote Genomes. In: *Genome Dynamics Vol. 7: Repetitive DNA*, edited by Garrido-Ramos, M.A., Karger Medical and Scientific Publishers, Basel, Switzerland. Pp. 68–91.

Lahti, D. C. and C. Pytte (2012). Sleep and Bird Songs. In: *Encyclopedia of Sleep and Dreams*, edited by D. Barrett and P. McNamara, ABC-CLIO, Santa Barbara, CA. Pp. 596–597.

Waldman, J. (2012). Ecology of Estuarine Fishes: Temperate Waters of the Western North Atlantic. *The Quarterly Review of Biology* **87**:381.

PEER-REVIEWED PUBLICATIONS

Tollis^P, M., G. Ausubel, D. Ghmire, and **S. Boissinot** (2012). Multi-locus phylogeographic and population genetic analysis of *Anolis carolinensis*: Historical demography of a genomic model species. *PLoS ONE* **7**:e38474.

Blass^U, E., M. Bell, and **S. Boissinot** (2012). Accumulation and rapid decay of non-LTR retrotransposons in the genome of the three-spine stickleback. *Genome Biology and Evolution* **4**:687–702.

Ferguson^P, W., S. Dvora^U, R. Fikes^U, A.C. Stone, and **S. Boissinot** (2012). Long-term balancing selection at the anti-viral gene *OAS1* maintains functionally different alleles in chimpanzees. *Molecular Biology and Evolution* **29**:1093–1103. Recommended by the Faculty of 1,000.

Dennehy, J.J. What can bacteriophages tell us about host-parasite coevolution? (2012). *International Journal of Evolutionary*

Biology. Article ID 396165, <http://dx.doi.org/10.1155/2012/396165>.

Hatfull, G.F., **Dennehy, J.J.**, and the Science Education Alliance Phage Hunters Advancing Genomics and Evolutionary Science Program, the KwaZulu-Natal Research Institute for Tuberculosis, and HIV Mycobacterial Genetics Course Students, and the Phage Hunters Integrating Research and Education Program (2012). The complete genome sequences of 138 mycobacteriophages. *Journal of Virology* **86**:2382–2384.

Ching, J., S.A. Musheyev^{HS}, D. Chowdhury^{HS}, J.A. Kim^M, Y. Choi^M, and **Dennehy, J.J.** (2012). Intermediate dispersal rate maximizes adaptation in bacteriophage populations evolving in an ecological sink. *Evolution* **67**:10–17.

Nakatsuka, N., S.N. Barnaby, **K.R. Fath**, I.A. Banerjee (2012). Fabrication of collagen-elastin-bound peptide nanotubes for mammalian cell attachment. *Journal Biomaterials Science Polymer Education* **22**:1843–1862.

Barnaby, S.N., **K.R. Fath**, A. Tsiola, I.A. Banerjee (2012). Fabrication of ellagic acid incorporated self-assembled peptide microtubes and their applications. *Colloids and Surfaces B: Biointerfaces* **95**:154–161.

Sarker, N.H., S.N. Barnaby, **K.R. Fath**, S.H. Frayne, N. Nakatsuka, I.A. Banerjee (2012). Biomimetic growth of gallic acid–ZnO hybrid assemblies and their applications. *Journal of Nanoparticle Research* **14**:1–12.

Barnaby, S.N., **K.R. Fath**, N. Nakatsuka, N.H. Sarker, I.A. Banerjee (2012). Formation of calcium phosphate-ellagic acid composites by layer by layer assembly for cellular attachment to osteoblasts. *Journal of Biomimetics, Biomaterials & Tissue Engineering* **13**:1–17.

Barnaby, S.N., N. Nakatsuka, S.H. Frayne, **K.R. Fath**, and I.A. Banerjee (2012). Formation of hyaluronic acid–ellagic acid microfiber hybrid hydrogels and their applications. *Colloid and Polymer Science* **291**:1–11.

Nakatsuka, N., S.N. Barnaby, **A. Tsiola**, **K.R. Fath**, B.A. Williams, and I.A. Banerjee (2012). Self-assembling peptide assemblies bound to ZnS nanoparticles and their interactions with mammalian cells. *Colloids and Surfaces B: Biointerfaces* **95**:154–161.

Morgan, Eric C. and **A.M. Greller** (2012). *Phellodendron amurense* and the woodlands of Long Island. *Quarterly Newsletter of the Long Island Botanical Society* **22**:29; 33–34.

Greller, A.M. and E.E. Lamont (2012). The Story of St. Ronan's Well, Flushing Bay, Queens, New York: Once a Premier Collecting Site for Now-Uncommon Long Island Plants. *Quarterly Newsletter of the Long Island Botanical Society* **22**:13; 15–18.

Singleman^P, C. and **N. G. Holtzman** (2012). Analysis of Post-Embryonic Heart Development and Maturation in the Zebrafish, *Danio rerio*. *Developmental Dynamics* **241**:1993–2004.

Johnson, N. A., **D. C. Lahti**, and D. T. Blumstein (2012). Combating the assumption of evolutionary progress: lessons from the decay and loss of traits. *Evolution: Education & Outreach* **5**:128–138.

Lapierre, L. R., **A. Meléndez**, and M. Hansen (2012). Autophagy links lipid metabolism to longevity. *Autophagy* **8**:144–146.

Hong, R., T.Y. Kang, **C.A. Michels**, and N. Gadura (2012). Membrane lipid peroxidation in copper alloy mediated contact killing of *Escherichia coli*. *Applied and Environmental Microbiology* **78**:1776–1784.

Barnaby, S.N., N.H. Sarker, **A. Tsiola**, I.A. Banerjee (2012). Biomimetic formation of

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chicoric-acid directed luminescent silver nanodendrites. *Nanotechnology* **23**: 294011.

Waldman, J., L. Maceda, and I. Wirgin (2012). Mixed-stock analysis of wintertime aggregations of striped bass along the mid-Atlantic coast. *Journal of Applied Ichthyology* **28**:1–6.

Wirgin, I., L. Maceda, **J.R. Waldman**, S. Wehrell, M. Dadswell, T. King (2012). Stock origin of migratory Atlantic sturgeon in the Minas Basin, Inner Bay of Fundy, Canada, determined by microsatellite and mitochondrial DNA analyses. *Transactions of the American Fisheries Society* **141**:1389–1498.

Haremaki, T., and **Weinstein, D.C.** (2012). Eif4a3 is required for accurate splicing of the *Xenopus laevis* ryanodine receptor pre-mRNA. *Developmental Biology* **372**:103–110.

Kim, K., B.B. Lake, T. Haremaki, **D.C. Weinstein**, and S.Y. Sokol (2012). Rab11 regulates planar polarity and migratory behavior of multiciliated cells in *Xenopus* embryonic epidermis. *Developmental Dynamics* **241**:1385–1395.

Sridharan^D, J., T. Haremaki, Y. Jin^D, S. Teegala^D, and **D.C. Weinstein** (2012). Xmap2113 mediates dorsoventral patterning in *Xenopus laevis*. *Mechanisms of Development* **129**:136–146.

Maghsoudi, N., **Z. Zakeri**, and R.A. Lockshin (2012). Programmed cell death and apoptosis: Where it came from and where it is going: from Elie Metchnikoff to the control of caspases. *Experimental Oncology* **34**:146–152.

D = Doctoral student
M = Master's student
U = Undergraduate student
HS = High school

Student Highlights

We are pleased to tell you about some of the activities that the Biology Department's students have been involved in and the honors earned.

ELLIOT AGUILAR (doctoral student in the Lahti lab) was awarded the NSF Nordic Research Opportunity fellowship to spend an academic year working abroad at the Centre for the Study of Cultural Evolution at Stockholm University.

FRANCES GELLER (doctoral student in the Lahti lab) gave a presentation at the American Museum of Natural History Lang Science Program entitled "Mechanisms of cultural divergence in the eastern house finch (*Carpodacus mexicanus*) population."

COLIN GRUBEL (master's student in the Waldman lab) participated in a variety of conferences and was invited to speak at the 2012 Northeastern Natural History Conference in New York, NY, and the American Fisheries Society Annual Meeting in St. Paul, MN, where he lectured on "Diet composition of Double-crested Cormorants, *Phalacrocorax auritus*." He spoke on his "Rapid assessment of habitat and wildlife losses from Hurricane Sandy in the Hudson-Raritan estuary" at the NY-NJ Harbor Estuary Program in New York, NY, and at the Hudson River Foundation, Board of Directors meeting.

KEVIN JHUN, an undergraduate in the Macaulay Honors College and Biology major from the Class of 2012, received several awards resulting from his research carried out in the Dennehy lab. His poster entitled "Absolute fitness and host attachment of bacteriophage $\phi 6$ host range mutants" received First Place Best Undergraduate Student Poster at the Northeast Regional Sigma Xi meeting, Flushing, NY. Kevin received the Biology Department's Muriel & Philip Feigelson Award, given to the graduating Biology major with the strongest academic and research record. At graduation, Kevin received the University Scholar Award and graduated with Honors in Mathematics and Natural Sciences. This outstanding young scientist is currently a PhD student at Mt. Sinai Medical College.

SHANAWAJ (ROY) KHAIR and DANIEL ARANGO, both John Bowne High School students of the Class of 2012 doing research in the Dennehy lab, were recognized as "Finalists" at the 2012 Intel International Science and Engineering Fair in Pittsburgh, PA, where the two present-

ed their research, "Do you have the guts to lose weight: correlation between mouse body mass index and *Bacteroidetes* and *Firmicutes* frequencies in the gut." They also received the First Prize Award at the NYC Science and Engineering Fair for high school students and First Prize Best High School Student Poster at Northeast Regional Sigma Xi meeting, Flushing, NY.

Insight as to the impact of the undergraduate research experience on a student's career path is made clear from Roy's message, taken from his Linked-In page. "I am a student researcher at Department of Gastroenterology-Hepatology at Stony Brook Medicine. I am currently exploring the relationship between gut bacteria and colorectal cancer. My long-term career goal is to work at a university hospital where I will do clinical studies on gastroenterological diseases, teach some classes, and tend to patients. My prior research experience and exposure to medicine has led me to such a decision."

RITA MONFORT (doctoral student in the Boissinot lab) gave an oral presentation on the results of her research on "The determinants of helminth infestation in baboons" at the annual meeting of the American Society of Parasitologists, Richmond, VA.

M. AARON OWEN (doctoral student in Lahti lab) published two papers based on research carried out at Northern Illinois University and Purdue University, where he was an undergraduate and master's student, respectively. The full references are: King, B.H. and M.A. Owen (2012). Post-mating changes in restlessness, speed and route directness in males of the parasitoid wasp *Spalangia endius* (Hymenoptera: Pteromalidae). *Journal of Insect Behavior* **25**: 309–319; and Owen, M.A., K. Rohrer and R.D. Howard (2012). Mate choice for a novel male phenotype in zebrafish (*Danio rerio*). *Animal Behaviour* **83**:811–820.

MARC TOLLIS (doctoral student in the Boissinot lab) was invited to speak on his thesis research at the First Joint Congress on Evolutionary Biology, Ottawa, Canada. His lecture was entitled "Multi-locus phylogeography and historical demography of the green anole (*Anolis carolinensis*)."

GRADUATION AWARD HONOREES & DEGREE RECIPIENTS

BIOLOGY GRADUATION AWARD HONOREES

Laura H. and Arthur L. Colwin Prize Kristina C. Zabierek

Charles Darwin Prize Avi Bitterman

Muriel and Philip Feigelson Award Lauren M. Alvarez, Kevin Jhun, Maureen Pereyra

Donald E. Lancefield Award Heng Qi

BACHELOR'S DEGREE RECIPIENTS

HH—with High Honors; H—with Honors; ΦBK—Phi Beta Kappa, the national honor society;

ΒΔΦ—Beta Delta Phi, the national Biology Honor Society

Jason Abella	Annick Fremont	Anika Paul—H
Muhammad Ali	Kelly Garces—H	Maureen Pereyra—H
Guylsda Alphonse	Jonathan A. Goldstein—H, ΒΔΦ	Valini Persaud
Lauren Alvarez—HH, ΒΔΦ	Jin Hee Gwon	Lauren Peyer—H, ΒΔΦ
Maria Anjum	Dinah Han	Antanas Planutis—H
Shabana Ansari	Kevin Jhun—HH, ΒΔΦ	Prakash Prasad
Vaghasrsh Antanesian	In Kang	Heng Qi—HH, ΦBK
Jessica Arias—H	Christine Katwaru	Omar Qureshi
Mohammad Awan	Khaleda Khan	Emily Raghubir
Chris Azarnejad	Cynthia Komar	Jaspreet Saini
Nadezhda Bababekova	Marina Konta	Munaff Shadick
Miriam Ben-Dayan—H, ΒΔΦ	Joseph Kooran	Enobong Shammah
Austin Bennett	Jenny Lai—H	Harmandeep Singh—H, ΒΔΦ
Esi Benn	Cathy Le—H, ΒΔΦ	Harminder Singh
Avi Bitterman—HH, ΦBK	Jinyu Li	Sharon Slomovich—H
Lindsay Cahn	Thomas Li	Jessica Sodhi
Jessica Chandhok	Fizza Mahmud	Michael Spigner—HH, ΒΔΦ
Jane Ching—H	Richard Martirosian—H	Susan Stanley
Sarang Choi	Bushra Meraj—H	Lev Starikov
Stella Chow	Oren Michaeli—H	Henry-Robert Thomas—H
Wontaek Chung	Jacob Noveck—H, ΒΔΦ	Luis Vega—H
David Clarke	Lizbeth Nunez	Kaiser Wang
Francois Desinor	Mansoor Pandhair	Tazio Whyne
Stephanie Eccles	Brianna Paolino	Kristina Zabierek—HH
Wilson Echeverria	Amy Park	

MASTER'S DEGREE RECIPIENTS

Marina Konta

Jinyu Li

Lizbeth Nunez

Amy Park

Enobong Shammah

Susan Stanley

Samantha Zieran

BIOLOGY ALUMNI FUND DONATIONS FY2011

Starting with this issue, we will report alumni donations according to the College's fiscal year, which is July 1 to June 30, in order to be consistent with the way the Queens College Foundation records donations. As a result, donations made in Fall 2010 that appeared in the 2010 issue of *Biology Currents* are also listed here. In FY2011, 78 alumni donated a very generous **\$14,712.50**, including matching contributions from two corporations. Your gifts are greatly appreciated. The funds enhance discretionary activities of the Department, including presentations by visiting scientist and faculty recruitment candidates, support of student and faculty research, student travel to scientific conferences, as a supplement to student graduation awards, and for special events like the annual Biology Symposium. Alumni Funds Awards are reviewed by the Department's Alumni Funds Advisory Committee, which makes recommendations to the Chair. We greatly appreciate your support.

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BIOLOGY ALUMNI FUND DONATIONS FY2012

In FY2012, 58 alumni (names listed below) donated a very generous **\$16,392.50**, the largest Biology Department total since the College began its fund-raising activities over 20 years ago. Thank you all very much. Your gifts enhance the Department's discretionary activities including our weekly colloquium series of research presentations by visiting scientists, support for student research and travel to scientific conferences, and student graduation awards, among other activities. Alumni Funds Awards are reviewed by the Department's Alumni Funds Advisory Committee, which makes recommendations to the Chair. We greatly appreciate your support.

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Marie V. Tangredi

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We want to keep in touch! If you just wish to say hello, or tell us what is new in your life, please fill in the information below and return to: Distinguished Professor Corinne Michels, Department of Biology, 65-30 Kissena Blvd., Queens, NY 11367-1597. Alternately, just provide the information below in an email (Corinne.Michels@qc.cuny.edu) and be sure to write "Biology alum" in the subject line.

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