

BRAIN WAVES

UTSA Brain Health Consortium
Official Newsletter

June 2021

WHAT'S INSIDE:

Location Change for the BHC

Campus Reopening Plans

Student Research

2020 Brain Health Consortium Review

Stem Cell Core

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Transdisciplinary Research at UTSA

and much more!

Message from our Director

Summer is here again and I'm looking forward to having more in person activities and on campus events to support our collaborative community of researchers. As we begin to come out of perhaps one of the most challenging times of our lives, our dedicated team of scientists have been persevering towards their research goals. Many of us have spent the better part of last year finding new ways to connect with one another and work together in a collaborative environment. New technologies allowed us to engage with scientists around the world. We discovered the importance of promoting our own physical and emotional health so that we can pursue our brain health research to benefit others. This is the second edition of UTSA's Brain Health Consortium newsletter. As we continue to emerge from the pandemic, I anticipate many exciting developments in the year ahead.

Please feel free to pass along news items or suggest improvements by email:

BrainHealth@utsa.edu



Dr. Jenny Hsieh

**Professor and Semmes Foundation Distinguished Endowed
Chair in Cell Biology, Department of Biology (COS)**





WE'VE MOVED!

A lot has happened since our last update, including the completion of the new home for the Brain Health Consortium, the **Science and Engineering Building (SEB)**.

The SEB was completed in the Summer of 2020 and is currently the largest construction project in UTSA history. This groundbreaking building was designed with innovative and fresh ideas on how research can be conducted to foster a more open, collaborative environment.

One of the key features behind the SEB design was to bring together students, faculty, and staff from all disciplines to advance UTSA's Brain Health Initiative. Looking at the 4th floor that the Consortium calls home and seeing the thousands of square feet of open lab design, you can see the potential waiting to be tapped in these shiny glass walls.



CAMPUS REOPENING PLANS

UTSA strives to protect its community by offering the most informed and conscientious plans for action that can be arranged based on a wide variety of informative sources. In doing so, official announcements concerning the details of a full return to operations have been delayed for the time being.

However, Roadrunners have been assured by President Eighmy that "UTSA will be open this fall with a semester crafted for personalized, impactful student learning experiences and the safety of all Roadrunners."

Main items of interest that are already being put in place to move forward:

UTSA's academic calendar for this fall will not change

An extensive set of public health safety measures are being implemented

Student Housing, Libraries, Campus Rec, and the Student Union will be available

Return-to-work modalities are being explored for staff and faculty

The entire semester is designed to be highly adaptable

For more information: <https://www.utsa.edu/strategicplan/initiatives/campus-reopening/updates/>

TRANSDISCIPLINARY RESEARCH AT UTSA



Stem Cells and Precision Medicine

Dr. Melanie Carless (COS) is focused on identifying genetic and epigenetic factors that increase risk for complex diseases, such as mental illness. Currently, she is interested in how brain-enriched epigenetic signatures might be modulated during neurodevelopment to impact risk for bipolar disease. She and her lab plan to identify differences in hydroxymethylation profiles between cortical spheroids derived from individuals with bipolar disorder and those without any history of mental illness. For more information: <https://www.utsa.edu/bhc/about/members.html>



Neuroengineering

Dr. Gabriela Romero Uribe (COE) is focused on developing exclusive nanotechnologies to manipulate cellular signals and behaviors. These nanotechnologies are centered in engineering soft magnetic nanomaterials for applications in wireless neuromodulation, nerve regeneration and drug delivery.

For more information: <https://engineering.utsa.edu/guribe/>



Neuroscience

Dr. Isabel Muzzio (COS) is using tiny microscopes embedded in a mouse's brain to evaluate neural activity within the hippocampus. This brain region is important for making memories and making a map of your location. Her team hopes to understand how this part of the brain is affected in Alzheimer's disease and during aging.

For more information: <https://www.utsa.edu/biology/faculty/IsabelMuzzio.html>

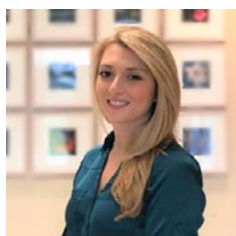


Psychology and Behavior

Dr. Edward Golob (HCAP) studies two lines of research in the auditory arena. Auditory attention (particularly spatial awareness in regards to the origin of a sound) and the study of relationships between auditory perception (recognizing speech versus music). Both of these share a common theme in how other cognitive systems (attention, memory, and perception and reaction) interact with sensory processing in the auditory system. This research can be applied to the study and potential therapies for neurological disorders such as Alzheimer's and speech fluency disorders like stuttering. For more information: <http://www.golobcogneurolab.org/>

SPOTLIGHT ON STUDENT RESEARCH: COVID-19 and the Brain

Courtney McMahon

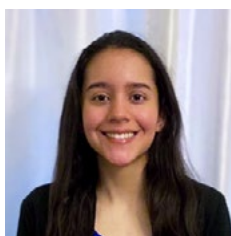


(Cell and Molecular Biology PhD student) Courtney is focused on the effects of maternal exposures during pregnancy on the developing fetal brain using a unique laboratory model called an organoid. She has

leveraged this technique to create brain organoids to assist in a groundbreaking study that suggests COVID-19 can impact and enter the human brain via glial cells, which are a multifunctional set of brain cells involved in nerve communication as well protecting the brain from infection and chemical harm. For more on the study please see:

<https://www.utsa.edu/today/2021/02/story/coronavirus-brain-infection-study.html>

Mariah Antopia



(UTSA undergraduate) Mariah is a biology major in the ESTEEMED program conducting neuroscience research. She was recently awarded the Goldwater Scholar for Research Excellence, one of

the most prestigious national scholarships awarded to undergraduate students in research. Mariah's research involved looking at molecules that could help SARS-CoV-2 infect the brain. For more information on Mariah and the other Barry Goldwater Scholars at UTSA:

<https://www.utsa.edu/today/2021/04/story/goldwater-scholars-named-2021.html>

BHC SEED GRANT AWARD WINNERS

FY2021 Faculty Awardee	Dr. Matthew Wanat	The role of VTA astrocyte-neuron interactions in drug addiction
FY2021 Faculty Awardee	Dr. Melanie Carless	Hydroxymethylation Patterns of Cortical Spheroids Across Neurodevelopment

The Brain Health Consortium (BHC) Collaborative Seed Grant (CSG) program, sponsored by the Office of the Vice President for Research, Economic Development, and Knowledge Enterprise (REDKE) at The University of Texas at San Antonio (UTSA), is offering seed grants to support collaborative research at UTSA.

These grants support a broad range of trans-disciplinary research that may yield fundamental insights into the mechanisms underlying brain disorders.



SPOTLIGHT Q&A: Dr. Sonal Goswami



Dr. Sonal Goswami is investigating the cellular and network physiology underlying epilepsy in the lab of Dr. Jenny Hsieh.

She is looking at the underlying causes of both acquired and genetic origins by manipulating adult-born granule cells involved in seizure-related phenotypes and developing assays to use in “disease-in-a-dish” models of genetic epilepsy. Her research interests include epilepsy, stem cells, and electrophysiology.

Tell us how you first got involved in brain research?

It all started in AP Psychology class, where the teacher referred to the limbic system as “the seat of emotion”. I was amazed that a collection of cells could be responsible for generating our most subjective feelings. I made sure to attend a University where I could obtain an undergraduate degree in Neuroscience and luckily found such a place near home at the University of Texas at Dallas.

This is where I was first exposed to whole-cell patch-clamp techniques in Dr. Tres Thompson’s lab, where a graduate student was recording activity from individual neurons in the hippocampus. I was amazed to see what nerve impulses looked like and how these responses change with different types of manipulations done on living cells.

What has surprised you the most about working with the brain?

To understand such a complex system, you have to use an interdisciplinary approach.

What would you tell someone who is thinking about pursuing a research career?

“...1% inspiration, 99% perspiration” - Thomas Edison

FUNDING IN BRAIN HEALTH



Read about the Oskar Fischer Prize opportunity to expand understanding of Alzheimer’s disease at:

<https://oskarfischerprize.com/>

Entries have been closed and are under review as of Spring 2021. Announcement of Winners coming soon, stay tuned!

UTSA

Aug 18, 2020

2020 IN REVIEW

Dr. Nicole Wicha named a Fellow in the National STEM Academy based on her innovative research, her passion for mentoring and her impact and influence on brain health research.

Dr. Wicha is the director of the UTSA Laboratory for Brain, Language and Cognition and a member of the graduate faculty in neurobiology. She joined the faculty in 2005, adding unique interdisciplinary expertise in the neurobiology of human language and math cognition, with a special focus on the bilingual brain.

For more information about Dr. Wicha: <https://www.utsa.edu/biology/faculty/WichaLab/>



Nov 12, 2020

2020 Fall Neuroscience Symposium

The Brain Health Consortium's own Dr. Lindsey Macpherson was host to an esteemed scientific panel of researchers covering several areas of scientific interest, all come together to discuss the 'gut-brain axis'.

This emerging area of study is gaining significant interest and fundamentally changing the way we think about connections between mind and body. The panel was incredibly informative and thought provoking.



Nov 30, 2020



Hats off to Dr. Sandeep Vellanki, who as a graduate student in Biology secured a Seed Grant from the Brain Health Consortium to help further his studies on the link between fungal infections and neurodegenerative disorders.

Sandeep is a shining example of how interdisciplinary approaches are the key to brain health research and innovation. He will be taking his PhD in Cell and Molecular Biology from UTSA to continue his infectious fungi research as a postdoctoral fellow at the prestigious Geisel School of Medicine at Dartmouth College.

UTSA: STEM CELL CORE

WHAT WE DO

Derivation of iPSCs from skin and blood samples.

Reprogramming using episomal vectors or Sendai virus expressing OCT4, SOX2, KLF4, and c-MYC.

Customized projects including differentiation protocols, organoid generation and CRISPR/Cas9-based gene editing.

Access to a streamlined, IRB-approved consenting process for acquisition of patient samples and phlebotomy services.



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Wolf Cytometer and N1 Single Cell Dispenser

The Wolf cytometer and N1 single cell dispenser uses low pressure microfluidic sorting allowing sensitive cells to be sorted in their native media and the low pressure helps to assure their viability.

The Wolf cytometer is able to detect 3 fluorescent colors simultaneously along with back and forward scatter. In addition to bulk sorting the N1 single cell dispenser allows for as little as one cell to be plated into each well of a 96 or 384 well plate.

CyBio® FeliX

The CyBio FeliX is a flexible, programmable pipetting liquid handling station. The FeliX is housed in a Biosafety cabinet for use with BSL-2 samples.

In the current configuration it can pipette 96 wells simultaneously but can also pipette from 1-8 wells at a time expanding the flexibility and it can pipette from and into 24, 96 and 384 well plates. It has 12 deck positions allowing for complex experimental design or multiple plate feeding.

UTSA: GENOMICS CORE

WHAT WE DO

Prepare and sequence DNA libraries for Next Generation Sequencing (NGS) applications.

Process whole genomes, transcriptomes, epigenomes and more.

Expertise in bacterial genome assembly and mammalian single-cell genomics.

Provide cutting edge technology and services to maximize successful results.

CONTACT US

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NEW COURSES FOR FALL 2021!

Space and Time in the Brain (Undergrads and Graduates)

Graduates
BIOL 6973

CRN: 17749 Fall 2021 T 4:00- 5:15pm Online

Undergrads.
BIOL 4953

CRN: 19829 Fall 2021 T 4:00- 5:15pm Online

When you navigate a familiar environment, you don't need a map because the map is already in your brain. But where in the brain? And how can networks of neurons conjure up a map of your surroundings? This course covers what we currently know about these questions from animal and human studies. You will learn about place cells, grid cells, and other spatial cells found within and beyond the hippocampal formation.

Recently, scientists have observed that these cells also appear to signal the passage of time, suggesting that the brain uses common mechanisms to process space and time while forming memories.

BIOL 4953- Brain Diseases

CRN: 19830

Fall 2021

MW 10:00- 11:15 am

Main Campus

A study of selected major brain diseases and neurological disorders, their underlying causes and treatments, with an emphasis on molecular mechanisms.

Scheduled Topics

Down syndrome, Fragile X syndrome, ADHD, Autism spectrum disorders, Schizophrenia, Anxiety, Depression, Prion diseases, Alzheimer's diseases, Parkinson's disease, and many more.

SPECIAL THANKS TO OUR BHC DONORS:

BAPTIST HEALTH FOUNDATION OF SAN ANTONIO
THE BROWN FOUNDATION
THE LOWE FOUNDATION
THE MAX AND MINNIE TOMERLIN VOELCKER FUND
THE MINDFULL FOUNDATION
THE PERRY & RUBY STEVENS CHARITABLE FOUNDATION
ROBER J. KLEBERG, JR. AND HELEN C. KLEBERG FOUNDATION
SEMME'S FOUNDATION

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UTSA

Brain Health Consortium

Committed to research and student success