

Biology Department Presents:

The Beaker

November 2018

Newsletter

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Chair's Corner

A common theme you will see running through this issue of *The Beaker* is “**learning how to learn.**” Although the biology discipline is full of fascinating and often surprising facts, and allows students to learn about science, it is also a means in which students can acquire skills and abilities that they will use throughout their lifetimes. This issue highlights how some of our faculty facilitate student learning in the classroom by using different pedagogical techniques that encourage involvement and promote active knowledge acquisition. You will also read about how our faculty collaborate with students in conducting authentic research and actually “do science” and don’t just talk about it. These student-centered strategies help students grow personally and professionally. Employers and professional programs (graduate school and medical school programs, etc.) want future applicants who have developed their skills in critical thinking, oral and written communication, and group-collaborative problem solving. Remember the old adage, “you get out of something what **you** put into it.” The key word being **you**. Learning is a very active process that we do ourselves. Your faculty are here to assist you, but you are the ones who must do the heavy lifting. So, let your curiosity about the natural world loose and use it to motivate and inspire your learning now and in the future. You are never too old to learn.

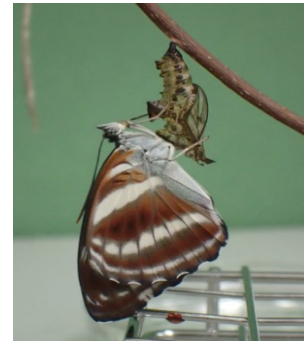
-Dr. Ahern-Rindell

Professor in the Spotlight

Dr. Taylor grew up in Hartford, Connecticut where he loved to be outside and explore nature. Growing up in a community that was largely Puerto Rican, he fell in love with Latin American/ Caribbean culture and the Spanish language, and knew he wanted to find a career that could intertwine his passion for other cultures and love of the outdoors. He attended the University of Connecticut, where he received degrees in both Biology and Spanish. While doing undergraduate research with the migrant Puerto Rican community in Connecticut, Dr. Taylor fell in love with ethnobotany—a subdivision of botany that studies plants utilized by different cultures for food, medicine, and other uses. Ethnobotany gave him the opportunity to combine his passions for studying both human and non-human communities, and is what introduced him to the field of botany. After graduating from the University of Connecticut, Dr. Taylor went off to graduate school at the University of Michigan, and then did his postdoctoral teaching in Kalamazoo, Michigan, and postdoctoral research at the University of Michigan and National Taiwan University, in Taipei. After his postdoctoral work, he taught in a joint program between Northwestern University and the Chicago Botanic Garden, before coming to the University of Portland in 2010.

At UP, Dr. Taylor has taught Introductory Biology courses, Field Botany, the Nature of Plants, and Plants as Food and Medicine. Dr. Taylor loves being able to teach in the Pacific Northwest because he can take his students outside to learn in the diverse habitats of the temperate rainforest. Last year, Dr. Taylor went on sabbatical where he travelled to New Caledonia and Taiwan to conduct research on the genus *Mussaenda* (in the same family as coffee, Rubiaceae) and *Stigmaphyllon* subgenus *Ryssopterys* (in the same family as the vitamin C supplement acerola, Malpighiaceae). Both plant groups showed a probable shift in pollinator syndrome and evolution of a new sexual system.

This sabbatical allowed Dr. Taylor to dive into plant reproductive biology, a field in which he had not previously conducted a lot of research. During his sabbatical, Dr. Taylor made long treks in the forest to perform 24-hour observations on plants. He was able to discover some amazing things and see evolution in process as hermaphroditic plants underwent evolutionary change to plants with separate sexes (in what he has now shown to be cryptically dioecious species). In the future, Dr. Taylor hopes to continue researching these plants by performing breeding experiments and studies of pollen, nectar, flower development, and pollinator diversity and behavior. In the meantime, Dr. Taylor looks forward to sharing his findings with his students and the scientific community.



Faculty Pedagogy Statements

Take a look at the information below to find out about the Biology Department Lecturers and their teaching styles. This information in poster format can be found on the first floor of Swindell's Hall.

Dr. Kyle Flann

- Dr. Flann likes to incorporate small group discussions in his courses as much as possible. These groups talk through difficult topics, discuss posed questions, answer clicker questions and write out concepts on the board
- Many of his A&P students are going into the health care field and will benefit from small group discussions as it is a critical part of the job
- Dr. Flann also involves students in research which focuses both in exercise physiology as well as biology education
- Fun fact: Dr. Flann loves spending as much time as possible with his wife and 3 little girls!
- Dr. Flann serves as one of UP's pre-health advisors



For more information, email flann@up.edu

Professor John M. White

- Prof. White encourages students to utilize all of the tools that are available to them to maximize their learning experience. He commonly poses thought questions during lectures, allowing for student-to-student discussion, and requiring constant student feedback.
- His office hours are typically filled with students reviewing content emphasizing the teach-reteach method. Early in the semester much of this time is spent teaching time management methods, pre-lecture preparation, and study strategies for optimal retention.
- Fun fact: Prof. White once spent an entire summer after college driving around the country in a VW van, visiting as many national parks as time and money would allow! The van only broke down 3 times.



For more information, email whitej@up.edu

Dr. Paula Tower

- Dr. Tower's students use a variety of active learning tools, from drawing concept maps and Venn diagrams, acting out a cellular process or handling pipe cleaner models, to answering questions in class or explaining a concept to a classmate. Analyzing real data or applying a concept to a new model helps students to think about what they are learning in new ways and identify what they do not understand. Asking questions about how a new topic relates to a previous one helps students to develop a sense of how things are connected and not just isolated facts. She uses lots of analogies to familiar, everyday things (food!) to make this invisible world more relatable.
- Fun Fact: Dr. Tower is a Harry Potter fan so be prepared to think of viruses as the Lord Voldemort of the microbial world.



For more information, email tower@up.edu

Dr. Christie Cesar

- Dr. Cesar creates multiple opportunities for students to interact with the material and peers. Students can be found drawing structures, acting out processes, sequencing pathways, discussing application to clinical scenarios and answering questions via classroom response software.
- At different points in class, a question about the patient might introduce a topic and at other times a question/activity might test for understanding of a topic just discussed. The questions can be posed as multiple choice (practice test questions), short answer explanations, anatomical identification and/or sequencing of pathways.
- Fun fact: Dr. Cesar has taught students ranging in age from middle school students to graduate students.



For more information, email cesar@up.edu

Dr. Priya Mani

- Dr. Mani uses a combination of active learning approaches in her classroom. Her favorite strategy is brainstorming with the help of thought provoking open-ended questions directed towards students working in pairs/groups. She sees her role as more of a facilitator who helps guide the students' responses in a way that solidifies understanding of the concepts.
- She often starts her Microbiology Lab classes by identifying an idea/concept for the day and throws out an open-ended thought-provoking question that is intended to get student's attention. Students are encouraged to brainstorm in pairs/small groups which allows them to interact, freely share ideas, and engage in class discussions.
- Fun fact: Dr. Mani loves playing online Microbiology games!



For more information, email mani@up.edu

Professor Adrienne Greaves

- Prof. Greaves uses problem sets and study guides, a lot of visual images, drawing, stories, and analogies which help students incorporate new information to things they already know from their everyday lives. Her hope is that students in BIO207 will try using many different materials and discover the learning strategies and practices that work best for them. This is a critical piece of self-knowledge to carry forward into upper-division coursework in the Biology Department.
- In her lab course, students work hands-on molecular modeling, allowing them to really see the three-dimensional nature of molecules, and to practice looking at simplified representations of a molecule on paper, then translating it to the full structure, and finally building it with a molecular model kit.
- Fun fact: Prof. Greaves used to be a dancer, so she's willing to make a fool of herself in front of a class dancing around and acting out different cellular and molecular processes.



For more information, email greaves@up.edu

Dr. Amy Beadles-Bohling

- Dr. Beadles-Bohling uses a two-stage collaborative exam that follows each individual exam. This utilizes a class period where students work in groups to answer all or a subset of the same questions. Each group is encouraged to discuss their reasoning behind their answer and to provide evidence to support their selection.
- Collaborative group exams allow students to practice important skills needed for their future professions and to enhance their understanding and retention of concepts. Students report that learning from their peers using their own words rather than those of their instructor often helps them better understand complex topics.
- Fun fact: Dr. Beadles-Bohling spent close to 10 years living in Walnut Grove MN, the home of Laura Ingalls Wilder, the author of the Little House on the Prairie series and the setting for the TV series of the same name.



For more information, email beadlesb@up.edu

Biology Without Borders: Tanzania

By: Shannon Leffler

Every two to three years students have the opportunity to take a two-week trip to Eastern Africa over Winter Break. The co-requisite courses are in the Departments of Biology and Communication, and the six credit courses will be offered next in Fall 2019. Topics covered in the classroom and abroad may include: evolution and ecology, vaccinations and sustainability, cultural identity and social strife, and globalization and relationships at the societal and biological level. The two disciplines work together to explore and understand the relationship between humans and the environment. The next trip to Eastern Africa is scheduled for December 28, 2019-January 12, 2020. Depending on your major and class standing, the two courses may count for credit as the social science core, UD social science, biology field requirement, biology capstone, or the Sustainability minor in the Pamplin School of Business

For more information, you can email holdt@up.edu or fletcher@up.edu

And the course website can be found at:

<https://pilotsclassic.up.edu/web/holdt/tanzania>



Teaching Assistant Recognition:

Genetics and Vertebrate Biology

By: Shannon Leffler

Jacey Wreggelsworth is currently a senior biology major at UP. Over her four years at UP, she has been a TA for both Genetics and Vertebrate Biology. As a TA, Jacey helps professors make sure that labs run smoothly by preparing and cleaning up before and after labs, helping students during and outside of lab time, and as is the case for field labs; driving to various locations. Jacey has thoroughly enjoyed being a TA because she has gained a deeper understanding of the subjects and created relationships with other TAs and professors. Jacey recommends becoming a TA to students because of the deeper knowledge one acquires in doing so. Through being a TA, Jacey has created lasting relationships with professors that have provided her with opportunities that would otherwise not be possible. Jacey is most passionate about Vertebrate Biology and has enjoyed being a TA for that class the most. She enjoys going off campus to explore and observe vertebrate animals in the Pacific Northwest. After graduation, Jacey plans on taking a gap year to get hands-on learning and guidance by working under a veterinarian, and then hopes to attend veterinarian school to become a veterinary anatomical pathologist.



Biology Alumni: Where Are They Now?

Sarah Donohoe graduated from the University of Portland in 2015. After graduation, she joined NOAA, where she still works today. Check out the article below to learn more about her amazing experiences and the path that lead her to NOAA.



By: Sarah Donohoe

Six months after my graduation from UP in 2015, I flew from my hometown in Juneau, AK to New London, CT where I swore an oath of office and officially became a National Oceanic and Atmospheric Administration (NOAA) Commissioned Corps Officer. That was the beginning of my four-month long training with the Coast Guard Officer Candidate School (OCS), a bootcamp environment where we marched in formation, shined our boots and did lots of push-ups. The NOAA Corps piggybacks on the Coast Guard OCS for basic officer training; we are the 7th Uniformed Service and our peacetime mission is to run and support scientific platforms (i.e. boats and planes) for NOAA. After graduating from basic officer training, I flew from Connecticut to San Francisco and stepped aboard NOAA Ship *Reuben Lasker* where I served for two years as the navigator. During that time, I became a fully qualified deck watch officer and navigated the ship from San Diego to Vancouver Island, BC and out to Midway Atoll in the Northern Hawaiian Islands and back. I completed my sea tour in May of 2018 and was promoted and assigned a land-based support role at the Pacific Marine

Environmental Lab (PMEL) in Seattle, WA; where I am currently located.

I first learned about the NOAA Corps through the Ernest F. Hollings Scholarship. The scholarship is for college students who can apply in their sophomore year. The scholarship is for anyone interested in research related to a NOAA mission, and is therefore quite broad. I fully believe the Hollings Scholarship and my time at the University of Portland snowballed me to where I am now. The scholarship tuition assistance allowed me to study abroad during my Junior fall through IES to Ecuador and the Galapagos Islands. I drew on my experience from the Galapagos and Amazon to write essays for the Truman Scholarship, and in my senior year, I used the Hollings funding to pay for the biology and communications interdisciplinary trip to Eastern Africa. I count that course among one of the most influential classes I took at UP.

To date, I've spent a little over one year (372 days) out at sea supporting NOAA's research missions with the NOAA Corps. Most recently, I've returned from my first buoy deployment and recovery trip to the Bering Sea. I served aboard the contracted *F/V Aquila* as the night-watch deck boss. This means I was directing and coordinating the crane operator and winch operator along with tag-line handlers to safely deploy and recover plankton tow nets and conductivity-temperature-depth (CTD) rosette casts, in the middle of the night. Moorings are dropped to record data for up to two years, and then recovered. The data is downloaded from the instruments and used in the nearly continuous 25-year-and-counting data time series to look at long-term and annual variability.

My work as a NOAA Corps Officer is equally physically and mentally challenging and I am overjoyed with how much I am learning in supporting such fascinating research. On top of working with a world-class lab, I am also brought to a place very few people have the privilege to visit, the Bering Sea. The Bering Sea's notorious reputation, dramatized by "Deadliest Catch", also proved true with 60 knot winds and 10-15 foot choppy waves with 5

Biology Alumni:

Where Are They Now Continued

second periods. Working in the NOAA Corps is best described as long periods of duress and grind punctuated either by pure terror or pure joy.

I consider the tough sacrifices and frustratingly steep learning curve in the NOAA Corps to be worth the cost for the opportunities and training it has afforded me. I've gotten trained as a NOAA diver, a marine firefighter and a GMDSS radio operator. I've been flipped upside down underwater in a simulated helicopter cockpit in the pitch dark and trained to egress. I've sailed the America's Tall Ship *USCGC Barque Eagle* around Cape Hatteras and marched in the Savannah, Georgia St. Patrick's Day parade. I drove the *Reuben Lasker* among a pod of sperm whales in the Northern Hawaiian islands, getting close enough for scientists to take crossbow biopsy samples. I've eaten a raw beating tuna heart. I've worked with PhDs and salty wage mariners. I've learned to adapt to really tough criticism. It's been harder than I could have imagined, yet I'm still glad I decided to take a chance on it.

If you are a student reading this and have any interest in the NOAA Corps feel free to call me and I would be happy to tell you so much more. In the meantime, dig in to what UP has to offer. I can promise that you will graduate and shortly down the road think "college did not prepare me for this!" Don't panic. UP will teach you the most important lesson: how to learn. With this, you will always be well prepared to adapt to the crazy adventures life throws at you.



Information:

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Building 3/ PMEL/EcoFOCI

Office: 206-526-6746

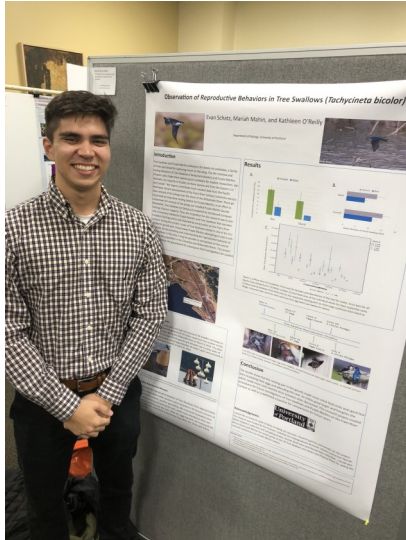
sarah.s.donohoe@noaa.gov

<https://www.pmel.noaa.gov/itae/>

<https://www.ecofoci.noaa.gov/>

University of Portland Poster Session

On Tuesday, October 30th, UP research students gathered in Franz Hall to present posters on their findings. Check out the pictures and posters below to see what some of your fellow classmates are conducting research on!



The Effect of Temperature on the Reproductive Capacity of Tree Swallows

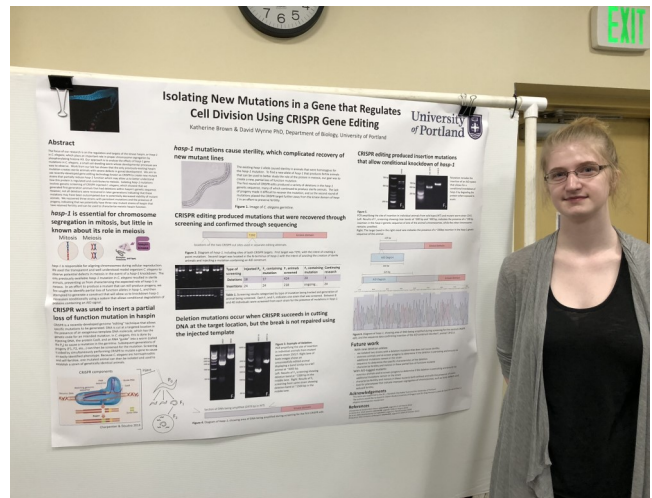
By: Evan Schatz

Faculty Mentor: Dr. Katie O'Reilly

Isolating New Mutations in a Gene that Regulates Cell Division Using CRISPR Gene Editing

By: Katherine Brown

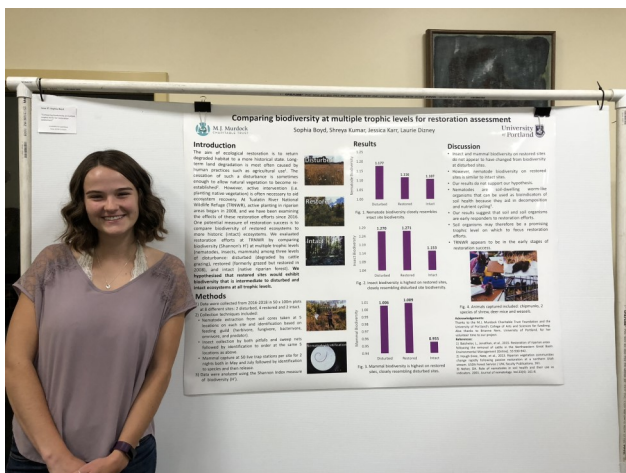
Faculty Mentor: Dr. Dave Wynne

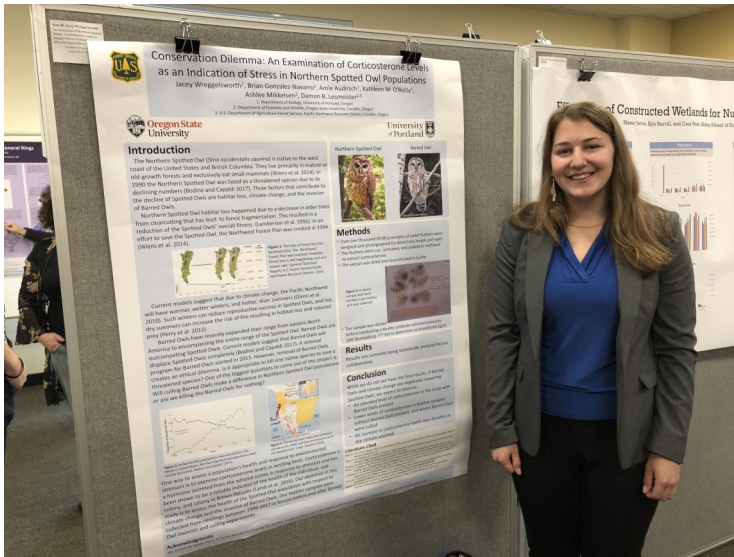


Comparing Biodiversity at Multiple Trophic Levels for Restoration Assessment

By: Sophia Boyd

Faculty Mentor: Dr. Laurie Dizney



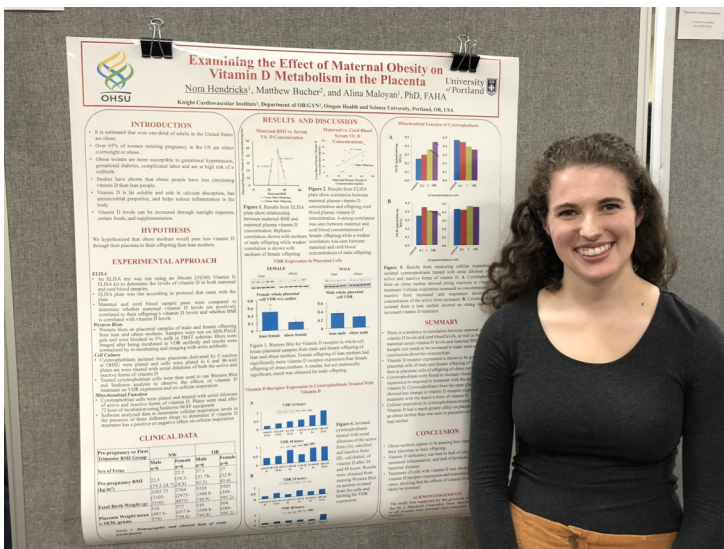
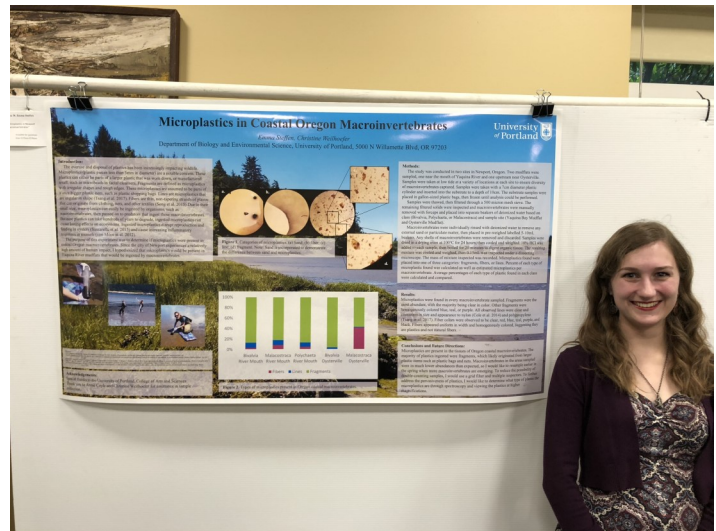


An Evaluation of Northern Spotted Owlets' Corticosteroid Levels to Support Efforts to Design an Effective Conservation Strategy

By: Jacey Wreggelsworth
Faculty Mentor: Dr. Katie O'Reilly

Microplastics in Newport Macroinvertebrates

By: Emma Steffen
Faculty Mentor: Dr. Christine Weilhoefer

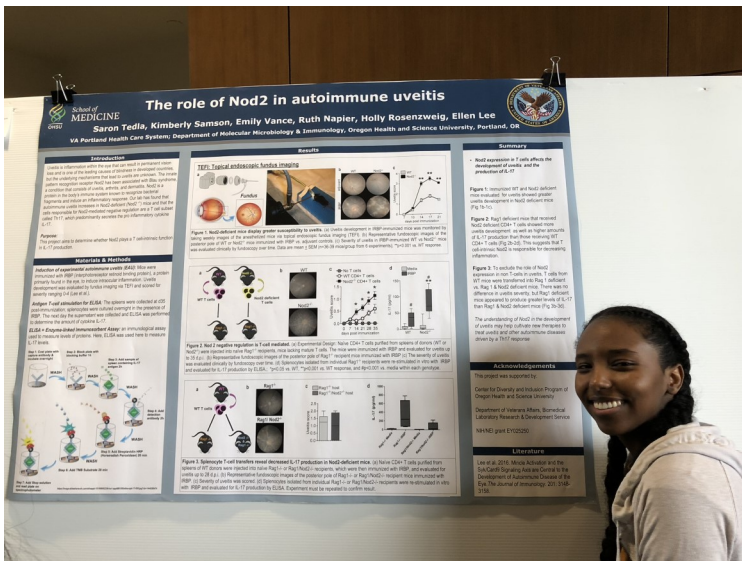
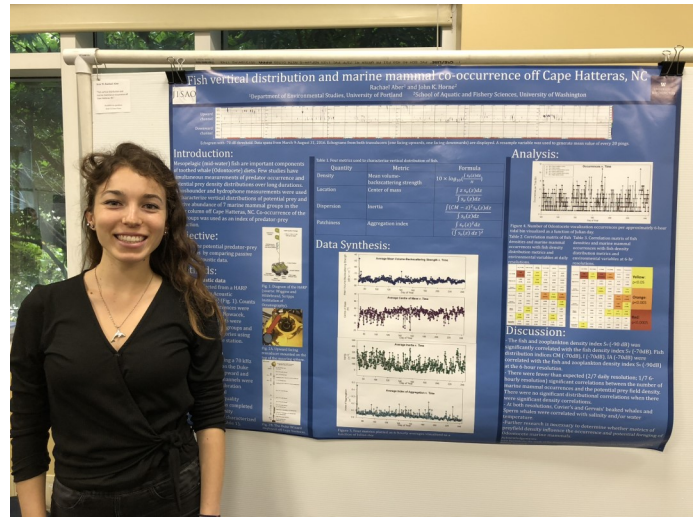


Examining the Effect of Maternal Obesity on Vitamin D Metabolism in the Placenta

By: Nora Hendricks
Murdock Collaborative, OHSU

Fish Vertical Distribution and Marine Mammal Co-occurrence off Cape Hatteras, NC

By: Rachael Aber
JISAO, UW

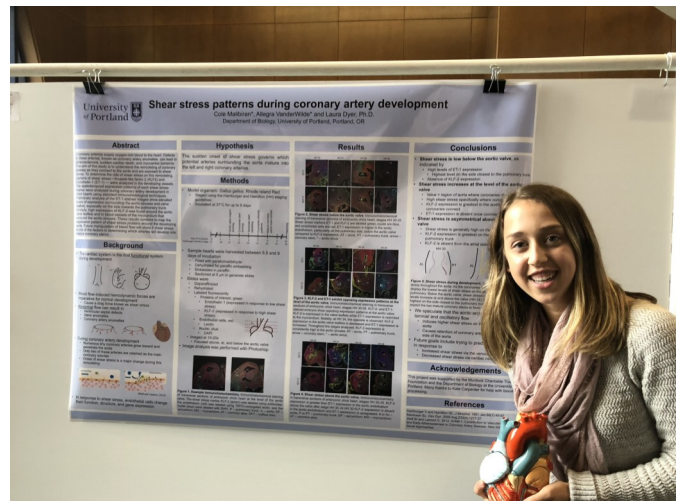


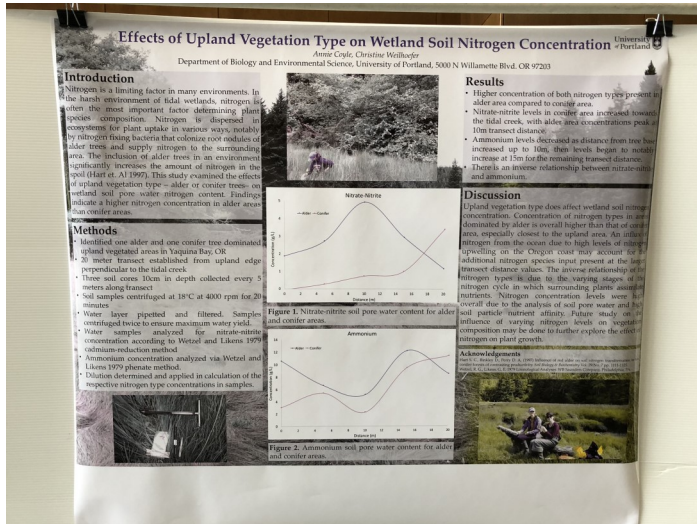
The Role of Nod2 in Autoimmune Uveitis

By: Saron Tedla
Summer Equity Research, OHSU

Shear Stress in the Coronary Arteries

By: Christopher Cole Malibiran and Allegra VanderWilde
Faculty Mentor: Dr. Laura Dyer

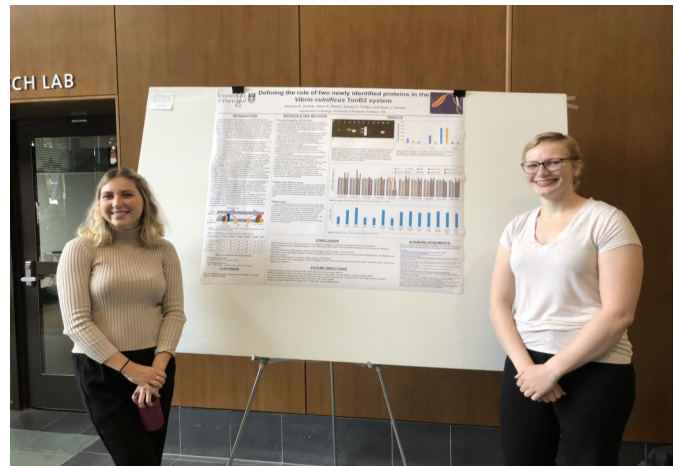
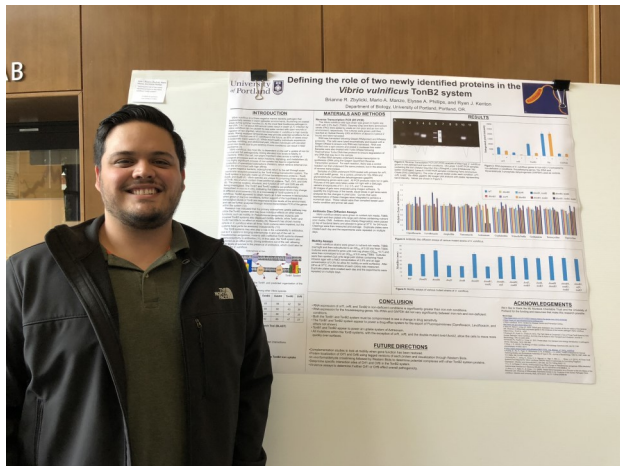




Effects of Vegetation on Soil Nitrogen Concentration

By: Annie Coyle

Faculty Mentor: Dr. Christine Weilhoefer

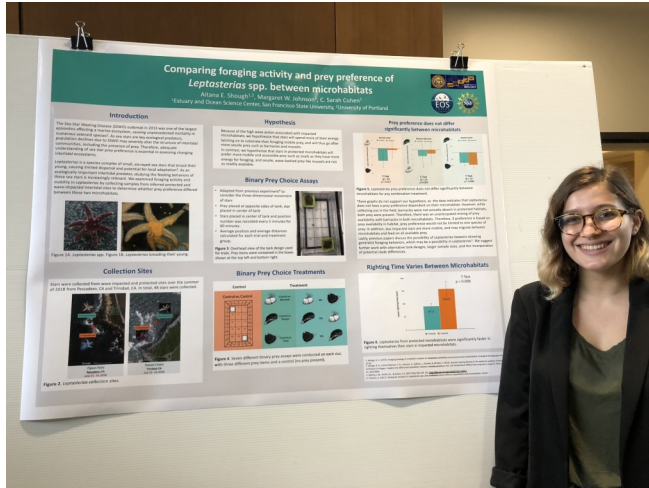


Defining the Role of Two Newly Identified Proteins in the *Vibrio vulnificus* TonB2 System

By: Brianne Zbylicki, Mario Manzo, and

Elyse Phillips

Faculty Mentor: Dr. Ryan Kenton



Comparing Foraging Activity and Prey Preference of *Lepasterias* spp. between Microhabitats

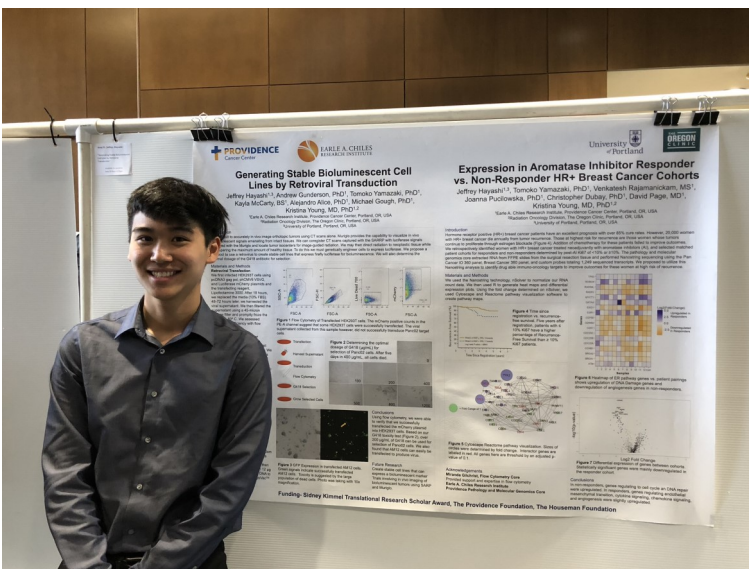
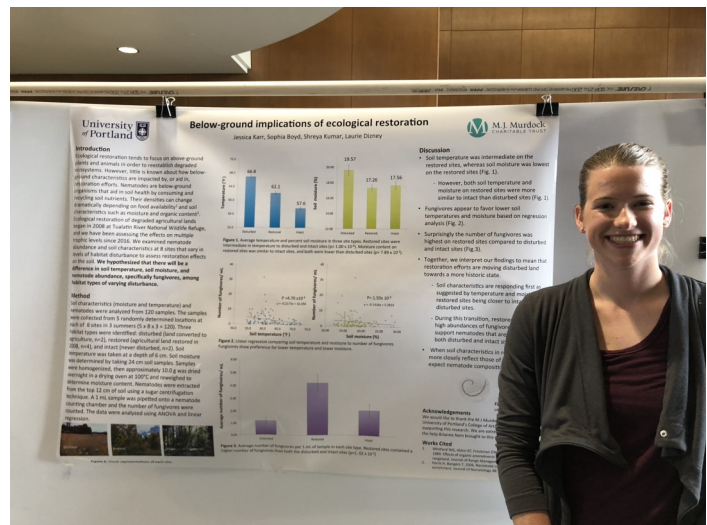
By: Aitana Shough

NSF REU at SFSU

Below-ground Implications for Restoration on Soil Characteristics

By: Jessica Karr

Faculty Mentor: Dr. Laurie Dizney



Generating Stable Bioluminescent Cell Lines by Retroviral Transduction

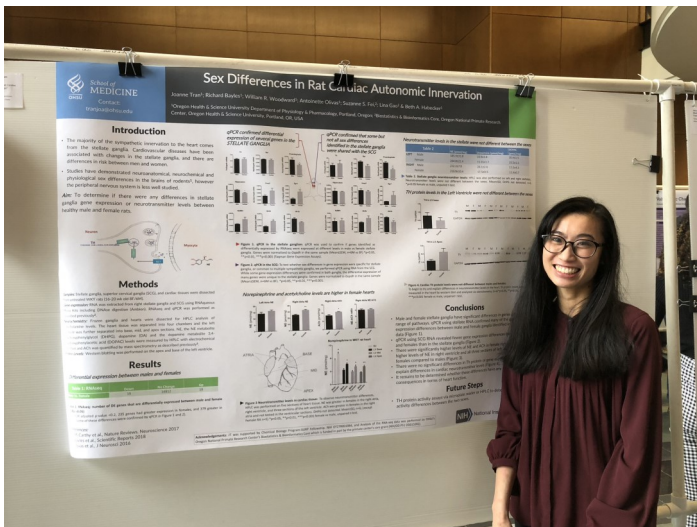
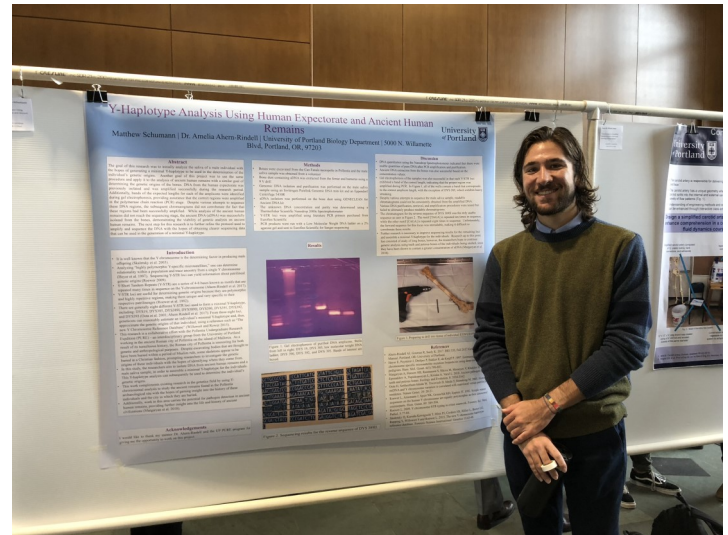
By: Jeffrey Hayashi

Chiles Research Institute

Y-Haplotype Analysis Using Human Expectorate and Ancient Human Remains

By: Matthew Schumann

Faculty Mentor: Dr. Amelia Ahern-Rindell



Sex Differences in Rat Cardiac Autonomic Innervation

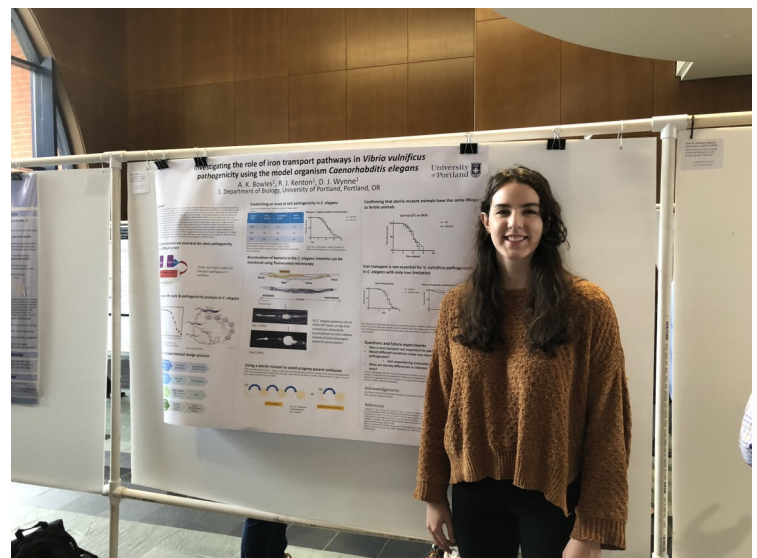
By: Joanne Tran

Summer Undergraduate Research, OHSU

Investigating the Role of Iron Transport Pathways in *Vibrio vulnificus* Pathogenicity Using the Model Organism *Caenorhabditis elegans*

By: Adria Bowles

Faculty Mentors: Dr. Ryan Kenton and Dr. Dave Wynne



New Glass Display Case

Check out the new Biology glass display case located by the front stairs on the first floor of Swindell's Hall. The case contains articles from the latest Newsletter, pictures from recent Biology activities, field trips, Undergraduate Research Conferences, and information about upcoming events.



Upcoming Events

- Cervical Cancer Prevention Workshop on **Tuesday, November 27th at 6:30pm and 8:00pm in Shiley 101.**
- The Biology Club will be taking a trip to Zoo Lights at **6pm on November 30th.**