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“CAPTURING THE ART OF SCIENCE”

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ENTER YOUR BEST RESEARCH IMAGE!

Submit your research image and a brief research description to litwak16@ecu.edu

DEADLINE: Friday, March 27

Winners Announced Mid-April!

Winning Submissions – Public Display & Fun Prizes
Lactate was thought for a long time to be the “dead-end waste product during periods of dysoxia” , but recent studies showed that Lactate plays major and critical roles in many vital processes inside our biological systems such as: angiogenesis, production of Alanine, Gluconeogenesis and Tricarboxylic Acid Cycle (TCA cycle). In this project, I am investigating the effect of Lactate on HUVEC under different acidic conditions. **Image A (Left):** Actin filaments (stress fibers) of endothelial cells overexpressing the pH-sensing G-Protein Coupled Receptor 4 (GPR4), treated with pH 7.4 EGM-2 medium that has no Lactate, stained with Rhodamine-Phalloidin. **Image B (right):** A modified artistic image of the original image, as the grouping cells resulted in an image of a woman praying peacefully and deeply.
Second Place (tie) – Emily Wilson (Graduate Student in Anatomy and Cell Biology)

- I use human induced pluripotent stem cells to produce human cortical spheroids like this one! These 3D cultures mimic human development and provide vast insights into neurodevelopment and disease. I am using them to investigate the regulatory role of the extracellular matrix on synapse formation and function. This 3D spheroid has been fixed, sliced into 10um thick sections and stained for markers of the extracellular matrix (green), cell nuclei (blue) and neural cells (red). Using spheroids such as this one I have shown that manipulation of the extracellular matrix can alter synaptic development and activity.
Host diversity and parasite diversity are tightly correlated, and my dissertation research tests whether we can use parasites as proxies for their hosts, particularly when evaluating the "success" of habitat restoration projects. In the image, you are looking at a number of larval cestodes (tapeworms) sampled from the body cavity of an oyster toadfish (Opsanus tau). There can be thousands of these parasites in a single toadfish. However, these individuals will not become sexually mature adults unless their host, the toadfish, is eaten by a final host, most likely a wading bird or a larger fish.
Third Place – Morgan Milton (Post-doctoral scholar in Biochemistry)

- Protein crystals growing on a fiber. This droplet contains crystals of a protein which controls antibiotic resistance in bacteria. The crystals are used to solve the structure of the protein at an atomic level so that we can better combat antibiotic resistance.
Honorable Mention: Amanda Petritsch  
(Graduate Student in Anatomy and Cell Biology)

- Our research looks closely at how neurons connect with each other and the extracellular environment. We use Total Internal Reflection Florescence Microscopy to examine the fine details of structural protein formations, like focal adhesions, in neurite extensions. This is one of the first TIRF images we captured of β-Actin expression in a neuron after 120 hours of neuronal differentiation.
Honorable Mention: Rohan Parekh (Graduate Student in Pharmacology and Toxicology)

• The image depicted is a 50x image of primary hypothalamic neurons. They were isolated from the hypothalamus of neonatal mice pups and were allowed to grow ex vivo for 14 days prior to immunohistochemical analysis of MAP2 (green-neuron marker).
Honorable Mention:
Samantha Dowiarz (Graduate Student in Biology)

- My current research is aging scales and otoliths (ear bones) of Hickory Shad, an anadromous fish well known to the North Carolina Sport Fishery. I am comparing the aging techniques for another closely related fish, the American Shad, because, unlike Hickory Shad, their numbers are declining rapidly. If their aging techniques are similar, along with other life history characteristics my lab is studying, then Hickory Shad could be a viable research surrogate for American Shad. The picture is of a four year old Hickory Shad otolith, which is about 5mm long (scale bar in the corner), taken using a stereo microscope. These are very fragile and pretty hard to see with the naked eye!
Honorable Mention:
Peter Kann (Graduate Student in Biology)

- A Pine Woods Tree Frog (*Hyla femoralis*) taking shelter from the midday sun beneath the hood of a carnivorous Yellow Pitcher Plant (*Sarracenia flava*), joined by an Eastern Leaf-footed Bug (*Leptoglossus phyllopus*). Many different frog and toad species live in the boggy habitat that pitcher plants thrive in, but tree frogs have toes that are sticky enough to scale the slippery walls of the pitcher’s trap. To these frogs, there’s no danger of falling in and being eaten by the plant, so they make use of the secluded space inside to rest and stay cool. This frog is just a casual member of an entire community of organisms that dwell within the pitcher plant; many of these creatures live there exclusively and have adapted to life inside the trap. My research focuses on a genus of flesh fly within that community (*Fletcherimyia*) and how it may have evolved alongside its carnivorous hosts.
• Zebrafish utilize neuromasts all over their body in order to sense vibrations, pressure changes, and movement in their environment. These neuromasts consist of a cluster of sensory hair cells possessing a mechanically-sensitive stereocilia that convert mechanical information into electrical signals via a collection of proteins known as the mechanotransduction complex. These sensory hair cells have the ability to regenerate if they were to be damaged through age, chemical, or physical means. My research consists of determining the role of the mechanotransduction complex in hair cell death and regeneration, as well as how various mutations affect this regeneration process.
Honorable Mention: Allison Beachum (Graduate Student in Biology)

- There is a complex system of networks working together inside every organism to promote life, especially in the female ovaries during the production of eggs. The Ables Lab sets out to understand different parts of this complex system in the hope to gain further knowledge of how eggs are created. To do this we study fruit fly ovaries, tracking germline stem cells' growth and development all the way to an egg, while manipulating one component of the complex system at a time. In studying these different components, like hormones and nuclear receptors, we are adding to the overall story of oogenesis.