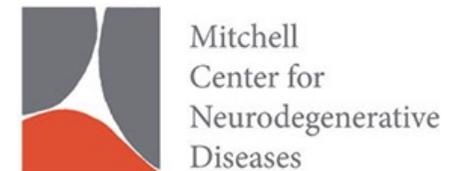


Mitchell Center for Neurodegenerative Diseases

Agenor Limon, MSc, PhD. Director
Simone Guillory, Business coordinator
March 27, 2025



Working together to work wonders



Mitchell Center for Neurodegenerative Diseases

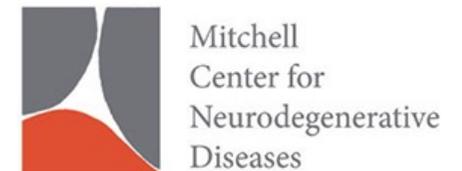


Mission statement:

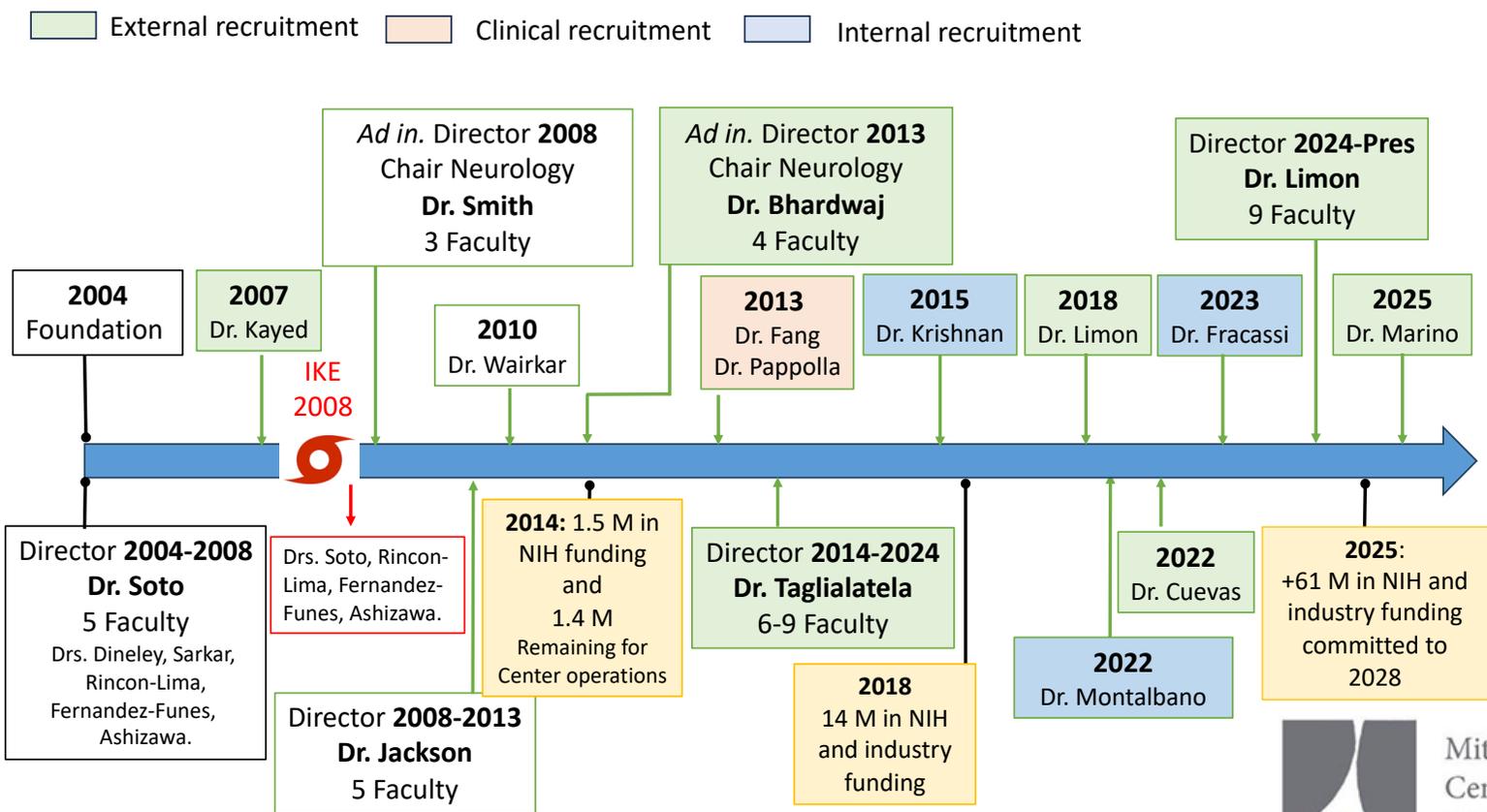
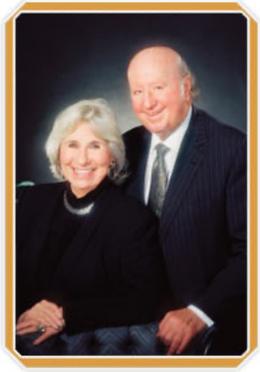
“To promote human health by developing innovative therapeutic approaches for neurodegenerative disorders through investigating and understanding the underlying cellular and molecular pathophysiological mechanisms”



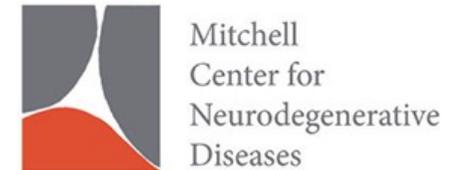
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Timeline



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Organizational structure



Anish Bhardwaj, M.D., M.B.A., M.S. (Lead.), M.S. (Comm.),
CPE, FACMPE, FACHE, FAHA, FCCM, FAAN, FANA
Chair of Neurology Department



Agenor Limon, MSc, PhD
Director Mitchell Center
Vice Chair of Research



Ms. Simone Guillory
Business coordinator

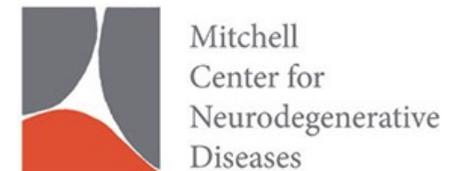
Values:

**Innovation, discovery-driven, translational focus,
collaborative spirit, excellence in teaching and
mentoring**

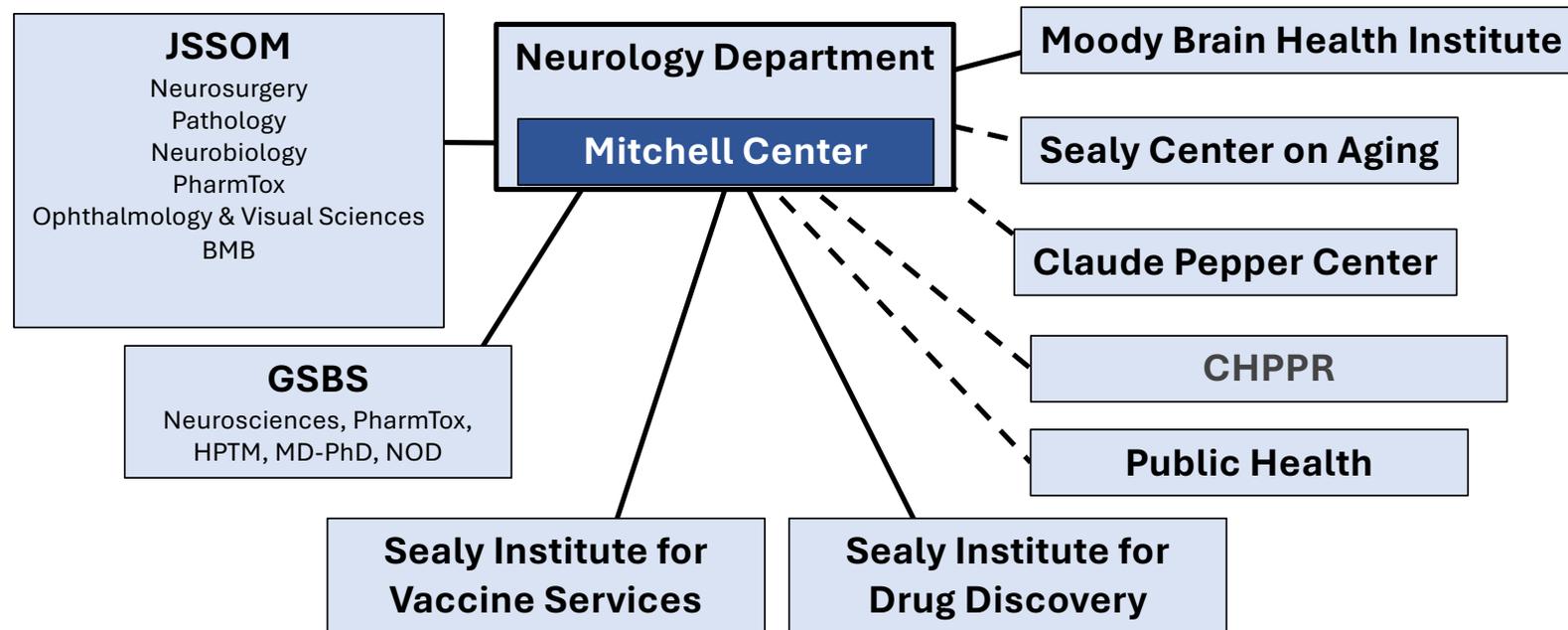


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4 Full Professors, 2 Associate Professors, 4 Assistant Professors



Synergy within UTMB

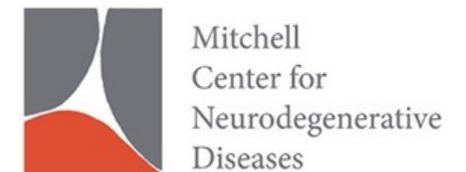


Extramural funding at glance



2018-2024

- 17 R01
 - 6 R21
 - 2 RF1
 - 3 R56
 - 1 R43
 - 1 U24
 - 4 F31
 - 1 T32
 - 4 Alzheimer's Assn & Foundation funds
- \$61.6 M**



Unique Research Strengths



Global leader in basic and translational research on disease-relevant polymorphs in AD/ADRD



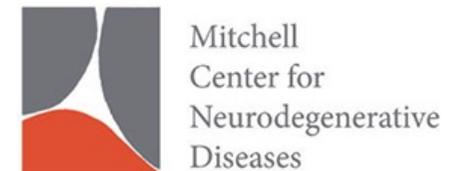
Strong multidisciplinary research program in neuroinflammation and resilience to Alzheimer's disease Neuropathology.



Pioneer in functional assays of neurotransmitter receptors reactivated from postmortem, banked human brains.



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Collaborative impact

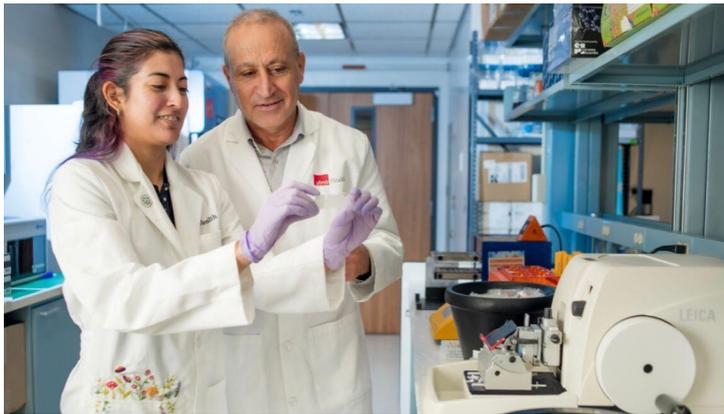


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Mitchell
Center for
Neurodegenerative
Diseases

Research Portfolio



Protein Aggregation in Neurodegenerative diseases

We study protein aggregation across different levels of complexity: from studies *in vitro* to cell and primary cultures, animal models and human tissues.

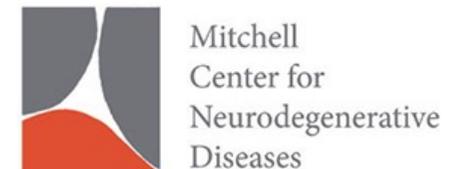
We specialize in the study of Tau, α -Synuclein, TDP-43, A β , focusing on pathological aggregates, toxicity mechanisms, their spreading and progression in disease, as well as senescence and inflammation.

We study amyloid oligomers and polymorphisms, developing methods, reagents and therapeutic approaches in neurodegenerative diseases.



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Kayed's Lab



Research

Leading therapeutics development



Science Translational Medicine

Current Issue First release papers

HOME > SCIENCE TRANSLATIONAL MEDICINE > VOL. 16, NO. 754 > NASAL TAU IMMUNOTHERAPY CLEARS INTRACELLULAR TAU PATHOLOGY AND IMPROVES...

RESEARCH ARTICLE | NEURODEGENERATIVE DISEASES

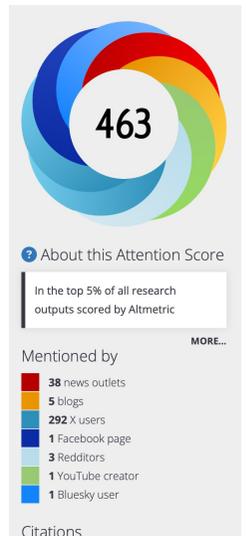
f X

Nasal tau immunotherapy clears intracellular tau pathology and improves cognitive functions in aged tauopathy mice

SAGAR GAIKWAD , NICHIA PUANGMALAI , MINAL SONAWANE , MAURO MONTALBANO , BACHEL PRICE , MALINI S. IYER , ANAMIKA RAY

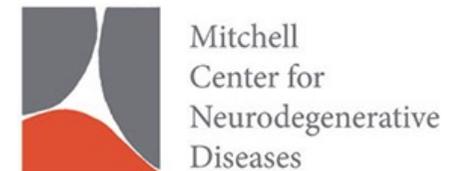
SANDRA MORENO , AND RAKEZ KAYED [Authors Info & Affiliations](#)

SCIENCE TRANSLATIONAL MEDICINE - 2014-07-24 - Vol 16, Issue 754 - DOI: 10.1126/scitranslmed.1268889

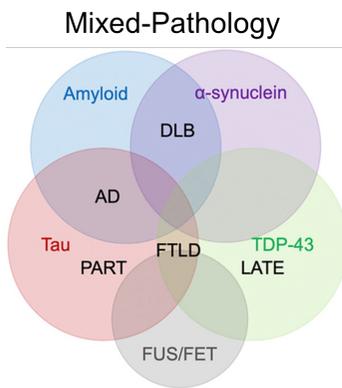
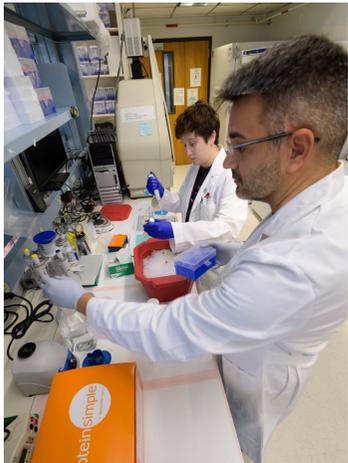


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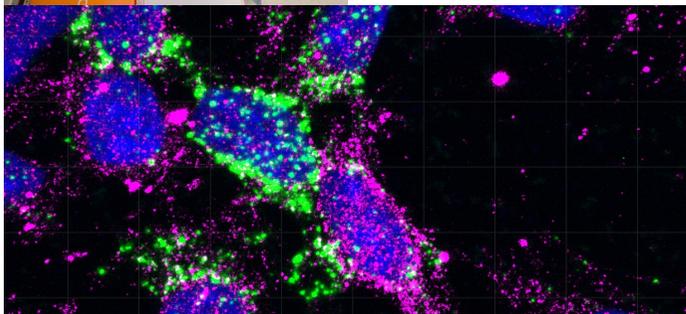
Research



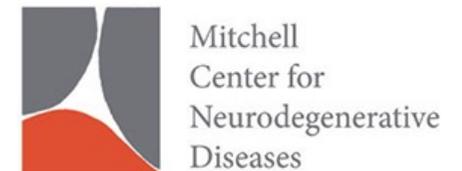
Chromatin remodeling and epigenetics alterations of RNA-binding proteins in AD/ADRD

We integrate cutting-edge approaches in neurobiology, transcriptomics, and computational modeling to investigate the roles of defective Tau protein, RNA-binding proteins (Musashi1, TDP-43 and others), nuclear lamina and envelope integrity, chromatin rearrangement, and epigenetic alterations in neuronal dysfunction and senescence.

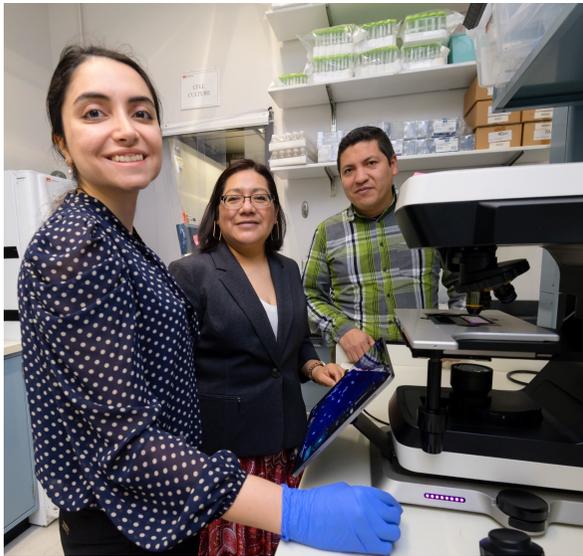
By leveraging state-of-the-art biochemical, genetic, and single-cell technologies, we aim to identify key pathological drivers and therapeutic targets that will inform precision medicine strategies



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Research



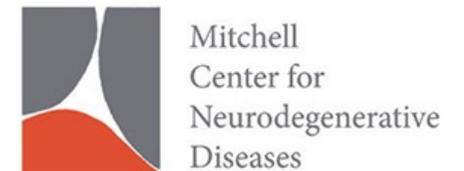
Sex differences in Ab and tau-driven neurovascular unit dysfunction in neurodegenerative diseases

We advance cutting-edge research and innovative methodologies focused on the neurovascular unit role and sex-specific differences in Alzheimer's Disease.

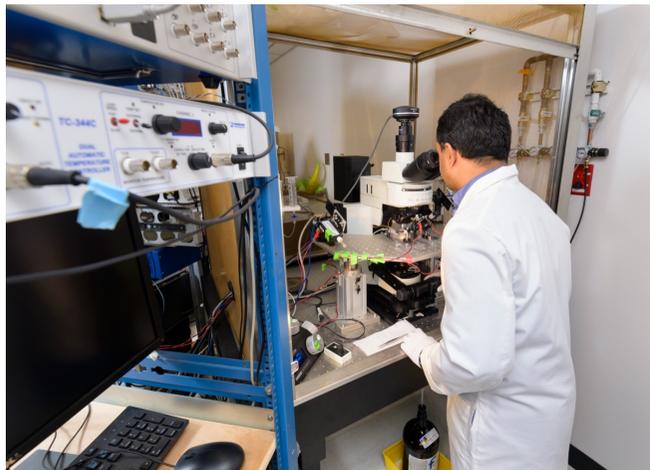
We use preclinical models, human specimens, brain-on-a-chip model and advanced imaging techniques to explore neurovascular unit dynamics in AD in a sex-specific manner.



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Research



Multimodal functional assessment of synaptic function in health and disease

We use electrophysiological approaches on preclinical models that includes *Drosophila* and rodents to discover mechanisms of synaptic plasticity dysfunction.

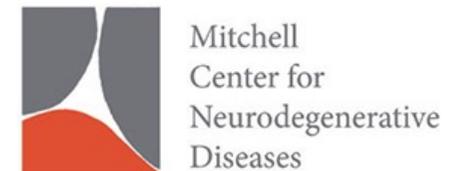
We use human specimens to ensure the human clinical significance of the findings in health and disease.

We study lipolytic pathways that can be therapeutically utilized to provide synaptic resilience against neurodegenerative states

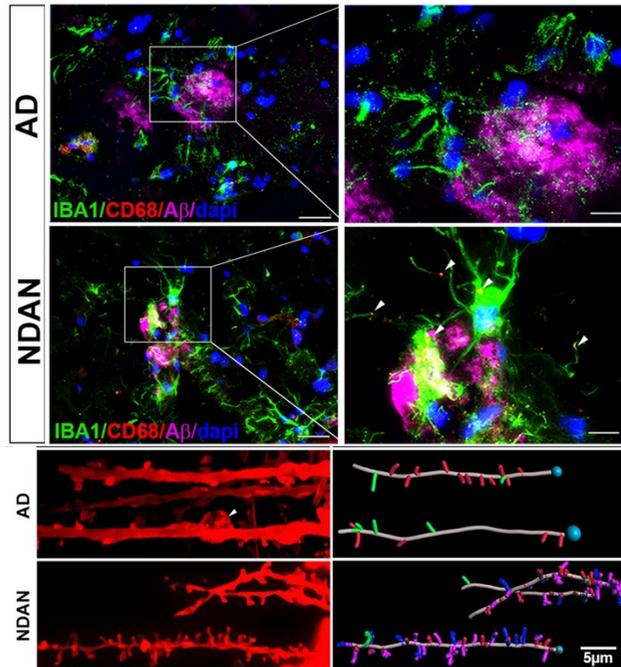


Working together to work wonders

Krishnan's Lab



Research



Neuroinflammation and autophagy mechanisms underlying cognitive resilience to AD neuropathology

We investigate microglial function, cellular clearance pathways and antioxidant defenses in NDAN using high resolution microscopy and omics approaches.

We investigate the role of autophagy and Lando pathway in neuroinflammation in AD and cognitive resilience

Research



Mechanisms underscoring brain resistance and resilience to Alzheimer's disease neuropathology

We pioneer the concept of non-demented with AD Neuropathology (NDAN) and study their resilient mechanisms

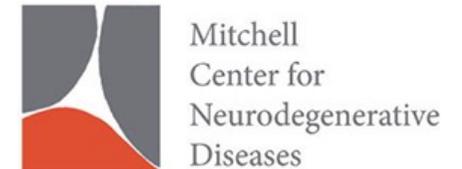
We are laying out the foundations for future development of harnessing an innovative therapeutic concept based on resilience.

We are evaluating pharmacological strategies to induce resilience to AD neuropathology involving FDA-approved Calcineurin inhibitors



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Tagliatela's Lab



Research

Leading the research in resilience to AD Neuropathology



2021 Alzheimer Award



Giulio Tagliatela, PhD



Balaji Krishnan, PhD

Functional Integrity of Synapses in the Central Nervous System of Cognitively Intact Individuals with High Alzheimer's Disease Neuropathology Is Associated with Absence of Synaptic Tau Oligomers

Ayush Singh^a, Dyron Allen^a, Anna Fracassi^a, Batbayar Tumurbaatar^a, Chandramouli Natarajan^a, Pietro Scaduto^a, Randy Woltjer^b, Rakez Kaye^a, Agenor Limon^a, Balaji Krishnan^{a,*} and Giulio Tagliatela^{a,*}

^aMitchell Center for Neurodegenerative Diseases, Department of Neurology, UTMB Galveston, TX, USA

^bDepartment of Pathology, Oregon Health and Science University, Portland, OR, USA

...article published during the previous year that has had the most significant impact on Alzheimer's disease (AD) research.

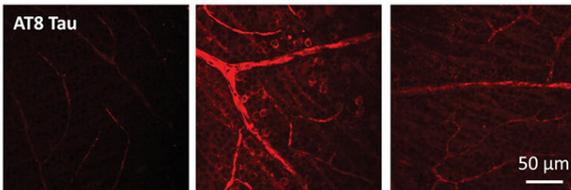


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Tagliatela's Lab



Research



Developing patient-inspired therapeutic approaches to treat neurodegenerative diseases

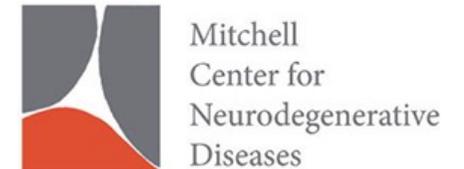
We aim to translate into therapies protective genetic variants against AD: APOE3Chirstchurch & RELN-COLBOS

We aim to develop novel therapies using peptides and small molecules targeting Heparan Sulfate proteoglycans interactions with Reelin

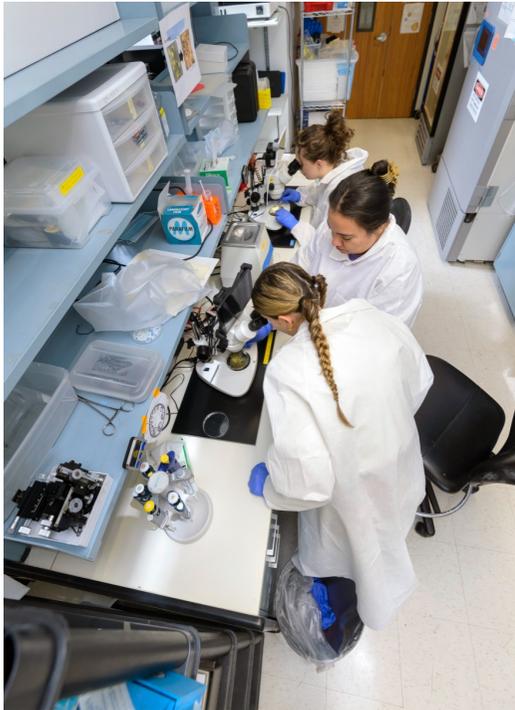


Working together to work wonders

Marino's Lab



Research



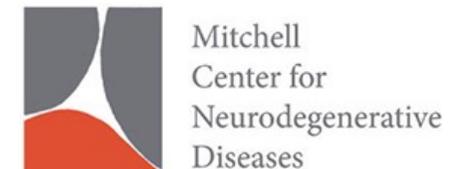
Synaptic mechanisms of excitation to inhibition imbalance in AD/ADRD and mental health disorders

We pioneer electrophysiological assessment of synaptic receptors from human postmortem tissue to investigate glutamatergic and GABAergic synaptic remodeling and excitability in disease-relevant contexts.

We develop electrophysiological-anchored large dataset analysis with multi-omics and clinical data to determine novel molecular hubs for therapeutical intervention.



Working together to work wonders

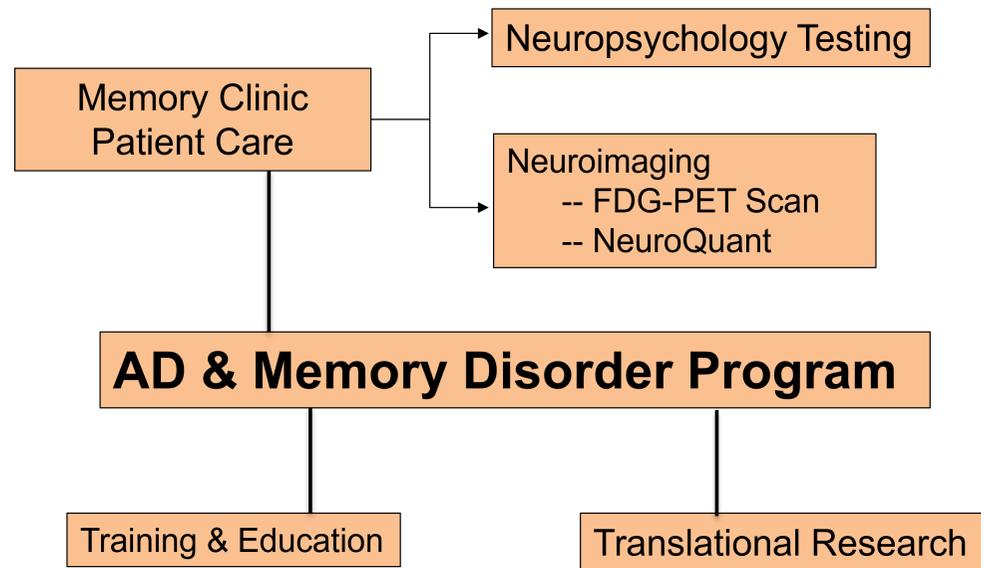


Research and Patient Care



Identification of novel blood Biomarkers in AD

Analysis of tRNA-derived RNA Fragments in AD

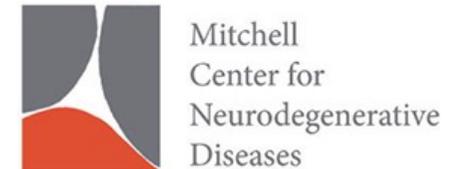


200+ individuals genotypically/phenotypically characterized cohort

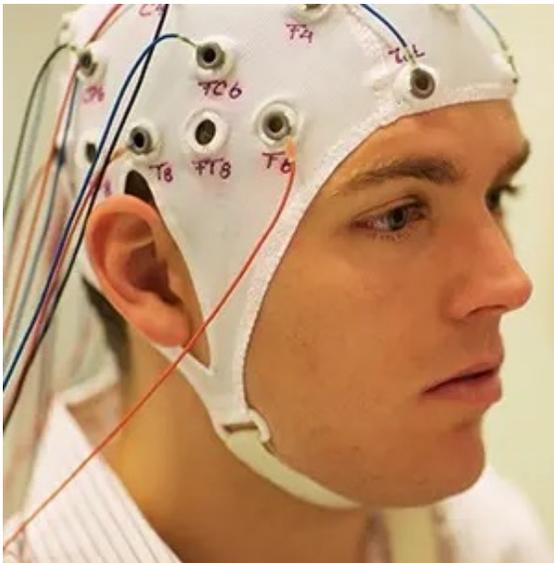


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Fang's Lab



Research and Patient Care



Quantitative EEG for brain function assessment, Traumatic Brain Injury and interventional pain management

We apply quantitative methods to extract more detailed and objective information from the EEG data. These quantitative analyses can include measures of power spectral density, coherence, and other parameters that provide insights into different aspects of brain function

We apply interventional pain management using a variety of non-surgical and surgical treatments for reducing pain and improving quality of life.



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St. Michael's Neurology and Pain Medicine
Miguel A. Pappolla, M.D, Ph.D

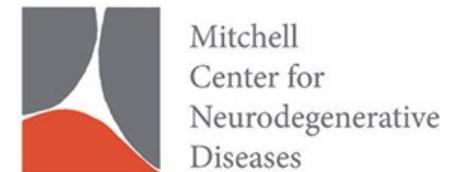


**Mitchell
Center for
Neurodegenerative
Diseases**

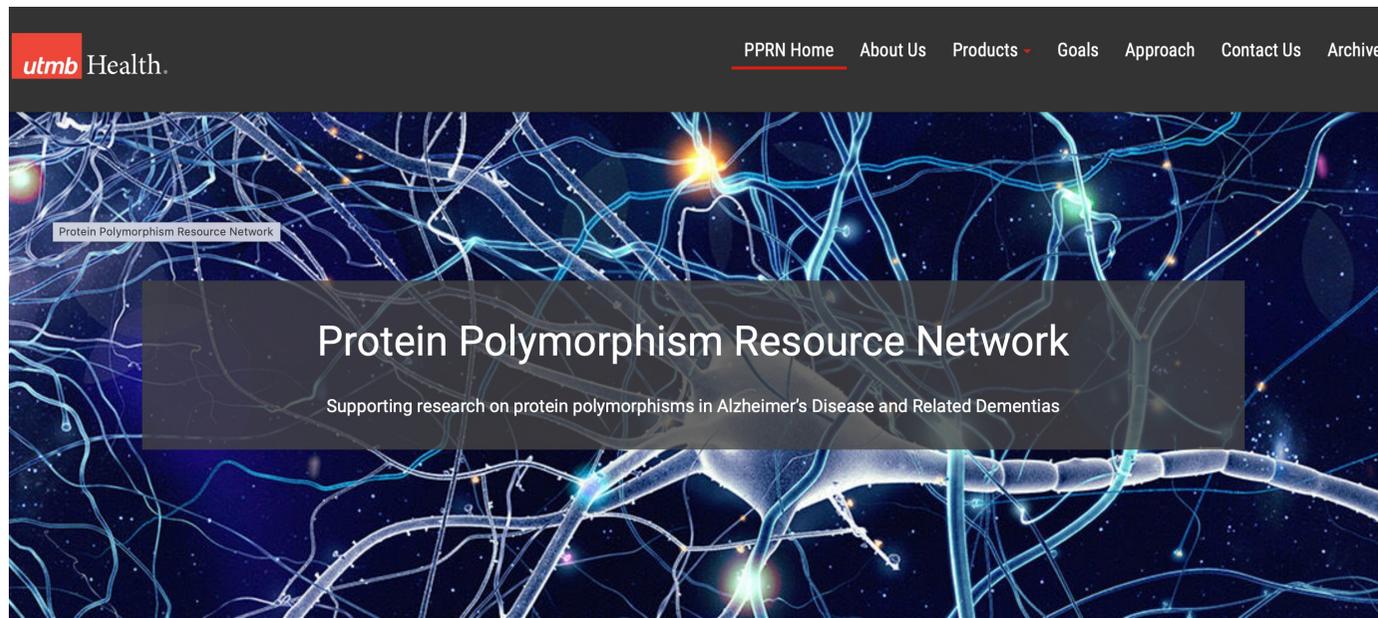
Impact



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Impact: Unique National Resources



The PPRN was created in 2021 by the National Institute on Aging to standardize the isolation and characterization of tau aggregates and fibrils for the greater Alzheimer's Disease and Related Dementias (AD/ADRC) research communities

U24, Lead Dr. Kayed



<https://www.utmb.edu/pprn/about-us>

Impact: Emergence of Novel Institutional Research Efforts

Moody Brain Health Institute

The Moody Foundation and the Moody Medical Research Institute contribute \$25 million to UTMB's Brain Health Institute

October 31, 2024 • 8:46 a.m.

The University of Texas Medical Branch has received a transformative \$25 million gift from the Moody Foundation and its affiliated organization, the Moody Medical Research Institute, which will significantly advance the work of its Brain Health Institute. In recognition of this generous contribution, the Institute will be renamed the Moody Brain Health Institute at UTMB. The gift is payable over a five-year period with the initial years' funding provided by Moody Medical Research Institute and all subsequent funding provided by The Moody Foundation.



Giulio Tagliatela, PhD

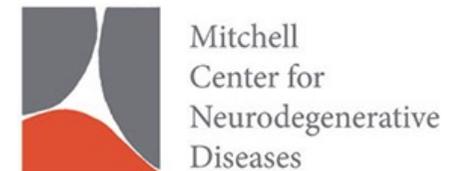
Vice President, Brain Health
Director, The Moody Brain Health Institute
The Lawrence J. Del Papa Distinguished
Chair in Neurodegenerative Disease
Research

Education

We are committed to cultivating the next generation of scientists and leaders through rigorous education, hands-on training, and dedicated mentorship.



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Education

Graduate School of Biological Sciences & JSSOM

Mitchell Center Faculty is heavily involved in training our next generation of scientist providing mentoring, teaching and resources for graduate students in the Cell Biology, the Neuroscience, and the Pharmacology and Toxicology graduate programs in GSBS, as well as Medical students and residents from the John Sealy school of Medicine. Mitchell Center has a population of **8-15 PhD, MD-PHD graduate students every year**

UTMB-University of Palermo joint graduate program

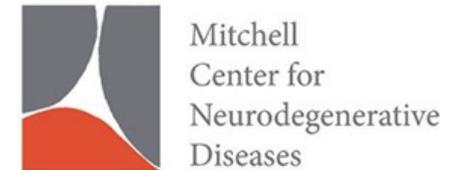
More than half of all trainees in the joint program are mentored by Mitchell Center Faculty and some are part of our core Faculty, which highlights our commitment to excellence in education



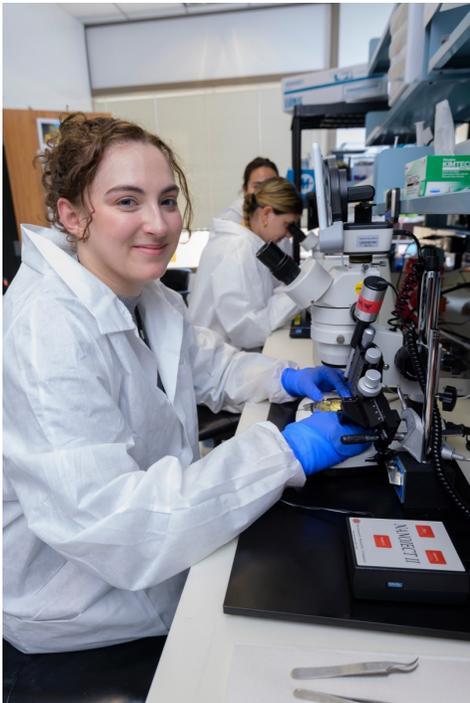
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UNIVERSITÀ
DEGLI STUDI
DI PALERMO



Education



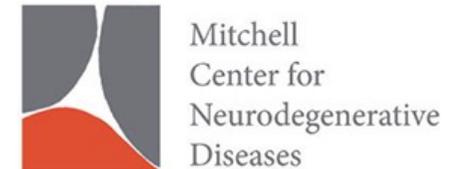
Neurobiology of Disease PhD Track for MD residents

This program provides a training venue within the Neuroscience Graduate Program (NGP) for medically trained personnel (Clinical Residents, fellows and junior faculty from all UTMB Academic departments) to obtain a PhD degree. The program emphasizes the study of basic biomedical mechanisms that contribute to the etiology and expression of diseases of the nervous system to prepare them as scientists-clinicians for rigorous translational research. Currently we have two trainees in the program.



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NOD: Director and contact: Dr. Kaye; NGP Dr. Ping Wu



Education



T32 Predoctoral and postdoctoral Training in Alzheimer's Pathophysiology

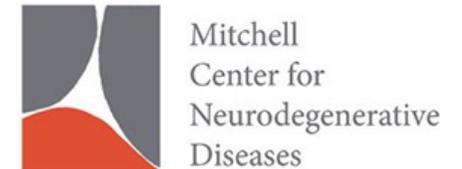
Our program is dedicated on advancing pre- and post-doctoral fellows into independent research scientists at research intensive universities and health- related research institutions. Our training program, supported by 13 faculty members from different departments and with commons goals incorporates, cellular animal models, disease progression mechanisms and pharmacological manipulations, immunotherapeutic approaches targeting tau and amyloid oligomers, synaptic electrophysiology and, DNA damage and repair in neurodegeneration, genetics of synaptic development and degeneration, molecular mechanisms in cognitive resilience, and metabolic determinants of neurodegeneration.

We successfully graduated 6 trainees, with 5 currently enrolled

Director and contact: Dr. Kaye



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Education

Mitchell Center Seminar Series

Pre-COVID weekly in-person conferences from local, regional and national speakers with high attendance from multiple departments across UTMB.

Neurodysfunction and Neurodegeneration Seminar Series

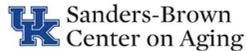
Post-COVID virtual zoom meetings organized by multiple institutions, with worldwide attendees

Development/directing NEURO and INTD courses GSBS

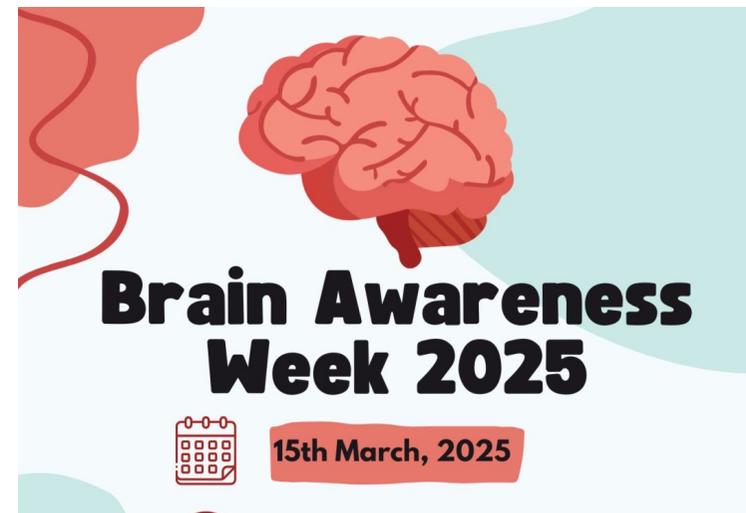
International Master of Neuroscience at Trieste Italy



SCHOOL OF MEDICINE
STARK NEUROSCIENCES RESEARCH INSTITUTE



Community Engagement



Contact: Drs. Cuevas and/or Gutierrez-Grebenkova

Community Engagement



Faculty and Student members

RICE UNIVERSITY'S
Baker Institute
for Public Policy

Economics & Finance Energy Foreign Policy
Domestic Policy Health & Science All Publications »

James A. Baker III Policy Leadership Program

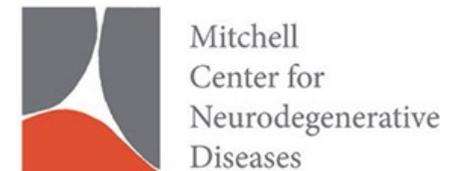
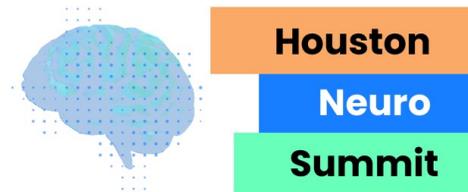
Brain Economy Seminar

April 7-10, 2025

[REGISTER](#)



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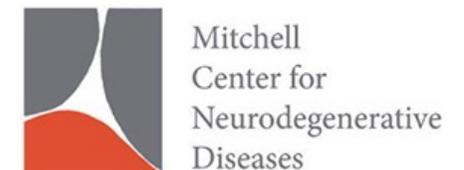
Community Engagement



Dementia Prevention Research Institute of Texas (DPRIT)



Working together to work wonders



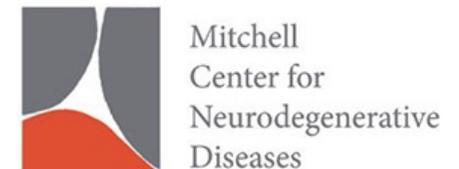
Plans and strategic goals

We aim to become a global reference center for foundational and translational research in Neurodegenerative diseases

- Structure and position our research into the components for an NIH Alzheimer's Disease Research Center to successfully compete for NIH and DPIRIT initiatives
- Maintain and upgrade our shared equipment and resources to support our essential research
- Boost the Center's visibility by hosting third national symposium and satellite conferences in AD/ADRD
- Strengthen the Center's internal structured research by developing MPI P01 projects
- Enhance collaboration with UTMB departments, centers, institutes and institutions by developing RM1, P01 and P30 projects



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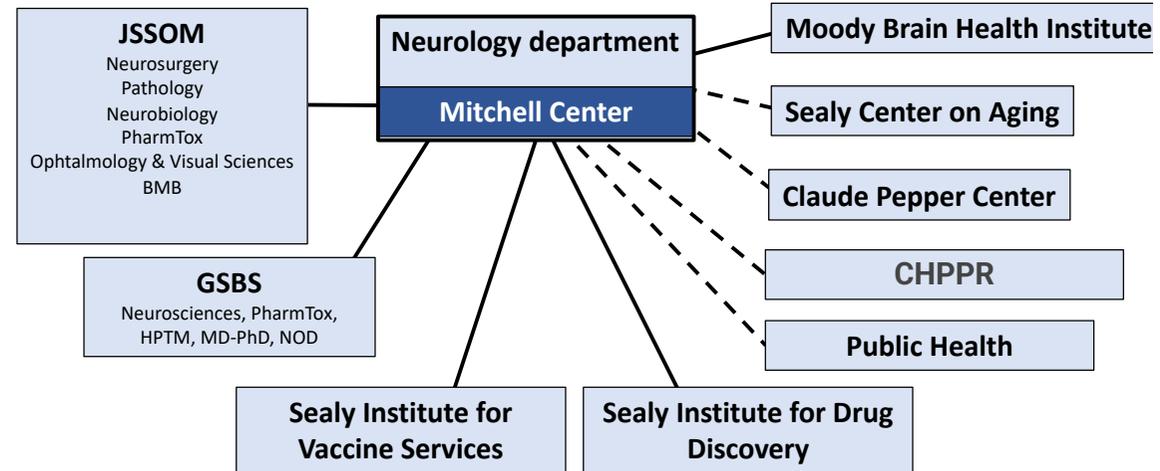


Plans and strategic goals

Structure our research into the components of an NIH Alzheimer's Disease Research Center to increase competitiveness to NIH and DPRIT initiatives

Administrative Core
Clinical Core
Data Management and Statistical Core
Neuropathology Core
Outreach, Recruitment, and Engagement Core
Biomarker Core
Research Education Component

Adjunct Faculty Fellows of the Mitchell Center



Develop and foster collaborations with Faculty, Centers and Institutes to strengthen each potential ADRC component



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Plans and strategic goals

Maintain and renew our common equipment and resources to support our essential research strenghts

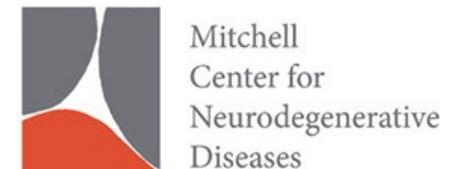
We need to renew and acquire equipment that is essential to sustain the work we are doing, particularly when competition is getting stronger.

Seek funding for infrastructure with Institutional support, UT Regents, DPRIT and Foundations

Build alliances with centers, departments and institutes at UTMB, GCC and TMC to develop funding grants around common interests where our expertise can be an asset.

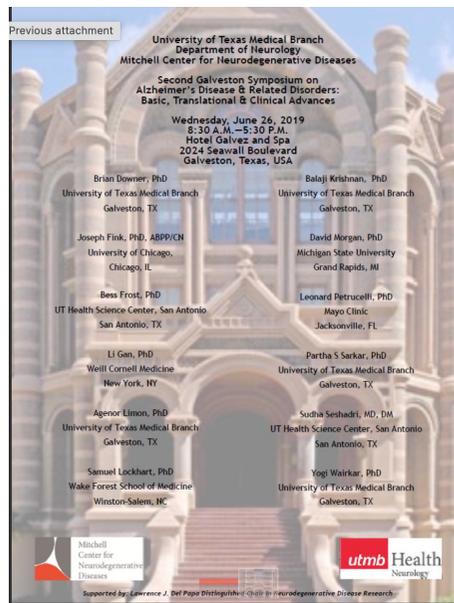


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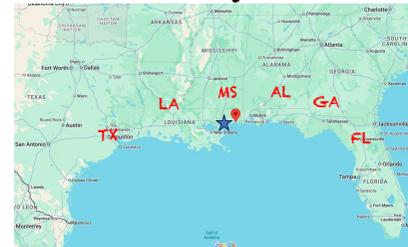
Plans and strategic goals

Increase Center visibility by hosting third national symposium and satellite local and southeast conferences in AD/ADRD and having social media presence



SEACON

• 1st SouthEast Amyloid CONDensate Symposium



Gulf Coast Consortia



QUANTITATIVE BIOMEDICAL SCIENCES



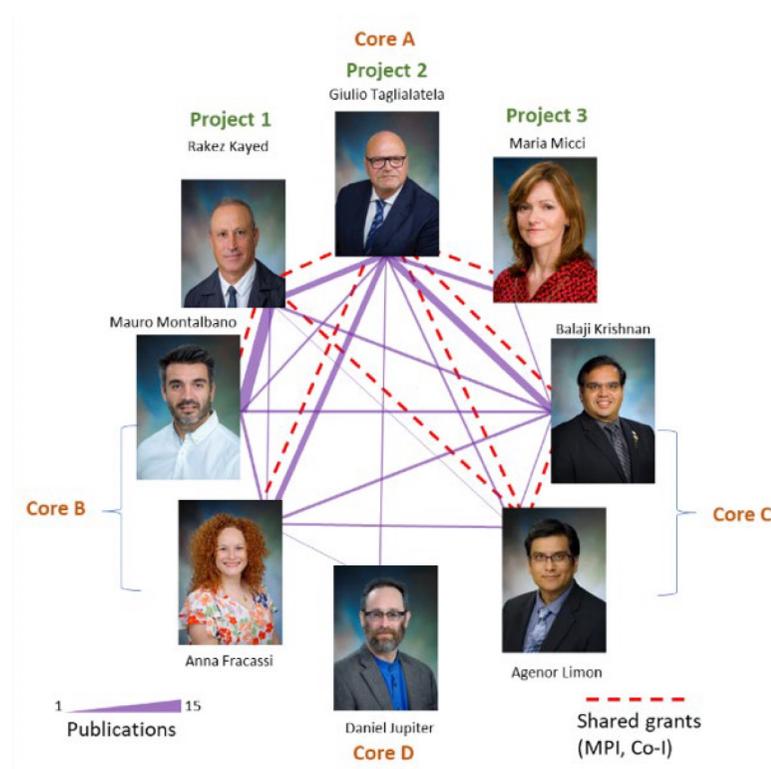
Mitchell
Center for
Neurodegenerative
Diseases



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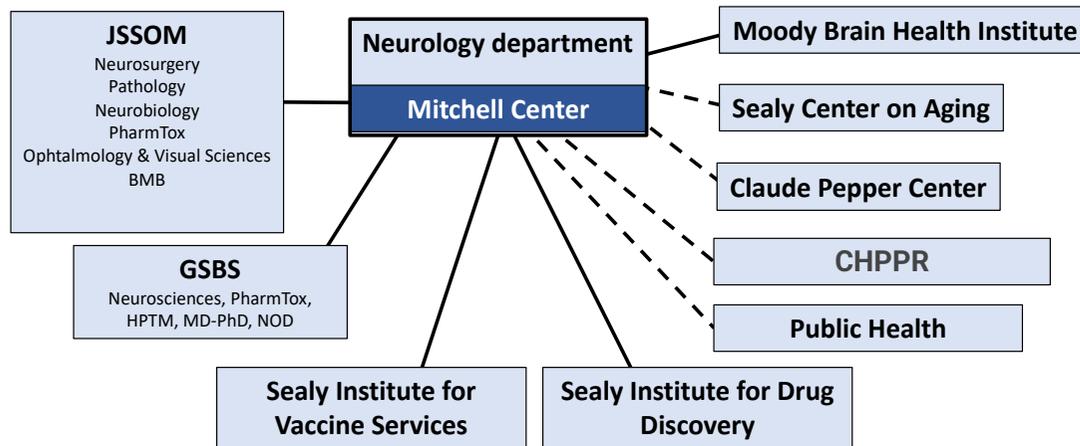
Plans and strategic goals

Strengthen Center's internal structured research by developing MPI program projects



Plans and strategic goals

Enhance collaboration with UTMB departments, centers, institutes and other Texas institutions by developing RM1, P01 and P30 projects



Greater Houston
Alzheimer's Disease Research Center





Making a Global Impact

Strategic Vision 2025-2030

Education
Elevating the academic experience through innovation and collaboration, including plans for new housing initiatives

Research
Strengthening research infrastructure to tackle global challenges and creating plans for a new world-class research facility

Clinical Care
Expanding programs and services across Southeast Texas with advanced treatments and enhanced specialty care to meet community needs

Innovation
Integrating education, research and clinical care to develop new technologies, accelerate biomedical breakthroughs, expand AI in health care, and create life-changing therapies

People
Attracting and investing in top talent, fostering a culture of excellence, and empowering a thriving workforce and community

Operational Excellence
Achieving national recognition for clinical, academic and research performance to maximize impact and enhance UTMB's success

Medicine 2.0
Redefining the future of patient care through AI-driven discoveries, gene therapy advancements, and pioneering medicine in space, at sea, and extreme environments

Cardiology, Kidney and Metabolic Care
Redefining chronic disease management by pioneering new therapies and treatment options through research and innovation

Healthy Living to Healthy Aging
Promoting longevity and well-being through evidence-based educational and clinical care programs, precision health advancements, and targeted research

Neurosciences
Advancing breakthroughs in brain research, neurodegenerative disease treatments, and pioneering innovations in neuroengineering and neurobionics

Global Initiatives
Leading global advancements through collaborative research, education and partnerships to develop solutions for complex clinical challenges worldwide



Thank you!



Working together to work wonders

