

# Tristan Henderson

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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]

*Anticipated Graduation: 05/2021*

Bachelor of Science (In Progress)

- Major in Biochemistry/Molecular Biology
- Honors in Biology – Research in the origin of animal multicellularity
- Additional coursework in physics and music.
- Class: Senior (Hrs: 114)
- Current GPA: 3.93
- Student Researcher, Lab Tech, Mentor, Teaching Assistant, and Tutor

## 3. Educational Initiatives (2018-2020) ▲

*Underground Science Society* – An organization created for students with disadvantaged backgrounds and those without research experiences during the pandemic. Teaching the language of academia and science: Reading articles, applying to graduate schools, finding research interests, contacting scientists, publishing, science communication and more.

*Protistory* – 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](http://protist.info).

*Journal Clubs* – Led >20 discussions over publications in various fields. Teaching literacy.

*Pandemic Lectures* – Teaching several biology classes virtually.

*Departmental Aid* - Aided students and faculty members with microscopy, supplies, and experiments. Got an interview with Oxford Nanopore and scored a deal if the department buys a minION.

*Mentorship* - Teaching and aiding students in scientific thinking and methodologies. Mentored 5 students in research. Aided several students in their projects.

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

## 4. Briefs of Research Experience ▲

*Independent research projects:*

**(Current)** Developing a system for locating, isolating, and characterizing novel protist lineages. A start by sampling holozoan protist diversity in Texas rivers and developing isolation methods. Aiding research in the origin of animal multicellularity.

*(Past)* Developed a [crude tool](#) to explore the locations of ancient Chordates through time and space on Earth by tracing coastlines. Paleobiogeography of amphioxii. Used GIS software.

Exploration of natural amphioxus GFP in reproductive behaviors and partially cloned bfGFP genes. Potential discovery of two GFP splicotype products. Amphioxii encode the largest known family of fluorescent proteins with some having near perfect quantum yield. I also found potential sexual dimorphisms in amphioxii dependent on fluorescent proteins. However, this needs to be explored by quantitative experimentation.

*Collaborative and mentored projects:*

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

A highly competitive NIH funded program providing students with experience in medical 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.*

\*Was accepted to the University of Iowa evolution REU to do research on beetle antennae diversification before it was canceled. A project termed "Beetlemania." The pandemic got in between me and beetle antennae. Quite disappointing.

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

Developed the amphioxus as a 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.

## 5. Employment at Houston Baptist University ▲

**Teaching Assistantship** (Started in my first year [3 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 (4 Semesters)
- General Biology 2 Lab (1 Semester)
- Immunology Lab (1 Semester)

**Tutoring** (3 yrs) –

- 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 ▲

● *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 ▲

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 amphioxys* - Poster

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

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

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

2019 April – Texas Undergraduate Research Day at the Capitol (Capitol building, Austin, Texas), *Localization of immune responsive cells in floridian amphioxii* – 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 amphioxii as model organisms for the emergence of adaptive immunity* - Poster

2018 March - Houston Baptist University (Houston, Texas), *Creating tools to study amphioxii 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
- ❖ Genetics
- ❖ RNA Biology
- ❖ Molecular Biology
- ❖ Advanced Cell Biology

- ❖ Microbiology
- ❖ Neuroscience
- ❖ Immunology
- ❖ Principle of Physics (Mechanics, Optics, E&M)
- ❖ Independent Study: Theoretical Physics