

# HSC EXPLORE PROGRAM

## Student Application 2023 - DRAFT ONLY

### Block 1

Thank you for your interest in the 2023 HSC Explore High School Research Internship Program.

The deadline to submit this application is 11:59 PM CST on March 31, 2023.

### Default Question Block

Your Name\*

Your email address\*

School\*

What year will you graduate high school?\*

- 2024
- 2025
- 2026
- 2027

Research areas of interest

List of honors or advanced courses taken:

Participation in special academic or research activities:

Awards or honors received:

Extracurricular activities:

Describe the reasons you are applying to this program. Explain how your participation will help you achieve your academic and career goals.\*

Please describe your summer availability.

\* Indicate required questions.

#### Block 4

##### Research Labs at UNTHSC

The following research labs have indicated their interest in hosting HSC Explore Students during Summer 2023. Please read the short descriptions on their research, and then rank the labs in order of your internship preference below.

##### **Cunningham Lab** ([Mark Cunningham, PhD](#))

- The Cunningham Lab research aim focuses on examining the mechanisms of cerebrovascular dysfunction, cardiovascular disease (CVD), and hypertension in women (during pregnancy and postpartum) and their offspring (intrauterine growth restriction (IUGR)). Preeclampsia (PE), hypertension during pregnancy, not only affects the mother's short-term (during pregnancy) and long-term (post-partum) health, but also the health of the neonates into adulthood. IUGR offspring from preeclamptic moms have an increased risk of developing hypertension, CVD, cerebrovascular and cognitive dysfunction. Three key factors that are associated with PE and the pathophysiology associated with IUGR offspring are inflammation, oxidative stress, and mitochondrial dysfunction. Current research in the lab will be to determine if inhibition of inflammation and oxidative stress along with the improvement of mitochondrial dysfunction can improve maternal and fetal outcomes during pregnancy and later in life.

- HSC Explore students will work with other lab members on several projects exploring blood pressure regulation, performing surgeries, western blots, assays, and mitochondria function.

**Gonzales Lab** ([Lauren Gonzales, PhD](#))

- The Gonzales Lab is a paleoanthropology focused lab, with ongoing research investigating behavioral signals (dietary, locomotor, etc) in both living and extinct fossil animals. Much of this work uses 3D technology (CT scans, surface scanners, and 3D models) to study variation in cranial and post cranial anatomy, allowing us to reconstruct past behaviors.
- HSC Explore students will be involved in several activities, including making casts of teeth and bones of 15 million year old fossil primates and also learning to surface scan this same material to create 3D models.

**Inman Lab** ([Denise Inman, PhD](#))

- The Inman lab investigates the role of metabolism in normal and pathological central nervous system function. We examine how neurons and glial cells interact to meet their metabolic needs by assaying mitochondrial function and cellular processes. Our goal is to identify targets for therapy to combat neurodegeneration.
- HSC Explore students can 1) analyze slides of tissue sections using microscopes and images taken on microscopes; 2) learn aseptic technique as practiced with cell culture; 3) analyze proteins and/or mRNA using state-of-the-art techniques.

**Krishnamoorthy Lab** ([Raghu Krishnamoorthy, PhD](#))

- The Krishnamoorthy Lab studies glaucoma. Glaucoma is the leading cause of blindness in the US, While lowering intraocular pressure reduces the progression of the disease, retinal ganglion cell death occurs. Our lab is focused on finding new therapies to protect retinal ganglion cells and prevent blindness due to glaucoma.
- HSC Explore students would be learning a technique called immunohistochemistry. This technique uses specific antibodies tied to fluorescent dyes in order to visualize targets within cells and tissues using fluorescent microscopy. Students will learn the techniques for staining, imaging, and analysis of the images.

Please rank the lab opportunities in order of your interest (1=highest interest; 4=lowest interest).

Cunningham Lab - cerebrovascular dysfunction, cardiovascular disease, pregnancy

Gonzales Lab - primate evolution, 3D imaging

Inman Lab - nervous system function, neurodegeneration

Krishnamoorthy Lab - glaucoma, histology

**Block 2**

The demographic data in the following questions will be used to track long-term trends and to help develop mentoring resources for the HSC Explore Program. All demographics questions are optional.

I identify as...

Female/woman

- Male/man
- Non-binary
- Other

My preferred pronouns are...

- she/her
- he/him
- they/their
- other

To which ethnic group or groups do you belong?

- African, African American, or Black
- American Indian or Native American
- Alaska Native
- Asian or Asian American
- Hispanic, Latino, or Latine/x
- Middle Eastern or North African
- Pacific Islander
- White, Caucasian, European American; not Hispanic
- Other

What is the highest level of education held by one or both of your parents?

- No high school diploma
- High school diploma
- Some college but no college degree
- Associates degree or other 2-year degree
- Bachelors degree or other 4-year degree
- Masters degree
- Doctoral degree (Ph.D., M.D., D.O., J.D., etc.)

How did you find out about the HSC Explore Program?

- Through social media
- Through a teacher or school counselor
- Through another student
- Through the UNTHSC website
- Through a search engine (like Google)
- Other

### Block 3

I affirm that all information contained in this application is true and correct to the best of my knowledge.

SIGN HERE

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clear

### Reminder!

After completing this form, have a teacher, academic counselor, or school

administrator complete the [Intern Recommendation Form](#).

The individual completing the recommendation form should email the form to Katy Heesch (katy.heesch@unthsc.edu) by March 31, 2023.

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