

# BRAIN WAVES

Official newsletter of the UTSA Brain Health Consortium

SPRING 2020



*What's inside:*

- *Featured research projects*
- *Student research*
- *Seed grant awardees*
- *New faculty*
- *Community outreach*
- *Stem Cell Core*

**UTSA**<sup>®</sup>  
Brain Health  
Consortium

# Welcome from the Director

As summer approaches and we adjust to the “new normal”, I look back on an exciting two years since arriving at UTSA. Thanks to the bold vision of UTSA’s leadership, we set out to establish a collaborative community of researchers with expertise in stem cells and precision medicine, neuroscience, neuroengineering, and psychology and behavior. By sharing expertise, we hope to discover the inner workings of the brain, with the common goal of applying this knowledge to prevent and treat neurological disorders. This is the first edition of UTSA’s Brain Health Consortium newsletter. We will be sending this out at regular intervals in an effort to keep everyone updated of events and accomplishments related to the Brain Health Consortium.

Please feel to pass along news items or suggest improvements by sending an email to [BrainHealth@utsa.edu](mailto:BrainHealth@utsa.edu).

Sincerely,  
Jenny Hsieh  
Director



## Facts and Figures

Faculty and Staff

**60+**

Total faculty and staff from UTSA departments, centers, and facilities affiliated with the Brain Health Consortium

UTSA Cross-College Teams

Colleges:

- Sciences
- Engineering
- Language & Fine Arts
- Education and Human Development
- Health, Community, & Policy

Institutes/Centers/Cores:

- Neurosciences Institute
- Autism Research Center
- Center for Innovative Drug Discovery
- Stem Cell Core
- Genomics Core

Collaborating Institutions



Areas of Research

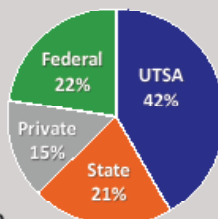
1. Brain development and dysfunction (epilepsy, autism)
2. Neuropsychiatric disorders (bipolar disorder, addiction)
3. Neurodegenerative diseases (Alzheimer’s disease, Parkinson’s disease)
4. Military brain health and traumatic brain injury

Total Research Impact

**\$ 18** million expenditures

**200+** Peer-reviewed journal articles, book chapters, and other professional papers

>**\$ 50** million expenditures by 2030



Contact us!

[utsa.edu/bhc/](http://utsa.edu/bhc/)

@UTSABrainHealth

#utsabrainhealth

[BrainHealth@utsa.edu](mailto:BrainHealth@utsa.edu)

Phone: (210) 458-7024

Fax: (210) 458-4061

BHC Operations Manager:  
Mary-Colette Lybrand, MS



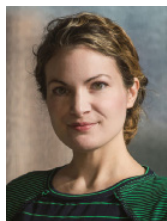
# Transdisciplinary Research at UTSA

## Stem Cells and Precision Medicine



Dr. Doug Frantz (COS) is collaborating with the UTSA Stem Cell Core to investigate how cells infected with SARS-CoV-2 react to different chemical compounds. By using organoid models, Dr. Frantz works to identify potential treatments for the ongoing coronavirus pandemic. Research with 3D stem cell models, complemented with laboratory testing, aims to take bold steps in examining the effects of chemical compounds in a “disease-in-a-dish” model of the human tissue. <https://www.utsa.edu/today/2020/04/story/frantz-doug-coronavirus-drug-research.html>

## Neuroengineering



The Quantu Project, led by Dr. Amina Qutub (COE), uses computational methods to analyze large amounts of daily behavioral data in combination with cellular and molecular information to predict how diseases will progress in the body, and identify ways to slow or stop their progression. Focusing on neurodegenerative diseases, test subjects will wear activity trackers allowing researchers access to vast amounts of data that can be correlated to neurological function.

<https://www.qutublab.org/>

## Neuroscience



Dr. Alfonso Apicella (COS), is using cutting-edge technology to investigate how the amygdala part of the brain functions during post-traumatic stress disorder, anxiety, depression, and Alzheimer’s disease. His team hopes to understand how this part of the temporal lobe processes emotions, in order to map pathways of neural circuits. This information is important for developing therapeutics for numerous psychiatric disorders. <https://www.utsa.edu/today/2019/11/story/brain-amygdala.html>

## Psychology and Behavior



Dr. Leslie Neely (COEHD) leads The San Antonio Applied Behavior Analysis Research Consortium (SAABA), a collaboration between the Autism Treatment Center, The Children’s Hospital of San Antonio, and the UTSA Department of Educational Psychology. In addition to clinical services, the SABAA Research consortium houses a number of labs advancing the scientific understanding of human behavior from a behavior analytic framework.

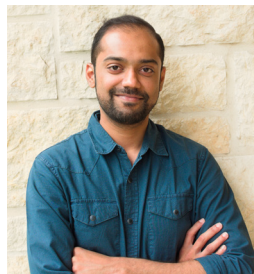
<https://sites.google.com/view/saaba/home>

# Spotlight on Student Research: Alzheimer’s Disease



*Kaisha is a member of Dr. Jenny Hsieh’s laboratory, Department of Biology*

Kaisha Meyer (Neurobiology PhD student, RISE student) is focusing on the ApoE4 allele, which is the major genetic risk for developing Alzheimer’s disease. Using brain organoids derived from patients with the ApoE4 allele, Kaisha will study mechanisms that make neurons more vulnerable to degeneration and death.



*Sandeep is a member of Dr. Soo Chan Lee’s laboratory, Department of Biology*

Sandeep Vellanki (Cellular and Molecular Biology PhD student) has two major focuses in his research - 1) the molecular mechanisms involved in fungal dimorphism and host-pathogen interactions, and 2) role of gut microbiota in the development of Alzheimer’s disease. Specifically, he is interested in the causative role of commensal fungi *Candida albicans* in Alzheimer’s disease.

# BHC Seed Grant Awards

The Brain Health Consortium announced seed grant awards in the 2018 and 2019 cycles of \$15,000 per award for graduate students and postdoctoral fellows. Priority was given to applications that focused on the BHC's research areas, including 1) stem cells and precision medicine, 2) neuroscience, 3) neuro-engineering, and 4) psychology and behavior, and involving use of the UTSA stem cell core. "A key component of the BHC is supporting our graduate students and postdocs in

meaningful and substantive ways," explained Jenny Hsieh, director of the UTSA Brain Health Consortium. "We created this funding opportunity in our first year to spark and encourage our trainees to explore new ideas and new lines of inquiry in our field. Aligning with the institution's strategic priorities, our goals were also to improve student success and the student experience, and increase research productivity to further our Carnegie R1 aspirations."

Student/Post-doc	Faculty Mentor	Project Title
<i>2018 Awardees</i>		
Francisca Acosta	Dr. Christopher Rathbone (COE)	Cerebral Organoid Augmentation using Intact Microvascular Fragments
Md Musaddaql Hasib	Dr. Yufei Huang (COE)	Characterize Signatures of Electric Signals in Human Epileptic Organoids using Deep Learning
Megan Mahlke	Dr. John McCarrey (COS)	Evaluating Pluripotency Using High-throughput Gene Expression Assays in Baboon ESCs and iPSCs
Solaleh Mirar	Dr. Teja Guda (COE)	Promoting Neuromuscular Function during Muscle Regeneration using Materials Based Biophysical and Biochemical Stimulation
Dr. Erin Pollet	Dr. Amina Qutub (COE)	Correlating Behavioral Changes and Activity to Cellular Changes in Alzheimer's Patients: A Quantu Project
Borna Sarker	Dr. Astrid Cardona (COS)	Generation of iPSC-Derived Retinal Organoids from Humanized CX3CR1 Variant Receptor Mice to Understand Mechanisms of Neuronal Damage
<i>2019 Awardees</i>		
Eden Crowsey	Dr. Alicia Swan (COLFA)	The Importance of Visual Deficits in Rehabilitation after Traumatic Brain Injury
Dr. Arun Das	Dr. Leslie Neely (COEHD)	Intelligent Augmented Reality (IAR) Learning for Children with Cognitive Disabilities: A Way of Rethinking Teaching and Learning Pattern
Frank DeLuna	Dr. Jing Yong Ye (COE)	Multiplex Biosensing of Neural Organoids Modeling Traumatic Brain Injury
Bryan Fowler	Dr. Lindsey Macpherson (COS)	Vagal Innervation of the Stomach and Duodenum
Brian Moy	Dr. J. Seshu (COS)	Pathogen-host cell interactions leading to neuroborreliosis
Sandeep Vellanki	Dr. Soo Chan Lee (COS)	Elucidating the role of Candida albicans in Alzheimer's disease

## Spotlight Q&A: Brain-Inspired AI

In Fall 2019, Dr. Dhireesha Kudithipudi (Professor, Robert F McDermott Endowed Chair, Director of AI Consortium) joined UTSA in the Department of Electrical and Computer Engineering. Her research interests are in neuromorphic computing, brain inspired neural algorithms, novel computing substrates, energy efficient machine intelligence, and AI-on-Chip.



What is your area of expertise?

Building next generation AI organisms and systems

What are top research questions?

- How can neural processing develop new AI algorithms?
- How can we deploy AI in the most energy efficient way?
- How can we build life-long learning systems?

What are interesting interdisciplinary ideas for your research interests in brain health?

AI has become more mainstream, and there are more opportunities for collaboration between biological neuroscientists and computational researchers. I'm inspired by the questions to be asked out of the boundaries of both disciplines, specifically - (1) How can your understanding of the brain give us new AI algorithms,? (2) Can AI help neuroscientists understand the brain at a deeper level?

(Lab website: <https://www.nuailab.com/>)

## New BHC Faculty



Dr. Anthony Burgos-Robles  
Assistant Professor, Biology, COS  
Research area: cortico-amygdala circuits, chronic stress and behavior



Dr. Melanie Carless  
Associate Professor, Biology, COS  
Research area: genetic and epigenetic factors in psychiatric disorders

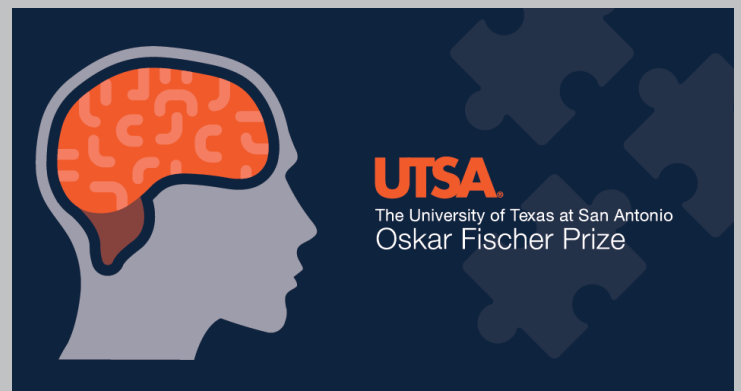


Dr. Francesco Savelli  
Assistant Professor, Biology, COS  
Research area: neural and computational basis of navigation

## Funding in Brain Health

Sign up to connect with potential grants and collaborators via Pivot. New opportunities are available weekly: [Brain Health Consortium](#). For more info on Pivot and connecting to funding, contact [Liana.Ryan@utsa.edu](mailto:Liana.Ryan@utsa.edu)

## Oskar Fischer Prize



Read about the Oskar Fischer Prize opportunity to expand understanding of Alzheimer's disease on [UTSA Today](#). Call for entries is now open! For more info on the OFP, contact [Roxana.Richardson@utsa.edu](mailto:Roxana.Richardson@utsa.edu)

# 2019 in Review: BHC Community Outreach



## *January 8, 2019 - Faculty Workshop*

To kick off the BHC's effort toward building teams, the 1st BHC Investigator's Workshop was held with scientists from COS, COE, COEHD, and COLFA. The objective of the meeting was to: (1) allow faculty to give a presentation of their research topics, (2) identify areas of synergy /collaborative opportunities, and (3) discuss ways to interact and how the BHC can serve to enhance team science.

## *April 10, 2019 - Distinguished Lecture*

The UTSA Brain Health Consortium and Neurosciences Institute hosted Dr. Brian Kaspar as the 2019 Distinguished Public Lecture speaker. Dr. Kaspar's research on single-dose spinal muscular atrophy (SMA) gene therapy has informed an ambitious new strategy for a one-time, foundational gene-replacement therapy designed to repair the genetic root cause of SMA Type 1 in humans.



## *May 28, 2019 - Scholars Speaker*

In 2019, UTSA was proud to present its 50th Anniversary Scholar Speaker Series, which was free and open to the public. Dr. Jenny Hsieh, UTSA Professor of Biology, presented a discussion "Gene Editing, Precision Medicine, and the Ethics of Designer Babies." This talk engaged the community for the good, the bad, and the ugly of gene editing as a new tool to fix genetic mutations.

Special thanks to our BHC Donors:

The Brown Foundation  
Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation  
The Lowe Foundation  
The MindFull Foundation  
Semmes Foundation  
The Perry & Ruby Stevens Charitable Foundation  
The Max and Minnie Tomerlin Voelcker Fund

# Info about the 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.
- Discounts for grant applications, first time clients, and bulk orders. Please contact the Stem Cell Core for an individualized price plan.

## CONTACT US

### **Stem Cell Core**

The University of Texas at San Antonio  
One UTSA Circle  
San Antonio, TX 78249

Phone: 210.458.6497

E-mail: Christopher.Navara@utsa.edu  
utsa.edu/bhc/core/stem-cell-core

Twitter: @UTSABrainHealth



Stem Cell Core Survey -  
We'd like to hear from you!

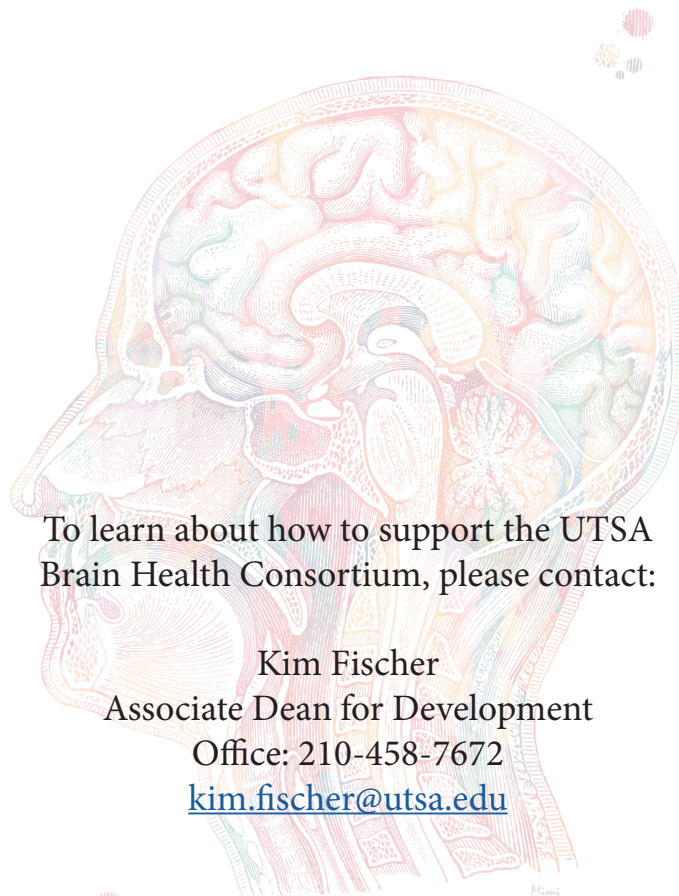
We invite you to participate in a survey about your experiences, needs, and use of the UTSA Stem Cell Core. In 2018, the University of Texas at San Antonio (UTSA) established a UT-system core facility for the generation of human iPSCs. We offer a streamlined, IRB-approved consenting process for acquisition of patient samples and creation of iPSC lines for basic and preclinical research.

The purpose of this survey is to gauge the current and past impact of the UTSA Stem Cell Core and understand user needs.

To participate, please click this link:

[https://utsa.az1.qualtrics.com/jfe/form/SV\\_8kRYC1wFrt07ehD](https://utsa.az1.qualtrics.com/jfe/form/SV_8kRYC1wFrt07ehD)





To learn about how to support the UTSA  
Brain Health Consortium, please contact:

Kim Fischer  
Associate Dean for Development  
Office: 210-458-7672  
[kim.fischer@utsa.edu](mailto:kim.fischer@utsa.edu)

**UTSA** Brain Health Consortium