Tristan Henderson

Interactive CV • tristan@protist.info • (979) 236-6837 • [ORCID]

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1. Research Interests ▲

Field protistology
Exploration, characterization, and interpretation of microbial eukaryotic diversity.
Model organism development
Isolating, culturing, and characterizing novel protist lineages.

There is a significant gap between the actual number of described protist species and the total number of protist species on Earth. Most exploratory research in this area relies on broad systematic sampling of protist diversity highlighting novel species. However, this method only reveals novel specie existence, and it does not characterize their morphology. It is inherently difficult to identify, isolate, and culture free-living single cells. Enhancing the discovery process could provide novel model organisms for multiple fields and has potential for interdisciplinary application outside of biology.

Co-interests: Science communication and teaching. Organismal photography and microscopy. Husbandry. Field research and specimen hunting.
Biological subdisciplines: Comparative biology. Eukaryotic microbiology. Field protistology. Molecular biology and biochemistry. Paleontology. Biogeography. Quantum biology.

2. Education ▲

Houston Baptist University [Houston, Texas, United States] *Graduation: 05/2021*
Bachelor of Science - Biochemistry/Molecular Biology

- Honors in Biology – Research in the origin of animal multicellularity.
- Additional coursework in physics and music.
- Researcher, Lab Tech, Mentor, Teaching Assistant, and Tutor

3. Active Educational Initiatives (2021) ▲

Protistory & protist.info – Segment based video series covering the diversity of microbial Eukaryotes. Fully describing the complexity and genre of all protists on Earth. Sourced from the Handbook of Protists and numerous keystone articles. Currently in development along with a database of protist resources at protist.info.

Wikipedia editor - Providing microscopy and text to neglected organism pages since 2018. **[Link]**

4. Briefs of Research Experience ▲

(Current) Hunting potentially novel unicellular relatives of animals in the Gulf of Mexico, which involves isolating parasitic protists from the intestines of marine invertebrates.

Independent research projects:

(Past) Developed a crude tool to explore the locations of ancient Chordates through time and space on Earth by tracing coastlines. Paleobiogeography of cephalochordates. Used R programing and GIS software.

Exploration of natural amphioxus GFP in reproductive behaviors and partially cloned bfGFP genes. Potential discovery of two GFP splicotype products. Amphioxi encode the largest known family of fluorescent proteins with some having near perfect quantum yield.

Found potential sexual dimorphisms in amphioxi dependent on fluorescent proteins. However, this needs to be explored by quantitative experimentation.

Collaborative and mentored projects:

Houston Baptist University | Agnieszka Czopik, Ph.D. | (2017-2019)

Developed the amphioxus into an immunological model organism for ancient chordates and the evolution of adaptive immunity. Husbandry and breeding protocols for the amphioxus and two saltwater algae species. Protocol development to culture and transfect amphioxus tissues with the goal to make immortal cell lines. Lots of cloning. Fluorescent and qPCR experiments geared to locate a site in the gut dedicated to immune system activity.

Baylor College of Medicine | Children's Nutrition Research Center | Davis Lab
United States Department of Agriculture | Texas Children's Hospital | (Summer 2019)

An NIH funded program providing students with experience in research as well as mentorship when applying graduate schools.

One goal of the Davis lab is to figure out how to enhance muscle growth in preterm infants to prevent developmental problems and metabolic disease. I was involved in analyzing muscle samples of preterm piglets from a study about how feeding schedules affect growth using immunohistochemistry.

5. Employment at Houston Baptist University ▲

Teaching Assistantship ([3-4 yrs]) – Frequently bringing real life into the classroom. Protist cultures, various fungi, moss, land plants, arthropods, flatworms, etc. Made virtual labs more interesting with the best microscopy on the internet.

- General Biology 1 Lab (5 Semesters)
- General Biology 2 Lab (1 Semester)
- Immunology Lab (1 Semester)

Tutoring (3 yrs) – *CRLA International Certified*

- Chemistry (Introductory, General, Organic)
- Biology (Introductory, General, Cellular, Genetics, RNA, Immunology, Molecular)
- Physics (Calculus based: Mechanics, E&M, Optics)
- Mathematics (Algebra, Calculus)
- Some music and history classes

Babysitter of nematode worms (Dec. 2019)

Stockroom and Chemical Organizer. Lab technician. (2019-2020)

6. Awards and Honors ▲

◉*National Science Foundation, Graduate Research Fellowship Program* (03/23/2021)
-**Honorable mention**-

◉*Grace Hopper Scholarship:* (Twice: 05/06/2019 and 04/25/2020)
An award of $5000 per year for high achieving students in STEM-related academic programs.

◉*Texas TRIO Association's 2019 Walter O' Mason Scholarship:* (05/10/2019)
$1500 scholarship based on strong academic performance, leadership ability, and community involvement for disadvantaged students and TRIO scholars.

7. Research Presentations ▲

2021 April – South-Regional Tri-Beta Convention, Virtual, *The neglect of microbes (and a potentially novel species of antibiotic resistant marine bacteria isolated from blood worms).* – Oral

2020 October – Gulf Coast Undergraduate Research Symposium, Virtual, Rice University (Houston, Texas) *Hunting Novel Unicellular Relatives of Animals.* – Oral [**International Conference**]

2020 September – Baylor McNair Research Conference, Virtual, Baylor University (Waco, Texas) *What did the first animal look like? Finding novel holozoan protist lineages.* – Oral – Held by judges as excellent in all aspects of presentation.

2019 September – Under the Microscope Series, Houston Baptist University (Houston, Texas), *Feeding schedules and prematurity. Working with pigs and developing muscle immunohistochemistry protocols.* **Invited lecture**, Oral

2019 September – TRIO McNair Research Conference, Baylor University (Waco, Texas), *Localization of immune responsive cells in Floridian amphioxi* - Poster

2019 September – TRIO McNair Research Conference, Baylor University (Waco, Texas), *Four dimensional ancient chordates. Paleobiogeography of amphioxi.* – Oral

2019 September - Capital of Texas Undergraduate Research Conference, University of Texas (Austin, Texas) *Four dimensional ancient chordates. Paleobiogeography of amphioxi.* – Oral

2019 July – Baylor College of Medicine, Texas Children's Hospital, Children's Nutrition Research Center, USDA ARS (Houston Medical Center, Texas) - *Determining if myonuclear accretion and satellite cell abundance are impacted by feeding modality in premature pigs* – Oral

2019 April - Houston Baptist University (Houston, Texas), *Localization of immune responsive cells in Floridian amphioxi* - Poster

2019 April – Regional Tri-Beta Convention (Dallas, Texas), *Localization of immune responsive cells in floridian amphioxi* - Poster

2019 April – Texas Undergraduate Research Day at the Capitol (Capitol building, Austin, Texas), *Localization of immune responsive cells in floridian amphioxi* – Poster **Invited**

2018 October - Representative at a **Nature** Careers Expo booth for Biomed Careers®

2018 March - Regional Tri-Beta Convention (Dallas, Texas), *Creating tools to study amphioxi as model organisms for the emergence of adaptive immunity* - Poster

2018 March - Houston Baptist University (Houston, Texas), *Creating tools to study amphioxi as model organisms for the emergence of adaptive immunity* – Poster

8. Membership in Academic Societies ▲

International Society of Protistologists (ISOP) – Student member

National Biological Honor Society (β β β) – Honors member

American Chemical Society (ACS) – Student member

TRIO SSS – Member with some affiliation to McNair programs

9. Relevant Coursework (BS) ▲

- General Biology
- General Chemistry
- Cell and Molecular Biology
- Organic Chemistry
- Biochemistry
- Bioanalytical Methods
- Genetics
- RNA Biology
- Molecular Biology
- Advanced Cell Biology
- Microbiology
- Neuroscience
- Immunology
- Principles of Physics (Mechanics, Optics, E&M)
- Independent Study: Theoretical Physics