

Bama Biology

Newsletter of the Department of Biological Sciences

Volume 2 No. 1

NOTE FROM THE CHAIR

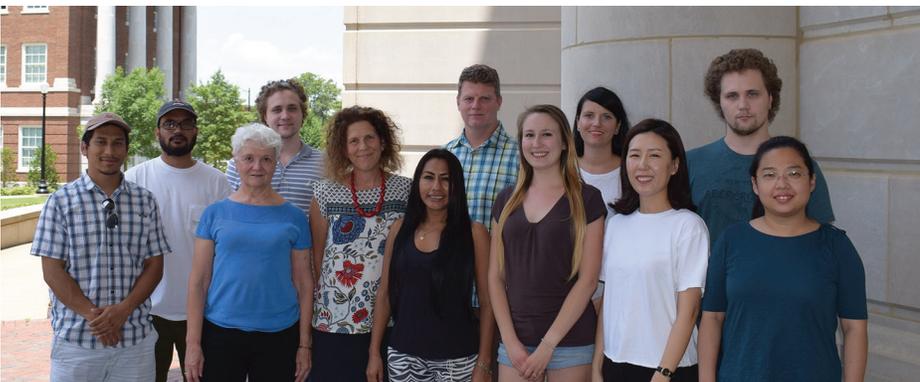
Dr. Janis O'Donnell

Welcome to the Summer 2017 edition of the Bama Biology Newsletter. We recently said goodbye to graduating Biology, Microbiology and Marine Science undergraduate majors and graduate students. These are students who come from all parts of the State of Alabama and of the U.S.—and from countries around the world. They, in turn, were taught and mentored by Biological Sciences faculty members of similarly diverse origins

human, plants, animals, microbes—absolutely depends on contributions from a diverse research community. In matters of human or environmental health, of delving into biodiversity and communities of interacting organisms, biologists across the globe share the same concerns and motivations, and they contribute their time, intellect and expertise to vital questions that impact all of us.

Alabama. In August, three more faculty members will join the department, one from the Midwest, one from Poland, and one from Brazil. They join a similarly international faculty—from across the U.S. (I myself am a Georgia native), and others from Mexico, Bulgaria, South Africa, and the U.K. Our graduate students also come from various parts of the U.S., and from nations such as Germany, Russia, China, Taiwan, India, and Nepal. Faculty, staff and students have ongoing research projects around the world—in Cuba and the Caribbean, in Alaska and Iceland, in France, England and Italy, in Nicaragua and Honduras, in Antarctica, Israel and Vietnam. You will be reading about some of these faculty and students in this issue and others in the future.

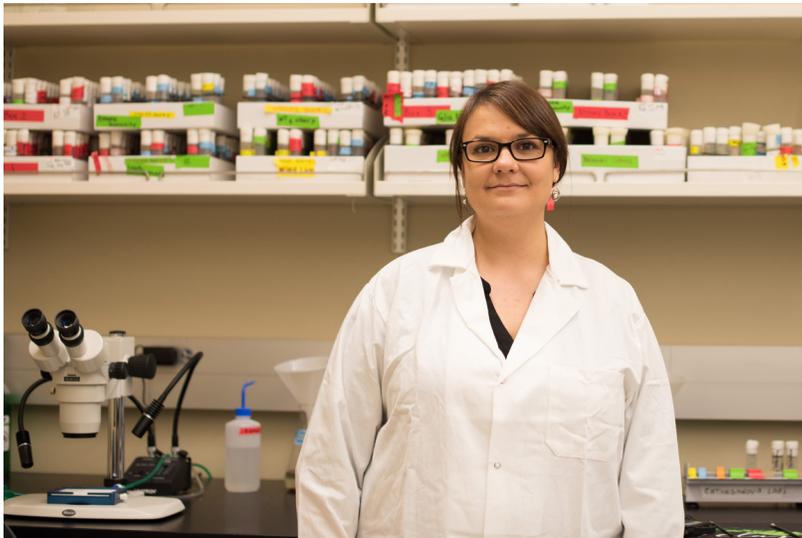
I also want to direct your attention to a new endeavor of this Department, the Bama BioFest, September 28-30, 2017. The details are in this issue of the newsletter, and we encourage one and all to join us for parts or all of the festivities, in which we remember the department of years past and celebrate the department of the present. Biofest will begin with a guest speaker for the annual Darden Lecture, which celebrates the long years of service by long-time Department Chair, Bill Darden, a Graduate and Undergraduate Research Symposium, a Biology Career Fair, and a Tailgate – it is after all a fall event and this one occurs prior to the Bama-Ole Miss football game!



Dr. Janis O'Donnell (front row, blue shirt) with scholars from our department who have international interests. Next to Dr. O'Donnell in the front row: Dr. Christie Staudhammer (Ph.D. from Canada and research studies in Bhutan, Brazil, and Costa Rica), Flora Magdaline Benitez Romero (visiting Ph.D. student from Brazil), Karolina Kodin (Ph.D. student from Ukraine), Hanna Kim (Ph.D. student from Korea), Yu Wang (instructor from China). Back row: Sujit Kunwor (Ph.D. student from Nepal), Sontosh Deb (Ph.D. student from Bangladesh), Andrei Bombin (Ph.D. student from Russia), Dr. Greg Starr (research studies in Costa Rica and Canada), Susi Weisner (Ph.D. student from Germany), and Sergei Bombin (Ph.D. student from Russia).

and with research collaborations across the globe. My thoughts have turned to this aspect of our department, one that we in the Biological Sciences often take for granted, because the subject of immigration and international travel has been headline news over the past year. Scientific research has always been an international endeavor and progress in our understanding of living things—

With that perspective in mind, I want to take this opportunity to celebrate the international nature of science, in general, and of the Department of Biological Sciences here at UA, in particular. Our outstanding faculty and students hail from all parts of the world. In January of this year we welcomed two new faculty members, both from the State of



NEW FACULTY SPOTLIGHT

Dr. Stanislava Chtarbanova-Rudloff

Stan uses the fruit fly *Drosophila* to study how the brain responds to aging and disease.

STANISLAVA CHTARBANOVA-
RUDLOFF

RESEARCH IN A NUTSHELL

Stan uses the fruit fly *Drosophila* to study how the brain responds to aging and disease.

BIOGRAPHY

Stan earned her BS in Biochemistry, MS in Immunology and PhD in Molecular and Cell Biology at the University of Strasbourg in France. She then completed postdoctoral training at the University of Wisconsin-Madison.

During her PhD studies, Stan was awarded a three-year predoctoral fellowship as well as a three-year teaching fellowship from the French Ministry of National Education, Research and Technology. In her final year as a graduate student, she was also awarded a one-year fellowship from the French Foundation for Medical Research.

STAN is a new Assistant Professor in the Department of Biological Sciences.

We are enjoying getting to know Stan and wanted to introduce her to you by getting her to answer a few questions.

Stan, what motivated you to pursue a career in science?

I think it was a combination of curiosity and the need to face new challenges and to “do what you love”. In high school I always enjoyed biology and chemistry, and in college my work as an undergraduate researcher oriented me toward a career in science.

Cells, which are the fundamental units of life, always intrigued me—how they function and interact to build up organs and tissues, and how everything is orchestrated within and between cells to keep organisms alive.

The chance to answer complex questions, such as what makes an organism susceptible to disease or succumb to infection, and to contribute to new

discoveries, definitely influenced my career choice. Additionally, I chose a career in science because it gives me the chance to be creative. It provides opportunities to meet absolutely interesting and amazing people, and it allows me to change or take new directions.

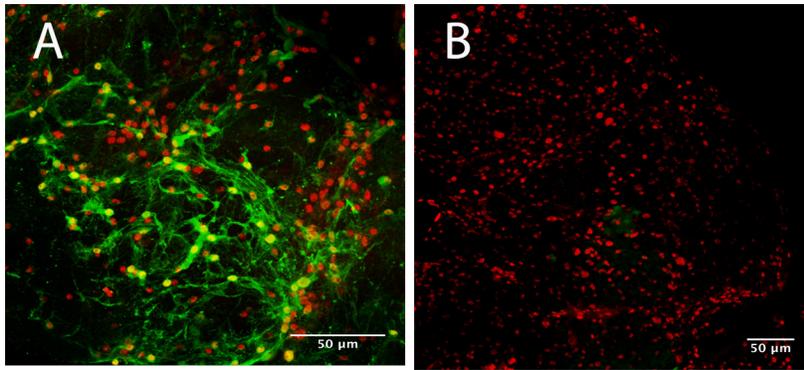
Would you describe the path that led you to your current research area?

My lab uses the fruit fly *Drosophila* as an experimental model to look at how the brain responds to infections and to gain further understanding of the mechanisms by which inflammaging (chronic inflammation that occurs with age) develops over time and impacts the survival of neuronal cells.

As an undergrad, I developed a strong interest in immunology and worked in several research labs on projects as diverse as antiviral immunity, rheumatoid arthritis and thrombocytopenia (platelet disorder). During both my PhD and postdoctoral trainings I had the privilege of working with two inspiring professors



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NEW FACULTY SPOTLIGHT

Dr. Stanislava Chtarbanova-Rudloff

The images show the activation of the innate immune response (green labeling) in glial cells following brain-specific infectious injury.

To obtain these images, flies that carry a reporter gene for the innate immune response (*attacin::GFP*) were subjected to injection all the way through the head with a thin needle that was either coated with bacteria (A) or not (B, controls). Dissected brains were then immunostained for GFP (green) and the glial marker Repo (red). The strong GFP labeling in the case of infectious brain injury (A) but not control injection (B), co-localizes with Repo and reveals the activation of the innate immune response specifically in glial cells.

(in two *Drosophila* labs!): Dr. Jean-Luc Imler at the University of Strasbourg and Dr. Barry Ganetzky at the University of Wisconsin-Madison. Learning from them was truly what shaped my interest in the fields of innate immunity, aging and neurodegeneration.

What about your area of research excites you the most?

What excites me the most is the possibility of answering questions and making new discoveries in the biomedical field by using fruit flies.

Both complex biological processes, such as aging, as well as diseases, including viral infections, neurodegeneration and even traumatic brain injury, can be modeled in this small insect.

The power of fly genetics to contribute to the unbiased discovery of new genes and proteins associated with these conditions is always exciting.

What are the biggest challenges of your job?

One main challenge of the job is to effectively manage time. In some situations I have to prioritize and decide what are the things that need immediate attention and which ones can wait. Whether it is about grant deadlines, preparing for class or doing experiments in the lab, I often have to make these decisions and organize my time in the most efficient way.

When I was a graduate student, my PhD supervisor wrote Stephen Covey's four quadrants of time management for me on a piece of paper, saying that in science we also have to effectively manage our time in order to get things done.

Even today, I refer to this time management matrix to decide on things that are urgent, important, not urgent and not important (Stephen Covey, *The Seven Habits of Highly Effective People*, 1989).

What advice would you offer to students?

My advice to students is to be passionate about their work and to pursue their goals. Science can sometimes be challenging, but it is also rewarding. Also, do not be afraid to change directions, and be perseverant toward your goals.

So far, what do you like most about your job at UA?

I absolutely enjoy the beautiful campus, the amazing colleagues in the Department of Biological Sciences and the wonderful and motivated students! I'm looking forward to what we can accomplish together.

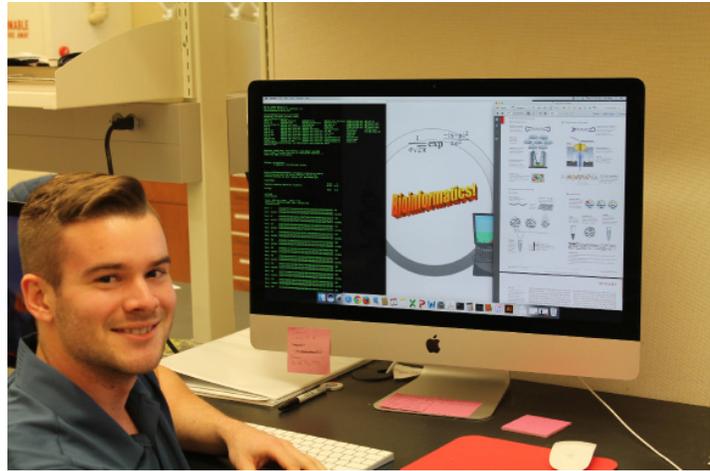
Thank you for the interview, Stan! With your passion for science, we know you'll make important contributions in your field and inspire the next generation of scientists.



GRADUATE STUDENT RESEARCH SPOTLIGHT

John Sutton

John uses high-powered computing as well as benchtop science to study acetylene degraders.



A WELL-INFORMED SCHOLAR

John Sutton, an Alabama alumnus and first year master's student in the lab of Dr. Janna Fierst, studies microbial genomics and metabolism. John's research focuses on members of the bacterial genus *Pelobacter* that utilize acetylene as a carbon and energy source. Acetylene is a trace component in the Earth's atmosphere but is abundant in the atmospheres of some of the Jovian planets and their moons (such as Saturn's moons Titan and Enceladus).

Only two known enzymes demonstrate the ability to metabolize acetylene: nitrogenase and acetylene hydratase. John is utilizing next generation sequence data to compare the known gene sequences of acetylene hydratase to better understand its evolutionary history. John collaborates with Dr. Denise Akob and Dr. Ron Oremland at the United States Geological Survey, and, together, the group is able to combine "benchtop science" with high-powered computing to better understand their organisms of interest.

Ultimately the goal of John's work is to develop new PCR primers to probe diverse terrestrial and extraterrestrial environments for this unusual enzyme. John has authored two *Genome Announcement* papers in his first semester in the graduate program and has a third currently in preparation.

Outside of the lab, John volunteers his time with SO College at UA, a group that sponsors Unified Sports with Special Olympics athletes and college students.



GIVING OPPORTUNITY

Biology Dept. Gift Fund:

This fund provides flexibility and is used to support student research, conference travel and equipment repair.

To make a tax-deductible donation:

GIVE ONLINE:

www.onlinegiving.ua.edu
under "where would you like gift directed"-OTHER
under "account"- code 30139
in text box type Biology Gift Fund

SEND A CHECK:

to Univ. AL; with fund name and acct. number 30139 on check and send to:
Shawn Winters
Box 870344
UA
Tuscaloosa, AL 35487

Thank you for your contributions!



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BIOLOGY OF ALGAE CLASS UTILIZES DAUPHIN ISLAND SEA LAB

Dr. Lopez-Bautista's Biology of Algae students visited the Dauphin Island Sea Lab.



UPCOMING EVENTS

Alumni, faculty, students and university community are invited.

WILLIAM DARDEN LECTURE
7 p.m., September 28, 2017
Northlawn

Emeran Mayer, MD, PhD, Professor, Departments of Medicine, Physiology and Psychiatry at the David Geffen School of Medicine at UCLA, Executive Director of the G. Oppenheimer Center for Neurobiology of Stress and Resilience, and Co-director of the CURE: Digestive Diseases Research Center at UCLA.

Research interests in nervous system-microbiome interactions.
<http://emeranmayer.com/about/>

BIOLOGY UNDERGRADUATE AND GRADUATE STUDENT RESEARCH POSTER SYMPOSIUM, WELCOME TO FRESHMEN AND TRANSFER STUDENTS, AND BIOLOGY CAREER FAIR.
1 p.m.–3 p.m., September 29, 2017
Ferguson Ballroom

TAILGATE ON THE SCIENCE AND ENGINEERING QUAD
Saturday, September 30, 2017, 3 hours prior to kick-off of the Bama-Ole Miss football game.

DR. JUAN LOPEZ-BAUTISTA ON THE 2017 DISL FIELD TRIP

From Feb. 24 to 26, we (Juan and the BSC 464 Biology of Algae students) explored the algal biodiversity of the Gulf Coast at Dauphin Island Sea Lab (DISL) Research Station. Though we focused on identification of algal species, our learning experience encompassed a broad range of biological issues.

Research Talk

After arriving at DISL and setting up our accommodations at the dorms and housing, we enjoyed our first meal at the DISL cafeteria: pork chops and salmon for dinner! Right after dinner we went to meet Dr. Behzad Mortazavi at the research laboratories. Dr. Mortazavi gave us a talk about the history of DISL (it used to be a bunker against nuclear attacks back in the 50's!) and the investigation lines by DISL researchers.

Bioluminescence Walk

Our trip to Dauphin Island began with a

walk along the beach at 9 p.m. in search of bioluminescent algae. The sky was cloudy and there was some drizzle in the beginning, but that helped create an even darker environment in which to search for bioluminescent algae. At one point, everyone stopped and put away their phones and lights. As we waited patiently for our eyes to adapt to the darkness, we glanced over to the water and saw luminescent waves—our first signs of bioluminescent algae! We picked up the sand and brushed it with our hands to motivate the glowing algae to work its magic, and we were all awed by the beauty and simplicity of this microorganism. It was the best way to begin such a memory-filled trip.

Collection of Marine Plankton

We boarded a research vessel—the 65-ft R/V Alabama Discovery—in order to explore diversity in the area. On our expedition we learned to use the plankton nets to collect phytoplankton. We also trawled the floor of the bay. Our net caught numerous jellyfish, squid, fish, crabs, and many other creatures.



DAUPHIN ISLAND SEA LAB FIELD WORK

Examining biodiversity in the lab

UA students identifying algal species collected from Dauphin Island and Mobile Bay.

We also collected phytoplankton from the Gulf of Mexico and the west side of the Mobile Bay and later identified them in the lab.

Algae Collection on Jetties

Collections for seaweeds took place on jetties from Dauphin Island's sandy beach. With an assortment of buckets, bags, and scraping utensils in hand, we experienced the sweet taste of what it's like to be phycologists. Sloshing around the wet rocks, we collected our first specimens and placed them in watertight zip lock bags. Mushy, green and red organisms filled our buckets. Some may dismiss the green, slime-like look of the rocks but not us! *Enteromorpha*, *Cladophora*, *Ulva*, and *Gelidium* were captured and later examined in the laboratory.

Dauphin Island Estuarium

We next visited the Estuarium across the street from the Sea Lab. The Estuarium takes you on a journey through the many freshwater and marine ecosystems that exist in Alabama. It gave us an opportunity to step out of the classroom and have a visual encounter with habitats and organisms that you would otherwise only be able to read about in a textbook. As students of biology, the Estuarium opened our eyes, through virtual and physical interaction, to the immense diversity of Alabama ecosystems, a diversity that often goes overlooked and underappreciated by many.

Examining Biodiversity in the Lab

We used microscopy to identify around thirty-five algal species

collected from Dauphin Island and Mobile Bay. These were part of the phytoplankton and the intertidal environments.

Concepts we learned included algal slide preparation, specimen fixation and preservation, and taxonomic identification. Our findings highlight the unique biodiversity found in the intertidal and planktonic habitats of the Gulf Coast.

Reflections

We gained greater appreciation of biological diversity through our work, whether it involved collecting algae from shoreline rocks or examining stunning diatoms under the microscope. Our trip allowed us to view the world from different perspectives via exposure to a diversity of people, environments, and outlooks.

Acknowledgements

Our course would like to thank The University of Alabama and the Department of Biological Sciences for making these hands-on learning experiences possible.



2017 DEPARTMENT OF BIOLOGICAL SCIENCES HONORS DAY AWARD RECIPIENTS

Undergraduate Awards

Grantland and Louise Rice Scholarships

Ethan Cissell and Kelsey Lowman

Mildred A. Endelbrecht Memorial Honors Award

Samuel Stanely

Michael McDaniel Memorial Endowed Scholarship

Emma J. Newman (Freshman); Olivia M. Van Praag (Sophomore);
Jayla M. Blanke (Sophomore); Alyssa M. Bentley (Junior); Anthony
T. Cremo (Junior)

Septima Cecilia Smith Scholarship

Justin Lomax (Biology); Meghan Lemmen (Marine Science)

James D. and Donjetter Yarbrough Endowed Scholarship

Nikki Singh

Dr. J. Henry Walker Memorial Scholarship in Biology

Amber M. Richardson

Department of Biological Sciences Honors Program Completion

Austin Brooks (Ryan Earley, mentor); Joshua Campbell (Matthew
Jenny, mentor)

Graduate Awards

Inge and Louise Hill Research Fellowship

Neil Gilbert

Graham Prize

Sujit Kunwor

Joab Langston Thomas Scholarship

Mollie Nugent

Ralph L. Chermock Prize

Gabriella Garcia-Soto

Outstanding Teaching by a Graduate Student in Biological
Sciences

Jason Jackson (Fall 2016); Heidi Michael (Fall 2016); Kiel Shuey
(Spring 2016); Matthew Lollar (Spring 2016)

E.O. Wilson Biodiversity Fellows

Jennifer Gresham, Rebecca Varney, Sujit Kunwor

Chair's Scholarship for Outstanding Contribution for Research &
Service by a Graduate Student in Biological Sciences 2016

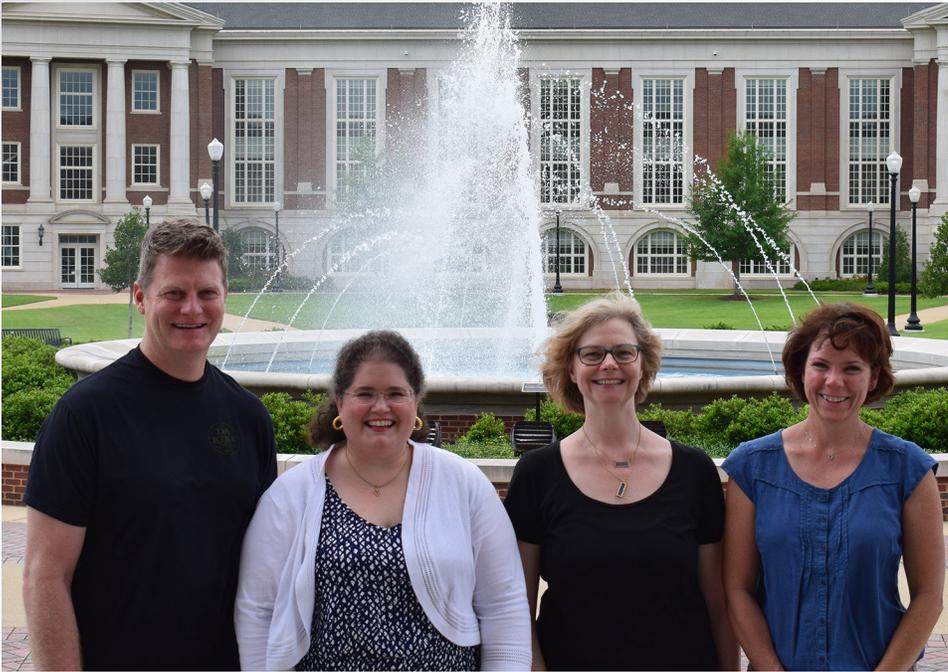
Sujit Kunwor

Chair's Scholarship for Outstanding Contribution for Teaching by
a Graduate Student in Biological Sciences 2016

Brandon Hill



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FOUR PROFESSORS RECEIVE AWARDS

Department of Biological Sciences faculty members (from left to right) Drs. Greg Starr, Katrina Ramonell, Kim Caldwell and Carol Duffy.

ALLELE SEMINAR SERIES 2017-2018

- 15-Sep Nina Jablonski (anthropology)
- 12-Oct Kristi Curry Rogers (paleontology)
- 9-Nov Leslie Rissler (Speaking Evolution Screening)
- 8-Feb Bernard Crespi (biology)
- 1-Mar Gene Robinson (biology)
- 12-Apr Don Hoffman (psychology)

RECOGNITION AT THE NATIONAL, UNIVERSITY AND COLLEGE-LEVEL

Greg Starr, Professor, was awarded the President's Faculty Research Award for Senior Investigator at The University of Alabama. Dr. Starr was also awarded a Fulbright Award, which is a competitive American scholarship program for international scientific exchange. He intends to use this award to spend the first six months of 2018 in France working on a project entitled " Food security and human populations growth: Trading water for carbon to increase food production for the 21st century".

Katrina Ramonell, Associate Professor, was recognized for her selfless and significant service and leadership to UA students with the awarding of a 2017 Premier Award - one of the top individual honors at The University of Alabama. Specifically, Dr. Ramonell received the Morris L. Mayer

Award for her leadership and service in undergraduate curriculum development. She is the Associate Chair for Academics in our department and is responsible for solving advising problems for our nearly 1,300 majors.

Kim Caldwell, Professor, was honored by the College of Arts & Sciences with the awarding of a three-year endowed professorship in honor of Marilyn Williams Elmore and John Durr Elmore. This is a newly established endowment within the College of Arts and Sciences at UA.

Carol Duffy, Associate Professor, was awarded an Arts & Sciences Distinguished Teaching Fellowship (2017-2020). Fellows comprise the A&S Teaching Fellows Committee and serve the college by acting as teaching mentors for other faculty, providing advice on teaching assessment, and working on ways to improve the overall teaching mission of the College.

