



TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER™
Garrison Institute on Aging

ANNUAL REPORT

2022

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MISSION AND VISION

Our mission is to promote healthy aging and address health issues of the aging population through cutting edge research and innovative educational and community outreach programs. The Garrison Institute on Aging (GIA) conducts and facilitates research into investigating the causes of neurodegenerative disease and dementias such as Alzheimer's and related brain dysfunctions. The GIA's educational programs for the community inform on aging-related health issues such as dementias and mental health, on preventative medicine, and on challenges impacting the geriatric population.

Our vision is to serve as the leader and central hub within Texas Tech University Health Sciences Center (TTUHSC) for collaborative initiatives in research, interdisciplinary education and community outreach related to healthy aging, aging-related disorders, brain diseases and dementias, and mental health through a combination of GIA-based programs and collaborations with colleagues across TTUHSC and beyond. The GIA plans to continue and grow its more than 40 collaborative projects involving preclinical and clinical studies on aging-related conditions and brain disease.

MESSAGE FROM PROVOST



DARRIN D'AGOSTINO
DO, MPH, MBA

The GIA began as a strategic initiative during a time when our population in the United States was growing older and it was clear the United States did not have enough health care services to keep people healthy as they age. TTUHSC identified this need and focused attention to one of our most precious resources, our elders.

Dr. Volker Neugebauer has led his team in discovery and education enhancing the lives of our aging communities. Recognized nationally and internationally, our research and clinical programs focus on the aging process and help explain why we age the way we do leading in strategies, therapeutics, and interventions that help us stay healthy, prevent disease, and keep joy in our lives. We are proud to share what we learn with others through community engagements, lectures and in the scientific literature, but we are especially proud to enhance the education of our students as we grow the next generation of care givers.

Shirley and Mildred Garrison, and many other visionaries, have partnered with TTUHSC and our amazing team of faculty and staff to make our communities healthy. Together, we are transforming health care through innovation and collaboration.

MESSAGE FROM EXECUTIVE DIRECTOR



VOLKER NEUGEBAUER
MD, PhD

The GIA was established in 1999 by the Board of Regents as the Institute for Healthy Aging, and became the Garrison Institute on Aging in 2005 thanks to a most generous donation by the Garrison family. The mission and goals of the GIA are to improve the quality of life of the aging population through innovation and collaborative programs in research, community outreach and education, which are well-aligned with the vision of TTUHSC to transform health care through innovation and collaboration. The GIA strives to play a leadership role in initiatives on aging and aging-related disorders and brain diseases across TTUHSC and beyond. As a reflection of success of our strategy, the GIA is leading or has initiated more than 40 collaborative projects involving preclinical and clinical studies on aging-related conditions and brain disease.

The GIA houses **research facilities** for behavioral assays, electrophysiology and molecular biology, as well as biobanks for human brain tissue, bodily fluids and DNA to study mechanisms and novel targets for neurodegenerative brain and other aging-related disease. **Preclinical brain research** at the GIA aims to determine causes of Alzheimer's disease (AD), other forms of dementia and neurodegenerative disorders, and aging-related brain diseases and to identify therapeutic targets. Current research is focused on dysfunction of neural signaling in the brain as an early-stage mechanism of AD, which is being recognized in the field as an important component of the Amyloid/Tau/Neurodegeneration (ATN) framework. GIA member Dr. Maria Manczak continued her NIH-funded work on unraveling the role of mitochondrial dysfunction in AD and GIA member Dr. Josh Lawrence received



two NIH R01 grants for his work on the protective role and mechanisms of retinoic acid signaling and impact of vitamin D depletion in AD pathogenesis.

The GIA **Brain Bank** provides a unique opportunity to apply basic research to the human condition, in addition to serving the families of patients with AD and other forms of dementias through free brain autopsies for a definitive diagnosis. Brain tissues from patients with AD and other conditions are available for the molecular analysis of mechanisms and targets that guide and enhance preclinical lab research. Protocols for obtaining, preserving and analyzing brain tissues are constantly updated, and for that we successfully recruited a new staff member, Dr. Yong Chen, who joined us from the University of Texas Medical Branch (UTMB) in Galveston, Texas. He will oversee quality analysis, storage and cataloging specimens, retrieval of tissue samples, and development of a searchable data base with clinical information about the patients.

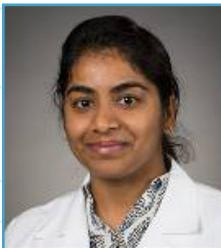
Our research program also includes **studies in humans** through the GIA-based **Project FRONTIER** (Facing Rural Obstacles to Healthcare Now Through Intervention, Education & Research) and other collaborative projects. Project FRONTIER is a laboratory and community based longitudinal study that collects epidemiological and biological data on cognitive health and aging in a multiethnic adult population from rural communities of West Texas to investigate the prevalence and risk factors of dementia among rural residents. With the recent addition of Lubbock as a site for Project FRONTIER we will be able to increase the value of Project FRONTIER by evaluating urban vs. rural population as well as within group differences (e.g., Hispanic persons in rural areas vs. Hispanic persons in urban areas.) This provides us the opportunity to further assess the barriers to care for persons in the rural areas and their effect on neurocognitive functioning and other psychological and physical health outcomes. Dr. Josh Lawrence and our Texas Tech University (TTU) collaborator Dr. Jonathan Singer published and submitted several meeting abstracts and are preparing several manuscripts for publication. It should be noted that Project FRONTIER data also provided the basis for student research projects and grant applications. Other collaborative studies in humans include mental health services for informal caregivers of dementia patients and biopsychosocial assessment of outcomes, and we are in the process of implementing a telehealth program to serve the rural population of West Texas.

Dissemination of knowledge and support of our community is the goal of the GIA **Community Outreach and Education** division, which strives to assist and educate the community on preventative medicine disease and challenges impacting the geriatric population. Our programs have largely resumed since the COVID-19 pandemic and include the Translational Research Seminar Series, Annual Research Symposium (key note speaker Dr. Walter Koroshetz, Director of the NIH National Institute on Neurological Disorders and Stroke), Healthy Aging Lecture Series, Care Partner Academy, Caregiver Stress-Busting Dementia Program, Mental Health for Caregivers, Dementia Friendly Lubbock (part of Dementia Friendly America and Healthy Lubbock Initiative (with Mayor's Fitness Council), and RSVP (Retired and Senior Volunteer Program established in 1979 under the umbrella of the Corporation for National and Community Service (CNCS), now identified as AmeriCorps Seniors). We are currently working with our TTU collaborator Dr. Singer on implementing a mental health telemedicine program for informal caregivers of persons with dementia in rural Texas.

Let me conclude by expressing our deep gratitude to all of our collaborators across the departments and schools at TTUHSC and TTU, to the TTUHSC Laboratory Animal Resources Center (LARC) team, Office of Research and Innovation, Office of Sponsored Programs, Office of External Relations, Dean of the School of Medicine Dr. Steven Berk, Provost Dr. Darren D'Agostino and President Dr. Lori Rice-Spearman for all their valuable support. A special thank-you goes to the Garrison Family for their generous support and continued commitment to the mission and vision for our Institute.

FACULTY AND STAFF

RESEARCH DIVISION



DIVYA BURUGU, MS
Research Scientist



MARIA MANCZAK, PHD
*Research Assistant
Professor*



YONG CHEN, PHD
*Senior Research
Associate*



**VOLKER NEUGEBAUER,
MD, PHD**
*Executive Director and
Chief Scientific Officer,
Garrison Institute on
Aging, Mildred and
Shirley L. Garrison Chair
in Aging, Professor and
Chair, Pharmacology
and Neuroscience*



RUBEN GONZALES
Senior Director



MELINDA SPIVEY, CRA
Assistant Director



J. JOSH LAWRENCE, PHD
*Associate Professor,
Pharmacology and
Neuroscience*



LINDA YIN, MS
*Senior Research
Associate*

FACULTY AND STAFF

COMMUNITY OUTREACH AND EDUCATION DIVISION



CORDELIA AGUIRRE
*Coordinator,
Project FRONTIER*



VERONICA MOLINAR-LOPEZ
*Unit Manager,
Community Outreach
and Education*



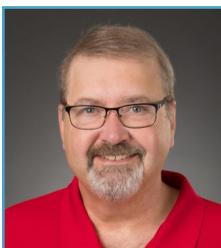
JOAN BLACKMON, MBA
*Specialist IV,
Community Outreach
and Education*



SUSAN THOMPSON
*RSVP Manager,
Community Outreach
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ANNETTE BOLES, MS
*Director, Community
Outreach and
Education*



MALCOLM BROWNELL, PHD
*Coordinator,
Community Outreach
and Education*



FACULTY AND STAFF

RESEARCH COLLABORATORS



GAIL A. CORNWALL, PHD
*Professor, Cell Biology
and Biochemistry*



IGOR PONOMAREV, PHD
*Associate Professor,
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Neuroscience*



**JOSEE GUINDON,
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Veterinary*



KEVIN PRUITT, PHD
*Associate Professor,
Immunology*



**ANDREY KARAMYSHEV,
PHD**
*Assistant Professor,
Cell Biology and
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Academy of Sciences*



JONATHAN SINGER, PHD
*Assistant Professor,
Clinical Psychology*



**NAIMA MOUSTAID-
MOUSSA, PHD**
*Professor, Nutritional
Sciences and Director,
Obesity Research
Institute*



SARAH SPARKS, MSc
*Doctoral Student,
Clinical Psychology*

**Other not yet mentioned collaborators on Dr. Lawrence's NIH-funded grants and grant applications include Jeremy Bailoo, SOM, Amanda Brown, Biological Sciences, TTU, Vadivel Ganapathy, SOM, GSBS, Bijoy Ghosh, Math, TTU, Alexander Idesman, Mechanical Engineering, TTU, Ravi Joshi, ECE, TTU, Dy Le, IMMS, TTU, Maria Onyango, Biological Sciences, TTU, Komaraiah Palle, SOM, Hemachandra Reddy, SOM, GSBS, and Sharda Singh, SOM.*

**Other not yet mentioned collaborators include Prabhu Arumugam, Louisiana Tech University, Mirla Avila, SOM, Nadia German, SOP, Joaquin Gonzales, Kinesiology and Sports Medicine, TTU, and Leslie Shen, SOM.*

FACULTY AND STAFF

CLINICAL AND PROJECT FRONTIER COLLABORATORS



DUKE APPIAH, PHD

*Assistant Professor,
Department of Public
Health*



JOHN CULBERSON, MD

*Associate Professor,
Family and Community
Medicine Bernard
T. Mittermeyer, M.D.,
Endowed Chair in Medical
Excellence in Geriatric
Medicine Director, Garrison
Institute on Aging, Clinical
Geriatric Programs, School
of Medicine*



**ALYCE ASHCRAFT, PHD,
RN, CNE, FNGNA, ANEF**

*Professor and Associate
Dean for Research and
Scholarship, University
Distinguished
Professor, Glenna
Roberts Endowed
Practiceship in Nursing,
School of Nursing*



GREG HANNABAS, MD, MPH

*Resident Instructor 3rd
Year, Family Medicine,
School of Medicine*



**THERESA BYRD, DRPH,
MPH, RN**

*Professor and Chair,
Department of Public
Health, School of
Population and Public
Health*



JOHN DETOLEDO, MD

*Vernon and Elizabeth
Haggerton Chair in
Neurology, Professor
and Chair, Department
Chairperson, Neurology,
School of Medicine*

**Other clinical collaborators include TTUHSC Mohamad Al-Rahawan, SOM, Mirla Avila, SOM, Leslie Shen, SOM, and the Texas Collaborators mentioned on the next page (details of affiliation can be provided).*

FACULTY AND STAFF

TEXAS COLLABORATORS



MAGGIE ELLEN FLANAGAN, MBBCH, BAO

Associate Professor of Pathology, South Texas ADRC Brain Bank



SID O'BRYANT, PHD

Executive Director, Institute for Translational Research, Professor, Department of Family Medicine, Texas College of Osteopathic Medicine, University of North Texas Health Science Center



KEVIN F. BIENIEK, PHD

Assistant Professor, Biggs Institute Brain Bank Director, University of Texas (UT) Health at San Antonio



CLAUDIA SATIZABAL, PHD

Assistant Professor, Glenn Biggs Institute for Alzheimer's & Neurodegenerative Diseases, UT Health San Antonio



MARCIA ORY, PHD, MPH

Regents & Distinguished Professor, Founding Director on Population Health & Aging, Texas A&M University



SUDHA SESHADRI, MD

Professor and Director, Glenn Biggs Institute for Alzheimer's & Neurodegenerative Diseases, UT Health San Antonio

COLLABORATIVE RESEARCH

FACILITIES, PROJECTS, SCHOLARLY ACTIVITIES & RESEARCH HIGHLIGHTS

BASIC RESEARCH FACILITIES TO ENHANCE RESEARCH AND COLLABORATORS —

The restructured and upgraded GIA laboratories include a molecular facility to study molecular mechanisms of brain changes in AD and aging conditions, an electrophysiology facility for the analysis of neural networks in ex vivo brain tissues, and behavioral facility for the comprehensive study of cognitive, affective sensory and motor aspects of behavior in AD and aging conditions.

- **Behavioral facility** is managed by Linda Yin, MS, and has equipment for motor deficit screening exploratory and anxiety related behavioral flexibility testing. Most of our systems are Noldus based, and where relevant infrared backlit, employing an automated means for precise and accurate data collection. Standard operating protocols and training for use of equipment are available.
- **Molecular laboratory** is managed by Maria Manczak, PhD, and has equipment for protein study, DNA and RNA analysis, immunohistochemistry, and cell culture, including a new fluorescent microscope with upright and inverted capability (ECHO/Revolve Microscopy System) and a new Real-Time PCR System (Applied Biosystems QuantStudio 7 Pro).
- **Electrophysiology laboratory** is managed by J. Josh Lawrence, PhD, and has equipment for brain slice physiology, including a Luigs and Neumann Infrapatch electrophysiology rig and a Scientifica electrophysiology rig. Both are equipped with Zeiss Axio Examiner upright microscopes and with components to integrate recording from fluorescent neurons and optogenetic stimulation. Additional equipment is for brain dissection, preparation of brain slices, and manufacturing recording electrodes.
- **Common laboratory** areas include the cell culture facility and interventional room for stereotaxic and other surgeries.

COLLABORATIVE RESEARCH PROJECTS ON AGING, AND ALZHEIMER'S DISEASE AND OTHER NEUROGENERATIVE DISEASES, AND BRAIN DISORDERS

**Names of GIA members are underlined*

• Preclinical Studies

Preclinical Research - Funded

1. The hippocampal dentate gyrus in aging and Alzheimer's disease: boosting transcription of retinoic acid-sensitive genes through vitamin A supplementation and HDAC inhibition. NIH/NIA R01 grant: Josh Lawrence, SOM, GIA, GSBS (PI), Maria Manczak, GIA (Co-I), Igor Ponomarev, SOM, GSBS (Co-I), Ranadip Pal, Electrical & Computer Engineering, TTU (Co-I), Andrew Shin, Nutritional Sciences and Obesity Research Institute, TTU (Co-I)
2. Transcriptional Dysfunction in Dentate Gyrus Cell Types: Roles of Retinoic Acid Responsive Genes in Protection Against Alzheimer's Disease Pathogenesis, NIH/NIA R01 grant: Josh Lawrence, SOM, GIA, GSBS (PI), Maria Manczak, GIA (Co-I), Igor Ponomarev, SOM, GSBS (Co-I), Jeremy Bailoo, Civil, Environment, & Construction Engineering, TTU (Co-I)
3. Reduced mitochondrial fission protein DRP1 and Mitophagy in Alzheimer's Disease. NIH/NIA R21 grant: Maria Manczak, GIA (PI) and GIA team
4. Impact of mitochondrial fission protein DRP1 on autophagy/mitophagy pathway under tauopathy conditions. GIA collaborative seed grant: Maria Manczak, GIA (PI), Igor Ponomarev, SOM, GSBS (Co-I), GIA team
5. Global gene expression profiling of high fat and fish oil effects in a mouse model of Alzheimer's disease. COHS AD Seed Grant: Naima Moustaid-Moussa, Nutritional Sciences and Obesity Research Institute, TTU (PI), Volker Neugebauer, GIA, SOM, GSBS (MPI)
6. Host defense amyloids in the brain. GIA collaborative seed grant: Gail Cornwall, SOM, GSBS (PI), Hemachandra Reddy, SOM, GSBS (CO-I)
7. Role of aberrant Wnt/Ca²⁺ signaling in Alzheimer's disease and cancer. GIA collaborative seed grant: Kevin Pruitt, SOM, GSBS (PI), Josh Lawrence, GIA, SOM, GSBS (MPI)

8. Role of mitochondrial dysfunction in changing inflammatory in aging mice subjected to chemotherapy-induced pain sensitivity. GIA collaborative seed grant: Josee Guindon, SOM, GSBS (PI), Maria Manczak, SOM GIA (Co-I), John Culberson, SOM (Co-I)

9. Characterizing Electron Emission for Nanoemitter Arrays Using Theory and Molecular Simulation, DoD: Ravi Joshi, ECE, TTU (Subcontract PI), Bijoy Ghosh, Math, TTU, Dy Le, IMMS, TTU, Alexander Idesman, Mechanical Engineering, TTU, Josh Lawrence, SOM, GIA, GSBS (TTUHSC subcontract PI)

10. A Novel Therapeutic Agent for the Treatment of Multiple Sclerosis: AZ257, Dual-Inhibitor of Histamine Receptor H1 and Dopamine Transporter. South Plains Foundation: Nadia German, SOP (PI), Mirla Avila, SOM (MPI), Volker Neugebauer, GIA, SOM, GSBS (MPI)

11. Ginger extract in anxio-depressive disorders: gut-brain-axis. Davis Foundation: Chwan-Li (Leslie) Shen, SOM (PI), Volker Neugebauer, SOM, GIA, GSBS (MPI)

Preclinical Research - Applications

12. Trans-synaptic signaling vulnerabilities early in Alzheimer's Disease. Bright Focus Foundation application: Josh Lawrence, SOM, GIA, GSBS (PI), Maria Manczak, GIA (MPI), Volker Neugebauer, SOM, GIA, GSBS (Co-I)

13. Trans-synaptic signal complex in Alzheimer's disease models, NIH/NIA R01 application: Volker Neugebauer, GIA, SOM, GSBS (PI), Maria Manczak, GIA (MPI), Josh Lawrence, SOM, GIA, GSBS (MPI), Shashank Dravid, Creighton University (Co-I)

14. Mitochondria and Oxidative Stress in Aging. Subproject 3: Role of RALBP1 in Mitochondrial Dysfunction and Aging and Alzheimer's Disease. NIH/NIA P01 grant application: Hemachandra Reddy, SOM, GSBS (PI), Komaraiah Palle, SOM (subproject-PI), Sharda Singh, SOM (Subproject-PI), Josh Lawrence, SOM, GIA, GSBS (Co-I)

15. SLC13A5 deficiency promotes Alzheimer's disease: Studies with two novel humanized mouse models. NIH R21 application: Vadivel Ganapathy, SOM, GSBS (PI), Josh Lawrence, SOM, GIA, GSBS (Co-I), Hemachandra Reddy, SOM, GSBS (Co-I), Jeremy Bailoo, SOM (Co-I)

16. Vitamin D in Decelerating Cognitive Decline and Epigenetic Age. Texas Alzheimer's Research & Care Consortium (TARCC) application: Josh Lawrence, GIA, SOM, GSBS (PI), Kevin Pruitt, SOM, GSBS (MPI), Duke Appiah, Public Health (Co-I)

17. Tetrode biosensor probes for real-time detections of biomarker dysregulation in Alzheimer's disease. NIH/NIA R21: Prabhu Arumugam, Louisiana Tech University (PI), Volker Neugebauer, GIA, SOM, GSBS (Subcontract-PI)

18. Protective Effects of Fish Oil in the APPswePS1dE9 Alzheimer's Mouse Model. NIH grant application: Naima Moustaid-Moussa, Nutritional Sciences and Obesity Research Institute, TTU (PI), Volker Neugebauer, GIA, SOM, GSBS (MPI)

19. Modulation of Dopamine-Induced Compartmentalized Inflammation. Multiple Sclerosis Foundation: Nadia German, SOP (PI), Mirla Avila, SOM (MPI), Volker Neugebauer, GIA, SOM, GSBS (MPI)

20. Several other collaborations between Josh Lawrence, GIA, SOM, GSBS and TTU faculty (Amanda Brown, Biological Sciences; Maria Onyango, Biological Sciences)

- **Human Studies**

- Human Studies - Funded**

- 1. Increasing Mental Health Services for Low Income and Minority Informal Caregivers of Dementia Patients: A GIA and TTU Collaboration, Garrison Family Foundation grant: Volker Neugebauer, GIA, SOM, GSBS (PI), Jonathan Singer, Psychological Sciences, TTU (Sub-contract-PI)

- 2. Implementing Individual Mental Health Treatment and Respite for Hispanic Informal Caregivers of Individuals with Dementia. Diversity, Equity and Inclusion (DEI) research grant: Volker Neugebauer, GIA, SOM, GSBS (PI), Jonathan Singer, Psychological Sciences, TTU (MPI)

- 3. Examining Effects of Respite and Individual Clinical Interventions on Biopsychosocial Outcomes in Informal Caregivers of Dementia Patients. Garrison Family Foundation grant: Volker Neugebauer, GIA, SOM, GSBS (PI), Jonathan Singer, Psychological Sciences, TTU (Subcontract-PI), Breanna Harris, Biology, TTU (Co-I)

4. Mental Health Telemedicine for Caregivers of People with Alzheimer's Disease and Related Dementias in Rural West Texas. TTUHSC SOM, CTNT, GIA Seed Fund Program: Jonathan Singer, Psychology, TTU (PI), Volker Neugebauer, GIA, SOM, GSBS (MPI)

5. Project FRONTIER Participant Assessment of COVID-19. TTUHSC Project FRONTIER funding: Gabriela Ashworth, GIA, SOM (PI), Jonathan Singer, Psychology, TTU (MPI), Volker Neugebauer, GIA, SOM, GSBS (MPI); GIA Research Team

6. Alzheimer's disease and urinary tract infections: nursing home workflow encompassing CAN, LVN and PCP communication. GIA collaborative seed grant: Alyce Ashcraft, SON (PI), Donna Owen, SON (MPI), John Culberson, SOM (MPI), Annette Boles, GIA, and GIA Research Team

7. Mind your heart: the association of heart/vascular aging with mild cognitive impairment using data from Project FRONTIER. GIA collaborative seed grant: Duke Appiah, Public Health, GSBS (PI), Gabriela Ashworth, GIA, SOM (MPH), Nandini Nair, SOM (Co-I), Annette Boles, GIA (Co-I)

8. Biopsychosocial predictors of cognitive stability, decline, and resilience in a sample of older rural-dwelling West Texans: A retrospective cohort study using data from Project FRONTIER. GIA collaborative see grant: Gabriela Ashworth, GIA, SOM (MPI), Duke Appiah, Public Health, GSBS (Co-I), Annette Boles, GIA (Co-I)

9. Pilot Study on enhancement of ventromedial prefrontal cortical – anterior cingulate functional connectivity with repetitive Transcranial Magnetic Stimulation for apathy in TBI. Moody Foundation: Bryce Cragg, SOM (PI), John Norbury, SOM (MPI), Chwan-Li (Leslie) Shen, SOM (MPI), Volker Neugebauer, SOM, GIA, GSBS (Consultant)

Human Studies - Applications

10. Neural Correlates of Pre-Death Grief and Psychosocial Distress in Family Members of Individuals with Dementia. NPCRC Kornfeld Scholarship Program Award application: Jonathan Singer, Psychological Sciences, TTU (PI), Volker Neugebauer, GIA, SOM, GSBS (Mentor)

11. Evaluating Group and Individual Mental Health Treatment for Minority Informal Caregivers of Individuals with Dementia. CH Foundation application: Jonathan Singer, Psychological Sciences, TTU (PI), Volker Neugebauer, GIA, SOM, GSBS (Consultant)

12. Neuro-Cognitive Outcomes and Vulnerabilities in the time of Infectious Disease pandemics (Neuro-COVID): TARCC Collaborative for patient and caregiver research. Clinical research study. Texas Alzheimer's Research & Care Consortium (TARCC) application. Marcia Ory, Texas A&M (PI), Volker Neugebauer, GIA, SOM, GSBS (Subcontract-PI), Jonathan Singer, Psychological Sciences, TTU (Subcontract-PI)

13. The West Texas TEACH program. Davidson Foundation grant application: Jonathan Singer, Psychological Sciences, TTU (PI), Volker Neugebauer, GIA, SOM, GSBS (MPI)

14. Alzheimer Disease Sequencing Project. NIH grant application: Claudia Satizabal, UT Health San Antonio (PI), Volker Neugebauer, GIA, SOM, GSBS – Project FRONTIER and GIA Brain Bank (Subcontract-PI)

15. Alzheimer Disease Brain Transcriptomics. Cohorts for Heart and Brain Aging in Genomic Epidemiology (CHARGE) application: Sudha Seshadri, UT Health San Antonio (PI), Volker Neugebauer, GIA, SOM, GSBS – Project FRONTIER and GIA Brain Bank (Subcontract-PI)

16. Burden of neuropathology in Hispanic (and NHW) persons and using digital pathology and AI methods. NIH U24 application: Maggie Ellen Flanagan, South Texas ADRV Brain Bank (PI), Volker Neugebauer, GIA, SOM, GSBS – Project FRONITER and GIA Brain Bank (Subcontract-PI)

17. GRow and EAT Leafy GREENS (GREAT GREENS): Sustainable Productions of Leafy Greens for Health and Food Safety. USDA application. Naima Moustaid-Moussa, Nutritional Sciences and Obesity Research Institute, TTU (PI), Volker Neugebauer, GIA, SOM, GSBS (External Advisory Board Member)

18. Protective Effects of Fish Oil in the APPswePS1dE9 Alzheimer's Mouse Model. NIH grant application: Naima Moustaid-Moussa, Nutritional Sciences and Obesity Research Institute, TTU (PI), Volker Neugebauer, GIA, SOM, GSBS (Subcontract-PI)

19. Evaluating Changes in Biomarkers of Aging in Cerebrospinal Fluid Among Children Receiving Chemotherapy for Acute Lymphoblastic Leukemia. CPRIT or NIH grant application: Mohamad Al-Rahawan, SOM, (PI), Volker Neugebauer, GIA, SOM, GSBS (MPI)



20. Characterizing Vascular Function in Long Sleeper. NIH R15 and AHA Institutional Research Enhancement Award application (AIREA) applications: Joaquin Gonzales, Kinesiology and Sports Medicine, TTU (PI), Volker Neugebauer, GIA, SOM, GSBS (Co-I/Consultant)

21. A COVID-19 Challenge: Telemedicine Expansion in Vulnerable Populations. Agency for Healthcare Research and Quality – AHRQ, HSS: Theresa Byrd, Public Health, GSBS, (PI), Gabriela Ashworth, GIA, SOM (Co-I)

22. The Impact of Biopsychosocial Factors on Mild Cognitive Impairment and MCI-to-ADRD Progression among Urban and Rural Hispanics/Latinos with Data from the Texas Alzheimer’s Research & Care Consortium (TARCC) and Project FRONTIER. Texas Alzheimer’s Research & Care Consortium (TARCC) application: Principal Investigators, Gabriela Ashworth, GIA, SOM (PI), Volker Neugebauer, GIA, SOM, GSBS (MPI)

23. All-trans retinoic acid deficiency in Alzheimer’s disease: evidence from human transcriptomics and a novel mouse model. Josh Lawrence, GIA, SOM, GSBS (PI), Maria Manczak, GIA (Co-I), Jeremy Bailoo, SOM (Co-I), Igor Ponomarev, SOM, GSBS (Co-I)

24. Depression, Vitamin D, and Health Disparities among Hispanics in Older Rural West Texans: A Project FRONTIER Study. TARCC: Josh Lawrence, SOM, GIA, GSBS (PI), Volker Neugebauer, GIA, SOM, GSBS (Co-I), John Culberson, SOM (Co-I), Gabriela Ashworth, GIA, SOM (Co-I), Annette Boles, GIA (Co-I)

25. Hippocampal All-Trans Retinoic Acid (ATRA) Deficiency in Alzheimer’s Disease: An Investigation of ATRA-Dependent Gene Transcription in Post-Mortem Hippocampal Tissue. TARCC: Josh Lawrence, SOM, GIA, GSBS (PI), Kevin Pruitt, SOM, GSBS (Co-I), Maria Manczak, GIA (Co-I), Igor Ponomarev, SOM, GSBS (Co-I)

- **Student Research Opportunities**

GIA faculty participate in the Medical Student Summer Research Program (MSSRP) by mentoring medical students.

- **Grant Applications in 2022**

- 11/29/2022 | Volker Neugebauer (MPI), Jonathan Singer, Psychology, TTU (PI) “Mental Health Telemedicine for Caregivers of People with Alzheimer’s Disease and Related Dementias in Rural West Texas”, TTUHSC SOM, CTNT, GIA Seed Fund Program (Funded)

- 10/17/2022 | [Josh Lawrence](#) (PI subcontract) “Characterizing Electron Emission for Nanoemitter Arrays Using Theory and Molecular Simulations”, DoD (Submitted)
- 10/14/2022 | Igor Ponomarev (Co-I), P. Grozdanov (PI) “Cell Type Specific Alternative Polyadenylation of mRNAs in Alzheimer’s disease”, NIH R21 (Submitted)
- 9/15/2022 | [Volker Neugebauer](#) (PI) “Increasing Mental Health Services for Low Income and Minority Informal Caregivers of Dementia Patients: A GIA and TTU Collaboration”, Garrison Family Foundation (Funded)
- 8/25/2022 | [Volker Neugebauer](#) (MPI), Leslie Shen (PI) “Ginger root extract and gut-brain-axis in neuropathic pain: a pilot randomized, double-blinded, placebo-controlled crossover trail”, USDA (Submitted)
- 07/29/2022 | [Volker Neugebauer](#) (MPI), Jonathan Singer, TTU/TTUHSC (PI) “Implementing Individual Mental Health Treatment and Respite for Hispanic Informal Caregivers of Individuals with Dementia”, TTUHSC DEI Research Grant program (Funded)
- 07/28/2022 | [Volker Neugebauer](#) (MPI), Jonathan Singer, TTU/TTUHSC (PI) “Providing West Texas Mental Health Services to Hispanic Informal Caregivers of Dementia Patients”, TTUHSC Health Disparities Research Program (Submitted, not funded)
- 05/31/2022 | [Volker Neugebauer](#) (MPI), Nadia German (PI), Tom Abbruscato (MPI) “Development of KOR Ligands for Neuropathic Pain”, NIH R01 (Submitted, not funded)
- 05/19/2022 | [Volker Neugebauer](#) (PI subcontract), Michael Burman, UNE (PI) “CRF Systems, Neonatal Trauma and Pain” NIH R01 (Submitted, not funded)
- 05/25/2022 | [Josh Lawrence](#) (Co-I), H. Reddy (PI) “Mitochondria and Oxidative Stress in Aging”, P01 Subproject (Submitted)
- 04/28/2022 | [Volker Neugebauer](#) (PI), Jonathan Singer, TTU/TTUHSC (Subcontract PI) “Increasing Mental health Services for Low Income and Minority Informal Caregivers of Dementia Patients: A GIA and TTU Collaboration”, Garrison Family Foundation (Funded)
- 03/03/2022 | [Josh Lawrence](#) (Co-I), Vadivel Ganapathy (PI) “SLC13A5 Deficiency Promotes Alzheimer’s Disease: Studies with Two Novel Humanized Mouse Models”, NIH

R21 (Submitted, not funded)

- 02/23/2022 | [Volker Neugebauer](#) (MPI), Frank Porreca, UA (PI) “Validating Peripheral Prolactin Signaling for Treatment of Pain in Females”, NIH R01 (Submitted, not funded)

- 01/26/2022 | [Volker Neugebauer](#) (MPI), Frank Porreca, UA (PI) “Brain Circuits of Migraine Pain”, NIH R01 (Funded)

- 01/21/2022 | [Volker Neugebauer](#) (Mentor), Jonathan Singer, TTU/TTUHSC (PI) “Neural Correlates of Pre-Death Grief and Psychosocial Distress in Family Members of Individuals with Dementia”, NPCRC (Submitted)

- 01/05/2022 | [Volker Neugebauer](#) (Consultant), Joaquin Gonzales, TTU (PI) “Characterizing Vascular Function in Long Sleepers”, AHA (Submitted, not funded)

- 01/03/2022 | [Josh Lawrence](#) (PI) “Vitamin D in Decelerating Cognitive Decline and Epigenetic Age”, TARCC (Submitted)

- **Newly Funded Projects on Aging and Alzheimer’s Disease in 2022**

- NIH R01 grant, “The Hippocampal Dentate Gyrus in Aging and Alzheimer’s Disease: Boosting Transcription of Retinoic Acid-sensitive Genes Through Vitamin A Supplementation and HDAC Inhibition”, Drs. [Lawrence](#) (PI) and [Manczak](#) (Co-I), Total awarded 3,184,045 (08/01/2022 – 04/30/2027)

- NIH R01 grant, “Transcriptional Dysfunction in Dentate Gyrus Cell Types: Roles of Retinoic Acid Responsive Genes in Protection Against Alzheimer’s Disease Pathogenesis”, Drs. [Lawrence](#) (PI) and [Manczak](#) (Co-I), Total awarded \$1,872,220 (01/01/2022)

- Diversity, Equity and Inclusion (DEI) research grant, “Implementing Individual Mental Health Treatment and Respite for Hispanic Informal Caregivers of Individuals with Dementia”, Dr. [Neugebauer](#) (PI), Total awarded \$14,500 (09/01/2022 - 08/31/2023)

- Garrison Family Foundation, “Increasing Mental Health Services for Low Income and Minority Informal Caregivers of Dementia Patients: A GIA and TTU Collaboration”, Dr. [Neugebauer](#) (PI), Total awarded \$75,000 (02/02/2022 - 02/01/2023)

- CTNT Seed Fund Program in cooperation with TTUHSC, “Development of a Model

System for Amyloid Precursor Protein Synthesis and Detection”, Andrey Karamyshev, PhD, [Maria Manczak](#), Ph.D, Total awarded \$60,000 (04/01/2022 - 03/31/2023)

- **Publications by GIA Members**

Ramesh Kandimalla, [Maria Manczak](#), Kandimalla R, Jangampalli Adi Pradeepkiran, Hallie Morton, P. Hemachandra Reddy. A Partial Reduction of Drp1 Improves Cognitive Behavior and Enhances Mitophagy, Autophagy and Dendritic Spines in a Transgenic Tau Mouse Model of Alzheimer Disease. *Hum Mol Genet.* Jun 4;31 (pp.): 1788-1805, **2022** PMID: 34919689.

Shen, C.-L., Wang, R., Ji, G., Elmassry, M.M., Zabet-Moghaddam, M., Vellers, H., Hamood, A.N., Gong, X., Mirzaei, P., Sang, S., [Neugebauer, V.](#) Dietary Supplementation of Gingerols and Dhogaols-enriched Ginger Root Extract Attenuate Pain-associated Behaviors while Modulating Gut Microbiota and Metabolites in Rats with Spinal Nerve Ligation. *J. Nutr. Biochem.* 100:108904 (12pp.), **2022**. PMID: 34748918; *PMC 8794052*.

Shen, C.-L., Watkins, B., Kahathuduwa, C., Chyu, M., Zabet, M., Elmassry, M.M., Luk, H.-Y., Brismee, J.-M., Knox, A., Lee, J., Zumwalt, M., Wang, R., Wager, T.D., [Neugebauer, V.](#) Tai Chi Improves Brain Functional Connectivity and Plasma Lysophosphatidylcholines in Postmenopausal Women with Knee Osteoarthritis: An Exploratory Pilot Study. *Front. Med.* 8: 775344 (16pp.), **2022**. PMID:35047525. *PMC8761802*.

Ashraf-Uz-Zaman, M., Ji, G., Tidwell, D., [Yin, L.](#), [Burugu, D.](#), Thakolwiboon, S., Pan, J., Junell, R., Griffin, Z., Shahi, S., Barthels, D., Sajib, M.S., Trippier, P.C., Mikelis, C.M., Das, H., Avila, M., [Neugebauer, V.](#), German, N.A. Evaluation of Urea-Based Inhibitors of the Dopamine Transporter Using the Experimental Autoimmune Encephalomyelitis Model of Multiple Sclerosis. *ACS Chem. Neurosci.* 13: 217-228, **2022**. PMID: 34978174.

Shen, C.-L., Castro, L., Fang, C.-Y., Castro, M., Sherali, S., White, S., Wang, R., [Neugebauer, V.](#) Bioactive Compounds for Neuropathic Pain: An Update on Preclinical Studies and Future Perspectives. *J. Nutr. Biochem.* 104: 108979 (29pp.), **2022**. PMID: 35245654.

Presto, P., Mazzitelli, M., Junell, R., Griffin, Z., [Neugebauer, V.](#) Sex Differences in Pain Along the Neuraxis. *Neuropharmacology* 210: 109030 (14pp.), **2022**. PMID: 35331712. *PMC9354808*.

Mazzitelli, M., Yakhnitsa, V., Neugebauer, B., Neugebauer, V. Optogenetic Manipulation of CeA-CRF Neurons Modulate Pain and Anxiety-like Behaviors in Neuropathic Pain and Control Rats. Neuropharmacology 210: 109031 (12pp.), **2022**. PMID 35304173. *PMC9352141*.

Shen, C.-L., Schick, A., Tompkins, C., Dunn, D.M., Neugebauer, V. Bioactive Compounds for Fibromyalgia-like Symptoms: A Narrative Review and Future Perspectives. Int. J. Environ. Res. Public Health 19: 4148 (17pp.), **2022**. PMID: 35245654. *PMC8998198*.

Ito, H., Navatilova, E., Vagnerova, B., Watanabe, M., Kopruszinski, C., Moreira de Souza, L.H., Yue, X., Ikegami, D., Moutal, A., Patwardhan, A., Khanna, R., Yamazaki, M., Guerrero, M., Rosen, H., Roberts, E., Neugebauer, V., Dodick, D.W., Porreca, F. Chronic Pain Recruits Hypothalamic Dynorphin/Kappa Opioid Receptor Signaling to Promote Wakefulness and Vigilance. Brain 153, **2022**. PMID: 35485490.

Yakhnitsa, V., Ji, G., Hein, M., Presto, P., Griffin, Z., Ponomareva, O., Navratilova, E., Porreca, F., Neugebauer, V. Kappa Opioid Receptor Blockade in the Amygdala Mitigates Pain-like Behaviors by Inhibiting CRF Neurons in a Rat Model of Functional Pain. Front. Pharmacol. 13: 903978 (16pp.), **2022**. PMID: 35694266. *PMC9177060*.

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Shen, C.-L., Wang, R., Yakhnitsa, V., Santos, J., Watson, C., Kiritoshi, T., Ji, G., Hamood, A., Neugebauer, V. Gingerol-enriched Ginger Supplementation Mitigates Neuropathic Pain via Mitigating Intestinal Permeability and Neuroinflammation: Gut-brain Connection. Front. Pharmacol. 13: 912609 (10pp.), **2022**. PMID: 358735544. *PMC9305072*.

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Mazzitelli, M., Presto, P., Antenucci, N., Meltan, S., Neugebauer, V. Recent Advances in the Modulation of Pain by the Metabotropic Glutamate Receptors. Cells 11: 2608 (40pp.), **2022**. PMID: 36010684. *PMC9406805*.

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Avils, M., Neugebauer, V., DeToledo, J., Gender Differences in MS Related Pain, Correlation with MRI Lesion Localization and Burden of Disease. Pharm. Pharmacol. Int. J. 9:258-261, **2021**.

MEETINGS ATTENDED AND PRESENTATIONS BY GIA RESEARCHERS

- Guindon, G. (Chair), Hunsberger, H., Ebner, N., and Lawrence, J.J. (Co-Chair). “All-Trans Retinoic Acid Deficiency in Alzheimer’s Disease Hippocampus: Novel Mouse and Human Evidence”. Panel discussion, Sex Differences in Aging from Sleep, Pain, Brain Circuitry, and Disease Stated. Winter Conference on Brain Research, Snowmass, CO. 02/04/2022.
- Texas Alzheimer’s Research and Care Consortium 2022 Scientific Symposium: Advances in Alzheimer’s Disease Science, Research, and Care, Austin, Texas, 05/12/2022. Dr. Maria Manczak attended.
- Pan, J., Thakolwiboon, S., German, N., Neugebauer, V., Avila, M. Neuroprotective Effect of AZ257, a Novel Urea-based Dopamine Transporter Inhibitor, in the Experimental Autoimmune Encephalitis (EAE) Mouse Model. American Academy of Neurology 2022 Annual Meeting. #2267, 2022.
- Azzam, S., Manczak, M., Neugebauer, V. Studying the Effect of Mitochondrial Dysfunction and Other Hallmarks of Alzheimer’s. 34th Annual Student Research Week, P. 124, 2022.
- Griffin, Z., Yakhnitsa, V., Hein, M., Navratilova, E., Presto, P., Porreca, F., Neugebauer, V. Kappa Opioid Receptor Blockage Reduces Pain-like Behaviors and Restores Inhibition of Amygdala CRF Neurons in a Functional Pain Model in Rats. 34th Annual Student Research Week, p. 130, 2022.
- Junell, R., Presto, P., Ponomarev, I., Neugebauer, V. Subacute Silencing of HMGB1 in the Amygdala Inhibits Pain-related Behaviors in a Rat Model of Chronic Neuropathic Pain. 34th Annual Student Research Week, p. 133, 2022.
- Watson, C., Wang, R., Yakhnitsa, V., Santos, J., Kirtoshi, T., Ji, G., Neugebauer, V., Shen, C.-

L. Ginger Root Extract Improves Mitochondrial Dysfunction in NP Model Animals. 34th Annual Student Research Week, p.146, 2022.

• Nia, S.S., Hossain, M.A., Ji, G., Obeng, S., Nozohouri, S., Patel, D., Kalem, R., Jonnalagadda, S., Sifat, A.E., Hiranita, T., Abbruscato, T.J., Tripper, P.C., Putman, W., L., Neugebauer, V., German, N.A. Selective KOR Antagonists, Novel Candidates for Treatment of Neuropathic Pain. 34th Annual Research Week, p.159, 2022.

• Presto, P., Neugebauer, V. CGRP1 Receptor Blockade in the Amygdala in Neuropathic Pain: Cellular and Behavioral Outcomes. 34th Annual Student Research Week, p.161, 2022.

• Shahi, S., Ashraf-Uz-Zaman, M.D., Ji, G., Tidwell, D., Tin, L., Thakolwiboon, S., Pan, J., Tripper, P.C., Avila, M., Neugebauer, V., German, N.A., Novel Class of DAT Inhibitor for the Treatment of Addiction. 34th Annual Student Research Week, p.163, 2022.

• Presto, P., Neugebauer, V. CGRP1 Receptor Blockade in the Amygdala in Neuropathic Pain: Cellular and Behavioral Effects. 6th Annual CTNT Symposium, p. 28, 2022.

• Shen, C.-L., Newman, J.W., Elmassry, M.M., Borkowski, K., Chyu, M.-C., Kahathuduwa, C., Neugebauer, V., Watkins, B.A., Tai Chi Improves Plasma Levels of Oxylipins and Endocannabinoids in Postmenopausal Women with Knee Osteoarthritic Pain. International Congress on Integrative Medicine and Health, p. 1866, 2022.

• Shen, C.-L., Elmassry, M.M., Santos, J., Wang, R., Yakhnitsa, V., Kiritoshi, T., Ji, G., Lovett, J., Hamood, A., Neugebauer, V. Two Curcumin Extracts Modify Composition of Gut Microbiota, Tight Junction Protein, and Neuroinflammation in Rats with Neuropathic Pain: Microbiota Gut-brain Axis. Nutrition, PO19-25-22, ID 1201566, 2022.

• Shen, C.-L., Wang, R., Yakhnitsa, V., Santos, J., Watson, C., Kiritoshi, T., Ji, G., Kim, N., Lovett, J., Hamood, A., Neugebauer, V. Ginger Root Extract Mitigates Neuropathic Pain via Suppressing Neuroinflammation: Gut-brain Connection. Nutrition, PO19-24-22, ID 1201512, 2022.

• Santos, J.M., Wang, R., Driver, Z., Bhakta, V., Contreras, J., Yakhnitsa, V., Kiritoshi, T., Ji, G., Neugebauer, V., Shen, C.-L., Curcumin and Curcuminoid Effects Modulating Chronic Mechanical Eensitivity in Spinal Nerve Ligation Model Revert Mitochondria Dysfunction and Oxidative Stress. Nutrition, PO07-63-22, ID 1209117, 2022.

- Presto, P., Ponomarev, I., [Neugebauer, V.](#) Subacute Silencing of HMGB1 in the Amygdala Reduces Pain-Related Behaviors in a Rat Model of Chronic Neuropathic Pain. 19th World Congr. Pain, IASP, PFR189, 2022.
- Mazzitelli, M., [Neugebauer, V.](#) Group II mGluR Agonists Decrease CeA Neuronal Excitability via Astrocytic mGluR3 Activation in an Arthritis Pain Model. 19th World Congr. Pain, IASP, PTH80, 2022.
- John, J., [Neugebauer, V.](#) Chemogenetic Modulation of the Amygdala in Pain. Transformative Undergraduate Experiences Symposium, 55, 2022.
- Santos, J.M., Wang, R., [Neugebauer, V.](#), Shen, C.-L., Curcumin Effects Modulating Chronic Pain in Spinal Nerve Ligation (SNL) Model by Reverting Mitochondria Dysfunction and Oxidative Stress in Spinal Cord and Amygdala. 4th Integrative Medicine Symposium and 11th Gender-Specific Medicine and Women's Health Symposium, LWBIWH, 2022.
- Welch, G., Presto, P., Mendoxa, B., [Neugebauer, V.](#) Role of Exogenously Induced Neuroimmune Activation in the Rodent Right and Left Central Amygdala. Soc. Neurosci. Abstr. 51: 047.01, 2022.
- Kiritoshi, T., Yakhnitsa, V., [Neugebauer, V.](#) Differential Pain-related Synaptic and Excitability Changes in Amygdala CRF and non-CRF Neurons in Acute and Chronic Phases of a Neuropathic Pain Model. Soc. Neurosci. Abstr. 51: 047.02, 2022.
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- Mazzitelli, M., [Neugebauer, V.](#) mGluR2 and mGluR3 Activation Mediate Different Neuronal and Synaptic Functions of CeA Neurons in an Arthritis Pain Model. Soc. Neurosci. Abstr. 51: 047.04, 2022.
- Mendoza, B., Presto, P., Ponomarev, I., [Neugebauer, V.](#) Hmgb1 Silencing in the Amygdala Inhibits Pain-related Behaviors in a Sex-specific Manner in a Rat Neuropathic Pain Model. Soc. Neurosci. Abstr. 51: 047.05, 2022.
- Yakhnitsa, V., Ponomareva, O., Thompson, J., Pruitt, K., [Neugebauer, V.](#) Reduced SK2-channel Expression in Central Nucleus of Amygdala in Chronic Neuropathic Pain. Evidence for Epigenetic

Mechanism. Soc. Neurosci. Abstr. 51: 047.06, 2022.

- Presto, P., Ji, G., Ponomarev, I., [Neugebauer, V.](#) Transcriptomic Profiling of the Central and Basolateral Amygdala in a Rat Model of Chronic Neuropathic Pain. Soc. Neurosci. Abstr. 51:047.07, 2022.
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- [Neugebauer, V.](#), Mazzitelli, M. Amygdala mGluR2 and mGluR3 Modulate Different Aspects of Arthritis Pain-related Behaviors. Soc. Neurosci. Abstr. 51: 047.09, 2022.
- Kopruszinski, C.M., Stratton, H.J., Watanabe, M., Martinez, A.L., Moreida De Souza, L., Dodicks, D.W., Moutal, A., [Neugebauer, V.](#), Porreca, F., Navratilova, E., Kappa Opioid Receptor Agonists Produce Sexually Dimorphic and Prolactin-dependent Hyperalgesic Priming. Soc. Neurosci., Abstr. 51: 705.19, 2022.
- [Manczak, M.](#), Yib, X., [Burugu, D.](#), [Lawrence, J.J.](#), [Neugebauer, V.](#) The Role Mitochondrial Fission Protein Drp1 in Mitophagy Process in Transgenic Mouse Model (Tau P301L). Soc. Neurosci. Abstr. 51: 705.19, 2022.
- [Dr. Volker Neugebauer](#) presented “Emotional Aspects of Pain – Preclinical Studies. Behavioral Assessment”. Neuroscience School of Advanced Sciences, Venice, Italy. 06/16/2022.
- [Dr. Volker Neugebauer](#) presented “Emotional Aspects of Pain – Preclinical Studies. Neuroplasticity”. Neuroscience School of Advanced Sciences, Venice, Italy. 06/16/2022.
- [Dr. Volker Neugebauer](#) presented “Amygdala CRF Neurons and Pain Modulation”. Pain Mechanisms and Therapeutics Conference. Verona, Italy. 06/01/2022.
- [Dr. Volker Neugebauer](#) presented “Mentoring Early Career Faculty and How to Deal with Senior Inactive/Unfunded Faculty?” AMSNDC, Long Beach, CA. 04/30/2022.
- [Dr. Volker Neugebauer](#) presented “Brain Mechanisms of Pain”. Biology of Pain course, UTHSC, San Antonio, TX (virtual). 03/22/2022.

- [Dr. Volker Neugebauer](#) presented “Amygdala Modulation of Pain Behaviors”. Texas Gulf Coast Consortium for Translational Pain Research, Houston, TX. Virtual Workshop. 01/21/2022.
- [Dr. Volker Neugebauer](#) presented “Differential Roles of mGluR2 and mGluR3 in the Amygdala in Pain Modulation”. 10th mGlu Meeting, Taormina, Italy. 10/04/2021.
- [Dr. Duke Appiah](#) presented in Denver, CO. 10/2021.
- [Dr. Volker Neugebauer](#) attended National Center for Complementary and Integrative Health (NCCIH) workshop “Methodological Approaches for Whole Person Research”. 09/2021. (virtual)



PROJECT FRONTIER

The GIA serves as an integrative platform for basic research, human studies, and community outreach and education for healthy aging at the TTUHSC (website: <https://www.ttuhsoc.edu/centers-institutes/garrisonaging/default.aspx>). Project FRONTIER is designed to investigate the prevalence and natural course of dementia and chronic disease development and its impact on cognitive, physical, (psycho-) social and interpersonal functioning in a multi-ethnic adult sample from rural communities of West Texas. Information from this study will advance knowledge about disease predictors, risk factors and mechanisms and help develop programs for effective disease management, preservation of cognitive functioning throughout the lifespan, and improvement of the overall health of individuals living in rural West Texas.

“Project FRONTIER Participant Assessment of COVID-19” (headed by Gabriela [Ashworth](#), PhD, GIA, SOM, Volker [Neugebauer](#), MD, PhD, GIA, SOM, GSBS, Jonathan Singer, PhD, Psychology, TTU; Research Team: Annette [Boles](#), MS, GIA, Veronica [Lopez](#), BS, GIA, Susan [Thompson](#), GIA, Cordelia [Aguirre](#), GIA) focused on COVID-19 experiences, preventative measures, and available resource services in rural West Texas communities in comparison with Lubbock County residents. Urban-rural comparison revealed disparities in COVID-19 experiences (testing, positive COVID cases, fatalities) amongst the communities, which call for strategies aimed at improving healthcare access in rural areas through telemedicine and other innovative approaches.

“Biopsychosocial predictors of cognitive stability, decline, and resilience in a sample of older, rural-dwelling West-Texans: A retrospective cohort study using data from Project FRONTIER” (headed by Gabriela [Ashworth](#), PhD, GIA, SOM, Duke Appiah, PhD, GSBS, Annette [Boles](#), MS, GIA) explored biopsychosocial risk factors on cognitive stability, cognitive resilience, and cognitive decline.

“Mind your heart: the association of heart vascular aging with mild cognitive impairment using data from Project FRONTIER” (headed by Duke Appiah, PhD, GSBS, Gabriela



Ashworth, PhD, GIA, SOM; Co-investigators: Nandini Nair, MD, PhD, SOM, and Annette Boles, MS, GIA) investigates the association of predicted heart/vascular age (PHA) with MCI, the role of ethnicity in changes in cognition due to PHA, and the influence of sociodemographic and lifestyle-related factors on excess PHA, and seeks to develop a statistical algorithm to predict MCI considering PHA, biomarkers and other factors pertinent to rural communities.

“Depression, Vitamin D, and Health Disparities among Hispanics in Older Rural West Texans: A Project FRONTIER study” (headed by J. Josh Lawrence, PhD, GIA, SOM, GSBS, Research Team: Mohammed Pourghaed, BS, SOM, Ashish Sarangi, MD, SOM, Felipe Ramirez Velandia, MD, Jonathan Kopel, MD, PhD, SOM, GSBS, John Culberson, MD, SOM, Gabriela Ashworth, PhD, GIA, SOM, Hafiz Khan, PhD, GSBS, Annette Boles, MS, GIA, and Volker Neugebauer, MD, PhD, GIA, SOM, GSBS) explored relationships between serum vitamin D (VD) levels and Geriatric Depression Scale (GDS), a subjective measure of depression. VD levels were negatively correlated with GDS total scores, were higher in clinically depressed with reported use of antidepressant medications, and were lower in Hispanic/Latinos (HLs) compared to non-HLs, suggesting disparities in VD-related health status and depression among HL, and non-HL populations.

“Associations between VD Levels with Hispanic Ethnicity, General Health Status, and Co-Morbid Conditions among Older Rural West Texas: A Project FRONTIER Study” (headed by J. Josh Lawrence, PhD, GIA, SOM, GSBS, Research Team: Mohammed Pourghaed, BS, SOM, Ashish Sarangi, MD, SOM, Felipe Ramirez Velandia, MD, Jonathan Kopel, MD, PhD, SOM, GSBS, John Culberson, MD, SOM, Gabriela Ashworth, PhD, GIA, SOM, Hafiz Khan, PhD, GSBS, Annette Boles, MS, GIA, and Volker Neugebauer, MD, PhD, GIA, SOM, GSBS) investigated relationships between measures of general health, history of disease, vitamin supplementation, and disease-related blood-based biomarkers. Obesity, diabetes, depression, and nicotine use were significantly negatively associated with VD level. The most significant parameters to predict VD level were Hispanic ethnicity and VD supplementation. VD levels were positively associated with VD supplementation. Sufficient VD levels achievable through VD supplementation may improve general health, reduce the severity of co-morbid conditions, and improve overall quality of life.

“The Role of Age and Education on Neurocognitive Functioning in Hispanic and Non-Hispanic Individuals in Rural West Texas” (headed by Jonathan Singer, PhD, Psychology, TTU, and Volker Neugebauer, MD, PhD, SOM, GIA, GSBS; Research Team: Veronica Lopez, GIA; Lauren Elliott, Carol Faballa, and Elisabeth McLean, Psychology, TTU) found that

lower age and higher education resulted in greater neurocognitive functioning. However, educational attainment had a disproportionate impact on neurocognitive functioning for Hispanic individuals compared to non-Hispanic individuals.

“A Public Health Crisis in Rural West Texas: Neurocognitive Disparities between Hispanic and Non-Hispanic Communities Moderated by Depression” (headed by Jonathan Singer, PhD, Psychology, TTU, and Volker Neugebauer, MD, PhD, SOM, GIA, GSBS; Research Team: Veronica Lopez, GIA; Lauren Elliott, Carol Faballa, and Elisabeth McLean, Psychology, TTU) found that racial-ethnic minorities are exposed to chronic stressors, which negatively influences functioning. Non-Hispanics individuals encounter fewer chronic stressors than minorities and, the introduction of stressors, like depression, may impact neurocognitive functioning – unlike Hispanic individuals. Results support the need for culturally tailored interventions because underlying factors related to cognitive function differ, such as depression in non-minority individuals.



GIA BRAIN BANK

The GIA Brain Bank (GBB) was established in 2007 to aid families interested in arranging a brain autopsy on individuals to confirm clinical diagnosis of dementia and to provide tissue for current and future research in dementia related diseases and other brain disorders. During the challenging time of the COVID-19 pandemic, the GBB continued to serve the families of enrolled patients while continuing to improve our banking procedures and protocols. The GBB maintained the service of providing autopsy results for the diagnosis of the patient in collaboration with Luisa Florez, MD, Pathologist, Texas Panhandle Forensics, Lubbock, Texas, and interpreting these findings to family members on occasion. Miller Mortuary & Crematory Service provided a safe and respectful environment for the extraction of the brain for the Brain Bank

During this past year, we reached out to other brain banks to seek collaborative opportunities and to inquire about their procedures and protocols to enhance and align our methods as needed. Some of the brain banks we reached out to were the University of Kentucky, University of Texas (UT) Southwestern and UT San Antonio. These inquiries resulted in establishing a direct line of communication with one another, exploring ways to assist each other with cases in the areas these universities cover, discussing the challenges faced in enrollment and harvesting tissue, and comparing harvesting and banking protocols, which led to the GBB purchasing additional lab supplies and an invitation from the Biggs Institute Brain Bank Core at UT San Antonio to participate in the neuropathology clinicopathologic consensus meeting on research subjects as part of the Texas Alzheimer's Research and Care Consortium (TARCC). This collaborative initiative of TARCC provides valuable opportunities for GBB to expand our research activities. A budding partnership is developing between the GBB and the TTUHSC Institute of Anatomical Sciences to seek collaborative opportunities between the Institutes, and our Executive Director, Dr. Volker Neugebauer, is serving on the Institutional Anatomical Research Committee.

Protocols for obtaining, preserving and analyzing brain tissues are constantly updated, and for that we successfully recruited a new staff member, Dr. Yong Chen, who joined us from UTMB at Galveston, Texas. He will oversee quality analysis, storage and cataloging specimens, retrieval of tissue samples, and development of a searchable data base with clinical information about the patients. Quality assessment of postmortem human brain tissues from 174 donors was done by RNA Integrity Number (RIN) analysis. GBB brains were from healthy individuals and from patients with neurodegenerative disorders. Both the surface and inner tissues from the brain were analyzed for every subject. Overall, 90 out of 174 samples had RTN of 4 or greater for at least one tissue sample, indicating they are suitable for molecular biology studies. This suggests that more than 50% of the brains from GBB could be potentially used for research and 38% of these GBB brains with high confidence.



EDUCATION

RESEARCH PRESENTATIONS, EDUCATIONAL PROGRAMS, LECTURE SERIES

TRANSLATIONAL NEUROSCIENCE AND PHARMACOLOGY LECTURE SERIES

09/17/2021 | *Studying Pain and Anger: A Clinical Translational Perspective* | Distinguished Guest Speaker, Yenisel Cruz-Almeida, MSPH, PhD, University of Florida

09/27/2021 | *Role of Neuroimmune Signaling in the Amygdala in Neuropathic Pain* | MD/PhD Student, Peyton Presto

10/19/2021 | *Impact of Sex Differences and Exercise on Osteoarthritis Pain* | Distinguished Guest Speaker, Tamara King-Deeny, PhD, University of New England

11/03/2021 | *Circuit and Network Mechanisms of Cognitive Deficits in Alzheimer's Disease* | Distinguished Guest Speaker, Jeannie Chin, PhD, Baylor College of Medicine

11/11/2021 | *The Brain-Penetrant Clinical ATM Inhibitor AZD1390 Radiosensitizes and Improves Survival of Preclinical Brain Tumor Models* | MD/PhD Student, Trevor Burrow

11/16/2021 | *Novel Rat Knock-in Models of Alzheimer's Disease* | Distinguished Guest Speaker, Marc Tambini, MD, PhD, Rutgers University

11/23/2021 | *Axonal Generation of Amyloid- β from Palmitoylated APP in Mitochondria-Associated Endoplasmic Reticulum Membranes* | MD/PhD Student, Josh Willms

11/30/2021 | *Differential Nervous System Functions of mGluR2 and mGluR3* | Graduate Student, Mariacristina Mazzitelli

12/14/2021 | *Chronic Pain: From Brain Circuits to Psychological Intervention* | Distinguished Guest Speaker, Tor Wager, PhD, Dartmouth College

02/01/2022 | *More than Skin Deep: Keratinocytes and Somatosensation* | Distinguished



Guest Speaker, Cheryl Stubcky, PhD, Medical College of Wisconsin

02/15/2022 | *A Missense Mutation Converts the Na⁺, K⁺-ATPase into an Ion Channel and Causes Therapy-Resistant Epilepsy* | Graduate Student, Ryan Sweazy

02/16/2022 | *Understanding Olfactory Function and Dysfunction – from Cellular Networks to Behaviors* | Distinguished Guest Speaker, Shaolin Liu, PhD, Howard University

03/01/2022 | *CRES and CRES Subgroup Members as Potential Functional Amyloids in the Brain* | Graduate Student, Alejandra Gomez

03/15/2022 | *Development of DSM-V Porcine Model of Alcohol Use Disorder* | Graduate Student, Xiaobo Liu

03/22/2022 | *Treatment of Inflammatory Disorders with Modified Minocycline Analogs* | MD/PhD Student, Josh Willms

04/05/2022 | *Cell-type Specific Gene Expression Changes in the Brain in Mice Leads to Excessive Alcohol Drinking; Role of Innate Immune System* | Graduate Student, Brent Kisby

04/12/2022 | *Function of Sodium-Couples Citrate Transporter NaCT and Defunction in Early Infantile Epileptic Encephalopathy* | Graduate Student, Valeria Jaramillo-Martinez

04/26/2022 | *Identifying the Epigenetic Role of Monoamine Neurotransmitter, Dopamine and Serotonin, in Alcohol Use Disorder* | Graduate Student, Praneetha Panthagani

05/03/2022 | *The Central Amygdala Mediates Alcohol Withdrawal Hyperalgesia* | Distinguished Speaker, Nicholas Gilpin, PhD, Louisiana State University

08/16/2022 | *The Inflamm-aging Axis in Microglia and the Link to Alzheimer's Disease* | Distinguished Speaker, I-Chen Ivorine Yu, PhD, Indiana University

09/09/2022 | *Circuits and Cells for Bidirectional Control of Pain in the Amygdala* | Distinguished Speaker, Yarimar Carrasquillo PhD, NIH

ANNUAL RESEARCH SYMPOSIUM

The Sixth Annual Research Symposium “Neuroplasticity in Clinical Disorders – From Chronic Pain to Neurodegenerative Disease” was a collaboration between the Center of Excellence for Translational Neuroscience and Therapeutics (CTNT) and the GIA.

In-person Event: Tuesday, April 19, 2022, TTUHSC, Lubbock, Texas.

- **Distinguished Keynote Speaker and ADK Lecturer:**

Walter Koroshetz, MD | Director, National Institute of Neurological Disorders and Stroke (NINDS) | “NINDS and the Taxpayer’s Investment in Neuroscience”

Opening Remarks

Dr. Lance McMahon, PhD, Senior Vice President for Research and Innovation

Dr. Volker Neugebauer, MD, PhD, Director, Center of Excellence for Translational Neuroscience and Therapeutics (CTNT)

Dr. Tom Tenner, PhD, Professor, Department of Medical Education

- **CTNT Collaborative Research Presentations**

Volker Neugebauer, MD/PhD, **Igor Ponomarev**, PhD, **Peyton Presto**, MD/PhD Student
“Pain mechanisms – Neuroimmune Signaling in the Brain”

Michaela Jansen, PharmD, PhD

“Molecular Determinants for the Interaction between the Chaperone RIC-3 and Pentameric Channels”

Josh Lawrence, PhD

“Hippocampal Functions in Alzheimer’s Disease”





- **Poster Presentations**

- Basic Science – Undergraduate/Medical Students

- Karsyn Hulbgewachs, Joselin Loewen, Harry May, Yuma Ortiz, Shreya Uppala

- Basic Science – Graduate Students

- Alejandra Gomez, Sarah Hernandez, Valeria Jaramillo-Martinez, Brent Kisby, Mosharaf Mahmud Syed, Mariacristina Mazzitelli, Caitlyn Mullins, Peyton Presto, Cesar Sanchez Villalobos, Kerri Spontarelli, Ryan Sweazey

- Basin Science - Postgraduate

- Henry Blanton, PhD

- Clinical - Undergraduate/Medical Students

- Ashley Bassett, Alyssa Rodaniche, Rebecca Hall, Nabeela Manal, Nandini Ray, Sparsh Ray, Akhila Reddy

- Clinical – Graduate Students

- Kiran Ali, Alexandra Bammel, Daniel De Simon, Vitoria Dennis, Marvely Iweh, Sadisna Shahi

- Clinical – Postgraduates

- Hatice Kurt, Micah Park

- **2022 Poster Award Winners**

- Basic Science**

- Undergraduate/Medical Student: Yuma Ortiz** – “Mitragynine Reverses Paclitaxel Chemotherapy-Induced Peripheral Neuropathy and is Medicated via Opioid Receptor Involvement”

- Graduate Student: Peyton Presto** – “CGRP1 Receptor Mlockade in the Amygdala in Neuropathic Pain: Cellular and Behavioral Effects”

- Post Graduate: Henry Blanton, PhD** – “Combination of Cannabidiol and Beta-caryophyllene Synergistically Mitigate Inflammatory Pain”

Clinical

Graduate Student: Daniel De Simon – “Preoperative Transcortical Mapping by Navigational Brain Stimulation in a Case of Temporal Astrocytoma”

Undergraduate/Medical Student: Rebecca Hall – “Effects of Repetitive Transcranial Magnetic Stimulation on Immediate Post-Intervention Chronic Daily Headache Intensity A Systematic Review and Meta-Analysis”

Post Graduate: Hatice Kurt, PhD – “Sociodemographic Factors as Moderators of the Association between Resilience and Suicidality in a Group of youth with Depression”

2022 NATIONAL ALZHEIMER'S DISEASE AWARENESS MONTH

In 1983, U.S. President Ronald Reagan declared November as National Alzheimer's Disease Awareness Month to foster awareness and inspire action against Alzheimer's disease, the most common cause of dementia among older adults. According to the Alzheimer's Association 2022 Alzheimer's Disease Facts and Figures report, an estimated 6.5 million Americans are living with Alzheimer's disease in 2022 (10.7% of people age 65 and older); and by 2050, this number is projected to reach 12.7 million Americans age 65 and older. In Texas, the number of people age 65 and older with Alzheimer's dementia is projected to increase by 22.5%. Alzheimer's disease is the sixth leading cause of death in the USA and the fifth leading cause of death among individuals aged 65 and older.

In November 2022 – The GIA commemorated National Alzheimer's Disease Awareness Month by raising awareness and educating the public on Alzheimer's disease. The GIA conducted this year's Alzheimer's Disease Awareness Month with all events in-person with an all-day community event which had over 130 individuals present and over 10 vendor booths with community resources.

November 2, 2022 – Care Partner Academy, “*Navigating the Dementia Maze*”, John W. Culbertson, MD, Associate Professor of Family and Community Medicine, Bernhard T. Mitemeyer, MD Endowed Chair in Geriatric Medicine, and Program Director, Geriatric Fellowship of TTUHSC.

November 8, 2022 – “*Examining Alzheimer's Biomarkers Across Diverse Populations in HABS-HD*”, Sid O'Bryant, PhD, Executive Director, Institute for Translational Research Professor, Department of Family Medicine, Texas College of Osteopathic Medicine, UNTHSC.



November 9, 2022 - Community member event – Alzheimer’s Disease Awareness Month Health Fair, Introduction by Volker Neugebauer, MD, PhD, GIA Guest Speaker - Jonathan Singer, PhD, Assistant Professor, Clinical Psychology, TTU, Dr. Henrik Wilms, MD, Associate Professor, TTUHSC, Dr. Leslie Shen, PhD, Associate Dean, Research & Professor of Pathology, TTUHSC, and Bailey Palmer, MS, CSCS, EP-C, Lecturer, TTU Kinesiology. Various vendors were in attendance.

HEALTHY AGING LECTURE SERIES

The Healthy Aging Lecture Series is a monthly educational program for the community to learn more about innovative research and health topics of interest to seniors. During the 2021-2022 academic calendar, the following lectures were hosted.

September 22, 2021 | *Healthy Food Demonstration* | Lauriena Cruz, RDN, Natural Grocers | Virtual

October 27, 2021 | *Financial Power of Attorney* | Lee Franks, JD, Law Offices of Lee Franks | Virtual

November 17, 2021 | *Stress Management for Older Adults* | Jonathan Singer, PhD, Assistant Professor, Clinical Psychology, TTU | Virtual

January 26, 2022 | *Hearing and Balance Evaluations* | Tessa Boesiger, AuD, CCC-A, Texas Tech Physicians | Virtual

February 23, 2022 | *Heartburn: The Good, the Bad, the Ugly* | Sameer Islam, MD, MBA, FASGE, FACG, Clinical Associate Professor, Department of Internal Medicine | Virtual

March 23, 2022 | *Spot Check, What’s That Spot?* | Michelle Tarbox, MD, Associate Professor of Dermatology, TTUHSC | Virtual

April 27, 2022 | *Guardianship 101, What Everyone Should Know* | Laura Beth Pleasant, Attorney, Associate Professor, TTU | In-Person

May 25, 2022 | *Geriatric Medicine* | John Culberson, MD, Associate Professor, Texas Tech Health Sciences Center | In-Person

MEETINGS ATTENDED BY GIA COMMUNITY OUTREACH AND EDUCATION STAFF —

The Ins and Outs of Dementia Care, Ian Kremer & Bonnie Wattles | September 15, 2021
| Alzheimer's Association | Virtual | [J. Blackmon](#)

Mental Wellness During COVID-19 hosted by Dr. Alan Korinek | September 21, 2021 |
Virtual | [J. Blackmon](#), [V. Lopez](#)

2nd Annual Virtual Conference "CHWs Moving Forward: Reset & Refocus" | September
27-28, 2021 | Virtual | [V. Lopez](#)

Retired and Senior Volunteer Program (RSVP) Senior Hay Day | Virtual | October 1, 2021
| [V. Lopez](#), [S. Thompson](#), [J. Blackmon](#), and [M. Brownell](#)

Essentials of Caregiving – The Importance of Sleep University of Texas Caregivers group |
October 14, 2021 | Virtual | [V. Lopez](#)

San Antonio (SA) Amigos Memory Café – UTHSCSA | October 18, 2021 | Virtual | [V. Lopez](#)

Presentation on GIA and Community Outreach | October 28, 2021 | Virtual | South
Plains Lions Club | [J. Blackmon](#)

Southwest Parkinson Society Meeting | November 2, 2021 | Lubbock | [J. Blackmon](#)

Social Determinants of Health – SDEP | November 4, 2021 | Virtual | [V. Lopez](#)

Dementia Friendly and Lubbock Application Follow-Up | November 9, 2021 | Virtual | [M.
Brownell](#), [J. Blackmon](#), and [V. Lopez](#)

COVID -19 & Building Immunity – Texas A&M CHWs | November 11, 2021 | Virtual | [V. Lopez](#)

Texas Cardiovascular Disease and Stroke Partnership – Department of State Health
Services (DSHS) | November 12, 2021 | Virtual | [V. Lopez](#)

Dementia Friendly Texas Network Quarterly Meeting | November 19, 2021 | Virtual | [J.
Blackmon](#) and [V. Lopez](#)

Texas State Plan for Alzheimer's Disease Webinar (DSHS) | December 9, 2021 | Virtual | [V. Lopez](#)



South Plains Hunger Solutions (SPHS) All Coalition Meeting | December 17, 2021 | Virtual | [V. Lopez](#)

Found Sound with the SA Amigos Memory Café | UT Health San Antonio | February 15, 2022 | Virtual | [V. Lopez](#)

Texas Cardiovascular Disease & Stroke Partnership Meeting | DSHS | February 25, 2022 | Virtual | [V. Lopez](#)

An Elderly Mother and an Aging Son: A Journalist Caregiving Story | March 20, 2022 | Lubbock | [J. Blackmon](#)

Brookdale Monterey Alzheimer's Support Group | March 28, 2022 | Lubbock | [J. Blackmon](#)

Amerigroup Saddle UP for your Health & Wellness Expo | March 31, 2022 | Windmill Museum of Lubbock | [V. Lopez](#) and [S. Thompson](#)

Association for Frontotemporal Degeneration (AFTD) 2022 Education Conference | April 8, 2022 | Virtual | [J. Blackmon](#)

Southcrest Baptist Church Health Forum | April 9, 2022 | Southcrest Baptist Church | [J. Blackmon](#)

RSVP State Conference | April 18-21, 2022 | Waco, Texas | [V. Lopez](#) and [S. Thompson](#)

Alzheimer's Association Conference | April 21, 2022 | Knipling Center | [J. Blackmon](#) and [M. Brownell](#)

Lubbock Adult Activity Health and Fitness Fair 2022 | May 21, 2022 | [J. Blackmon](#), [M. Brownell](#), [V. Lopez](#), and [S. Thompson](#)

South Plains Association of Governments Health Fair (SPAG) | May 25, 2022 | Slaton Senior Center | [V. Lopez](#) and [S. Thompson](#)

AmeriCorps Senior Summer Series | June 21-23, 2022 | Virtual | [S. Thompson](#) and [V. Lopez](#)

Annual Parkinson Disease Symposium | July 15, 2022 | Holy Spirit Catholic Church Lubbock | [J. Blackmon](#), [M. Brownell](#), [V. Lopez](#), and [S. Thompson](#)

COMMUNITY OUTREACH

DEMENTIA FRIENDLY LUBBOCK (DFL)

The GIA team is managing DFL, a new initiative of the Garrison Institute on Aging and part of Dementia Friendly America, which will commence its programming in April 2023 by offering training to volunteers and staff of Lubbock Meals on Wheels. The DFL program is designed to:

- Raise awareness of dementia and develop respect and inclusion for people with dementia,
- Provide services and resources embedded in all areas of community to promote quality of life,
- To support and educate people with dementia, their caregivers and families, from diagnosis through disease progression.

Program implementation and future collaboration were suspended in March 2020 due to the COVID-19 pandemic, but progress has been made this year once TTUHSC restrictions were lifted for in-person meetings in April 2022. The GIA team has gathered information from various agencies and organized a DFL Action Team. The DFL Action Team members are:

- Malcolm Brownell, Coordinator, TTUHSC Garrison Institute on Aging
- Joan Blackmon, Coordinator, TTUHSC Garrison Institute on Aging
- Veronica Lopez, Unit Manager, TTUHSC Garrison Institute on Aging
- Lisa Gonzales, Director of Caregiver Programs, South Plains Association of Governments
- Allison McMillan, Director of Memory Care, Brookdale Senior Living Center
- Connie Durham, Caregiver, Community Member

The DFL Action Team continues to work with key leaders and is creating an assessment of specific needs of Lubbock businesses, community agencies and other organizations to implement Dementia Friendly Lubbock. The data will then be compiled and interpreted to identify community priorities.

Through education, services and advocacy, DFL will engage community members, area businesses, and a wide variety of community-based organizations in better understanding the needs of those with dementia and the people that care for them. Various partners joined together to achieve Dementia Friendly status for Lubbock and these government, medical, and public entities will continue to provide guidance as we hone the vision of what a Dementia Friendly Lubbock will be. An upcoming kickoff will assist in recruiting additional partners to be part of this exciting initiative and begin the process of change in the way we think about and act towards those with dementia and their caregivers.

CARE PARTNER ACADEMY

The Care Partner Academy is led by Ms. Joan Blackmon. Ms. Blackmon has extensive experience working with caregivers. She works closely with local agencies and connects community members with resources that are available within the community. She also collaborates with Dr. John Culberson to determine educational session topics. Dr. Culberson is an Associate Professor of Family and Community Medicine, Bernhard T. Mitemeyer, MD Endowed Chair in Geriatric Medicine, and Program Director, Geriatric Fellowship of TTUHSC. Topics range from community service opportunities to stress management techniques, problem solving and coping strategies. These educational sessions were conducted via the Zoom platform at the beginning of the year but are now being conducted in-person with the option of Zoom participation.

Presenters and Topics:

September 14, 2021 | *“What’s Cooking?”* | Allison Childress, PhD, TTU | Virtual

October 5, 2021 | *“Hearing Loss and Dementia: Chicken or the Egg”* | Arica Black, AuD – The Hearing Doctor | Virtual

November 9, 2021 | *“Taking Care of the Caregiver When Hospice Steps In”* | Jeremy Brown, MD, Executive Director, Hospice of Lubbock | Virtual

December 14, 2021 | *“How to Minimize Holiday Stress”* | Open Panel discussion | Virtual

January 11, 2022 | *“Wills vs Trusts: How to Decide What is Best for You”* | Lee Franks, JD, Elder Law Attorney | Virtual

February 8, 2022 | *“No Gym Required: How to Get Fit at Home”* | Bailey Palmer, MS, CSCS, EP-C | Virtual

March 8, 2022 | *“Smarter Ways to Give-Top Tax Tips for 2022”* | Russell N. James, III, JD, PhD, CFP, TTU | Virtual

April 12, 2022 | *“Back in the Saddle”* | John Culberson, MD, TTUHSC | In-person

May 10, 2022 | *“What to Know About Medicaid”* | Lee Franks, JD, Elder Law Attorney | In-person

July 12, 2022 | Lubbock Adult Day Care Center | Diane Taylor | In-person

August 9, 2022 | *“Age in Place”* | Client Care Mangers for Home Instead | In-Person

8TH ANNUAL CAREGIVER CONFERENCE

The South Plains Association of Governments (SPAG) Area Agency on Aging (AAA), in collaboration with the GIA, TTUHSC School of Medicine, Newby Family Foundation, and Raider Ranch, hosted the 2022 Caregiver Conference on July 19th. The conference was held at the TTUHSC Academic Event Center in Lubbock, Texas. Our guest speaker was Pat Gleason-Wynn, Ph.D., LCSW, CSW-G, BSN, RN-BC, who spoke on “Things I wish I had known, Caring for People with Dementia”. Dr. Wynn is a Licensed Clinical Social Worker with an emphasis in Gerontology. She has helped thousands of families and professional care partners throughout Texas to understand the stages of dementia and the process of disease. This event was attended by 125 individuals and with over 20 local vendors participating and sharing community resources.

LUBBOCK RETIRED AND SENIOR VOLUNTEER PROGRAM (RSVP)

The Lubbock RSVP is grant-funded and serves the purpose of encouraging adults, who are 55 and older, to volunteer and assist the Lubbock community by using the abilities, interests and skills they have acquired throughout their life to meet the needs of the community. This program engages seniors in a wide array of community services that help non-profit and community-based organizations, including health, nutrition, human services, education, community and economic development and public safety.

• Recognition Dinner

On February 22, 2022, after two-years of COVID-19 restrictions, Lubbock RSVP had its first in-person recognition dinner. Fifty-four RSVP volunteers attended the event, and eight volunteers were awarded with Lifetime Achievement awards, dating from 2019-2021. The theme of the recognition dinner was “Tea Party” and several attendees wore big hats and enjoyed hot tea, live music and great food.

• RSVP Statistics

September 21, 2021 – August 31, 2022

- Total Volunteers as of September 1, 2022: 603
- New Volunteers from September 1, 2021-August 31, 2022: 83
- Approximate number of community service hours: 26,770.88
- Obtained augmentation award for RSVP (S. Thompson, V. Lopez)
- Annual Recognition Event held on February 22, 2022 had 54 volunteers present for the dinner
- Items made by volunteers since September 1, 2021-August 31, 2022:
 - Lap quits: 300
 - Knitted hats and beanies: 1,000
 - Stockings for U.S. servicemen: 2,000
 - Bears for Children’s Connection, Children’s Cancer Center and Texas Boys & Girls Ranch: 500
 - Adult bibs: 300
 - Walker pockets: 120

• Presidential Lifetime Achievement Awardees

Each year, Lubbock RSVP recognizes volunteers that have contributed more than 4,000 hours of volunteer service to our community. They were presented an award and received a certificate from Senator Ted Cruz as well. The 2022 Presidential Lifetime Achievement Award was presented to:

JENN BOREN

Volunteers for RSVP Comfort Corps

BRIGIDA GARCIA

Volunteers for RSVP Comfort Corps and Lubbock Meals on Wheels

TERRI COFFEY

Volunteers for Friends of the Library, RSVP Social Services and UMC Activities Center Line Dancers

DIANNE IVY

Volunteers for Friends of the Library

From left to right:

*Terri Coffey,
Brigida Garcia,
Susan Thompson,
Floyd Price,
Sharon Anderson,
and Sylvia Hill*





- **RSVP Advisory Council Members**

The RSVP Advisory Council is a group of individuals representing the interests of our volunteers, volunteer stations, and the community at large. Advisory Council members advise, assist, and advocate for effective project operations of RSVP of Lubbock County. They support constructive changes within the program, generate new ideas, and serve as ambassadors to the wider Lubbock community. Advisory Council members are committed to the following goals:

- Promote RSVP to potential members in order to help the program meet its volunteer recruitment targets.
- Assist with planning and executing one or more successful recognition events each year to celebrate the contributions of RSVP volunteers.
- Capture the remarkable stories of RSVP volunteers in order to communicate these to the local and national service communities.

The 2021-2022 Advisory Council includes the following leaders:

- Michael Boyd, Veterans Affairs
- Liz Castro, South Plains Associations of Governments
- Ayda Chapa, South Plains Associations of Governments
- Chris Gallaneau, Texas Home Health
- Lesli Griffin, Calvert Home Health
- Stacie Perez, HHSC Foster Grandparents
- Joseph Pullen, Carillon
- Carson Scott, TTUHSC, Senior Clinical Department Administration

STRESS BUSTING PROGRAM

The GIA kicked off its first Stress Busting program on Tuesday, April 26, 2022. Trained and certified leaders and GIA members, Veronica Lopez and Joan Blackmon, welcomed the individuals that attended the one-hour weekly sessions for 9-weeks. The Stress Busting Program for Family Caregivers is an evidence-based program that provides support to family caregivers of persons with dementia or a chronic illness.

It is proven to:

- Improve the quality of life of family caregivers who are providing care to an older loved one.
- Help Caregivers manage their own stress and cope better with their lives.

In the Stress-Busting Program for Family Caregivers, caregivers:

- Learn about stress and its effects.

- Practice stress management techniques.
- Develop problem solving skills.

High levels of stress, anxiety, and depression are common among family caregivers. How caregivers deal with the stresses associated with caregiving may be critical to their well-being. Caregivers are essential not only because they are important as individuals, but also because caregivers who care for themselves take better care of their loved ones.

The multi-component Stress-Busting Program for Family Caregivers provides caregivers the tools and strategies they need to take care of themselves. This program helps them cope more effectively with the stress related to caregiving.

This program has been highly beneficial for many family caregivers. Most have viewed it as a source of strength and support in their caregiving role. “You have changed my life” is a comment that is often offered by caregivers who have completed the program. Indeed, learning skills and developing attitudes to address the challenges of life can be life changing.

GARRISON FAMILY FOUNDATION MENTAL HEALTH CAREGIVER STUDY | COLLABORATIVE PROJECT | GIA AND TTU PSYCHOLOGY DEPARTMENT

The goal of this study headed by Volker Neugebauer, MD, PhD, GIA, SOM, GSBS (PI) and Jonathan Singer, PhD, Psychological Sciences, TTU (Subcontract-PI), is to provide mental health services and the stress busting program for informal caregivers of patients with dementia.

TELEMEDICINE MENTAL HEALTH PILOT PROJECT

This new program headed by Drs. Jonathan Singer (TTUHSC Psychiatry and TTU Psychology) and Volker Neugebauer (TTUHSC Pharmacology and Neuroscience and GIA) is to implement a current individual mental health treatment that is showing promising results in Lubbock County to rural areas of West Texas through telehealth. More specifically, the purpose of this study is to advance our understanding and improve mental health care of an underserved population by implementing individual mental health service for informal caregivers of persons with dementia in rural Texas. This program will serve to stimulate telehealth at TTUHSC, generate vital pilot data for sustained funding including an NIH grant application, and provide rural Texas with clinical services to be accessed. Caregivers of persons with Alzheimer’s Disease (AD) and Alzheimer’s Disease Related Dementias (AD/ADRD) experience a significant amount of stress and burden, as

well as higher rates of depression and anxiety than their age matched non-caregivers. Also, recent research has indicated that caregiving can impact neurocognitive functioning in caregivers of person with AD/ADRD. However, an important knowledge gap exists about the mechanism(s) underlying this demonstrated cognitive decline in caregivers, though it has been hypothesized to be in part due to high rates of poor psychosocial functioning in caregivers. Notably, caregivers living in rural communities are especially susceptible to reduced psychosocial functioning. However, the relationship between more severe AD/ADRD symptoms and severe behavioral and psychological symptoms has not been examined in relation to caregivers' neurocognitive functioning.

The overarching goal of this new project is to implement a telehealth program to expand our mental health services to individuals living in rural counties (e.g., Cochran County; Bailey County) in West Texas. We will also examine the dyadic relationship between family caregivers receiving telehealth services and the person with AD/ADRD and underlying biopsychosocial mechanisms. Currently, we have more than 30 family caregivers enrolled over the last 9 months in our study located in Lubbock, TX, with more than 15 participants already completing the treatment.

Specific Goals:

- Identify individuals who have high rates of biopsychosocial risk factors (inflammation; high Heart Rate Variability HRV) for poor mental health outcomes (e.g., pre-death grief; caregiver burden). This will provide us a greater understanding of underlying biopsychosocial mechanisms of poor caregiver outcomes.
- Provide and test mental health treatment (mindfulness based cognitive therapy; behavior activation) over telehealth to reduce mental health outcomes in rural Texas and assess if reducing these mental health outcomes can have a downstream effect on neurocognitive functioning in the family caregiver.
- Conduct a randomized control trial over telehealth that replicates our current clinical trial in Lubbock, that is in person (NCT05334992).
- Gain a greater understanding of the relationship between neurocognitive functioning of the family caregiver and the severity of neurocognitive decline and behavior concerns of person with AD/ADRD.



AWARDS

2021 University Distinguished Faculty Award at the Texas Tech University Health Sciences Center. This honor acknowledges Dr. Neugebauer's outstanding contributions in at least one of the following areas- teaching, research and/or service. His achievements have brought distinctions to TTUHSC and serve as an exemplar for other faculty, staff and students.



NEWS RELEASES

EDUCATIONAL ACTIVITIES FOR THE LAY PUBLIC

1. *“TTUHSC Events Seeks to Spread the Word About Alzheimer’s Disease”*. In: TTUHSC Statline Daily Dose, by Mark Hendricks, November 4, 2022:

<https://dailydose.ttuhs.edu/2022/november/garrison-alzheimers-awareness.aspx>

2. *“TTUHSC Receives NIH Grant Impact of Vitamin A Depletion on Alzheimer’s Disease”*. In: TTUHSC Statline Daily Dose, by Mark Hendricks, March 21, 2022:

<http://dailydose.ttuhs.edu/2022/march/nih-lawrence-vitamin-a-alzheimers.aspx>

3. *“TTUHSC researchers receive new NIH grant to continue studying amygdala-pain link”*. In: EurekAlert, a service of the American Association for the Advancement of Science. Media Contact: Suzanna Cisneros, February 1, 2022.

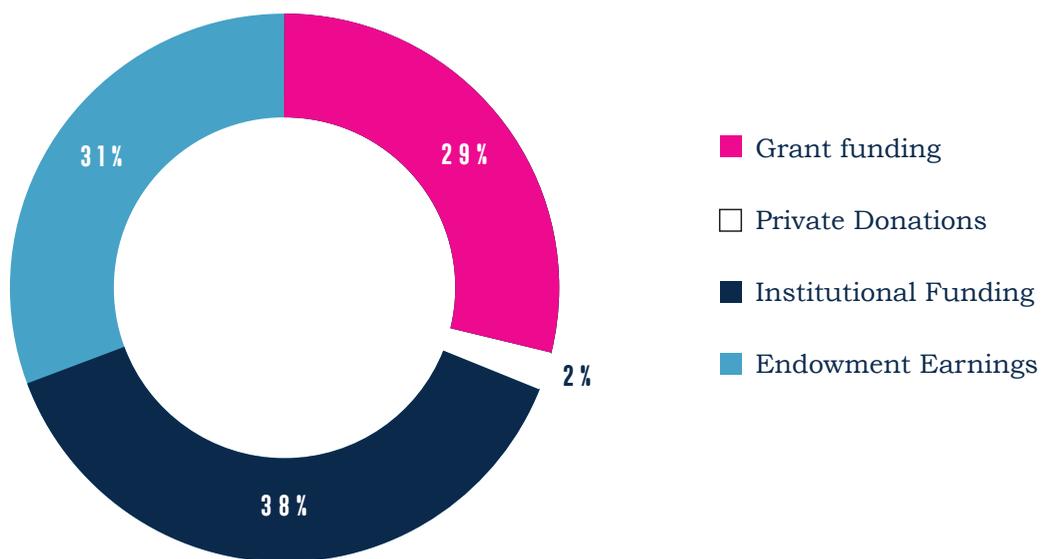
<https://www.eurekalert.org/news-releases/941989>

4. *“TTUHSC Researchers Receive New NIH Grant to Continue Studying Amygdala-Pain Link”*. In: TTUHSC Statline Daily Dose, by Mark Hendricks, January 31, 2022:

<https://dailydose.ttuhs.edu/2022/january/researchers-receive-nih-grant-amygdala-pain-link.aspx>

FINANCIALS

The Garrison Institute on Aging (GIA) is funded by a combination of competitive grants, institutional funding, and endowment earnings. The GIA is committed to securing external grant funding through competitive grant applications, collaborative projective projects, and faculty who would further enhance GIA-based research on aging and Alzheimer’s disease and strengthen our expertise in epidemiological studies centered on Project FRONTIER, while engaging in collaborations across TTUHSC. Dr. Lawrence successfully obtained funding for his work on vitamin A and retinoic acid signaling in Alzheimer’s disease through two new NIH R01 grants. Through a generous endowment provided by the Garrison family, the GIA receives a secure flow of income from the earnings on the endowment. While these earnings have decreased, due to economic factors and the COVID-19 pandemic, they are greatly appreciated and provide valuable funding for a variety of research projects, community outreach and education programs, and the GIA brain bank. The earnings alone are not enough to operate the GIA and we are very grateful for the continued support of the Texas Tech University Health Sciences Center administration.



FUTURE GOALS AND PLANS

The GIA seeks to play a critical role in the vision of Texas Tech University Health Sciences Center (TTUHSC) to transform health care through innovation and collaboration. The GIA strives to serve as a hub for collaborative translational research, education, and community outreach activities in the areas of healthy aging and aging-related health issues, including dementias such as Alzheimer's disease, and brain disorders.

A major change and accomplishment at the GIA over the past years has been the focus on enabling and leading collaborative preclinical and clinical research projects. We will ensure the success of our more than 40 existing collaborative projects and continue to grow and develop new GIA-led collaborations. One example is the new telehealth pilot program for mental health services in rural areas of West Texas to advance knowledge and improve mental health care of an underserved population implementing individual mental health services for informal caregivers of person with dementia in rural Texas. In conjunction with the School of Medicine, we are in the process of recruiting new faculty for basic research on Alzheimer's disease and related brain disorders to enhance our ability for collaborative initiatives.

The GIA Brain Bank (GBB) provides a unique opportunity for collaborations. Continued quality assessment and improved preservation and organization of the tissue samples will allow tissue sharing. A newly recruited staff member is being trained and will oversee these processes and develop a searchable database with clinical information. These efforts should generate collaborative opportunities in research and education across TTUHSC, TTU and beyond.

Project FRONTIER serves as platform for collaborations on basic research and studies in humans. This longitudinal study generates valuable information about prevalence and risk factors for the development of dementia and other chronic diseases in a multi-ethnic adult sample from rural communities of West Texas. A current collaborative GIA

project with Dr. Jonathan Singer addresses COVID-19 trends between urban-and rural-dwelling residents of the South Plains Texas Region by assessing and comparing the rates of COVID-19 vaccination, preventing measures, availability/utilization of health care resources and services, prevalence, and symptomology. Neurocognitive disparities between Hispanic and non-Hispanic individuals in rural West Texas is the topic of another collaborative project between the GIA team and Dr. Singer that investigated the contribution of age, education and depression. A study headed by Dr. Josh Lawrence analyzes the relationship between serum vitamin D levels, depression, comorbidities and health disparities. We are in the process of recruiting together with the new School of Population and Public Health, a member to enhance and obtain external funding for Project FRONTIER and our community outreach programs.

The GIA community outreach programs have largely resumed following some challenges during the COVID-19 pandemic. We will continue our Healthy Aging Lecture Series, Care Partner Academy, Caregiver Stress-Busting Dementia Program, Dementia Friendly Lubbock (part of Dementia Friendly America) and Healthy Lubbock Initiative (with Mayor's Fitness Council), Diabetes Self-Management Program (endorsed by CDC), and RSVP (Retired and Senior Volunteer Program). We are excited about our new mental health programs for informal caregivers of Alzheimer's disease and related dementia patients, including low income and minority caregivers. These programs will provide mental health services and the stress busting program as well as respite care through weekly therapeutic recreation. As already mentioned, our new telehealth pilot program will pioneer mental health services provided in rural areas of West Texas.

Our overarching goal is focused on serving as a hub for aging-related brain research and dementia and mental health care for community members from West Texas, the South Plains, and neighboring states through collaborations and telehealth initiatives. The GIA is fully committed to its mission of promoting healthy aging through innovation and collaboration. We will continue to explore collaborative opportunities across TTUHSC and TTU in translational research, curricular activities, and advanced educational and service programs for our community.



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