

Double Helix

Biology Department Newsletter

Notes from the Chair

Biology Branches out...into the world and across the sciences! Belmont's Biology students and faculty have worked to make sure we stay connected here and beyond. Branching out to the world, our 3rd trip to Costa Rica (5th Trip to Central America) this decade is scheduled for Maymester. Our students will be exposed to the diversity and wonder of tropical ecosystems, and to the benefits, challenges and solutions for living with that biodiversity.

A number of students have begun to spend entire semesters abroad in science, with recent experiences in Australia and Costa Rica. Recent Alumni have been going abroad through the Lumos Program, and one student is now following up our Maymester class with an internship in UGA Costa Rica.

Opportunities for faculty are expanding as well. Dr. Thomas will be participating in an interdisciplinary learning community that will spend spring break in Iceland! Speaking of interdisciplinary Biology, several faculty participated in FYS (First Year Seminar) this year. In Dr. McGrew's course, freshman from all disciplines learned that dead men can tell tales while Dr. Heard's student's learned how much of nature is trying to kill them!

We continue to expand our interdisciplinary programs with Dr. Heard who is the Environmental Science Coordinator and Dr. Scherling who is an Assistant Professor of Neuroscience in Psychology. Dr. Scherling was recently hired to increase visibility and collaboration in CSM's interdisciplinary programs. BMB continues its popularity and Biology continues to prepare the best possible students across the sciences.

Our world is interconnected, our disciplines are interconnected and our graduates, whether protecting the planet or our health, will gain broad experiences and some very specific knowledge to meet the challenges of the 21st century.



John Niedzwiecki

Dr. John Niedzwiecki
Chair of Biology
Associate Professor



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Fall 2017

Special points of interest:

Research students at conferences -

TAS

SURS

SfN

SEPEEG

Inside this issue:

SfN Conference	2
TAS	3
SURS	4
Alum Update	5

Women in Science (WIS)

A new science club, Women in Science (WIS), was introduced to campus this fall by Crystal Lemus, neuroscience major. Crystal has served as both president and founder of the club. The organization's officers include Maddy Clarke as vice president, Bailey Bergmann as secretary, Shaoyun Yang as treasurer and Claire Holden and Aditi Buch both serving as community outreach co-chairs. Dr. Danielle Garrett, chemistry, is the faculty advisor.

Goals of WIS include building community among women in STEM related fields, encourage their love for the sciences and bring recognition of their achievements and contributions to the field. Another goal is to educate women about their options in the sciences and encourage them to seek professional advancement.

Events for the semester included movie nights, female professor panels and spa days. The club's first event was a viewing of "Hidden Figures" with a discussion led by Dr. Garrett. More than 60 students attended and participated in conversation regarding the characters' challenges as African American women who worked for NASA in the 60's.

SfN 2017

Society for Neuroscience

Dr Lori McGrew took her senior research students to Washington DC to attend The Society for Neuroscience conference. The conference opened Saturday morning with the Neuroscience and Society session. The speaker, Siddhartha Mukherjee, a physician and researcher, wrote the Pulitzer Prize-winning book *The Emperor of All Maladies: A Biography of Cancer*, which explores the disease that has plagued humans for thousands of years. His new book, *The Gene: An Intimate History*, examines the quest to decipher how human heredity combines with life experiences to control our lives. In this lecture, Dr. Mukherjee spoke with SfN President Eric Nestler about the excitement and importance of communicating the promise of scientific inquiry to the public. He spoke eloquently about the role of researchers in communicating honestly with the public, the danger of over-promising, and the obligation for research to either advance our understanding of the world around us or cure disease.



Pictured: Rebecca Derby and Kara Garrett

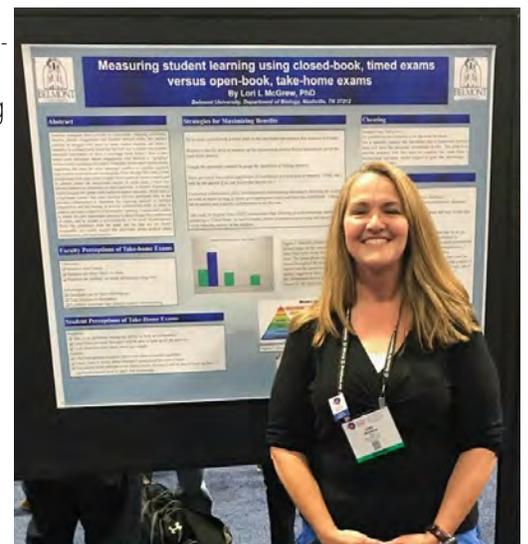


Pictured: Elizabeth Sparks, Christian Candler, Rebecca Derby and Kara Garrett

During the afternoon, Dr McGrew presented a poster in the History and Teaching session entitled "Measuring Student Learning Using Closed-book Timed Exams Versus Open-book Take-home Exams". The students were able to visit several other posters detailing current research in the field. McGrew and students wrapped up day 1 by attending the Presidential Lecture "Insights From Nonhuman Animals Into the Neurobiology of Language" by Dr Jarvis. This lecture presented a modern model of language from molecular, circuit, to behavior levels. Dr Jarvis described key concepts of language, including vocal learning, and brain regions that are necessary for vocal language. While most of his work involved songbirds, Dr Jarvis played clips of mouse vocalizations that were modified in order to be detectable by human ears. These mouse songs were remarkably similar to bird song and are helping researchers to better understand language across species.

On Sunday, the groups started the day by attending sessions on brain imaging in *Danio rerio*, studies of traumatic brain injury and mechanisms of memory. One of the dynamic posters demonstrated a technique for characterizing neural activity in swimming zebrafish by immobilizing their heads in agar gel. That evening, the students presented their research at the Faculty for Undergraduate Neuroscience poster session and social.

On Monday morning, Dr McGrew attended a workshop focused on evidence-based methods in teaching neuroscience while the students visited some posters describing gender bias in research animals and the role of hormones in memory before returning to Nashville.



Pictured: Dr. Lori McGrew

Tennessee Academy of Science Annual Meeting

Twenty-six students from Belmont's Biology Department attended the 127th Meeting of the Tennessee Academy of Science at the University of Tennessee at Martin, TN on November 17th. Students, representing majors in Biology, Biochemistry & Molecular Biology, Environmental Science and Neuroscience, presented their senior undergraduate research projects in various poster sessions, ranging from Ecology and Environmental Science to Cell and Molecular Biology. Nine Belmont students received recognition for their excellent work.



Nine of our Senior research students received recognition for their poster presentations at the Tennessee Academy of Sciences Annual Meeting.

Cody Rasner, second place, Microbiology section. His research is entitled *"Abiotic Factors Affecting the Migration Rate of Cyanobacterial Cells Through Sediment Columns"*

Faculty Advisors: Darlene Panvini, Ph.D., J.S. Metcalf, K. Rasner, and R. Richer [Belmont University, Nashville, Tennessee (CR, DP), Institute for Ethnomedicine, Jackson, Wyoming (JSM), and University of Wisconsin Marinette, Marinette, Wisconsin (KR, RR).]

Haley Hatfield, third place, Microbiology section. Her research is entitled *"Synchronization of the life cycle of Caenorhabditis elegans and the correlation of worm age and worm death from the pathogen Bacillus thuringiensis."*

Faculty Advisor: Robert Grammer, Ph.D.

Brandi Duke, first place, Cell and Molecular Biology section. Her research is entitled *"Insight on aversive learning in Caenorhabditis elegans when introduced to Bacillus thuringiensis during reproduction and growth"*

Faculty Advisor: Robert Grammer, Ph.D.

Priyanka Kumar, tied for second place, Cell and Molecular Biology section. Her research is entitled *"Novel etoposide drugs inhibit the growth of cancer cells in culture"*

Priyanka Kumar, Amber Bradley and Joe Deweese, Ph.D.

Faculty Advisor: Chris Barton, Ph.D.

AC Dowd, tied for second place, Cell and Molecular Biology section. Her research is entitled *"Effect of Inorganic vs. Organic Selenium Compounds as a Pre-treatment to Oxidative Stress Caused by 6-Hydroxydopamine Treatment in C. elegans"*

Faculty Advisor: Nick Ragsdale, Ph.D.

Bailey Bergman, tied for first place, Health and Medical Science section. Her research is entitled *"Amodiaquine, an anti-malarial compound, inhibits the growth of epithelial cancer cells in culture"*

Faculty Advisor: Chris Barton, Ph.D.

Sargo Rezanajad, tied for first place, Health and Medical Science section. Her research is entitled *"The effects of an antidepressant, Bupropion, on the chemotaxis of nicotine-treated Caenorhabditis elegans towards an attractant"*

Faculty Advisor: Robert Grammer, Ph.D.

McKenzie Roberts, second place, Health and Medical Science section. Her research is entitled *"Lycorine hydrochlorine induces a proliferative arrest in colorectal cancer cells"*

Faculty Advisor: Chris Barton, Ph.D.

Caroline Glover, first place, Botany section. Her research is entitled *"A Quantitative Analysis of a Kale Hybrid, Tronchuda Beira, Grown on an Extensive Green Roof, Garden and Earthbox®"*

Faculty Advisor: Darlene Panvini, Ph.D.

SEPEEG

Southeast Population Ecology and Evolutionary Genetics

Associate Professor of Biology, Dr. John Niedzwiecki, and four Belmont seniors presented their research projects at the Poster Session of the 44th Southeast Population Ecology and Evolutionary Genetics (SEPEEG) Meeting held October 20-22 at UNC Chapel Hill, Chapel Hill, NC. The meeting, hosted by UNC, included research presented by faculty, post-docs, graduate students and undergraduates from universities across the southeast including Belmont, University of Florida, University of Georgia, University of South Carolina, Mississippi State, University of Alabama, Auburn University and Florida State University. Belmont students Dylan Adler, Catherine Isaac, Martena Ibrahim and Shaoyun Yang each presented posters in the Saturday night poster session. Dr. Niedzwiecki is the co-author on the student's research projects.



Pictured: Dylan Adler, Shaoyun Yang, Dr. John Niedzwiecki, Catherine Isaac and Martena Ibrahim

SURS 2017

Science Undergraduate Research Symposium



In its fourteenth year, SURS was hosted by the College of Sciences and Mathematics. 30 Biology seniors, three BMB seniors, one ENV senior, and two Neuroscience seniors set up their posters in the 3rd floor atrium area of the Janet Ayers Academic Center.

Additional posters and oral presentations in the areas of Chemistry, Mathematics, Computer Science and Psychological Science were also presented.

The keynote address "Glow Sticks, Origami, and Coffee Rings: The Scientific Inspiration of Everyday Things" was delivered by Dr. David Wright, Department of Chemistry at Vanderbilt University.

SURS is the culmination of hours of work done during the summer and fall with advisors and peers and offers these research students the opportunity to show the Belmont community what the sciences are doing. Additional photos can be seen on our Facebook page—Serotonin Helix.



Fall Semester Biology Speakers

This fall, students and faculty had opportunities to hear from several speakers including some Belmont alums: Vaughn Science Lecture Speaker:

Jesse Spencer-Smith, PhD. Director, Enterprise Data Science HCA | Clinical Services Group

"Data Science and the Dawn of Artificial Intelligence: How We Are Using Mathematics, Statistics, and Computer Science to Reshape Our Lives"

Dr. Erin McClelland, Assistant Professor, MTSU
"Gender susceptibility in *Cryptococcus neoformans*"

Rachel Chandler, Belmont Alum (13)
Stacey Crockett, Belmont Alum (17),
"Creativity and Problem-Solving: Two Biology Alumni Talk about Their Careers"

Morgan Turner, Belmont Alum (16) **"Genetic Counseling: An Expanding Field in Healthcare"**

Dr. Tina Iverson, Dept. of Pharmacology and Biochemistry, Vanderbilt University
"Understanding how proteins encode information: a matter of life and death"

Alumni: if you would be interested in talking with current students about your career path and experiences, please contact us.

Alumni Update

Sandra Bojic (17)

"Howdy from your neighborhood bug girl (and the only presenter at TES (Tennessee Entomological Society) studying biodiversity preservation rather than optimum pest control compounds !!). Just droppin in to let y'all know my presentation won second place at this year's TES meeting!! Shoutout to the bugs for being cool and beautiful and the weirdest career path I could have taken."

Allison McCoy (14)

Graduated from Medical University, South Carolina PA school. "It has been the best, hardest, most terrible

and wonderful thing I have ever done. But I have had the most amazing family and friends by my side through all of it, and it was worth every second! I cannot wait to celebrate with my wonderful classmates. It's been an honor to learn and work with you, and I know you will all be amazing providers! Welcome to the world, MUSC PA Class of 2017!"

Bellamy Hawkins (13) Graduated from PA school at U of Alabama at Birmingham. She was also awarded on of two Deans Leadership Awards.

"It's graduation day!!!! 27 months of PA school has come to an end. It's been the longest, shortest two years of my life. So much life happened these two years - good bad and ugly...I've learned so much about medicine and about myself. I've learned how to completely assess and diagnose a patient all the while empathizing and caring for them. I've learned that I can handle far much more than I ever thought I could and that grades aren't as important as the knowledge you gain. I've learned when you fall to get back up and dust yourself off because the road **doesn't end there.**"

Jimmy Berthaud (06) has accepted a faculty position as Assistant Professor in the Department of Neurology at the University of Michigan in Ann Arbor. Jimmy will start in July 2018 and will join 7 of the faculty in the Vascular Neurology division. He will be the director of educational activities for the adult neurology residency program and he will also be involved in medical education within the medical school along with the vascular neurology fellowship.

Lynette Rives (09) was inducted into the Belmont Athletic Hall of Fame in September. Rives, a biology alum, stands as the most decorated sprinter - male or female - in Belmont University history. An 18-time All-Atlantic Sun performer and eight-time Atlantic Sun Conference event champion in four different disciplines, Rives qualified for the NCAA National Championship back-to-back years in the 200 meters. She was also invited to the 2008 U.S. Olympic Trials.

Laura Horton (16) attending TSU, Dept. of Agriculture & Environmental Sciences as a graduate student and graduate research assistant. Laura is working on her Masters in the Wildlife Ecology lab developing her thesis on parasite reptile interactions.

Liberty Foye MD, MPH (13) "I am a recent graduate of East Tennessee State University where I received a Medical Degree and a Master of Public Health. I will be completing my Pediatric Residency at INOVA Fairfax Hospital in the D.C. Metro area."

Justin Smith (15) Summer Research Fellow

"I was selected as one of a small group medical students for the Medical Student Research Fellowship (MSRF) at UTHSC College of Medicine for the summer (May – July 2017) between my first and second years of medical school. I am currently performing the work in the laboratory of Dr. Ankush Gosain at the Children's Foundation Research Institute (CFRI) at LeBonheur Children's Hospital. The work that I am conducting involves exploring changes in gut inflammatory homeostasis in Hirschprung's Disease and associated enterocolitis.

Chelsea Lee (15)

"Incredibly excited to announce that I will be moving to California. I have accepted a job offer at Safari West and I am very much looking forward to this opportunity"

Parin Patel (16)

Currently attending University of Tennessee College of Pharmacy.



Sandra Bojic

Current faculty news

Molecular Genetics and Metabolism Reports, a scientific journal, recently published Dr. Chris Barton's article, "The cardiac glycoside convallatoxin inhibits the growth of colorectal cancer cells in a p53-independent manner". The article describes research completed by Sarah Anderson (17), as a part of the Summer Scholars Research Program during the summer of 2016. Sarah is now working as a clinical researcher in Washington, D.C.

Dr. Matt Heard had an article accepted for publication in the journal *The American Biology Teacher*. The article, entitled "Using Life History Data to Examine Trade-Offs in Body Size and Reproductive Ability", describes a laboratory exercise that he has used in his classes which helps students learn about basic concepts and topics in ecology, evolution and natural history.

This fall, Dr. Lori McGrew and her family were named Volunteers of the Month for Warner Parks. Dr. McGrew's husband Joe and her son Conor, a Belmont sophomore and chemistry major, have participated in many volunteering opportunities at the parks over the years. Their involvement has been inspired by McGrew's grandfather's passion for the environment and his career as a naturalist with the US Department of Forestry

Biology Department

Dr. Chris Barton, Assistant Professor
Dr. Robert T. Grammer, Professor and BMB Coordinator
Dr. Matt Heard, Assistant Professor and Environmental Science Coordinator
Dr. Roger Jackson, Lecturer
Dr. C. Steven Murphree, Professor
Dr. Lori L. McGrew, Professor
Dr. John Niedzwiecki, Associate Professor, Gulf Coast Research Lab Coordinator and Chair
Dr. Darlene Panvini, Professor
Dr. D. Nicholas Ragsdale, Professor, Pre-Health Advisor and Associate Dean, CSM
Dr. Laura Stephan, Lecturer
Dr. Jennifer T. Thomas, Professor
Mr. Ray Seely, Laboratory Manager and Biological Safety Officer
Ms. Terri Templeman, Administrative Assistant

Contact Us!

- Have any comments about the newsletter or the Department?
- An alum with an update on activities?
- Like further information about the Department, its offerings or activities?

Please contact us by one of the following e-mail addresses or by postal service.

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**Check out our website:
www.belmont.edu/biology**

Biology Alumni Update

We want to hear from you! Please take a moment to fill out the information below and send to us.

Name _____ Graduation Year _____

Address _____

City _____ State _____ Zip Code _____ Phone _____

Email address _____

Employment _____ Title _____

Recent promotion, honor, award, family activity? _____

