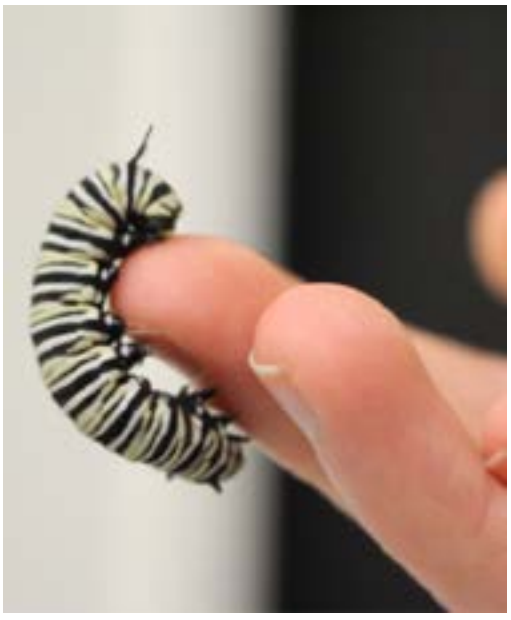
TEXAS A&M UNIVERSITY
Biology

BIOSPHERE

Spring Newsletter 2020



Contents

Head's Message

Dear friends of the Department of Biology,

I am writing this message as the 2019 fall semester comes to a close, and once again, it was a hectic, but rewarding time. We had nearly 600 freshmen and 18 new Ph.D. students join our department in September, continuing the growth of both our undergraduate and graduate programs. In October, we received final approval to offer a new BS degree in neuroscience, beginning in the 2020 fall semester. This new degree is likely to increase our undergraduate population even further.

To keep up with the increasing student body, not only in our department, but across the university, we are currently searching for three new assistant professors, one each in evolutionary biology, microbiology, and neurobiology. Even with these three new hires, our faculty will be very small relative to similar departments at peer institutes. To address this long-standing problem, we have developed a 10-year strategic plan with input from other life-science departments across campus. This plan proposes to increase our number of tenured and tenure-track faculty to 56, or a total of 20 new positions, in addition to our normal replacement hires. The new positions will be clustered in 5 broad areas that represent current or emerging strengths in the department; biological timing, biological resilience, repair and regeneration, biological evolution, and synthetic biology. This plan, which also proposes a new biology research building, has been endorsed by the upper administration. We currently are using the plan to guide our 2021 round of faculty hires, which will focus on circadian rhythms and other biological timing processes.

Our research productivity continues to climb, and although we are small, we can still have a big impact. In November, Promedior (https://www.promedior.com/), a company founded by Drs. Richard Gomer and Darrell Pilling in 2006 to market an anti-fibrosis protein they discovered, was sold to the pharmaceutical giant Roche for $1.39 billion dollars. This anti-fibrosis protein, called pentraxin-2, has proven remarkably effective in treating fibrosing diseases, such as myelofibrosis and idiopathic pulmonary fibrosis in humans. Congratulations, gentlemen!

I also want to congratulate Dr. Ira Greenbaum, who will be retiring after the spring 2020 semester, on his long and distinguished career. Ira received his Ph.D. in zoology from Texas Tech in 1978 and joined our department as an assistant professor later that same year. Most of his research focused on the role of chromosomal rearrangements and other cytogenetic phenomena in speciation events in mammals, especially the deer mouse genus *Peromyscus*, the most common native North American mammalian genus. His work resulted in 117 publications and was well funded by grants from the National Science Foundation and the National Institutes of Health. His proposals frequently scored in the top few percentile. Although Ira taught many graduate and undergraduate courses over the past 42 years, he is most closely associated with BIOL 466 Principles of Evolution and BIOL 318 Chordate Anatomy, both key courses in our BS Zoology curriculum. For the past 12 years, Ira was the director of Lower Division Instruction, where he led our enormous freshman biology program. Congratulations, Ira, on a very successful and productive career, and thank you for all you have done for our department and our students. I wish you a long and happy retirement.

Tom McKnight

Thomas D. McKnight
Professor and Department Head

www.bio.tamu.edu

Faculty Spotlight

gil rosenthal

Dr. Gil Rosenthal was selected as a Chancellor's Enhancing Development and Generating Excellence in Scholarship (EDGES) Fellow and recognized at a reception on November 5, along with the other nine EDGES fellows in this inaugural class. These fellowships (and the substantial funding that accompany them) honor and support mid-career faculty members who have gained recognition both nationally and internationally and are on-track to be honored for their accomplishments at the highest levels, such as national academies and national or international awards.

Gil is an evolutionary biologist, and his research program began during his Ph.D. studies at UT Austin. He had a small grant to do research in central Mexico and discovered natural hybrids between two species of little freshwater fish called swordtails. In the 23 years since, 14 of them here at TAMU, these swordtails have helped his research group understand one of the most important decisions an individual makes: choosing who to mate with. They found that these hybrids arose only a few decades ago, coinciding with human-caused changes in water chemistry. When they can't smell each other's sex pheromones, highland fish and lowland fish mate with one another rather than their own species. These hybrids give us a window on the neurobiology and hormone chemistry underlying mate choice and the central role it plays in determining how species fuse together and come apart. Gil's lab studies both wild and artificial populations that help them extend the cutting edge of both evolutionary genomics and animal behavior.

Dr. Rosenthal, Texas A&M Biology Professor of and Chair of the interdisciplinary doctoral program in Ecology and Evolutionary Biology

As co-director of the Centro de Investigaciones Científicas de las Huastecas "Aguazarca" (CICHAZ) field station in the Sierra Madre Oriental Mountains of Hidalgo, Mexico (along with Rhonda Struminger and the Department of Ecosystem Science and Management at Texas A&M), he used his research there to help foster a broader community of people working on basic science, applied problems, and STEM outreach in an under-served part of the world. Back in College Station, Gil is finishing up his term as chair of a University-wide PhD program he helped build, the interdisciplinary doctoral program in Ecology and Evolutionary Biology. This past month he was able to bring 14 first-year PhD students from all different backgrounds to CICHAZ for their first-year field course. Gil plans to use his EDGES fellowship funding to build new fish facilities in Butler Hall and buy a new vehicle for field research in the mountains of Mexico.

"I feel fortunate to be in a broad-based Biology Department that values quality research and teaching."

"I especially want to thank the staff who have to handle so much non-standard stuff from my work in the field and internationally."

Hybrid swordtails swim around a tank in the Rosenthal fish facilities

Good Bull

Dr. Duncan MacKenzie Recipient of 2019 Wells Fargo Honors Faculty Mentor Award

Duncan MacKenzie is the recipient of the 2019 Wells Fargo Honors Faculty Mentor Award, an award that recognizes and rewards Honors faculty members whose dedication and commitment to excellence in education is exceptional. This award is of special significance because recipients are nominated and selected by the University's Honors students. Dr. MacKenzie was selected from a group of candidates who exhibit the strongest desire to train a new generation of thinkers and creators by instilling a spirit of inquiry in their students. The award recognizes the countless hours that Honors faculty pour into developing and challenging the lives and minds of their students.

Dr. MacKenzie is an Associate Professor in the Department of Biology, the Director of the Biology Honors Program, and a Co-Chair for the Texas A&M Marine Biology Graduate Interdisciplinary Degree Program. Dr. MacKenzie previously served as the Associate Director for Undergraduate Research for the LAUNCH Honors Program, where he directed the Undergraduate Research Scholars program, before becoming the inaugural Director of Biology Honors in 2016. He is a recipient of the University-level Association of Former Students Distinguished Achievement Award for Teaching and the Department of Residence Life Honoring Excellence Award, as well as two college-level AFS teaching awards and two Texas A&M University System Student-Led Awards for Teaching Excellence (SLATE).

"Providing opportunities for students to develop academic and professional relationships with the very best faculty is a key principle in honors education."

- LAUNCH Honors Program

From left to right: Association of Former Students Director of Campus Programs, Kelli Hutka '97, Dr. Asha Rao, and Dean of the College of Science, Dr. Valen E. Johnson

Dr. Asha Rao Honored with Teaching Award

Asha Rao, Instructional Assistant Professor of Biology, was recently recognized for excellence in the classroom with the 2019 College-Level Association of Former Students Distinguished Achievement Award for Teaching. Dr. Rao was among twelve faculty, staff, and students within the Texas A&M University College of Science recognized for outstanding accomplishments by Dean Val Johnson.

Since joining the Department of Biology in 2011, the scope and impact of Dr. Rao's efforts to enhance student learning have been profound. Dr. Rao has elevated a large portion of the department's overall teaching through a remarkable combination of teaching excellence in her own classes, helping other faculty employ high-impact practices and technology in their classrooms, reshaping curricula, and the development of programs to help at-risk students. As a result, her efforts have yielded dramatic improvements in academic success and retention for more than 3,000 students each semester of their critical first year at Texas A&M.

Most of Dr. Rao's initiatives begin with input from her students. As part of her inquiry into why some students were performing poorly in her class, she found that 12% of the students admitted they did not have access to the $200 textbook. She then helped secure a free, open source textbook from OpenStax that has now been adopted for all BIOL 111 and 112 classes. This ensures all students, regardless of economic situation, have the same access to course materials.

During the first semester of use, she and others noted that many of the illustrations in this new textbook could be improved. She received an education enhancement grant from Information Technology Services and matching funds from OpenStax to revise more than 100 of the illustrations and associated text, which should be completed by spring 2020. Dr. Rao and other participating faculty will be listed as authors on the revised text, which OpenStax intends to advertise nationally, further spreading the association between Texas A&M and academic excellence.

Vets Who Code

"Being able to code even a little bit and being able to visualize data, these are skills that transcend any one field and can help a student get the job that they really want. As an Air Force vet myself this is one of the most rewarding things that I have been able to do at Texas A&M."

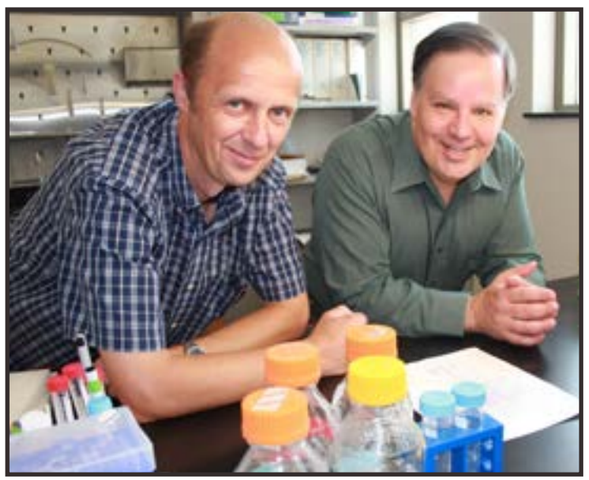
- Dr. Heath Blackmon, Director and Founder of Vets Who Code

Heath Blackmon, Assistant Professor of Texas A&M Biology, has created a program designed to give student veterans the chance to learn valuable coding skills needed in modern day STEM fields called Vets Who Code. This two-day program provides in-person training and certification in coding and data analysis. The aim of Vets Who Code is to make student veterans more competitive in today's STEM fields, where coding and data analysis are valuable and necessary skills, but not always accessible ones. Many companies offer coding courses over the internet, but face-to-face, in-classroom interaction is a highly effective way to teach the skills needed to succeed in a STEM career.

According to the Student Veterans of America, a non-profit organization focused on addressing the needs and concerns of American military veterans in higher education, STEM degrees are more difficult for veterans to pursue due to the prerequisites needed, such as pre-college math, which can push graduation past what is covered in the GI bill. A short weekend course, such as Vets Who Code, can provide sustainable and effective training and make our veteran students more competitive.

There were 13 veteran students in this year's Vets Who Code program. The students learned to code in the open source program R, a programming language widely used among statisticians and data miners for developing statistical software and data analysis. The first day of training focused on basic coding skills. On the second day, students used the coding skills that they learned to make a linear model predicting the economic value of betta fish, the popular Siamese fighting fish, based on location, color, size, and parental price. For their final challenge, the students deployed a web-based application that uses the open source program R to allow the students to estimate the price of a fish based on the characteristics that impact its value. This intensive workshop with real-time data analysis and coding will give student veterans an advantage when applying to STEM fields.

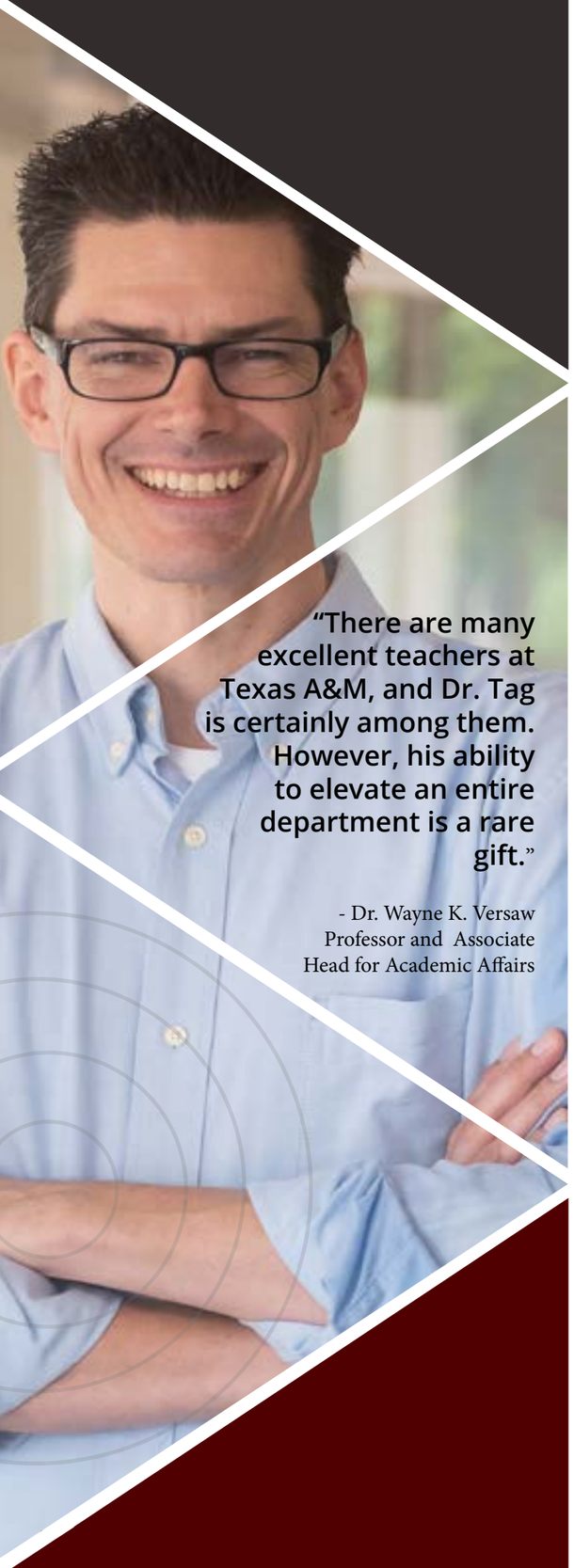
From Bench to Bedside: Basic Research Leads to Medical Breakthrough



Swiss multinational healthcare company, Roche, buys company co-founded by Texas A&M biologists Dr. Richard Gomer and Dr. Darrell Pilling.

In the late 1990s, while they were still working at Rice University, Drs. Richard Gomer and Darrell Pilling were studying what factors regulated how densely cells could grow and the related question of how organs grew to just the right size. After identifying several signaling molecules and pathways in the social amoeba *Dictyostelium discoideum*, they tried to isolate similar factors from humans. Their idea was to grow human monocytes in serum-free medium, and add back fractions purified from serum to identify proteins that influenced the growth and division of these cells. Almost immediately, they discovered that monocytes grown in serum-free medium rapidly differentiated into fibrocytes, cells that play important roles in wound healing and scar tissue formation. Obviously, some factor in serum blocked this developmental transformation *in vivo*. Their lab demonstrated that the protein known as serum amyloid P (SAP; also known as Pentraxin-2), was responsible for preventing monocytes from differentiating into scar-forming fibrocytes. Because fibrotic diseases, where scar tissue forms at inappropriate places or times, are responsible for up to 40% of all deaths in the US, SAP's ability to block fibrocyte formation had enormous clinical potential. In 2006, Drs. Gomer and Pilling helped co-found Promedior, a clinical stage company, to bring their potential therapy to market. After many years of increasing clinical success against fibrotic diseases such as idiopathic pulmonary fibrosis and myelofibrosis, the multinational pharmaceutical company Roche agreed to buy Promedior for $1.39 billion in November, 2019. The Gomer lab continues to work on basic cell biology questions in *Dictyostelium*, and they continue to deepen our understanding of how SAP performs its critical functions in humans.

Dr. Thomas McKnight, head of the Department of Biology, said, "I absolutely love this story, not only for the terrific therapeutic advance that many patients will benefit from, and not just for the success that Richard and Darrell have had, but also because it is a classic case of curiosity-driven research leading to real-world advancements. I congratulate them on their amazing success, and I thank them for demonstrating the value of basic research so effectively."



Dr. Andy Tag Recipient of Inaugural Teaching Excellence Award

Andy Tag was selected as one of 10 recipients in the inaugural cohort for the Provost Academic Professional Track Faculty Teaching Excellence Award. This award encourages, recognizes, and rewards faculty who provide students with meaningful learning experiences, embrace effective teaching approaches, and value student-centered learning. Recipients were awarded $5000, generously provided by the Marie M. and James H. Galloway Foundation.

Dr. Tag, Instructional Assistant Professor and Director of Lower Division Biology, joined the Texas A&M Biology faculty as a full-time member in 2012, though he has been teaching biology courses in the department since 2003. He earned his PhD in Plant Pathology and Microbiology at Texas A&M, followed by postdoctoral work in the laboratory of Dr. Terry Thomas in the Department of Biology at Texas A&M. He was previously recognized for his teaching excellence in 2018 by being named a National Academies Education Fellow, and he currently leads a University-sponsored project to redesign the introductory biology laboratory curriculum.

Students praise Dr. Tag’s humor and his efforts to illustrate how fundamental concepts discussed in class relate to “real-world” applications and to recent discoveries, especially those presented in the department’s weekly research seminar. Both students and faculty laud Dr. Tag’s expertise in the use of technology to promote learning through low-stakes assessments. These include on-line homework, use of an in-class response system, and early warning emails to students who are falling behind. He has been tireless in helping other faculty adopt these tools in introductory biology courses, and this has led to profound improvements in student success. As a result, he is now helping other professors adapt these tools and approaches for other courses within the Department of Biology, in other departments, and at other institutions.

RECENT PUBLICATIONS

Pilling, D, Cox, N, Thompson, MA, Karhadkar, TR, and Gomer, RH. (2019) Serum amyloid P and a dendritic cell-specific intercellular adhesion molecule-3-grabbing nonintegrin ligand inhibit high fat diet-induced adipose tissue and liver inflammation and steatosis in mice. *American Journal of Pathology*, 189, 2400-2413.

IMPACT: This paper describes a possible route to treating some high fat, diet-induced liver diseases

Suess, PM, Chinea, LE, Pilling, D, and Gomer, RH. (2019) Extracellular polyphosphate promotes macrophage and fibrocyte differentiation, inhibits leukocyte proliferation, and acts as a chemotactic agent for neutrophils. *Journal of Immunology*, 203, 493-499.

IMPACT: This paper describes how a signal from blood clotting might start the process of wound healing.

Hanzhi Zhang, Yaping Pan, Liya Hu, M. Ashley Hudson, Katrina S. Hofstetter, Zhichun Xu, Mingqiang Rong, Zhao Wang, BV Venkataram Prasad, Steve W. Lockless, Wah Chiu & Ming Zhou. (2020) TrkA undergoes a tetramer-to-dimer conversion to open TrkH which enables changes in membrane potential. *Nature Communications*, doi.org/10.1038/s41467-019-14240-14249.

IMPACT: This paper describes how the sodium and potassium channel TrkA opens and closes in response to change in metabolism, thereby regulating membrane potential in *E. coli*. These changes can affect fundamental processes such as energy homeostasis, motility, and antibiotic resistance.

Mandal S, Ji W, McKnight TD. (2020) Candidate gene networks for acylsugar metabolism and plant defense in wild tomato *Solanum pennellii*. *Plant Cell*, 32(1):81–99.

IMPACT: This paper describes the use of comparative transcriptomics and weighted gene correlation network analysis to identify potential biosynthetic and regulatory genes that govern production of insecticidal acylsugars and other defense mechanisms in a wild tomato species.

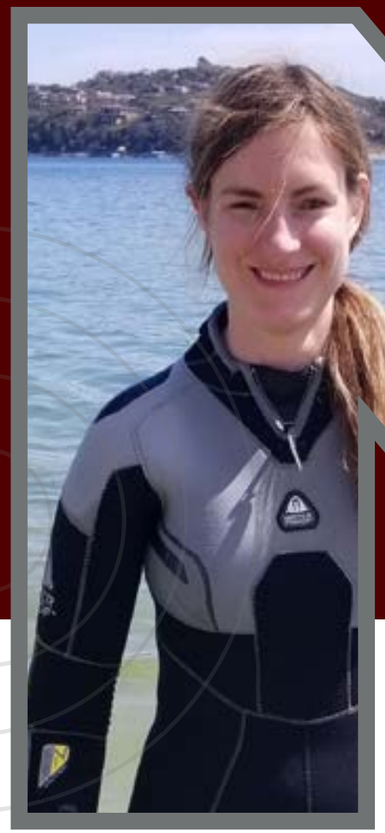
liams, SE, Lugena, AB, Zhang, Y, Hayden, AN, Merlin, C. (2019) Photoperiodic and clock regulation of the vitamin A pathway in the brain mediates seasonal responsiveness in the monarch butterfly. *Proc. Natl. Acad. Sci. U.S.A.,*116 (50):25214-25221.

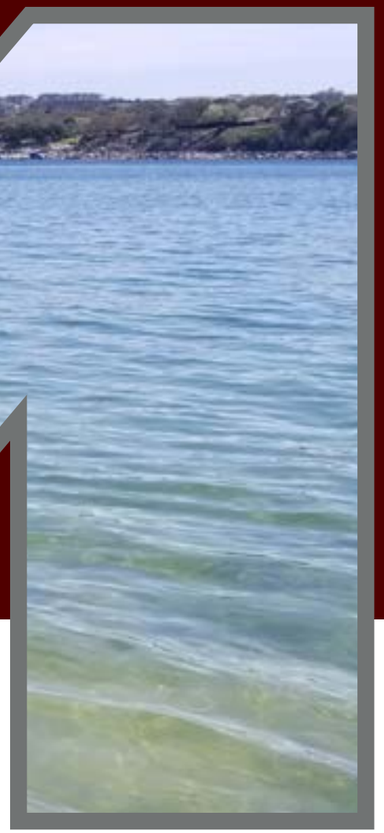
IMPACT: This work provides genetic evidence linking circadian clock genes and clock-regulated molecular pathways to the Monarch butterfly’s uncanny ability to sense the changes in day length, or photoperiod - an environmental cue that triggers reproductive dormancy in animals during the inimical season.

Achorn, AM, Rosenthal, GG. (2019) It’s Not about Him: Mismeasuring ‘Good Genes’ in Sexual Selection. *Trends Ecol. Evol.* (Amst.). doi: 10.1016/j.tree.2019.11.007. PubMed PMID:31858995.

IMPACT: This paper challenges the notion that the prettiest suitors always have the best genes.

One Voice





Maureen Hayden

A third year graduate student in the Marine Biology Interdisciplinary Program at Texas A&M, Maureen is working to identify bioindicator species that will provide a productive index of ecosystems on the Texas coast, specifically the effects of plastic pollution on amphipod populations on Texas beaches, under the advisory of Dr. Mary Wicksten. She is often asked, "How did a girl from the landlocked state of Arizona become interested in Marine Biology?"

Coming from a U.S. Navy family, she has always had an affinity for the ocean. She discovered her passion for marine biology during her junior year of high school while taking an elective oceanography course. She was later introduced to the importance of marine life through her aunt, who was a docent at the Clearwater Marine Aquarium in Florida.

Maureen decided to pursue her passion after high school and received her bachelor's degree in Marine Biology at the University of Rhode Island, and then obtained her MS Biology degree at Walla Walla University studying octopus physiology as part of the Onthank Cephalopod Physiology Lab. She has received numerous awards and scholarships, including the Gary Gray Memorial Student Recognition Award, the Accountability, Climate, and Equity (ACE) Award, the Valerie de la Valdene Memorial Disabled Diver Training Grant, National Federation of the Blind of Texas State Scholarship, and the Fred Scheigert Graduate Scholarship. She serves as the president of the student organization, Insightful Connections, a member of the Learning Ally College Success Program, and a member of the American Council of the Blind Students.

What is your current project in Dr. Mary Wicksten's Lab?
I am researching plastic pollution on Texas beaches. Currently, I am sampling in three state parks under a permit: Sea Rim State Park, Galveston Island State Park, and Mustang Island State Park. We do a transect where we sample a known area of sand along the high tide line. We collect any type of debris, such as fibers, plastics, or anything like. We need to know what is out there to make a diagnosis about the pollution problem. We bring those plastics back to the lab and we categorize every single one. We look at the size, color, and materials. We are working on processing that data right now.

What is a microplastic? What have you found so far?
These are plastics, as defined by the National Oceanographic and Atmospheric Administration, as being less than 5 mm in size. So to you give you an idea of how big that is, think about a piece of plastic that is about the size of a frozen pea or smaller. We have found plastic and microplastic pollution on all three beaches.

Why study microplastics?
At the University of Rhode Island, we were assigned a summer reading project for the book No Impact Man by Colin Beavan. Colin and his family attempted to live completely green in New York City for one year. This meant no electricity, no use of any public transportation that emits carbon, only eating local food with no packaging at all, no refrigerator, and no toilet paper (among other things). It got me thinking about how our consumption of resources is affecting our environment. Then, as an aspiring marine biologist, how can I use my career to help figure out human impacts on our oceans. When I came to Texas, I had this idea in my mind—I've always considered myself an eco-friendly consumer, but I didn't realize how bad the plastics problem was until I went out to the beaches in Texas and saw that every single beach had a significant amount of waste present. My idea is that if we want to fix the problem, we need to know how bad it is.

What made you decide to come to Texas A&M?
I applied to many schools, but a couple of things stood out here. One was the recruiting session, which was cool. I remember I got the email, and I called my dad. I said, "Hey, they want to pay to have me fly out. Is that normal?" He said, "That's awesome! They are recruiting you like a football player! You should definitely go!" I think the other thing that struck me was the atmosphere. Even though we are all doing different things, the cohorts stick together

and interactions are great. When we went through teaching together, we would practice the labs together. The graduate students are supportive of each other, which is a part of the Aggie Spirit.

What have been some of your biggest challenges as a PhD student?
One would be writing grant scholarships and permits for the first time on my own. I have never had to do that before, but my lab mate, Zach Hancock, encouraged me. He said, "Go for it. Write grants proposals and see if you get it. The answer if you don't apply is zero dollars." Learning how to write those was good for me because it was like writing preliminary drafts of my proposal because I had to be able to communicate my research to others. Another challenge was going from being a teaching assistant at a small university to a really big university where you have over 90 lab sections and everything is so standardized because it has to be. The labs were so busy. It is one thing taking them as an undergrad, but it is another thing when you are the one who has to teach them and really know the lab inside and out. It taught be to be proactive in lesson planning and in my teaching skills.

> **"After having observed a dozen previous students in the Marine Biology program on campus, I can confirm that Maureen has quickly distinguished herself as one of the most motivated, carefully prepared, and interactive."**
>
> **- Dr. Duncan MacKensie**
> **Associate Professor and Director of Biology Honors**

You mention that you have applied for grants. What grants have you received?
One of the grant opportunities is through Texas SeaGrant, and it was the first grant I applied to for funding for preliminary data. I was so nervous, and I contacted some of my colleagues in the marine biology program because I had no idea how to write about a new idea that was still an abstract concept. I got this baseline grant to do some basic research, and I thought I could do others. I have applied to other marine biology grants through the Women's Divers Hall Of Fame, American Philosophical Society, Lewis and Clark Foundation, among others.

What organizations are you involved in outside of school?
One, I am a musician. I have been playing the trombone for about 18 years. For me, that is a big form of stress release and self-expression. Throughout my undergrad career, I was in marching band, the trombone choir, and the Pep Band. During my master's program, I played in the symphonic band, the orchestra, and the jazz band. Now, here at A&M, I have played in the A&M concert band my first year, and now I am in the A&M symphonic band and the Brazos Civic Orchestra. For me, playing music gives my brain something totally different to focus on because if I am really into the music, I don't have room to think about anything else. Also, because I don't drive, for my 18th birthday, instead of a car, my parents bought me a professional trombone (and it does no good sitting in the instrument case).

I am active on advocacy and awareness on people with disabilities, so I am the current president of Insightful Connections. We aim to promote, awareness, education, and outreach of persons in the blind and visually impaired community. We do educational workshops where we teach people about braille code, orientation and mobility skills, how to navigate with a white cane or a guide dog, or how to orient yourself around the campus when you have low vision.

I am also active in a College Success Mentoring program through Learning Ally. I am paired with mentees who are blind or low vision from around the nation who are in college in some realm of the sciences.

Do you have any advice for current or future graduate students?
Everyone's graduate school experience is different, so don't compare yourself to others. Find a good friend who you can talk to. Even if they are not in your lab, you can bounce ideas off of them. They might ask you some really obvious question that you haven't thought about even though you've been looking at your proposal for three months. Don't be afraid to reach out to others or to your resources on campus if you are having any kind of health issues, physical, mental, or spiritual. There are people here who will help you find what you need. Also, pets are great! If you have a dog or a cat, they are good stress relief.

What types of outreach are you involved in?
I have been contacted by classrooms ranging from elementary school to universities. I was recently contacted by Dr. Penny Rosenblum from the University of Arizona who wanted me talk about my job and being a marine biologist and what kinds of tools I use, so I told her class about microplastics and these little crustaceans which are kind of like knights in shining armor because they have an exoskeleton. And then I talked to them about the things I use the in the lab like my computer magnifier, monocular (which is like a binocular but with one eye so I get to be an honorary pirate every time I use it), or using my white cane when in unfamiliar places. I want students to know that there are tools and ways to go about learning that can allow them to access any area of STEM they might be interested in.

Side note:
Everyone can make a difference when it comes to how we use resources. Please consider making small changes to your daily routine like using cloth grocery bags, reusable utensils and stainless steel or silicone straws, or traveling with a reusable water bottle or travel mug for coffee. Hopefully, plastic pollution won't be a topic of academic journals in the near future.

A shout out to all the people in my village who have helped me reach this point because it takes a village to raise a PhD student.

Maureen holds up one of millions of microplastics found on Texas beaches.

What's Next

Our December 2019 graduates are looking forward to a bright future of scientific discoveries and breakthroughs

Sarah Beagle, PhD Biology

Sarah's PhD work centered on characterizing the role of potassium channels in bacterial physiology in Dr. Steve Lockless's lab. She gained computational and bioinformatics skills that were helpful in moving her projects forward. She has accepted a postdoctoral position at Washington University at St. Louis. In her new position, she will study how bacteria adapt to their environment.

Joshua Beytebiere, PhD Biology

Joshua's PhD work in Dr. Jerome Menet's lab addressed how the circadian clock drives tissue-specific rhythmic gene expression. He credits the Department of Biology and the Menet lab with molding him into a better scientist and mentor. He has accepted a postdoctoral position in the lab of Dr. Marc Montminy at the Salk Institute for Biological Studies.

Disha Bhattacharjee, PhD Biology

Disha conducted research on *Clostridioides difficile* spore germination in Dr. Joe Sorg's lab for her PhD work. She is departing soon for a postdoctoral position at Clemson University where her project will focus on host/pathogen/microbiome interactions.

"I am glad that I joined Dr. McKnight's lab and became a part of Texas A&M Biology. I have had some of the best experiences of my life."

- Sachi Mandal

Christine Figgener, PhD Biology

Christine worked in the labs of Dr. Pamela Plotkin and Dr. Joseph Bernardo where she studied the foraging and spatial ecology of marine turtles using stable isotope analysis and satellite telemetry. Her study site was the entire Eastern Tropical Pacific, but the starting point was the Pacific coast of Costa Rica. She is considering several options in non-profit and research sectors for her future career.

Shanta Karki, PhD Biology

Shanta's PhD work in Dr. Bell-Pedersen's lab involved understanding the mechanism of how circadian clock regulates mRNA translation. She has accepted a postdoctoral position in the Department of Pharmacology and Toxicology at the University at Buffalo. She will be testing potential drugs that work as agonists/inverse agonists of melatonin, which could be used to treat different conditions such as insomnia, circadian sleep disorders, and depression.

Sachi Mandal, PhD Biology

For Sachi's PhD work, he developed a large transciptomic dataset that he used to identify candidate metabolic and regulatory genes involved in acylsugar biosynthesis and other defense mechanisms in a wild tomato species. He will continue this project as a postdoc in Dr. McKnight's lab to further mine this dataset and characterize the function of these genes.

Jie Tian, PhD Biology

Jie's PhD work in Dr. Hongmin Qin's lab involved investigating how O-GlcNAcylation levels regulate primary ciliary length by promoting axoneme disassembly in mammalian cells and explored *Chlamydomonas reinhardtii* as a template to synthesize biomolecules. She has accepted a postdoctoral position at the University of Georgia in Dr. Gerald Hart's lab.

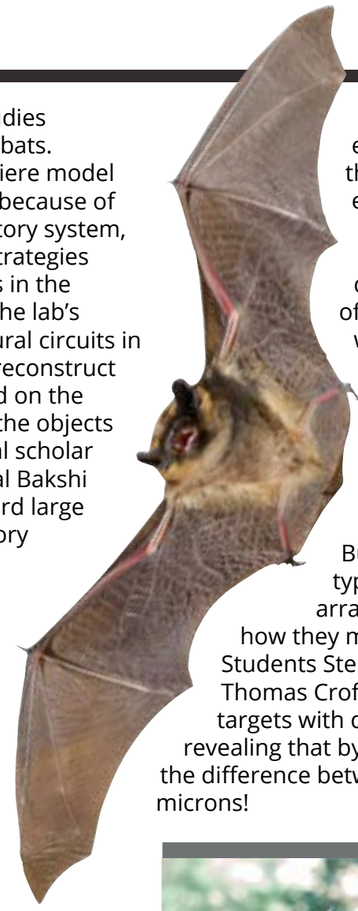
"A&M is the center for studying circadian clocks and I had the great opportunity to learn from the experts in the circadian field."

- Shanta Karki

At the Forefront

Welcome to The Bat Lab

Mike Smotherman's lab at Texas A&M studies the sensory ecology and neurobiology of bats. Echolocating bats have long been a premiere model for studying the neurobiology of hearing because of the extraordinary sensitivity of their auditory system, but bats also display unique behavioral strategies for hunting and navigating at high speeds in the dark using both biosonar and olfaction. The lab's neurobiology studies investigate how neural circuits in the auditory system are wired to rapidly reconstruct a mental image of the environment based on the steady stream of echoes bouncing off of the objects all around them. To do this, post-doctoral scholar Silvio Macias and graduate student Kushal Bakshi have successfully developed tools to record large populations of neurons in the bat's auditory cortex while the bat actively explores its environment with biosonar. They can record the bats' sonar pulses and the echoes they hear while simultaneously seeing how the auditory cortex represents the targets that created the echoes. What's particularly exciting about this research is that the bats are apparently able to create a highly detailed impression of the auditory scene from surprisingly sparse acoustic cues. This research helps identify the complex computational strategies and neural shortcuts that evolved to make echolocation possible. This not only teaches us about how the brain works, but also guides development of more efficient signal processing algorithms for man-made sensors and robotic systems.



In their behavioral studies, the lab uses a combination of high-speed cameras and ultrasonic microphones to record and analyze flight paths and trajectories of bats as they perform difficult navigational tasks. Most of these studies focus on how bats manipulate their biosonar to attempt different tasks under a variety of lab and field-based conditions. Recently, graduate student Alyson Brokaw has been using these tools to study how some bats can use smell to find food. These bats use echolocation for navigating through the forest and around obstacles, but since they feed on ripe fruit, they are very adept at detecting and tracking down these tasty treats by smell. Olfactory tracking is challenging to do on the ground, and even more so when flying fast. Alyson's research is revealing how bats have solved this difficult problem with important implications for bat ecology, evolution, and conservation. Again, this work may also prove useful for engineered systems. For example, there could be great benefits to using aerial drones to search disaster sites and hunt for the source of a toxic or dangerous odor. Alyson's work may help solve critical problems about how drones are able to rapidly and efficiently search an area using chemical sensors.

The Smotherman lab also has several undergraduate student research projects going on. Olivia Butaud is investigating how different types of inhibitory neurons are arranged in the auditory cortex and how they may contribute to echo processing. Students Stephen Odunsi, Mikayla Hobbs, and Thomas Croft have trained bats to discriminate targets with different textures using echolocation, revealing that by just using echoes, bats can tell the difference between surfaces differing by only 10 microns!

Dr. Michael Smotherman, Professor and Chair of the Texas A&M Institute for Neuroscience, received his PhD in Physiology from UCLA in 1998. He joined the Biology Department at Texas A&M University in 2004. Dr. Smotherman teaches undergraduate and graduate courses in neurobiology and behavior. His research focuses on bio-inspired engineering design, using a combination of behavioral and physiological studies of bat echolocation to guide improvements in artificial sonar, active sensing, and communications systems. He has been awarded nearly 2.5 million dollars in funding from the NIH, NSF, DoE and DoD. He has published 35 peer-reviewed journal articles and 3 book chapters. He currently serves as vice-chair of the Institutional Animal Care and Use Committee.

Undergraduate Programs Advising Office

The Department of Biology is proud that we have an incredible advising team! They are the first people our undergraduate students meet, either through a prospective student visit, Aggieland Saturday, or at a New Student Conference. They are also present at the end when they clear each student for graduation and then assist with the graduation ceremony. And in between, they are gently (or firmly) guiding students through their academic career in one of the six undergraduate degrees our department offers.

Every biology student meets with their advisor at some point to discuss course options, apply for a wait list, get a degree evaluation, request approval for transfer credit, process Biology 491 research credit, or perhaps to respond to a gentle reminder or warning email. But behind the scenes, advisors do much more to ensure that students make it to graduation and that the department is prepared to meet the needs of the next generation of Aggies.

In addition to helping all ~1,400 biology majors enroll each semester, our advisors manage the enrollment of all participants in our first-generation in college program, BioFirst, and in the Biology Honors program. They are also the keepers of the course catalog, which includes updating entries for all of the courses, majors, and minors offered by the department to ensure that these meet accreditation requirements. To help recognize our outstanding students, our advisors coordinate university, college, and department student awards, and organize the graduation and awards reception held each May. To help students land their first job, they assist with the annual Career Fair. Our advisors also help faculty and administrators collect data and prepare reports related to student success. Moreover, they assist the department's Undergraduate Program Committee in the assessment and long-term planning of the undergraduate curricula.

Despite a heavy load of traditional advising and "extra" activities, the Department of Biology advising team remains the go-to group for both advisors and students in many other departments and programs on campus.

Christine Farris is a Fightin' Texas Aggie Class of '92 Agricultural Economics major. She obtained a Master's in Higher Education Administration in 2003. She has been an academic advisor since 1993 and in Biology since 2001, where she is now the Director of Biology Undergraduate Programs. In this role, she works with faculty to help determine the curriculum needs of our undergraduates. She also works directly with undergraduates to steer them toward degree completion, locate the various resources available to them on our campus, and achieve their academic goals.

Crystal Wager has lived in the Bryan/College Station area her whole life. She attended Blinn College. She previously worked in banking until finding a home here at Texas A&M Biology as the undergraduate office Administrative Assistant. When not working, she enjoys reading, Zumba, and spending time with family.

Vanessa Nordell is a Fightin' Texas Aggie Class of '97 Genetics major. She also obtained her Master's in Nutrition in '04. Vanessa has been an academic advisor for Biology Undergraduate Programs for over 13 years. In this role, she has been able to mix her interest in science with being of service to others. She assists the director as needed on special projects and works with students in various advising areas to help ensure they achieve their goals at Texas A&M. In her spare time, she loves reading, baking cookies, travel, and running.

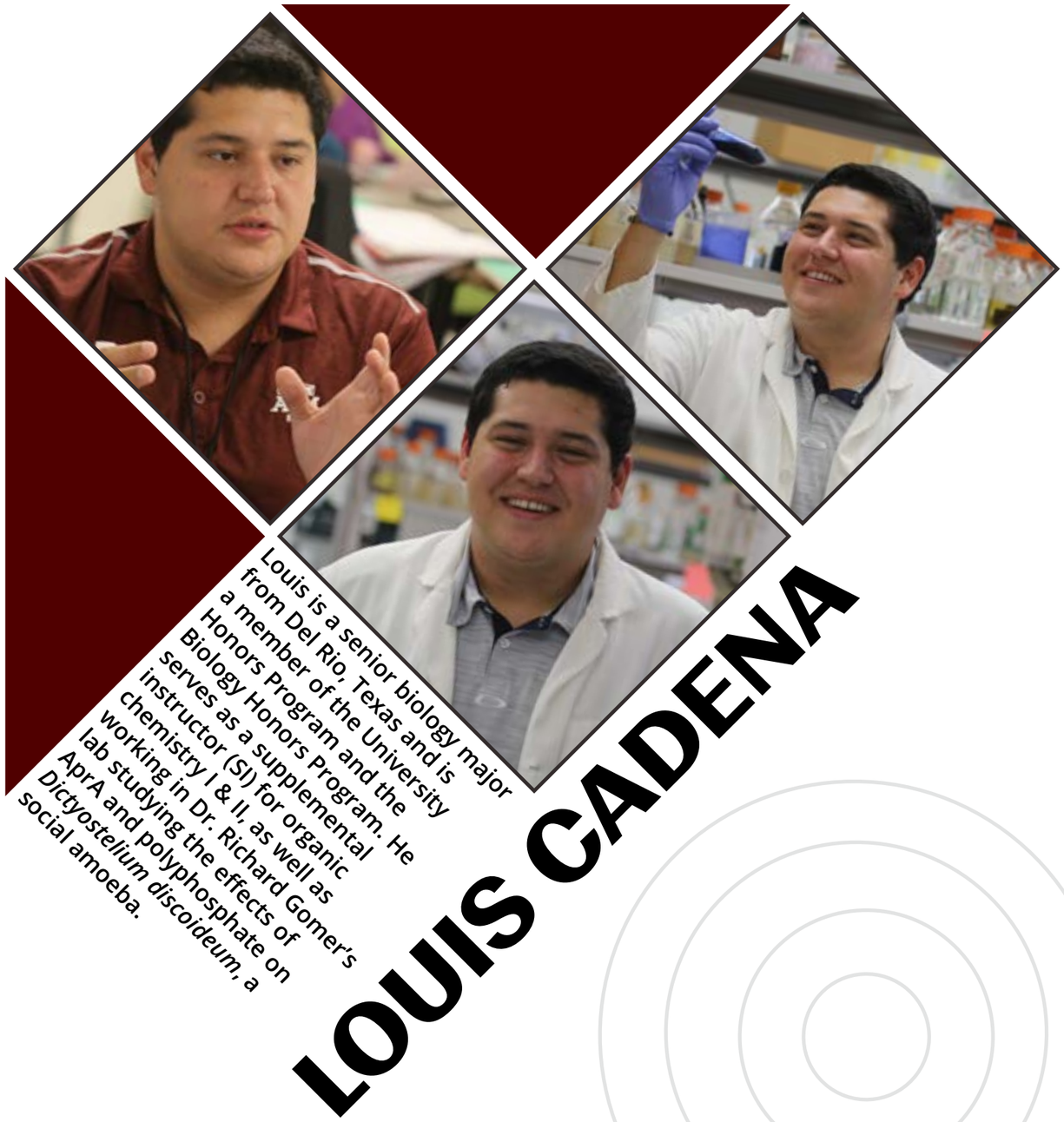
Clint Crampton is a Fightin' Texas Aggie Class of '99 Political Science major. Clint has been an academic advisor in the Department of Biology since January of 2004. He is originally from Houston, but has lived in College Station for the last 10 years. In his spare time, Clint enjoys reading and playing with his dog, Sasha.

ADVISORS meet the

Grace Jones is a Fightin' Texas Aggie Class of '17 English major with minors in History and Anthropology. Her undergraduate research focused on science and medicine in romantic literature and philosophy. She currently works as an academic advisor and is pursuing a Master's in History, with a focus on the history of science fiction. Grace enjoys photography, travel, and everything Star Wars.

Jill Lyster is a Fightin' Texas Aggie Class of '87 in Curriculum and Instruction, and earned an MBA at TAMU. Jill has a passion for helping students excel, which explains her history of teaching and advising. She was elated to join the Undergraduate Biology Advising team in October 2019. Jill loves entertaining, traveling, baking, and spending time with family and friends.

Raising the Bar



Louis is a senior biology major from Del Rio, Texas and is a member of the University Honors Program and the Biology Honors Program. He serves as a supplemental instructor (SI) for organic chemistry I & II, as well as working in Dr. Richard Gomer's lab studying the effects of AprA and polyphosphate on *Dictyostelium discoideum*, a social amoeba.

LOUIS CADENA

Louis Cadena, a senior biology major, was born and raised in the border town of Del Rio, where both of his parents are family practice physicians. His maternal grandfather was a pathologist, and one of the first Mexican doctors to come from Del Rio.

After graduating valedictorian from high school, Louis enrolled in the Department of Biology in fall 2016. He is in both the University Honors Program and the Department of Biology Honors Program, where he serves as co-chair of the advisory council. During his freshman year, he took Dr. Asha Rao's BIOL 111 class and developed a deep appreciation for the way she cares for her students and the way she was able to treat so many students as individuals. The admiration was mutual, and Dr. Rao invited Louis to be a Supplemental Instruction (SI) leader for the BioFirst program she was starting to help first-generation college students succeed in the biology major. After working with Louis, Dr. Rao realized that other students would benefit from Louis's knowledge and encouragement, and she asked him to be part of her next adventure, the Science Peer-Learning Center (SPLC), a study hub in the basement of Butler Hall open 36 hours per week, where students can get help with a wide variety of science courses from upper-level peer tutors. He continues to be a tutor for the BioFirst program and an SI leader for Organic Chemistry I and II, working with Dr. James Pennington in the Chemistry Department. Louis also provides leadership to the campus-wide SI program by serving as a supervisor assistant, where he is responsible for the management, evaluation, and training new SI leaders.

Some of his professors worried that doing so much to help so many other students might impede Louis's own academic progress, but he told one professor that the tutoring kept him sharp and provided a bit of review that made his own classes easier. Apparently, his assessment was correct, as he scored in the 99th percentile when he took the MCAT earlier this year. Congratulations, Louis!

Since the fall of his sophomore year, Louis has worked in Dr. Richard Gomer's lab, under the supervision of Dr. Ramesh Rijal, a post-doctoral fellow. One of his projects is analyzing the effects of AprA, an autocrine proliferation repressor protein and chemorepulsion signal in *Dictyostelium discoideum*, a social amoeba. A second project is studying the effects of polyphosphate of the development and sporulation of *D. discoideum*. Louis will be compiling the outcomes of these projects into a capstone thesis this semester to complete the University Honors and Biology Honors programs.

How has your background and childhood experiences influenced who you are today?
My desire to be a physician is in large part due to my exposure to the medical field from my parents and my maternal grandfather. I was always fascinated by their jobs and was moved by the ways in which they could use their profession to serve their community. My primary and secondary education at Sacred Heart Catholic School formed the basis of my academic habits and critical thinking skills that have served me to this day. My extracurricular activities, such as golf, National Honor Society, and Future Business Leaders of America, during high school taught me the value of hard work, dedication, and leadership skills, which I still use to achieve my goals today.

What is your greatest passion?
My passion is helping others around me. At this point in my life, that passion has been primarily through academic means. This passion is what has driven me to become an SI, a tutor in the SPLC, and a tutor and peer mentor in the BioFirst program. I love being able to use my experiences to help others around me achieve their goals, and reach their potential. My other major passion is research, which I also view as a way to help others. I love applying the knowledge I am gaining during my undergraduate education to discovering new information in the field of biology, which I hope can one day be used to improve the lives of others.

What does leadership mean to you?
To me, the truest sign of leadership is using your position for the benefit of others over yourself. A true leader is one who abandons pursuit of his own goals to allow others to pursue their goals. In this way, leadership embodies drawing on your own resources to empower others in pursuit of their goals.

Future plans after graduation?
I am currently in the application and interview process for medical school. After graduation, I hope to matriculate and begin studying to become a physician.

Meet the Dynamic Duo

Drs. Joshua and Ramona Neunuebel met as graduate students at Texas A&M Biology. They connected through their love of biological research and haven't looked back since.

Josh Neunuebel is an Assistant professor in the Department of Psychological and Brain Sciences at the University of Delaware. He received a BS in molecular and cellular biology and an MS in Zoology (working with Dr. Mark Zoran) from the TAMU Department of Biology. After earning his PhD in Neuroscience from the UT Health Science Center at Houston, he took a postdoctoral position at John Hopkins

During a second post-doc at Howard Hughes Medical Institute's Janelia Research Campus in Ashburn, VA, Josh studied the role that mouse ultrasonic vocalizations play in shaping social behavior. Researchers discovered ultrasonic vocalizations by mice over 50 years ago, but understanding their function was hindered by the difficulty of identifying the vocal contribution of each mouse actively involved in a social interaction. Josh developed a novel microphone array that could assign vocalizations to individual socially interacting mice. With colleagues, he showed that female mice vocally interact with males during courtship, contrary to the longstanding belief that only males produce these vocalizations. Female vocalizations may indicate her receptivity to the courting male. These findings offered insight into one of biology's fundamental principles, reproductive fitness, and set the foundation for a comprehensive mechanistic dissection of natural social behavior.

Josh's current research continues to focus on neural mechanisms that process and integrate social cues. As PI on several university-funded grants and a pilot study funded through the Delaware Center for Neuroscience Research, he laid the groundwork for elucidating the neurobiology of social behavior by building a unique system for simultaneously recording neural, audio, and behavioral data from freely socializing mice. Analysis of data collected by this system requires the use of high-performance computing. With the financial support from the university-funded grants, his research team developed a fully functional data processing pipeline, allowing them to conduct innovative research from socially interacting groups of mice using advanced behavioral techniques, electrophysiological recordings, and sophisticated computational analyses.

Ramona Neunuebel is an Assistant Professor in the Department of Biological Sciences at the University of Delaware. She received her B.A. degree in Biology from Babes-Bolyai University in Romania and obtained an M.S. degree in Cell Biology and Molecular Biotechnology from the same university. Her early work was focused on studying the toxic effect of cyanobacterial blooms. Ramona earned her PhD in Microbiology from Texas A&M University in 2008, where her doctoral work in Dr. Jim Golden's lab centered on regulation of cellular development in cyanobacteria. She then became a postdoctoral fellow at the National Institute for Child Health and Human Development at the NIH in Bethesda, Maryland where she gained expertise in the study of microbial pathogenesis. In 2014, Ramona was recruited to the Department of Biological Science at the University of Delaware. Her group investigates the cellular and molecular mechanisms that bacterial pathogens use to survive and replicate inside host cells. She is specifically interested in *Legionella pneumophila*, an opportunistic bacterial pathogen that infects human alveolar macrophages upon inhalation of contaminated aerosols causing a severe form of pneumonia known as Legionnaires' disease. Dr. Neunuebel's research is currently funded by an NSF CAREER award and an NIH R21 grant.

Tell us about a time in your life that you wanted something so badly that you were unstoppable in pursuing it? What obstacles did you overcome to get there?

JOSH: About a year into my master's at Texas A&M, I realized that my dream job would be running my own research lab. I enjoyed designing experiments, collecting and analyzing data, and loved the idea that my work would help answer challenging scientific questions. This idea motivated me throughout my doctoral and postdoctoral studies. In particular, for my dissertation work, I chose a project looking at the flow of information through the hippocampus, a structure critically involved in memory. My project involved simultaneously recording from two subregions of the hippocampus, the CA3 and the dentate gyrus (DG). James Knierim, my Ph.D. advisor, warned me this would be a tough project because, although the DG has over a million granule cells, most are "silent" or fire sparsely, making them extremely difficult to record. Of course, this kind of warning only stoked my motivation to figure out a way to record these ever-elusive neurons. After many months of training rats, surgically implanting neural recording devices, carefully advancing electrodes a few microns at a time over the span of weeks, and then recording the neural firing from freely moving animals, I collected vast amounts of data. Making sense of this mountain of data was crucial for determining the role the DG played in memory formation and provided my first foray into computational data analytics, and I was hooked for life. This approach to analyzing data required creativity, logic, and ultimately allowed us to validate the predictions of a long-standing computational model of hippocampal function. This willingness to tackle challenging problems has endured throughout my scientific career. Now, as I run my own lab at The University of Delaware, my research team shares the same excitement for pursuing high-risk high-reward projects that focus on the neural encoding of social information.

The Neunuebels enjoying family togetherness in the great outdoors

RAMONA: I was in the second year of my postdoc when an inspired idea led me to discover something important, a missing link of sorts. I had been studying how the bacterial pathogen *Legionella pneumophila* survives within human macrophages, ultimately causing severe pneumonia. My discovery offered insight about how this bacterium commandeers the host cell's vesicular traffic pathways early during infection. I was elated about my finding. However, recognizing that this was one of those ideas whose time had come, I anticipated that others would soon make this discovery. Working with my postdoc advisor and other members of the team we carefully outlined all the experiments and controls that we would need. Needless to say, I was excited to begin and prepared to push this project forward.

Dr. Ramona Neunuebel's laboratory group at the University of Delaware

To put things into perspective, on the home front, I was a first time mom of a sweet 1-year old boy who didn't yet sleep through the night. Commuting one hour each way through D.C. traffic added to the challenges outside of work. Though it was not easy, I was determined to see this project through. To get the most out of my time in the lab, I planned each experiment days in advance and wherever possible I used commercial kits that maximized my efficiency. Within a half a year of that initial discovery, I submitted a co-first author manuscript that was accepted and published in Science.

What helped me through this time was focusing on one thing at a time, being mentally present at work and at home so that I could bring my best. I also learned to sometimes allow progress over absolute perfection, which does go against my natural inclination, but keeps things moving in the right direction. This experience taught me that as women we can succeed both in our careers and have a fulfilling family life. If anything, I feel that balancing my career and family life has sharpened my determination, focus, and instinct, and has helped me harness more of my potential.

Tell us about a person or organization that you admire. Why do you think they have made an important impact?

RAMONA: I'm most impressed with the impact that Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) is making on promoting the success of students who are from groups underrepresented in STEM. The annual SACNAS conference connects thousands of students with opportunities to advance their careers and scientific research in an exceptional environment that celebrates cultural diversity. As the current advisor of University of Delaware's SACNAS chapter, founded recently by my graduate student, Barbara Romero Duenas, it is clear to me that this multicultural, multidisciplinary organization supports the students it serves in meaningful, tangible ways.

What's the most important thing we should know about you?

JOSH: I don't follow the beaten path. I question assumptions, embrace big challenges, and am undeterred in pursuing answers to scientific questions. This might not be the easiest approach to science, at times it feels more akin to climbing Mount Everest, but I enjoy every step of the journey.

RAMONA: In my personal life and in conducting research, my mindset is that everything is "figureoutable." Over time I learned that tapping into my intuition as much as I rely on scientific reasoning helps me formulate the most creative solutions and innovative hypotheses. As a parent and research mentor, I try to provide a positive learning environment, balancing close guidance with the freedom to explore.

How have you successfully balanced your career and raising a family?

JOSH: The schedules of professors are more flexible than most occupations. For the most part, we make our own hours. We know when our critical grant deadlines, classes, and important meetings will occur weeks or months in advance. By planning ahead, I can more efficiently accomplish career goals while being fully present for my family, which is really important for me. As a family, we make time to attend our kids' school events, field trips, soccer games, family Taekwondo classes, and travel. Things don't always work out as we plan, but we always try to stay flexible.

RAMONA: While Josh was finishing up his PhD at Johns Hopkins, I was starting my postdoc work at the NIH, all while raising an infant. As you might imagine, this wasn't easy! What helped us get through those times and is still helping us today is our attitude towards the type of work we do. Being in the scientific research is exciting, and we don't view it as work. We root for and support each other, whether it means reviewing each other's work, allowing time to work on writing grants/papers, or going to conferences. As a family, we spend time together at home, at various school related activities, and even exercising at our bi-weekly family Taekwondo classes.

Who has had the most influence on your scientific career?

JOSH: I have been incredibly fortunate to have amazing mentors throughout my life and they have all profoundly influenced my scientific career. Mark Zoran, my master's advisor at Texas A&M, opened my mind to the joy of thinking about science and doing research. Jim Knierim, my mentor during my doctoral studies at The University of Texas Health Science at Houston, taught me to shoot for the stars and believe in myself. Roian Egnor, my post-doctoral advisor at the Howard Hughes Medical Institute at Janelia Research Campus, helped me realize that nothing is impossible. I also want to acknowledge my biggest advocate, Ramona Neunuebel!

RAMONA: At all stages of my scientific career, I have been fortunate to work in supportive, positive environments. My undergraduate, graduate, and postdoctoral research mentors have all provided me with a healthy combination of guidance and freedom to explore my own ideas. This is truly what allowed me to gain confidence and grow into my creative potential as a scientist.

What is a favorite memory that you have of your time at Texas A&M?

JOSH: This is a challenging question to answer, as I had so many wonderful memories at Texas A&M during my days as both an undergraduate and graduate student. I could describe the fond memories of the friends I made as an undergraduate or the professors who introduced me to the fascinating world of cell and molecular biology. What I want to highlight are events from my experience as a master's student. When I think about Texas A&M, I think about the people I interacted with—fellow students, faculty members, administrative staff, and of course my lovely wife. Everyone was friendly, supportive, and collaborative. This was essential for overcoming the daily trials and tribulations as we pursued the unknown. People were excited about science, not only their own, but everyone's research. This excitement showed as we routinely had late night discussions over dinner and drinks about the latest hurtle one of us was encountering, a cool, but puzzling result, or a phenomenal seminar we just attended. I will forever remember the experiences with my peers at Texas A&M, as they hooked me on science and the importance of a friendly, collaborative, and energetic environment.

Class Notes

The Biology Graduate Student Association

The Biology Graduate Student Association (BioGSA) is a student-led organization, whose primary goals are to address issues of concern and advocate for student needs at the department, college, and university level. In addition, the BioGSA is involved in several other aspects of the department, including fundraising, event planning, and selection of student seminar speakers. The BioGSA has 12 graduate student positions, including President, Vice President, Treasurer, Faculty Liaison, Fundraising Representative, Graduate Programs Committee Representative, Dean's Graduate Student Council, Graduate Recruiting and Admissions Committee representative, Graduate and Professional Student Government representative, and the Student and Postdoc Research Conference representative.

Members of the 2019 BioGSA from left to right, top to bottom: Sara Maynard, Ashley Hudson, Maureen Hayden, Marko Baloh, Kasuni Daundasekara, Abira Sahu, Amy Tan, Aldrin Lugena, Aditi Raju, Ananya Dasgupta, Andrea Martinez Aguirre, and Kyoungsun Rha.

What is the BioGSA up to?

This year, the BioGSA has hosted a Welcome Social for incoming graduate students and has helped plan the annual Student and Postdoc Research Conference (SPRC). Additionally, the BioGSA is heavily involved in graduate student recruitment – a three-day event consisting of interviews, dining, socials, and more.

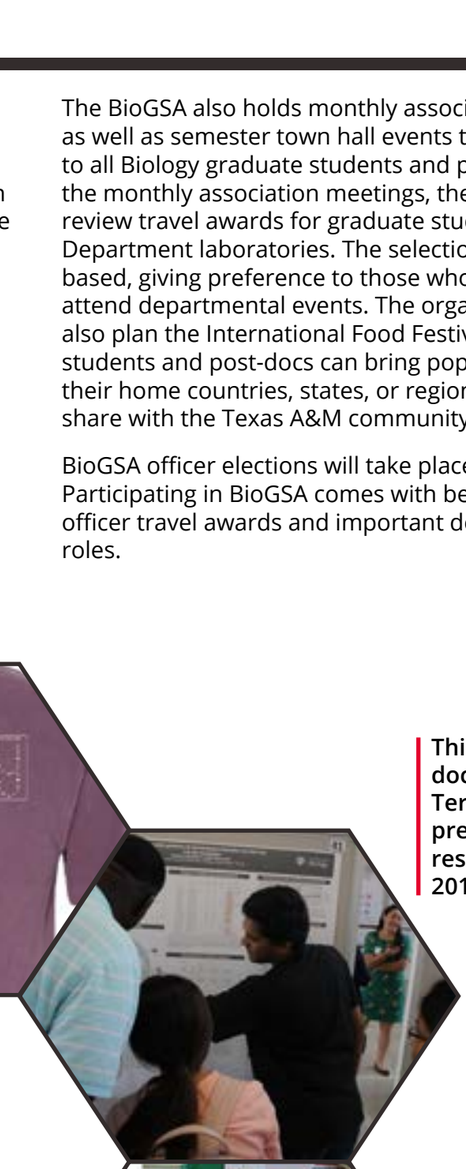
The organization has designed and sold Department of Biology merchandise for fundraising efforts; for this fundraising season, we had shirts, jackets, decals, and koozies. Decals ($5) and Koozies ($3) are still available for purchase from Sara Maynard (smaynard@bio.tamu.edu) or from Jennifer Bradford (jbradford@bio.tamu.edu).

For the Fall and Spring Seminar Series, BioGSA reviewed many excellent proposals from current students and chose speakers from four different labs. Yufeng Wan (Garcia lab) and Andrea Martinez Aguirre (Sorg lab) were the speakers for the Fall Seminar Series. Yufeng's talk was titled "Identification of the probabilistic parameters during *C. elegans* male mating behavior," and Andrea's talk was titled "An *in-vivo* and *in-vitro* approach for elucidating the roles of *Clostridium scindens*, *C. hiranonis* and *C. leptum* on *Clostridium difficile* infections." For the Spring Seminar series, post-doc Ramesh Rijal (Gomer lab) and graduate student Terrence Sylvester (Blackmon lab) gave talks in January. The title of Ramesh's talk was "Polyphosphate inhibits the killing of ingested bacteria in *Dictyostelium* and human macrophages," and Terrence Sylvester's talk was titled "Idiosyncratic patterns of chromosome evolution are the rule not the exception."

The BioGSA also holds monthly association meetings, as well as semester town hall events that are open to all Biology graduate students and postdocs. At the monthly association meetings, the BioGSA will review travel awards for graduate students in Biology Department laboratories. The selection is merit-based, giving preference to those who regularly attend departmental events. The organization will also plan the International Food Festival where students and post-docs can bring popular food from their home countries, states, or regional areas to share with the Texas A&M community.

BioGSA officer elections will take place in the spring. Participating in BioGSA comes with benefits, including officer travel awards and important decision-making roles.

This year's winning design for the Biology Department merchandise.



Third year doctoral student, Terrence Sylvester, presenting his research at the 2019 SPRC.

Doctoral student, Gaston Jofre, represents Mexico at the BioGSA International Student Festival

Upcoming Events

Texas A&M Biology Art Contest

The Department of Biology invites you to enter your biology-themed artwork in our our inaugural Texas A&M Biology Art Contest! Bring your artwork submission to the Blackmon lab in BSBW 309 by Tuesday, April 7, 2020.

Voting will begin on Friday, April 10, from 1-3 pm and winners will be announced at 3:30 pm.

Please contact hblackmon@bio.tamu.edu for more information about the contest.

JAN 14 Biology Seminar Series: Every Tue at 4 PM in BSBE 115 from January 14 - April 21

JAN 29 Biology Faculty Search Seminars: Every Wed from 2-5 PM in Rudder 510 from Jan 29 - Feb 26

JAN 31 Graduate Recruiting Weekend starts

FEB 14 Darwin Day - A Celebration of All Things Biology

Veterinary Medicine Building I (VENI), 5-8 PM

MAKE A DIFFERENCE

Your support of the department is incredibly valuable. Please consider making a difference to today's students, faculty, facilities, and programs—at whatever level is right for you.

Contributions can be sent to the Texas A&M Foundation, 401 George Bush Drive, College Station, TX 77840-2811 or online. Please click on the box below to contribute online.

SUPPORT BIOLOGY

"WE MAKE A LIVING BY WHAT WE GET, BUT WE MAKE A LIFE BY WHAT WE GIVE."

- Winston Churchill

Reflections

Kirsten Maulding

Kirsten earned her BS in Molecular and Cell Biology in 2015 and is now working on her PhD in Cellular and Molecular Medicine at Johns Hopkins University.

My passion for science - and my connections with Texas A&M University - began early. By the time I reached high school, I knew that I was keenly interested in science. In fact, it was actually a science-based summer camp at TAMU that I attended after my freshman year of high school which inspired my interest in research in the first place! A few summers later, I completed an internship doing research at Rockefeller University and loved every minute of it. I ended up attending Texas A&M once I graduated high school in order to study biology.

I was so excited to get started that I began working in Dr. Bruce Riley's lab the summer before I was to start my Freshman year. I had the opportunity to be mentored by a wonderful graduate student, Neha Bhat, who took it upon herself to teach me from the ground up. In a twist of fate, I ended up with a project all to myself as soon as the year officially started since my graduate student mentor, well, graduated. Let me tell you, I was in way over my head. I hadn't even taken a single course yet! This was one of the most challenging experiences I've had in my professional career, but with challenge comes an opportunity for growth. I stuck with it, despite deep-seated feelings that it would never work. Every failed experiment felt like a personal failure. But experiencing these things taught me that failure in science is normal and even expected! In fact, my most interesting finding came from proving our hypothesis wrong. In the end, I worked in the lab for all four years of my undergraduate studies and ended up publishing the results of that first challenging project, as well as numerous other achievements that came later. I learned and grew as a person and a scientist. Looking back, I can truly say that this was one of - if not the - most formative experiences of my life, and without it, I would not be where I am today.

The educational experiences offered within the Department of Biology were truly amazing for my growth as a student and a scientist as well. These included a variety of diverse courses, many of which included a hands-on lab component. In particular, I remember my cell biology and developmental biology courses, taught by Dr. Kathryn Ryan and Dr. Arne Lekven, respectively, especially fondly as they most closely aligned with my interests at the time. The quality of instruction offered by the professors allowed me to gain a thorough understanding of the fundamentals of biology.

I had so many other wonderful experiences while at Texas A&M that I wish I could tell you about in detail. Working with the Undergraduate Research Ambassadors gave me such great opportunities to reach out to other students and, hopefully, to inspire the next wave of scientists. Presenting at the Biology Department poster session helped me learn to craft a story from my data and keep an audience interested. And of course, I can't forget all the wonderful students I formed lasting connections with. All these experiences allowed me to begin pursuing the next step in my education, a Ph.D. at Johns Hopkins in the Cellular and Molecular Medicine program. I am thoroughly grateful for how well my experiences prepared me for my career path, and I cherish the time I spent at Texas A&M.

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THOMAS D. MCKNIGHT
Professor & Department Head

WITH SPECIAL THANKS TO ALL OF OUR CONTRIBUTORS.

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The Department of Biology Biosphere Newsletter is a publication for faculty, staff, students, alumni, and friends. We welcome comments and news of note, milestones, and transitions for inclusion in future issues. Please e-mail ljean@bio.tamu.edu.

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