

# BIOFEEDBACK

Winter 2019-2020

Newsletter of the Andrews University Department of Biology

## Andrews Biology: setting the stage for new opportunities

**Nina Woodard** is an Andrews biology student who is interested in marine biology and ecology. Last year she worked with Dr. Daniel Gonzalez-Socoloske on a research project investigating dental mesowear in manatees, showing that Florida manatees exhibited higher levels of wear than other manatee taxa. While working with Dr. Gonzalez, Nina applied for an REU (research experience for undergraduates) to get further experience in these fields of research. She describes her experience below.

"This past summer, I received the fantastic opportunity to participate in an REU summer program to develop my research skills and interests. I worked for the Maryland Sea Grant, an organization administered by the University of Maryland Center for Environmental Science whose mission is to preserve Maryland's coastal waters. Specifically, I worked at the Horn Point Laboratory, where my research mentors and I developed a research project integrating the Virginia oyster with breakwaters, creating living shorelines. We did this to prolong the effectiveness of shoreline protection against sea-level rise in Cambridge, Maryland. Sea-level rise is occurring rapidly in Maryland, and it

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**Shekinah Dosunmu** graduated from our biology program this year (2019). As a student, Shekinah was very active in many areas. She served as president of our biology club, Biophilia, initiating a now annual Earth Week, and worked with Dr. Benjamin Navia in neurobiology research, having the opportunity to present her research at Neuroscience 2018. She describes below her acceptance into medical school and the role that her Andrews education played in this.

"When I got my acceptance to NYU Long Island School of Medicine (NYULISOM) I was very excited and humbled. For those who are unaware, NYULISOM is a campus that is part of New York University and thus, has been honored with a full tuition scholarship for all those who matriculate at the school. NYULISOM differs from NYU School of Medicine (NYUSOM) in a couple ways. The first is that NYULISOM is a three year curriculum focused on preparing students for careers as primary care physicians. Those who are accepted into the school are also reserved a residency position after completing the medical school program.

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Alumni! This is what we're doing. But what are you doing? We'd love to hear from you so that we can share your news with others through Biofeedback. Please share with us any recent milestones, job changes, family news, etc.

## Setting the stage, continued

**Nina, continued** can be quite devastating to coastal habitats. My study focused on filling a knowledge gap and building a foundation for a long-term ecosystem project, measuring the impact of installing these structures. Other elements of this program included attending marine science seminars and participating in workshops as a way to network with other members of the marine science community and to discuss scientific responsibility, and applying to graduate school. The REU program was an experience that facilitated my passion for coastal restoration. More specifically, I discovered a passion for developing strategies to increase resistance to climate change in our ecosystems.

"I continued exploring this passion as I started my semester at Duke University's Marine Laboratory. Soon classes such as coastal pollution and marine ecology were capturing my attention. I learned about the complexity of marine ecosystems and their services. As a part of my scholarship, I got the chance to go to Panama to study tropical marine ecology. We explored leaf herbivory, hermit crab chemosensory behavior, and mangrove and coral communities. During my time at the Duke Marine Lab, I was able to network with others who shared my interest in coastal restoration, and I met many people who helped me navigate through graduate school preparation.

"Both experiences were terrific opportunities that helped advance my research skills. I credit the classes and the professors at Andrews University for helping me prepare for both of these opportunities. Without the research background that I earned at Andrews, I would not be the researcher that I am today. After undergrad I intend to pursue a PhD, to carry out research and making meaningful contributions to environmental sustainability and restoration."



During orientation for the summer program, Nina and colleagues were taken on a research cruise. Half of this group, including Nina (front row, second from right), was from the Horn Point Laboratory, while the other half was from the Chesapeake Bay Laboratory.

### Earth Week 2019

Biophilia organized the second annual Earth Week this year. The poster to the right shows the many events organized for this special week of awareness. The focus was on conserving the resources we have, including water, electricity, food, paper and plastic. The week culminated in the showing of the documentary film, Just Eat It. This film documented the prevalence of food waste in most western countries, through one couple's attempt to eat for 6 months without ever buying food. They lived on discarded food!

We thank our Biophilia club for bringing these issues to the forefront, reminding us to care for the limited resources we have.

**Shekinah, continued** "One of the main reasons why I decided to choose NYULISOM was their focus on primary care. So far, I have successfully completed and passed the first two blocks of our medical school curriculum. One of the reasons that I would attribute this success to would be the biology curriculum at Andrews University. Andrews does an amazing job of preparing its students for medical school. The rigor and difficulty of my curriculum here at NYULISOM did not come as a surprise to me because of the rigor of the Andrews Biology pre-med program. Taking classes like Histology, Developmental Biology, and Anatomy really set me apart from some of my colleagues and helped me in those particular subject areas in medical school. I am very grateful that I obtained my undergraduate education at Andrews University and I am even more grateful for the support I have received from Andrews biology faculty after matriculating in medical school."



Above photo. Dr. Steven Shelov, founding dean of the New York University Long Island School of Medicine, congratulates Shekinah at her White Coat Ceremony.

**Earth Week**  
March 25-29

**Carnation Fundraiser**  
We are raising funds for the National Resource Defense Council to help save our planet and the beautiful creatures who inhabit it. So Come! Buy flowers for the people you love and show support for our planet!

**Food Waste Awareness**  
The food waste awareness week occurs in the cafeteria throughout earth week. It encourages people to make a conscious commitment to limit their food waste by starting off with one plate at a time

**Conservation Challenge**  
Participate in these challenges to help create a better environment!  
MONDAY- Conserve water  
TUESDAY- Conserve electricity  
WEDNESDAY- Don't waste food  
THURSDAY- Limit plastic and paper waste  
FRIDAY- Walk or bike, don't drive

**Recycling Challenge**  
Bring your paper items to the recycling hubs in Lamson, Meier & Science Complex! REDUCE REUSE RECYCLE

**Tuesday Choice**  
Come out to the Biology amphitheater to learn more about conservation at 11:30

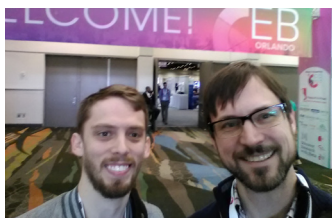
**Just Eat It**  
Come out and watch a food waste documentary in the Biology amphitheater from 3-4:30 as we wrap up Earth Week

## Graduate research: discoveries in new places

Graduate school can mean hard work on a thesis, discovering new areas of science, and exploring new parts of the world. And just like any program, it eventually comes to an end, with a certain amount of trepidation as new frontiers await. Our graduate students are at all of the above stages and more. Here are some of the things they have done this year.

Priscilla Kyi and Tendai Hunyeniwa both traveled together with their thesis advisor, Denise Smith, to the annual meeting of the American Association for Cancer Research (AACR) held in Atlanta. Priscilla presented a poster entitled “Novel hybrid benzothiazole screening in U87-MG glioblastoma cell line.” Both Priscilla and Tendai graduated in the summer. Priscilla has taken a job at the South Bend Medical Foundation, while Tendai has begun a PhD in Biomedical Sciences at the Medical College of Wisconsin.

Christian McDonald and his thesis advisor, Peter Lyons, traveled to Orlando for Experimental Biology 2019 and the annual meeting of the American Society for Biochemistry and Molecular Biology (ASBMB). Christian presented a poster, “Searching for the function of Ecm14, a pseudopeptidase, using a synthetic lethal assay.” They pose here in front of the conference hall entrance.



Roshelle Hall attended the Midwest Fish and Wildlife Symposium in Cleveland, OH, where she presented on the “Status and assessment of Eastern Massasauga Rattlesnakes in Berrien County, Michigan.” Roshelle completed and defended her thesis on November 8th. Congrats, Roshelle!



In June of this year, Austin Menzmer defended his thesis entitled “Seasonal Diet Variation in Thirteen-Lined Ground Squir-

rels (*Ictidomys Tridecemlineatus*) in Southernwestern Michigan. Austin is pictured as he began a PhD in Integrated Plant Science this fall at the University of Georgia.

Last, but not least, Amanda Moore had the opportunity to spend several weeks this summer in Panama, collecting data for her thesis. She shares a short description of her experience below.

“In July, Dr. Gonzalez, Mindy McLarty, and myself went to Bocas del Toro Province, Panama to conduct research on Antillean manatees and their feeding ecology. We spent two weeks on the San San Pond Sak River trying to determine if manatees find food via the use of chemoreceptive cues, visual cues, or chemoreceptive + visual cues. We conducted our research using plexiglass boxes, which we constructed on site, to control for the environmental cues which were provided during experiments. Choice trials were used to determine how manatees locate food known to be in a close proximity and “long distance” trials were conducted along the San San Pond Sak River by placing boxes in random locations to determine the amount of time it took manatees to locate food when provided chemoreceptive cues or chemoreceptive + visual cues. The choice trial experimental setup used two plexiglass boxes, both clear and open on the bottom, in order to test chemoreceptive + visual cues given by bananas and their leaves. Our research produced preliminary data in this area as it is the first of its kind to be conducted on manatees.

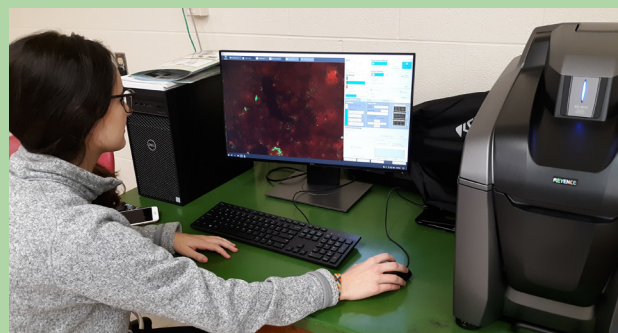
“While conducting research we also got to see two racoons (a rare sighting in this remote location), listen to the calls of monkeys, and see two, three-toed sloths – one of which was swimming, a rare sight as well. Additionally, we got the opportunity to release a few nests of leatherback sea turtles into the ocean after they hatched in captivity.”

Left. Amanda poses in mosquito netting. Right. Dr. Gonzalez participates in the release of leatherback sea turtles into the ocean.



## A new fluorescence microscope!

Thanks to generous donations from our alumni and support from Physics Enterprises, we were able to purchase a new microscope this past year. This microscope from Keyence, shown here as graduate student Erika Bauza Nowotny examines her stained cells, hardly looks like a microscope, as it is enclosed in a case and largely automated and computer-controlled. It is an inverted microscope that contains a motorized stage that fits many items for imaging, from slides to cell culture plates. Fluorescence imaging is enabled with a highly sensitive monochrome CCD camera, while brightfield imaging is performed by a color camera. The microscope is also capable of phase contrast and oblique illumination. Imaging is simplified with auto focus at the click of a button, haze reduction via image deconvolution, and also the production of a fully focused composite image from a z-stack for thick samples. We are very happy with this purchase, as it is easy to use and easy to obtain high-quality images. Many of our undergraduate and graduate students have made use of this instrument already!



## A few events of the year



This June, Dr. Benjamin Navia, traveled to Loma Linda University, where he participated in the EXSEED Program, giving two workshops on teaching neurobiology. He also had breakfast with a few of our former students who are second and third year students at LLU (right; back row) Dr. Navia, Tony Chirachevin, Nicholas Chun, Andrew Walayat; (front) Sophia Navia (future AU biology student), Linnea Burke, Temi-



tope Idowu, Talisa Tait, Hyelin You, Gabrielle Cook, and current AU student, Julianne Johnson).

As always, our Christmas party is a big hit, with a wide variety of soups and salads for everyone to warm up with (above left).



Dr. Navia took two of his undergraduate researchers, Brandon Shin and Bryan Ashley, to Neuroscience 2019 in Chicago. They presented their work on cricket neurobehavior, and had the added bonus of meeting Dr. Eric Kandel, recipient of the 2000 Nobel Prize in Physiology or Medicine for his research on the physiological basis of memory storage in neurons (left).

Dr. Brian Wong incorporated some interesting features into his Environmental Science course for nonmajors. He worked with Dr. Nakajima Yoshihiro from the Faculty of Economics at Osaka City University in Japan, to connect their classes along the topic of "Economics and environment impact of the

Kyoto Protocol and Paris agreement." This was part of the COILL Fellows program, designed to support faculty in developing and implementing courses that use a Collaborative Online International and Local Learning approach.



Dr. Daniel Gonzalez-Socoloske travelled to the Brazilian Amazon where he used his sonar skills to help local scientists track Amazonian manatees. He is shown to the left at Lake Amanã with Camila Carvalho, a Master's student from the Federal University of Rio Grande, Brazil.

In May, fifteen undergraduate students traveled to Cuba for two weeks for the field portion of a General Ecology course taught by Dr. Daniel Gonzalez-Socoloske. Accompanying Dr. Gonzalez was Andre Moncrieff, PhD candidate at LSU and Andrews biology alumnus (BS '14).

Students traveled to various locations on the eastern side of the island and were able to interact with Cuban nationals at the homes they stayed in. Two Cuban biologists also traveled with the group, Dr. Alejandro Barro (Dean of Biology, University of Havana) and Eddy Garcia (veterinarian and conservation biologist with the Cuban federal wildlife agency). One of the highlights of the trip was a four day camping trip to the eastern most point of Cuba in Guanahacabibes National Park (see picture) where students got to see many endemic plant and animal species including an endemic bat species that is found only in one cave in the whole world.



### BioFeedback

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### BioFeedback

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