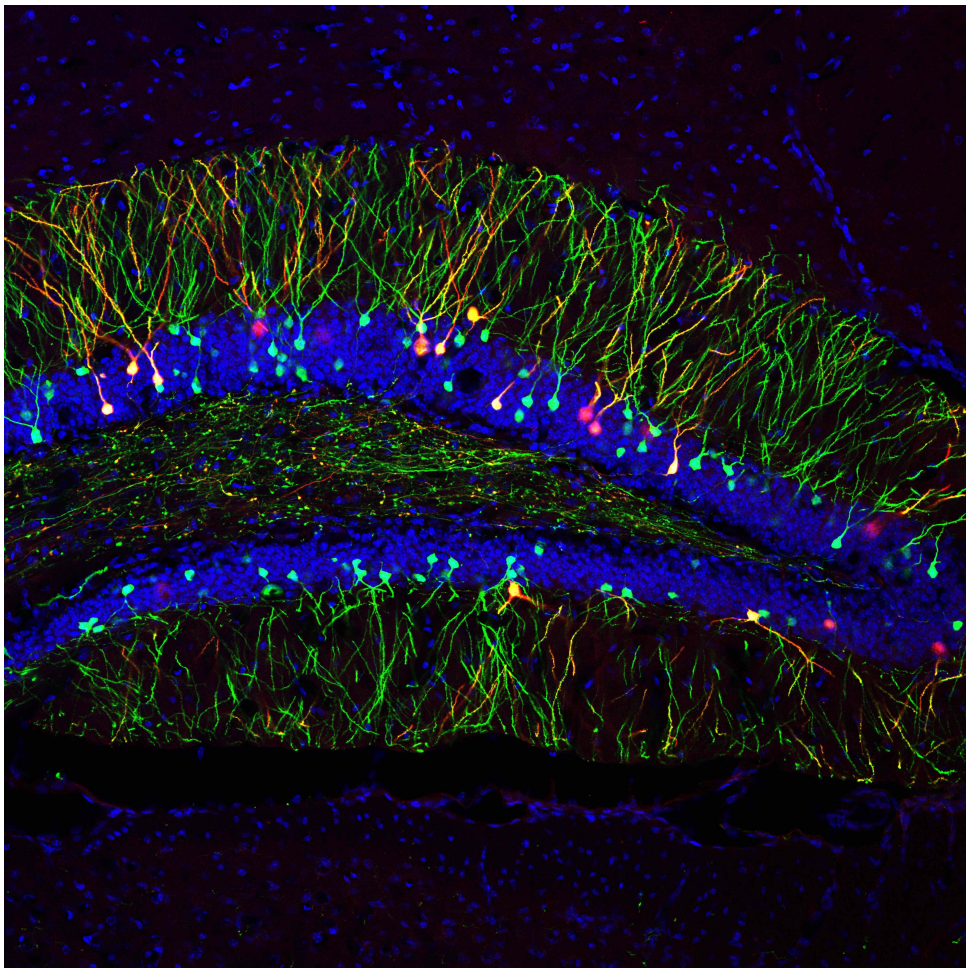
UTHSC NEUROSCIENCE INSTITUTE

THEC Neuroscience Center of Excellence

Annual Report to the

Tennessee Higher Education Commission (THEC)

Fiscal Year 2022 (7/1/2021-6/30/2022)



I. MISSION STATEMENT

The Neuroscience Institute (NI) at the University of Tennessee Health Science Center (UTHSC) is supported by the Neuroscience Center of Excellence, one of several Centers of Excellence established by the Tennessee Higher Education Commission in 1985. Our mission is to develop and support multidisciplinary research and training in neuroscience. We feature basic science and clinical members spanning 13 departments and three colleges, and foster neuroscience research through support of neuroscience track graduate students and postdocs, the NI Imaging Center and Behavioral Core, a robust seminar series, and start-up packages for new faculty. The brain is the final frontier of biology. Scientific inquiry has produced remarkably detailed knowledge of the physical world and much of the life sciences, including details of the human genome. However, our knowledge of the brain is far from complete. The nature and mechanisms of consciousness, thought, perception, learning, memory and many diseases of the nervous system are poorly understood. Neuroscience is now at an exciting threshold of discovery and unprecedented growth. The resulting explosion of information is rapidly increasing our understanding of the basic mechanisms of brain structure and function. This emerging knowledge is helping us discover effective treatments and even cures for some neurological diseases. More information concerning the NI is available at: https://www.uthsc.edu/neuroscience-institute/

II. EXECUTIVE SUMMARY

In FY 2022 the NI Center of Excellence continued the start-up fund support of (1) Dr. Tauheed Ishrat, an R01-funded associate professor and stroke/Alzheimer's neurobiologist recruited into the Anatomy & Neurobiology Department in 2017; (2) Dr. Il Hwan Kim, an R01-funded assistant professor and social behavior neurobiologist recruited from Duke University into Anatomy & Neurobiology in 2019; and (3) Dr. Jianyang Du, an R01-funded associate professor and social behavior neurobiologist who joined Anatomy & Neurobiology in January 2020. We provided stipend support to 5 graduate students and had 16 students in the Neuroscience Track of the Biomedical Sciences Ph.D. program, after accepting 2 new students. We supported 7 postdocs in the Departments of Anatomy and Neurobiology, Ophthalmology, Pharmaceutical Sciences and Physiology. We promoted neuroscience research by: (1) providing the Neuroscience Seminar series, mixing outside with UTHSC and affiliated faculty. Due to the impact of Covid seminars were offered by Zoom, which offered the advantage of participation of international speakers; (2) supporting competitive pilot project research award program, funding 3 projects to UTHSC NI faculty; and (3) continuing the undergraduate summer Neuroscience Merit Fellowship program supported two students from Rhodes College. We supported the NI Imaging Center, a cost-recovery facility providing the only transmission electron microscope (JEOL 2000) on campus, a state of the art Zeiss 800 Aryscan laser-line confocal microscope (upgraded from a Zeiss 710), and a Neurolucida 3-dimensional reconstruction workstation, and the Neuroscience Behavioral Core. We purchased new software to expand the image analysis capabilities of the Imaging Center. We supplemented the service contracts of these instruments and software to keep user fees low. We supported the Imaging Center's technical director, Esther Marquez Wilkins, Ph.D. Matthew Ennis, Ph.D., Chair of the Department of Anatomy & Neurobiology, continued as Interim Director since the retirement of the former NI Director, Dr. Armstrong, in August 2020.

III. TABLE OF CONTENTS

IV. ADMINISTRATIVE STRUCTURE

Interim Director: Matthew Ennis, Ph.D., Department of Anatomy & Neurobiology

Co-Director: John Boughter, Ph.D., Department of Anatomy & Neurobiology

Administrative Specialist: Mistie Brewer

Program Coordinator/IT Specialist: Brandy Fleming, M.S.

Center Address: University of Tennessee Health Science Center
875 Monroe Ave., Suite 426, Wittenborg Building, Memphis TN 38163
(901) 448-5960 https://www.uthsc.edu/neuroscience-institute/

Neuroscience Executive Committee:

John Boughter, Ph.D., Professor and NI Co-Director, Department of Anatomy and Neurobiology

Matthew Ennis, Ph.D., Professor and Chair, Department of Anatomy and Neurobiology

TJ Hollingsworth, Ph.D., Assistant Professor, Department of Ophthalmology

Jon Jaggar, Ph.D., Professor, Department of Physiology

Shalini Narayana, Ph.D., Associate Professor, Pediatric Neurology, Le Bonheur Hospital/UTHSC

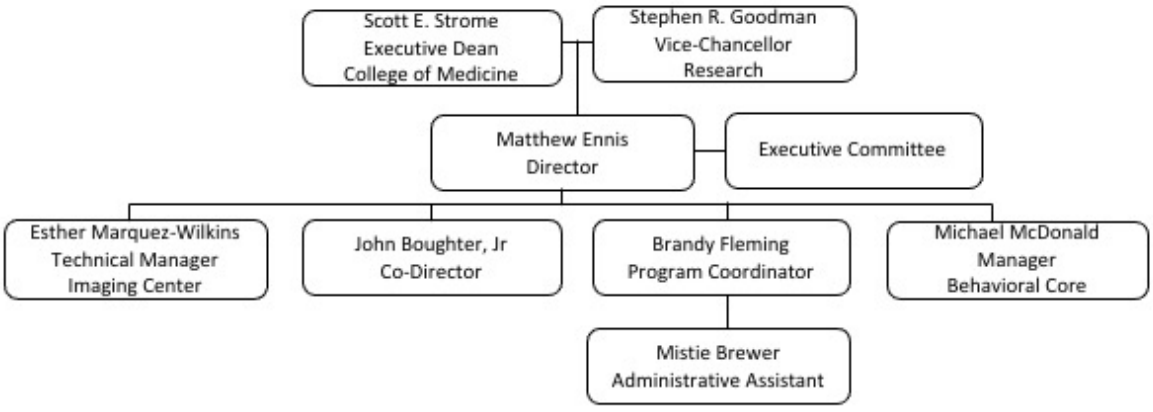
Jeff Steketee, Ph.D., Professor, Department of Pharmacology

Steven Tavalin Ph.D., Associate Professor, Department of Pharmacology

Jim Wheless, M.D., Professor, Chief of Pediatric Neurology and LeBonheur Chair, Le Bonheur Hospital/UTHSC

The executive committee meets at least twice a year to (1) review the budget and make budget recommendations, (2) vote on faculty who wish to become NI members or addition of new Executive Committee members, (3) reviews and determines awardees for the NI Postdoctoral Support and Pilot Project programs.

NI Organizational Chart



V. FACULTY OF THE NEUROSCIENCE INSTITUTE

In FY2022, the Neuroscience Institute wass comprised of 73 faculty members in 13 different departments on the UTHSC campus, including those with primary appointments at St. Jude Children's Research Hospital and one faculty member at UT Knoxville. Faculty are listed by department; those with primary appointments outside UTHSC or UTK are so indicated. We added 4 new members (*), and 3 members left UTHSC as indicated, this past FY.

Department of Anatomy and Neurobiology

William E. Armstrong, Ph.D., Professor Emeritus
Alessandra d'Azzo, Ph.D., Affiliated Professor (St. Jude)
*Jay Bickoff, Ph.D., Affiliated Assistant Professor (St. Jude)
John D. Boughter, Jr., Ph.D. Professor and NI Co-Director
Joseph C. Callaway, Ph.D., Associate Professor
Viktor Chizhikov, Ph.D., Associate Professorr
Jianyang Du, Ph.D., Associate Professorr
Michael A. Dyer, Ph.D., Affiliated Professor (St. Jude)
Matthew Ennis, Ph.D., Simon R. Breusch Professor and Chair; Interim NI Director
Max Fletcher, Ph.D., Associate Professor
Robert C. Foehring, Ph.D., Professor
Kristin Hamre, Ph.D., Associate Professor
Detlef Heck, Ph.D., Professor
Marcia G. Honig, Ph.D., Professor Emeritus
Tauheed Ishrat, Ph.D., Associate Professor
Il Hwan Kim, Ph.D., Assistant Professor
Hitoshi Kita, Ph.D., Professor Emeritus
Peter J. McKinnon, Ph.D., Affiliated Professor (St. Jude)
James I. Morgan, Ph.D., Affiliated Professor (St. Jude)
Anton J. Reiner, Ph.D., Professor Emeritus
Lindsay Schwarz, Ph.D., Affiliated Assistant Professor (St. Jude)
J. Paul Taylor, M.D., Ph.D., Affiliated Professor (St. Jude)
Robert S. Waters, Ph.D., Professor
Steven L. Youngentob, Ph.D., Professor (retired 6/2022)
Stanislav Zahkarenko, Ph.D. Affiliated Professor (St. Jude)

Department of Biochemistry and Cellular and Molecular Biology, UT Knoxville

Rebecca A. Prosser, Ph.D., Professor

Department of Genetics, Genomics and Informatics

Robert W. Williams, Ph.D., UT-Oak Ridge National Laboratory Governor's Chair in Computational Genomics, Professor and Chair; Director, Center for Integrative and Translational Genomics

Byron Jones, Ph.D., Professor

Lu Lu, Ph.D., Professor

Megan Mulligan, Ph.D., Assistant Professor

Burt Sharp, M.D., Van Fleet Professor

Department of Medicine/Cardiology

Syamal Bhattacharya, Ph.D., Professor

Department of Psychiatry

Ronald Cowan, M.D., Ph.D., Professor and Chair

Department of Neurology

Michael McDonald, Ph.D., Professor

Mohammad Khan, Ph.D., Assistant Professor

Thaddeus S. Nowak, Ph.D., Professor

Lawrence T. Reiter, Ph.D., Professor

Jack Tsao, M.D., Ph.D., Professor (left UTHSC 1/2022)

Department of Neurosurgery

Frederick Boop, M.D., Professor and Chair

Department of Ophthalmology

Rajashekhar Gangaraju, Ph.D., Assistant Professor

*TJ Hollingsworth, Ph.D., Assistant Professor

Monica M. Jablonski, Ph.D., Professor

Nawajes Mandal, Ph.D., Professor

*Siamak Yousefi. Ph.D., Assistant Professor

Department of Pediatrics, Pediatric Neurology and LeBonheur Children's Hospital

Abbas Babajani-Feremi, Ph.D., Assistant Professor, Pediatrics, Le Bonheur (left UTHSC 12/2020)

Shalini Narayana, Ph.D., Associate Professor, Pediatric Neurology, Le Bonheur

Massroor Pourcyrous, M.D., Professor, Pediatrics

James W. Wheless, M.D., Professor and Chief of Pediatric Neurology, Le Bonheur

Department of Pharmaceutical Sciences

Duane D. Miller, Ph.D., Van Fleet Professor and Chair

Bob Moore, Ph.D., Professor

Jianxiong Jiang, Ph.D., Associate Professor

Department of Pharmacology

Alex M. Dopico, M.D., Ph.D., Professor and Chair

Suleiman W. Bahouth, Ph.D., Professor

Anna Bukiya, Ph.D. Professor

Hao Chen, Ph.D., Associate Professor

Chang Hoon Jee, Ph.D., Assistant Professor

*Dean Kirson, Ph.D., Assistant Professor

Francesca-Fang Liao, Ph.D., Professor

Kafait U. Malik, Ph.D., Professor

Kazuko Sakata, Ph.D., Associate Professor

Jeffery Steketee, Ph.D., Professor

Steven J. Tavalin, Ph.D., Associate Professor

Brendan Turnstall, Ph.D., Assistant Professor

Thirumalini Vaithianathan, Ph.D., Assistant Professor

Fu-Ming Zhou, M.D., Ph.D., Professor

Department of Physiology

Julio Cordero-Morales, Ph.D., Associate Professor

Ioannis Dragatsis, Ph.D., Professor

Jonathan Jaggar, Ph.D., Maury Bronstein Professor

Charles W. Leffler, Ph.D., Professor Emeritus (deceased)

Helena Parfenova, Ph.D., Professor

Valeria Vásquez, Ph.D., Associate Professor

Paula Dietrich, Ph.D., Assistant Professor

Department of Preventive Medicine

Khyobeni Mozhui, Ph.D., Associate Professor

College of Nursing

Ansley Stanfill, Ph.D., Associate Professor

St. Jude Children's Hospital (see Departments Above for Affiliated Appointments)

*Jay Bickoff, Ph.D., Assistant Professor

Michael Dyer, Ph.D., Professor

Alessandra D'Azzo, Ph.D., Professor

Peter McKinnon, Ph.D., Professor

James Morgan, Ph.D., Professor

Lindsay Schwarz, Ph.D., Assistant Professor

J. Paul Taylor, M.D., Ph.D., Professor

Stanislav Zakharenko, Ph.D., Professor

VI. GRADUATE STUDENTS & POSTDOCTORAL STUDENTS

***Graduate Students*:** The NI supports the Neuroscience Graduate Program, which is a division of the Biomedical Sciences Program at UTHSC. A description of the Neuroscience program can be found at: https://www.uthsc.edu/anatomy-neurobiology/neuroscience_graduate_program.php. This program is directed by NI members Dr. Max Fletcher (Track Director) and Dr. Matthew Ennis (Program head and Chair of Anatomy and Neurobiology). Students in this track take Functional Neuroanatomy, and 2 of 3 additional Core courses (Cellular Neuroscience, Behavioral Neuroscience, Developmental and Molecular Neuroscience), in addition to Statistics and Research Ethics. In addition, all graduate students must take the Neuroscience Seminar/Journal Club Class each year until they pass their qualifying exam, and all students participate in the student Neuroscience Symposium class every year, where they present their research. Both the Seminar and Symposium courses are coordinated and supported by NI. All students in good standing in the program are awarded matching stipends for at least 2 years (typically, years 3 and 4) of their Ph.D. research phase with the exception of students working at St. Jude Children's Hospital, which provides their complete stipend. The program had 16 students in FY 2022, including 2 who graduated and 1 who left the program after the first year. Three students were at St. Jude's (faculty mentors have affiliate faculty appointments in Anatomy & Neurobiology) while the other students were placed with faculty mentors at UTHSC in Anatomy & Neurobiology, Pediatrics (Division of Neurology), Neurology, Pharmacology and the College of Nursing. With the addition of 3 new students in August 2022, there are currently 14 students in the program.

In the last 7 years, four NI supported students have been awarded nationally competitive NIH F31 predoctoral fellowships during their graduate tenure: Sarah Neuner, Jordan Ross, Jessica Baker and Angela Taylor. Drs. Neuner and Ross graduated and left for postdocs several years ago, and Jessica Baker and Angela Taylor graduated in FY2021. These are the *only* UTHSC students from the larger Biomedical Sciences Program to have F31 fellowships.

Postdoctoral Fellows: The NI supports matching postdoctoral fellowships to some extent every calendar year, and successful postdocs can receive support for a maximum of 2 years. In November 2021, we solicited applications for postdoctoral support **(see Appendix 4)**. Applications were reviewed by the Neuroscience Executive Committee based on productivity and promise in neuroscience research and awards were made on a competitive basis to the following 7 candidates with Neuroscience Institute faculty mentors: Tanbir Ahammad (Physiology Dr. Cordero-Morales), Sally Elshaer (Ophthalmology, Dr. Gangaraju), Xiaoqin Huang (Ophthalmology, Dr. Yousefi), Lexiao Li (Pharmaceutical Sciences; Dr. Jiang), Kaushik Mondal (Ophthalmology, Dr. Nawajes Mandal), Gyeongah Park (Anatomy & Neurobiology, Dr. Jianyang Du), and Rong Zhang (Physiology, Dr. Helena Parfenova). We also continued (and completed) support of 5 postdoctoral fellow awards made in FY21. Further information on postdoctoral awards is available at https://www.uthsc.edu/neuroscience-institute/education/postdoc-awards.php

VII. PROGRAM OVERVIEW AND ACCOMPLISHMENTS

OVERVIEW

***Organizational Structure*:** The Tennessee Higher Education Commission Neuroscience Center of Excellence comprises the administrative core and financial engine of the Neuroscience Institute (NI), which is located within UTHSC's College of Medicine in Memphis. Dr. Matthew Ennis is the Interim Director, and Dr. John Boughter is the Co-Director. The Director reports to the Executive Dean of the UTHSC College of Medicine, Scott Strome, M.D., and the UTHSC Vice Chancellor of Research, Steven Goodman, Ph.D. Physically the NI is housed within 13 different departments in 3 colleges (Medicine, Pharmacy, Nursing) with an administrative suite in Rm 426 Wittenborg Building at UTHSC. Affiliated members reside at UT Knoxville, St. Jude Children's Hospital, and LeBonheur Children's Hospital.

Dr. Ennis supervises Ms. Brandy Fleming, M.S., who is our Program Coordinator and also functions as our IT specialist. Ms. Fleming and Dr. Ennis supervise our administrative assistant, Mistie Brewer. With Ms. Fleming's help, the administrative assistant organizes the seminar series including all travel arrangements, assists in ordering and billing, and handles NI official correspondence. The Neuroscience Imaging Center is managed by Dr. Esther Marquez Wilkins, Ph.D., who reports directly to NI Director Ennis.

History: The Neuroscience Center of Excellence at UTHSC was established in 1985 and designated an accomplished Center of Excellence by the Tennessee Higher Education Commission in 1988. In 1998, the Neuroscience Center of Excellence was designated as the University of Tennessee Neuroscience Institute, with dedicated space in the Wittenborg, Link and Johnson buildings. The Neuroscience Center of Excellence award was designed to support graduate and postdoctoral research training and education, to recruit and provide initial support to new neuroscience faculty, to renovate laboratory facilities, to purchase research equipment, to host symposia, a weekly seminar series, and to support community outreach programs such as those associated with Brain Awareness Week. The Director from 1985-2002 was Dr. Steven T. Kitai (retired, 2002; deceased 2019). Dr. David Smith was named director from 2002-2006 (deceased, Sept. 2006). Dr. William Armstrong was director from 2006-2020. Dr. Matthew Ennis, Chair of the Department of Anatomy and Neurobiology, was selected as NI Interim Director by UTHSC administration in 2020 upon Dr. Armstrong's retirement.

The program brings together neuroscience faculty members from the Departments of Anatomy and Neurobiology, Genomics, Medicine, Neurology, Neurosurgery, Nursing, Ophthalmology, Pediatrics, Pharmaceutical Sciences, Pharmacology, Physiology, Preventive Medicine, Psychiatry, and the Department of Biochemistry and Cellular and Molecular Biology at the University of Tennessee, Knoxville. Strong affiliations exist with Methodist University Hospital, Le Bonheur Children's Hospital, St. Jude's Children Hospital, the University of Memphis, Rhodes College, and Christian Brother's University. The interdepartmental nature of the program and the collaborations it fosters provide the cross-disciplinary environment necessary for high quality neuroscience research.

***Neuroscience Administrative Suite and Conference Rooms*:** The NI maintains an administrative suite with offices for the Director, Program Coordinator, and Administrative Assistant in the Wittenborg Building, 4th floor (Room 426). This suite also contains 2 conference rooms, one large room for classes, lab meetings, and large committee meetings,

and a smaller room for small meetings. We also maintain a breakroom for the NI staff, graduate students, postdocs as well as for staff from the animal vivarium located in the basement of the Wittenborg building, which houses animals for Anatomy and Neurology, Physiology, and Neurology faculty.

Neuroscience Imaging Core: The NI maintains a full-service Imaging Center (https://www.uthsc.edu/neuroscience-institute/facilities/imaging-center.php) housing confocal and electron microscopes, 3-dimensional reconstruction workstations, microtomy facility and lab and office space for the Director of the Imaging Core, Dr. Esther Marquez Wilkins, located on the 3rd floor of the Link Building. This is a cost recovery facility that NI supports in order to keep costs low. Scheduling is on-line.

Neuroscience Behavioral Core: This core is located on the 3rd floor of Wittenborg building (https://www.uthsc.edu/neuroscience-institute/facilities/behavioral-core.php), and is managed by Dr. Mike McDonald of Neurology. NI helped recruit Dr. McDonald. Dr. McDonald personally trains users in the great variety of testing equipment available in this core; nearly all equipment in the core was generously donated by NI faculty. This core is free of use to any UTHSC faculty, but NI occasionally supplies equipment and software on an as-needs basis. Scheduling is on-line.

Neuroscience Institute Web Site: Our Program Coordinator, Ms. Brandy Fleming, maintains the NI website with assistance from IT at UTHSC (https://www.uthsc.edu/neuroscience-institute/). This site contains information about our cores, the graduate and postdoctoral support programs, undergraduate fellowships, conference room and core on-line scheduling, faculty funding, spotlights on new faculty, seminars and symposia, and a full list of participating departments and NI faculty members. Ms. Fleming maintains 2 servers for NI members. One server is for file exchange for users of the Imaging Center. All images are digitally acquired from our confocal and electron microscopes, and these can be uploaded to this site by users, stored for a month, and downloaded at their convenience during that period. We also maintain a second server for archiving all NI business.

Areas of Neuroscience Research

Neurological and Neurodegenerative Disorders

Neurological diseases include disorders of the nervous system arising from nervous system malfunction or degeneration. Current areas of focus within NI include: cellular and network physiology of basal ganglia in the context of Parkinson's disease, traumatic brain and eye injury, stroke, seizures/epilepsy, neuronal dysfunction and death in Huntington's disease, the molecular biology of synaptogenesis in dystonia, and animal models of Alzheimer's disease.

Faculty	**Department**	**Faculty**	**Department**
M. Khan	Neurology	I. Dragatsis	Physiology
D. Heck	Anatomy & Neurobiology	B. Jones	Genetics, Gen. Inform.
H. Kita	Anatomy & Neurobiology	F.-F. Liao	Pharmacology
L. Reiter	Neurology	T. Nowak	Neurology
T. Ishrat	Anatomy & Neurobiology	A. Reiner	Anat. & Neurobiology

J. Tsao	Neurology	J. Wheless	Pediatric Neurology
J. Jiang	Pharmaceutical Sciences	S. Narayana	Pediatric Neurology
M. McDonald	Neurology	M. Mulligan	Genetics, Gen. Inform.
F. Zhou	Pharmacology	J. Taylor	Anatomy & Neurobiology
B. Moore	Pharmaceutical Sciences	J. Stanfill	Nursing
R. Gangaruju	Ophthalmology	P. Dietrich	Physiology

Excitable Properties of Neurons

Behavior, mentation and physiological homeostasis are all a function of neuronal activity in the nervous system. This activity can be encoded by membrane polarity or in the rates and patterns of neuronal action potentials. Information is passed among neurons through synaptic transmission.

Faculty	**Department**	**Faculty**	**Department**
R. Foehring	Anatomy & Neurobiology	H. Kita	Anatomy & Neurobiology
W. Armstrong	Anatomy & Neurobiology	J. Du	Anatomy & Neurobiology
J. Callaway	Anatomy & Neurobiology	S. Tavalin	Pharmacology
J. Cordero-Morales	Physiology	R. Waters	Anatomy & Neurobiology
A. Dopico	Pharmacology	V. Vásquez	Physiology
M. Ennis	Anatomy & Neurobiology	D. Heck	Anatomy & Neurobiology
F. Zhou	Pharmacology	A. Bukiya	Pharmacology
S. Zahkarenko	Anatomy & Neurobiology	T. Vaithianathan	Pharmacology

Sensory Information Processing

Sensory systems extract information from the environment and provide the nervous system an interface with the outside world. Understanding the way in which this information is represented in neuronal activity is the focus of this research group, which includes the study of olfaction, taste, pain, and vision.

Faculty	**Department**	**Faculty**	**Department**
M. Ennis	Anatomy & Neurobiology	R. Waters	Anatomy & Neurobiology
J. Boughter	Anatomy & Neurobiology	J. Du	Anatomy & Neurobiology
J. Cordero-Morales	Physiology	V. Vásquez	Physiology
M. Fletcher	Physiology	I. Kim	Anatomy & Neurobiology
D. Heck	Anatomy & Neurobiology	S. Youngentob	Anatomy & Neurobiology

Vision and Retina

Understanding the normal function of the eye and the way this process is affected by disease is the primary interest of this group. Researchers are addressing the normal development of the eye as well as the genetic basis of function and disease.

Faculty	**Department**	**Faculty**	**Department**
M. Dyer	Anatomy & Neurobiology	A. Reiner	Anatomy & Neurobiology
M. Jablonski	Ophthalmology	R. Williams	Genetics, Gen. Inform.
N. Mandal	Ophthalmology	S. Yousefi	Ophthalmology
TJ. Hollingworth.	Ophthalmology		

Neurogenetics and Development

This group is interested in gaining a deeper understanding of the origins of the impressive structural and functional complexity, diversity, and plasticity of the nervous system. Experimental and technical expertise of this group is broad, ranging from genetic and molecular analysis of the early stages of central and peripheral nervous system development to sophisticated functional assays of neuronal plasticity in response to environmental manipulations.

Faculty	Department	Faculty	Department
R. Williams	Genetics, Gen. Inform.	L. Lu	Genetics, Gen. Inform.
J. Boughter	Anatomy & Neurobiology	P. McKinnon	Anatomy & Neurobiology
V. Chizhikov	Anatomy & Neurobiology	J. Morgan	Anatomy & Neurobiology
A. d'Azzo	Anatomy & Neurobiology	K. Mozui	Preventive Medicine
I. Dragatsis	Physiology	A. Reiner	Anatomy & Neurobiology
K. Hamre	Anatomy & Neurobiology	L. Reiter	Neurology
M. Mulligan	Genetics, Gen. Inform.	M. Honig	Anatomy & Neurobiology
B. Jones	Genetics, Gen. Inform.		

Mental and Addictive Disorders

Mental and addictive disorders are due to changes in normal brain function. This research group collaboratively explores changes in brain function that might explain mental disorders, such as depression, schizophrenia, ADHD, anxiety, post-traumatic stress disorder and addiction, and drug-induced changes in brain function that may be responsible for relieving mental disorders or producing addiction.

Faculty	Department	Faculty	Department
H. Chen	Pharmacology	B. Sharp	Pharmacology
A. Dopico	Pharmacology	J. Steketee	Pharmacology
K. Hamre	Anatomy & Neurobiology	S. Tavalin	Pharmacology
K. Sakata	Pharmacology	F. Zhou	Pharmacology
I. Kim	Anatomy & Neurobiology	B. Turnstall	Anatomy & Neurobiology
A. Reiner	Anatomy & Neurobiology	S. Youngentob	Anatomy & Neurobiology
M. Mulligan	Genetics, Gen. Inform.	L. Schwarcz	Anatomy & Neurobiology
J. Du	Anatomy & Neurobiology	R. Cowan	Psychiatry
D. Kirson	Pharmacology		

ACCOMPLISHMENTS

Faculty support and recruitment: NI is currently disseminating start-up funds to 3 faculty. (1) Dr. Tauheed Ishrat, awarded $150,000 to be spent over 5 years. Dr. Ishrat was recruited in 2017 into Anatomy & Neurobiology as an associate professor with an R01. He is a stroke neurobiologist and is interested in factors that mitigate or exacerbate stroke susceptibility in a focal ischemia model. (2) Dr. Il Hwan Kim, $150,000 to be spent over 5 years. Dr. Kim was recruited in 2019 into Anatomy & Neurobiology as an assistant professor; his R01 funded research area is social behavior and schizophrenia. He received a second R01 in September 2022. (3) Dr. Jianyang Du, $100,000 to be spent over 5 years. Dr. Du was recruited in 2020 into Anatomy & Neurobiology as associate professor; his R01-funded research investigates social behavior and autism and he is working towards a second R01 in this area.

NI provided $8,472 in research bridge funding to NI member Dr. Stanfill (Associate Professor, College of Nursing) to provide laboratory supplies and partial graduate student stipend support until her new research grant is awarded.

Acquisition of Equipment for Cores: In the past, NI has contributed matching funds for multi-user pieces of equipment, including those obtained from NIH for an electron microscope, for two confocal microscopes and a computerized light microscope for three-dimensional neuronal reconstructions. In addition NI partnered with UTHSC Research to obtain a high resolution digital camera attachment for the electron microscope and to upgrade the Zeiss 710 to a Zeiss 800 Airyscan confocal microscope. A separate post-image acquisition Zen workstation is available for off line image analysis. The workstation is also equipped with Imaris software suite: (1) the Tracking XT Package which provides interactive processing, visualization and analysis software for 3D and 4D microscopic images; and (2) the ClearView Deconvolution 9.5 module for confocal image deconvolution. All are located in the Neuroscience Imaging Core and are maintained and supervised by a dedicated Technical Manager (Dr. Esther Marquez Wilkins) supported by the NI. This past year we renewed our service agreements for this imaging equipment. The web site for the Imaging Center is: (https://www.uthsc.edu/neuroscience-institute/facilities/imaging-center.php) and features on-line scheduling for equipment use.

Research Support-Pilot Project Awards: Every several years, NI has supported pilot project research awards to NI faculty members. This program is intended to facilitate collaborative research by awarding research funds for the collection of pilot data or for the purchase of small equipment items to support multi-PI grant applications. Applications are reviewed by the Executive Committee and awarded on a competitive basis. This year we received 9 applications and competitively contributed matching funds for 3 applications to Drs. Chizhikov (Anatomy & Neurobiology), Fletcher (Anatomy & Neurobiology, and Zhou (Pharmacology). (**See Appendix 4**)

Graduate Student Support and Recruiting: Our interdisciplinary Graduate Neuroscience Track attracts outstanding applicants from around the country, with an emphasis on those in the Mid-South. The NI pays 50% of their stipend for 2 years (years 3 and 4), the remainder is paid by their mentor. For FY22 we spent $71,166 on matching stipends for 5 students and another $1235 on travel support. Note that the impact of Covid since March 2020 cancelled travel to many meetings that otherwise would have been supported by NI. During FY22 we had 16 Neuroscience students, including 2 new students who entered in the Fall 2021. In Fall 2022 we recruited 3 new graduate students. Our recruiting flyer can be found at the end of **Appendix 4**, but through querying students, we find that most discover the program based on the NI Web site.

***Postdoctoral Research Awards*.** The NI provided matching funds on a competitive basis for 12 postdoctoral fellows or research associates for FY2022 (this includes 5 awarded in the previous calendar year). These awards range from

$10,000-$15,000 each and totaled $60,691. The 7 postdocs newly awarded in 2021, and their NI faculty mentors and departments, are listed above under item VI.

***NI Neuroscience Seminar Series and Symposia*:** This series is a major mechanism for interaction among neuroscience faculty and students and brings outstanding neuroscientists from around the world to the UTHSC campus. During the 2021-2022 academic year, the NI sponsored the weekly Neuroscience Seminar Series, hosted 18 speakers, one internal, one from St. Jude, and 16 from outside UTHSC. The NI seminar series serves as the basis for a graduate course, Neuroscience Seminar (ANAT 821), which is attended by all neuroscience track IBS graduate students and within which they read papers by and meet with the visiting scientists (course director Dr. Du, Anatomy & Neurobiology, co-director Dr. Iskusnykh, Anatomy & Neurobiology). This seminar program is vital to the Neuroscience Track of the Graduate Program and to the entire UT neuroscience community, serving to keep our faculty and students abreast of recent developments and, perhaps even more important, to showcase our strengths to national and international leaders in neuroscience research visiting our campus. NI also assists in the Spring Student Seminar course (course director Dr. Fletcher), where students give seminars and receive critical feedback from their colleagues. A complete list of the seminar speakers and their topics are provided in **Appendix 3**.

***Undergraduate Neuroscience Merit Scholarships*:** These are given to outstanding undergraduates at Rhodes College, Christian Brothers University (CBU) and University of Memphis. The Rhodes and CBU scholars work on independent projects for their undergraduate thesis. We spent $8,255 supporting 3 scholarships in the summer of 2021 (after July 1, 2021, so part of FY2022). We are currently supporting two new students in summer 2022.

VIII. GOALS AND FUTURE PLANS

***Faculty Support and Recruitment*:** From time to time the Executive Dean of the College of Medicine asks NI to partner on start-up funds for neuroscience faculty recruits. The most recent recruits are listed above under Faculty support. NI will continue to partner on neuroscience faculty recruitments in consultation with UTHSC administration.

Core Support: NI will continue to support the Imaging Center (including the microtomy facility), and Behavioral Core. This requires collecting and processing user fees, paying service contracts, and repairing/replacing equipment. Our electron microscope computer workstation and camera are very old and experiencing problems; the contractor is troubleshooting the problems. Depending upon the outcome, we may need to replace the camera (~$50,000) and the computer. Further Details are found in the budget for FY22 below.

Graduate Student Support and Recruiting: We expect to recruit 3 new students into the Neuroscience Track for Fall 2022. We will support matching stipends of 4 students during the next fiscal year beginning July 1, 2022. Dr. Fletcher will run the Neuroscience Student Symposium class with Drs. Ennis and Heck assisting, and Dr. Iskusnykh will

run the Neuroscience Seminar Series class for graduate students. The NI offers travel stipends ($500 per trip) to any Neuroscience student or supported postdoc for a national meeting if they are the first or presenting author of a talk or poster.

***Postdoctoral Research Awards*.** We will continue ongoing support to 7 postdocs. Depending on budgetary issues (allocation of NI start up funds to the recruit of a new Director, replacement of electron microscope equipment), we may continue to support new Postdoctoral Awards in FY2023. These applications are competitive, and ranked by the NI Executive Committee. See Budget for FY22 for further details.

NI Neuroscience Seminar Series: We will continue to run the Neuroscience Seminar Series, which will be held in person or on-line by Zoom with the preference up to the individual speaker.

***Undergraduate Research Fellows*:** We will support 2-4 undergraduate research fellows from Rhodes College, Christian Brothers University, or University of Memphis.

IX. BUDGET (see Schedule 7, page 21)

A. FY2022 The FY 2022 THEC appropriated budget for the UTNI was $644,850. We carried forward $308,280 from the previous year for a total budget of $953,130. This carryover reflects amounts encumbered but unspent for Graduate Stipends that were picked up previously by NI and are now picked up by UTHSC for the student's first 18 months, monies encumbered to support our new faculty hires for whom we provided startup packages (Drs. Ishrat, Du, and Kim) and any unspent funds from research award accounts. Additionally, the carry forward reflects funds for seminar arrangements (travel, per diem, hotel and honorarium) that were not expended due to Covid.

This past FY, we expended $511,575 total personnel costs (including salaries and fringe). Personnel costs include administrative supplements for the NI Director (who also directs the NI Imaging Center), the NI Co-Director, a full-time Program Coordinator/ IT specialist, a ¾ time Administrative Specialist, and a full time Technical Manager of Imaging Center as well as the students and postdocs mentioned below.

Students: We awarded matching or partial funds for 5 graduate stipends to NI faculty mentors with Neuroscience track graduate students for a total $71,166. The mentors were located in the department of Anatomy & Neurobiology and in the College of Nursing.

Postdoctoral Support: We provided matching funds for 10 postdoctoral fellows for a total $60,691. The NI faculty mentors and departments are listed above under item VI.

***Neuroscience Imaging Center*:** Currently the NI Imaging Center is run by Dr. Esther Marquez Wilkins. We supplement our cost-recovery program to keep user fees low, helping to pay the service contracts on our JEOL 2000 Electron Microscope, the Zeiss 710/800 confocal microscope, the Microbrightfield Neurolucida workstation, and the Imaris software suite (including the new modules purchased this past year as noted above). This year our cost-recovery program took in $22,900 which was used against the fees needed to pay the service contracts on the Zeiss 710/Airyscan ($22,690) and the JEOL 2000 ($16,800). The cost recovery this FY was much less than previous years due to the restricted research operations during Covid-19. We purchased a Neurolucida software upgrade ($4,200) and had several repairs: (1) Diamond Knife sharpened ($6,445), (2) Transmission Electron Microscope repairs ($7,850), (3) Ultramicrotome repairs ($2,457), and (4) Cryostat repairs($888). The equipment available for use can be viewed at: https://www.uthsc.edu/neuroscience-institute/facilities/imaging-center.php.

Neuroscience Behavioral Core: The procedures for use and available equipment can be viewed at: https://www.uthsc.edu/neuroscience-institute/facilities/behavioral-core.php. Due to the generally low cost of maintenance (Dr. McDonald generously trains new users at no charge and faculty provide their own research personnel to use the equipment), NI has not instituted fees for services in this facility.

***Seminars and Symposia*:** No funds went to support travel/lodging/meals this year due to Covid. We did pay honoraria ($2,600), for the Neuroscience Seminar series (see **Appendix 3**).

***Research Project Support**:* We provided startup funds for Drs. Ishrat, Du, and Kim, who were awarded $150,000, $100,000 and $150,000, respectively (see details above under Accomplishments – Faculty Support and Recruitment). We also sent out a request in January 2022 for research pilot project/equipment support grants. We awarded 3 of those grants at $15,000 each. Those receiving the awards were: Drs. Chizhikov (Anatomy & Neurobiology), Fletcher (Anatomy & Neurobiology, and Zhou (Pharmacology). Drs. Chizhikov and Gangaraju carried forward funds into FY22 which is reflected in our carryover.

Undergraduate Fellowships: We spent $8,255 supporting these and 3 scholarships in the summer of 2021 (after July 1, 2021, so part of FY2022) and 2 students who began research in summer 2022..

Travel Awards: Most national and international research meeting were cancelled in the past year due to Covid and thus our expenditures in this area were down from normal levels. $1,235 in travel awards for graduate students and postdoctoral fellows were awarded.

B. <u>FY2022</u>. We will carryover $316,999 to the coming fiscal year, and have been appropriated $666,514 for a total of $983,513. In addition to providing support for all the NI staff (Program Coordinator, Administrative Assistant, and Imaging Center Manager), below is a breakdown of the major anticipated projects for FY2022:

Students: For the coming year, we have awarded matching, or partial support, funds for 5 graduate stipends to NI faculty mentors with Neuroscience track graduate students. Mentors are located in Anatomy & Neurobiology, Pediatrics and the College of Nursing. The NI match is ~$14,500 each for 5 of these making an expected total of ~$72,500.

Postdoctoral Support*:* We continued to provide funds for 5 postdoctoral fellows ($10,000-15,000 each for a total of ~$35,000 for the coming year). Some can be given to awardees from last year assuming good progress, with a maximum of 2 year's support. In addition, we allotted another $40,000 for 5 new postdoctoral fellows, bringing the total expected postdoctoral expenditures to $75,000 during FY 2022.

***Neuroscience Imaging Center*:** We will pay/renew the service contracts on the: (1) JEOL 2000 ($16,800), (2) Zeiss 710/800 Confocal ($22,690), (3) Microbrightfield Neurolucida system ($4,000); (5) Imaris software suite ($4,346), (6) Leica Glass Knife Maker ($585), and (7) Leica Ultramicrotome ($6,170). As noted above, we may need to replace the computer and camera for the electron microscope.

Neuroscience Behavioral Core*:* We will continue to support the Behavioral Core in FY2021, but expenditures are expected to be minimal. However, should a need arise for additional equipment, or for a part-time assistant to help run behavioral studies, NI would consider additional funding assuming a fee for service program were approved and initiated.

***NI Faculty*:** We will provide administrative supplements to Drs. Ennis and Boughter. We are currently providing startup funds to 3 faculty as detailed above: (1) $150,000 to Dr. Ishrat over 3-5 years to (2/01//2018-1/31/2023); (2) $150,000 to Dr. Kim over 3-5 years (to ~2024), and (3) $100,000 to Dr. Du over 3-5 years (to 2025). We limit NI expenditures for each faculty at no more than $50,000/year, and request that they use at least $30,000 per year should they wish to extend the full five years. UTHSC administration opened a national search for the next NI director with the goal of recruiting a marquis neuroscience researcher from outside UTHSC. The search is in progress and in the case of a successful search, NI may be asked to partner on startup funds from the unobligated budget balance.

Research Projects and Bridge Funding: We can provide small amounts of bridge assistance, but this will be limited by our commitments to start-up fund packages noted above for Drs. Ishrat, Kim, and Du.

Seminar and Undergraduate Neuroscience Merit Fellowships: We will fund the Neuroscience Seminar series,

currently offered in person or virtually on-line and featuring national and international speakers (on-line only). We will continue to fund summer Undergraduate Neuroscience Merit Fellowships to Rhodes and Christian Brothers University students who are doing research projects in Neuroscience towards fulfilling their degree requirements (from 2-4 awards, depending on qualifications).

Impact of Covid. As the impact of Covid Pandemic subsides, we anticipate that funds allocated to the Seminar Series and Student Symposium (catering) will begin to return to normal expenditures in the current fiscal period. Unspent funds in these categories will allow us to fully fund 50,000/year in faculty start-up packages and also to repair or replace core equipment in the Imaging Center.

Schedule 7

CENTERS OF EXCELLENCE ACTUAL, PROPOSED, AND REQUESTED BUDGET

Institution: University of Tennessee Health Science Center **Center:** Neuroscience Center Total

	FY 2021-22 Actual			FY 2022-23 Proposed			FY 2023-24 Requested		
	Matching	Appropr.	Total	Matching	Appropr.	Total	Matching	Appropr.	Total
Expenditures									
Salaries (Exclude Longevity from Salaries and report separately)									
Faculty	$555,654	$56,783	**$612,437**	$554,004	$56,614	**$610,618**	$581,704	$59,445	**$641,149**
Other Professional	$249,851	$236,900	**$486,751**	$211,644	$229,505	**$441,149**	$222,226	$238,207	**$460,433**
Clerical/ Supporting	$214,561	$138,917	**$353,478**	$87,500	$125,556	**$213,056**	$91,875	$95,609	**$187,484**
Assistantships	$0	$2,040	**$2,040**	$0	$2,634	**$2,634**	$0	$2,766	**$2,766**
Total Salaries	**$1,020,066**	**$434,640**	**$1,454,706**	**$853,148**	**$414,309**	**$1,267,457**	**$895,805**	**$396,026**	**$1,291,832**
Longevity (Excluded from Salaries)	$3,415	$2,474		$3,612	$4,228		$3,793	$4,389	
Fringe Benefits	$373,660	$111,523	**$485,183**	$202,345	$94,785	**$297,130**	$212,462	$93,290	**$305,752**
Total Personnel	**$1,397,141**	**$548,636**	**$1,939,888**	**$1,059,105**	**$513,322**	**$1,564,587**	**$1,112,060**	**$493,705**	**$1,597,584**
Non-Personnel									
Travel	$0	$175	**$175**	$0	$28,000	**$28,000**	$0	$29,400	**$29,400**
Software	$0	$0	**$0**	$0	$0	**$0**	$0	$0	**$0**
Books & Journals	$0	$0	**$0**	$0	$0	**$0**	$0	$0	**$0**
Other Supplies	$0	$38,977	**$38,977**	$18,000	$147,836	**$165,836**	$0	$92,524	**$92,524**
Equipment	$0	$0	**$0**	$0	$130,950	**$130,950**	$0	$130,650	**$130,650**
Maintenance	$0	$55,452	**$55,452**	$0	$63,000	**$63,000**	$0	$66,150	**$66,150**
Scholarships	$0	$0	**$0**	$0	$0	**$0**	$0	$0	**$0**
Consultants	$0	$4,678	**$4,678**	$0	$5,000	**$5,000**	$0	$5,250	**$5,250**
Renovation	$0	$0	**$0**	$0	$0	**$0**	$0	$0	**$0**
Other (Specify):Communications/Media	$0	$811	**$811**	$0	$950	**$950**	$0	$998	**$998**
Rentals	$0	$3,189	**$3,189**	$0	$2,550	**$2,550**	$0	$2,678	**$2,678**
Insurance	$0	$7,468	**$7,468**	$0	$7,468	**$7,468**	$0	$3,921	**$3,921**
Recovery	$0	-$23,254	**-$23,254**	$0	-$20,000	**-$20,000**	$0	-$21,000	**-$21,000**
Total Non-Personnel	**$0**	**$87,495**	**$87,495**	**$18,000**	**$365,754**	**$383,754**	**$0**	**$310,570**	**$310,570**
GRAND TOTAL	**$1,397,141**	**$636,131**	**$2,027,383**	**$1,077,105**	**$879,076**	**$1,948,341**	**$1,112,060**	**$804,275**	**$1,908,153**
Revenue									
New State Appropriation	$0	$644,850	**$644,850**	$0	$666,514	**$666,514**	$0	$699,839	**$699,839**
Carryover State Appropriation	$0	$308,280	**$308,280**	$0	$316,999	**$316,999**	$0	$104,436	**$104,436**
New Matching Funds	$1,415,141	$0	**$1,415,141**	$1,059,105	$0	**$1,059,105**	$1,112,060	$0	**$1,112,060**
Carryover from Previous Matching Funds	$0	$0	**$0**	$18,000	$0	**$18,000**	$0	$0	**$0**
Total Revenue	**$1,415,141**	**$953,130**	**$2,368,271**	**$1,077,105**	**$983,513**	**$2,060,618**	**$1,112,060**	**$804,275**	**$1,916,335**

X. FACULTY PUBLICATIONS

The Neuroscience faculty at UTHSC is consistently productive, both in terms of peer-reviewed publications and participation in the national neuroscience community. Lists of peer-reviewed journal publications during the last academic year, as cited in PubMed are presented in **Appendix 2**. These PubMed-cited publications do not include the many chapters, reviews and other articles written by NI faculty. NI faculty members are indicated in **bold** in **Appendix 2. NI members published 190 papers.**

XI. EXTRAMURAL FUNDING OF NEUROSCIENCE FACULTY

The total annual grant dollars (total costs) currently held by UTHSC NI faculty (*i.e.*, excluding affiliate members, such as St. Jude, and excluding grants in no cost extensions) is **$19,632,057**, marginally down from the $20,291,627 value last year. The research grants (current year total costs) currently held by individual NI faculty are listed by Principal Investigator in **Appendix 1**. These values are reported to us by Research Administration at UTHSC. **Appendix 4** includes some highlights of publications and grants recently awarded to NI faculty.

APPENDIX 1

External Funding of Neuroscience Institute Faculty

FY 2021-2022

Lead PI	Department	Project Title	Sponsor	Award Number	Begin Date	End Date	Total Amount
Boughter, John	Anatomy & Neurobiology	Spatial taste coding in mouse gustatory cortex	HHS - NIH - NIDCD	A19-0052-011	5/1/2022	4/30/2023	$386,694
Bukiya, Anna	Pharmacology, Addiction Science, and Toxicology	Fetal alcohol exposure and cerebrovascular development	HHS - NIH	A22-0351-001	7/4/2021	2/28/2022	$23,568
Bukiya, Anna	Pharmacology, Addiction Science, and Toxicology	Fetal cerebral arteries and prenatal alcohol exposure	HHS - NIH - NIAAA	A22-1017-001	3/15/2022	1/31/2023	$628,113
Chen, Hao	Pharmacology, Addiction Science, and Toxicology	Reduced complexity mapping of oxycodone self-administrationand stress responsiveness in rats	HHS - NIH - NIDA	A20-1080-009	3/1/2022	2/28/2023	$311,035
Chen, Hao	Pharmacology, Addiction Science, and Toxicology	System genetics of menthol and nicotine addiction	HHS - NIH - NIDA	A19-0991-011	1/1/2022	12/31/2022	$591,932
Chen, Hao	Pharmacology, Addiction Science, and Toxicology	System genetics of menthol and nicotine addiction	HHS - NIH - NIDA	A19-0991-012	1/1/2022	12/31/2022	$65,770
Chizhikov, Viktor	Anatomy & Neurobiology	Nf2-dependent regulation of neuronal scaling in the developing cerebellum	HHS - NIH - NINDS	A22-1364-001	6/15/2022	5/31/2023	$426,364
Cordero-Morales, Julio	Pharmacology, Addiction Science, and Toxicology	The Role of Bioactive Lipids in Transient Receptor Potential Channels Gating	HHS - NIH - NIGMS	A18-0701-015	1/1/2022	12/31/2022	$273,600
Cowan, Ronald	Psychiatry	Sex differences in pain reports and brain activation in older adults with Alzheimers disease	Ohio State University (OSU)	A21-1356-004	7/1/2021	5/31/2022	$48,336
Cowan, Ronald	Psychiatry	Pain Sensitivity and Unpleasantness in People with Alzheimer's Disease and Cancer	HHS - NIH - NIA	A21-1019-007	6/1/2021	5/31/2022	$884,066
Dopico, Alejandro	Pharmacology, Addiction Science, and Toxicology	Ionic mechanisms of toluene cerebrovascular actions	HHS - NIH - NIEHS	A22-1427-001	5/25/2022	2/28/2023	$457,173
Dopico, Alejandro	Pharmacology, Addiction Science, and Toxicology	Regulation of arterial diameter through specific sensing of endogenous steroids and novel nonsteroidal analogs by BK channel subunits.	HHS - NIH - NHLBI	A19-0926-009	2/1/2022	1/31/2023	$533,686
Du, Jianyang	Anatomy & Neurobiology	CO2 inhalation enhances the lability of fear memory.	HHS - NIH - NIMH	A20-1330-007	5/1/2022	4/30/2023	$371,067
Du, Jianyang	Anatomy & Neurobiology	CFTR activators regulate emotional behaviors	Cystic Fibrosis Foundation	A22-0731-001	11/1/2021	10/31/2022	$55,996
Fletcher, Max	Anatomy & Neurobiology	Centrifugul regulation of olfactory function by melanin-concentrating hormone	University of Florida (UF)	A22-1438-001	4/1/2022	3/31/2023	$45,807
Fletcher, Max	Anatomy & Neurobiology	Cholinergic modulation of olfactory bulb glomerular sensitivity	HHS - NIH - NIDCD	A15-0771-021	6/10/2022	5/31/2023	$465,422
Foehring, Robert	Anatomy & Neurobiology	Dynamics of Kv channel function in identified populations of pyramidal neurons in neocortex	HHS - NIH - NINDS	A03-0877-057	2/1/2022	1/31/2023	$419,875
Heck, Detlef	Anatomy & Neurobiology	Engrailed genes and cerebellum morphology, spatial gene expression and circuitry Amendment 4	Memorial Sloan Kettering Cancer Center	A22-1301-001	12/1/2021	11/30/2022	$34,200
Heck, Detlef	Anatomy & Neurobiology	Neuronal mechanisms of cerebellar cognitive function	HHS - NIH - NIMH	A18-0989-018	1/1/2022	12/31/2022	$356,711
Jablonski, Monica	Ophthalmology	Neuroprotective Properties of a Novel Glaucoma Drug and Formulation	Oculotherapy	A22-0691-001	7/4/2021	5/31/2022	$69,352
Jablonski, Monica	Ophthalmology	Genetic Modulation of Glaucoma	HHS - NIH - NEI	A11-0607-021	2/1/2022	1/31/2023	$371,798
Jablonski, Monica	Ophthalmology	Novel Extended Release Glaucoma Therapy for Once Daily Dosing	HHS - NIH - NEI	A20-0897-009	3/1/2022	2/28/2023	$927,111
Jaggar, Jonathan	Physiology and Biophysics	PKD proteins in endothelial cells	HHS - NIH - NHLBI	A21-0805-009	2/1/2022	1/31/2023	$542,101
Jaggar, Jonathan	Physiology and Biophysics	SK3 channel trafficking in endothelial cells	HHS - NIH - NHLBI	A22-0106-007	5/1/2022	4/30/2023	$572,358
Jiang, Jianxiong	Pharmaceutical Sciences	Targeting TRPC3 Channels for Epileptic Seizures	HHS - NIH - NINDS	A22-0630-001	12/1/2021	11/30/2022	$380,000
Jones, Byron	Genetics, Genomics and Informatics	Genetics of epigenetic response to high circulating glucocorticoids and organophosphorus compounds	HHS - NIH - NIEHS	A21-1026-008	2/1/2022	1/31/2023	$580,839
Khan, Mohammad Moshahid	Neurology	Examining Progression of a Neurodegenerative Disorder	HHS - NIH - NINDS	A21-0355-003	9/1/2021	8/31/2022	$76,000
Kim, Il Hwan	Anatomy & Neurobiology	Genes, Neural Circuits and Behavior	HHS - NIH - NIMH	A19-1197-012	5/1/2022	4/30/2023	$380,837
Kirson, Dean	Pharmacology, Addiction Science, and Toxicology	Hypothalamic oxytocin influence on extended amygdala CRF neurons in alcohol dependence	HHS - NIH - NIAAA	A22-0400-001	9/20/2021	8/31/2022	$249,000
Liao, Francesca-Fang	Pharmacology, Addiction Science, and Toxicology	Novel mechanistic link between metabolic changes and dementia potential role of miRNA21	HHS - NIH - NIA	A19-0118-011	6/1/2022	6/30/2023	$527,519
Liao, Francesca-Fang	Pharmacology, Addiction Science, and Toxicology	Validation of a novel tau clearance mechanism	HHS - NIH - NIA	A22-1305-003	6/1/2023	5/31/2024	$719,061
Liao, Francesca-Fang	Pharmacology, Addiction Science, and Toxicology	Blood-brain-barrier and white matter mechanisms underlying dementia	HHS - NIH - NINDS	A21-0800-004	2/1/2022	1/31/2023	$983,503
Liao, Francesca-Fang	Pharmacology, Addiction Science, and Toxicology	Novel mechanistic link between metabolic changes and dementia potential role of miRNA21	HHS - NIH - NIA	A19-0118-011	6/1/2022	6/30/2023	$527,519
Mandal, Nawajes	Ophthalmology	Sphingolipids and their Impact in Corneal Wound Healing	HHS - NIH - NEI	A21-0119-011	7/1/2021	5/31/2022	$153,052
Mandal, Nawajes	Ophthalmology	Therapeutic Potential of n-3 PUFAs TBI Mediated Visual Dysfunction	DOD - Department of Defense	A21-0367-003	9/30/2021	9/29/2022	$202,534
Nowak, Thaddeus	Neurology	Genetics of stroke vulnerability in C57BL/6 mouse substrains	HHS - NIH - NINDS	A21-0161-008	7/1/2021	6/30/2022	$357,200
Reiner, Anton	Anatomy & Neurobiology	Progression of Cortical and Basal Ganglia Pathology in Human Huntington's disease and Q175 Huntington's disease Mice	CHDI, Inc.	A22-0735-001	12/1/2021	11/30/2022	$369,017
Reiner, Anton	Anatomy & Neurobiology	Progression of Cortical and Basal Ganglia Pathology in Human Huntington's disease and Q175 Huntington's disease Mice	CHDI, Inc.	A19-0359-012	7/4/2021	9/30/2021	$62,341
Reiter, Lawrence	Neurology	Analysis of Delayed Neural Development in PWS DPSC Derived Neurons	Foundation for Prader -Willi Research	A22-0511-001	10/1/2021	9/30/2022	$102,600
Reiter, Lawrence	Neurology	Testing Lead Anti-Epileptic Compounds in a Drosophila Model of Duplication 15q Epilepsy	Tarnagulla Ventures	A22-0510-001	######	4/12/2022	$15,678
Reiter, Lawrence	Neurology	The role of UBE3A in gliopathic seizures.	HHS - NIH - NINDS	A21-0405-008	8/1/2021	7/31/2022	$410,400
Sharp, Burt	Pharmacology, Addiction Science, and Toxicology	Genetics of oxycodone intake in a hybrid rat diversity panel	HHS - NIH - NIDA	A21-1067-008	2/1/2022	1/31/2023	$615,596
Stanfill, Ansley	Nursing - Research	The utility of the Neuro-QoL measures to trigger neuropsychological assessment post-aneurysmal subarachnoid hemorrhage: A pilot study	National Academy of Neuropsychology (NAN)	A22-0688-001	10/1/2021	9/30/2022	$7,500
Tavalin, Steven	Pharmacology, Addiction Science, and Toxicology	Amyloid precursor protein control of NMDA receptor signaling	HHS - NIH - NIA	A21-0117-005	7/1/2021	6/30/2022	$190,000
Tsao, Jack	Neurology	Does Military Traumatic Brain Injury Increase the Risk for Developing Early Onset Dementia and Mild Cognitive Impairment?	DOD - Department of Defense	A20-0396-005	9/30/2021	9/29/2022	$283,459
Vaithianathan, Thirumalini	Pharmacology, Addiction Science, and Toxicology	Dynamics of calcium signals control neurotransmitter release in retinal ribbon synapses	HHS - NIH - NEI	A21-0710-008	1/1/2022	12/31/2022	$342,000
Vasquez, Valeria	Physiology and Biophysics	Regulation of mechanosensitive ion channels by membrane lipids.	HHS - NIH - NIGMS	A20-0151-010	7/1/2021	6/30/2022	$326,800

Lead PI	Department	Project Title	Sponsor	Award Number	Begin Date	End Date	Total Amount
Vasquez, Valeria	Physiology and Biophysics	Studying prolonged nociceptors sensitization by TRPV1 combining a spider toxin and C. elegans	US-Israel Binational Science Foundation	A21-0115-003	10/1/2021	11/30/2022	$40,000
Waters, Robert	Anatomy & Neurobiology	Investigations into the Etiology of Phantom Limb Sensations and Phantom Limb Pain	HHS - NIH - NICHD	A19-0306-012	5/1/2022	4/30/2023	$538,968
Williams, Robert	Genetics, Genomics and Informatics	Imaging Genetics of Brain Structure and Cognitive Aging in Murine Models of Alzheimer's Disease	HHS - NIH - NIA	A21-0777-008	2/1/2022	1/31/2023	$1,119,171
Williams, Robert	Genetics, Genomics and Informatics	A Unified High Performance Web Service for Systems Genetics and Precision Medicine	HHS - NIH - NIGMS	A17-0993-014	8/1/2021	6/30/2022	$453,683
Yousefi, Siamak	Ophthalmology	Impact of Glaucoma on Retinal Ganglion Cell Subtypes	BrightFocus Foundation	A21-0379-003	9/1/2021	8/31/2022	$90,000
Yousefi, Siamak	Ophthalmology	Improved Glaucoma Monitoring Using Artificial-Intelligence Enabled Dashboard	HHS - NIH - NEI	A21-0296-005	9/1/2021	8/31/2022	$191,826
Yousefi, Siamak	Ophthalmology	Predicting the risk of glaucoma from structural, functional, and genetic factors using artificial intelligence	HHS - NIH - NEI	A22-1076-001	4/1/2022	3/31/2023	$473,819
TOTAL							**$19,632,057**

APPENDIX 2

Faculty Publications (PubMed)

FY 2021-2022

Peer-reviewed publications for 2021-2022 (cited in PubMed):

Aditi, Downing, S. M., Schreiner, P. A., Kwak, Y. D., Li, Y., Shaw, T. I., Russell, H. R., & **McKinnon, P. J.** (2021). Genome instability independent of type I interferon signaling drives neuropathology caused by impaired ribonucleotide excision repair. *Neuron, 109*(24), 3962-3979 e3966. doi:10.1016/j.neuron.2021.09.040

Agrawal, M., Rasiah, P. K., Bajwa, A., Rajasingh, J., & **Gangaraju, R.** (2021). Mesenchymal Stem Cell Induced Foxp3(+) Tregs Suppress Effector T Cells and Protect against Retinal Ischemic Injury. *Cells, 10*(11). doi:10.3390/cells10113006

Ahmed, H. A., & **Ishrat, T.** (2022). Candesartan Effectively Preserves Cognition in Senescence Accelerated Mouse Prone 8 (SAMP8) mice. *J Alzheimers Dis Rep, 6*(1), 257-269. doi:10.3233/ADR-220016

Ahmed, H. A., & **Ishrat, T.** (2022). Repurposing verapamil for prevention of cognitive decline in sporadic Alzheimer's disease. *Neural Regen Res, 17*(5), 1018-1019. doi:10.4103/1673-5374.324843

Ahmed, H. A., Ismael, S., Mirzahosseini, G., & **Ishrat, T.** (2021). Verapamil Prevents Development of Cognitive Impairment in an Aged Mouse Model of Sporadic Alzheimer's Disease. *Mol Neurobiol, 58*(7), 3374-3387. doi:10.1007/s12035-021-02350-9

Al-Timemy, A. H., Mosa, Z. M., Alyasseri, Z., Lavric, A., Lui, M. M., Hazarbassanov, R. M., & **Yousefi, S.** (2021). A Hybrid Deep Learning Construct for Detecting Keratoconus From Corneal Maps. *Transl Vis Sci Technol, 10*(14), 16. doi:10.1167/tvst.10.14.16

Albadari, N., Deng, S., **Chen, H.**, Zhao, G., Yue, J., Zhang, S., **Miller, D. D.**, Wu, Z., & Li, W. (2021). Synthesis and biological evaluation of selective survivin inhibitors derived from the MX-106 hydroxyquinoline scaffold. *Eur J Med Chem, 224*, 113719. doi:10.1016/j.ejmech.2021.113719

Alehossein, P., Taheri, M., Tayefeh Ghahremani, P., Dakhlallah, D., Brown, C. M., **Ishrat, T.**, & Nasoohi, S. (2022). Transplantation of Exercise-Induced Extracellular Vesicles as a Promising Therapeutic Approach in Ischemic Stroke. *Transl Stroke Res*. doi:10.1007/s12975-022-01025-4

Alleyne, J., & **Dopico, A. M.** (2021). Alcohol Use Disorders and Their Harmful Effects on the Contractility of Skeletal, Cardiac and Smooth Muscles. *Adv Drug Alcohol Res, 1*. doi:10.3389/ADAR.2021.10011

Almeida, C., Pongilio, R. P., Movio, M. I., Higa, G. S. V., Resende, R. R., **Jiang, J.**, Kinjo, E. R., & Kihara, A. H. (2022). Distinct Cell-specific Roles of NOX2 and MyD88 in Epileptogenesis. *Front Cell Dev Biol, 10*, 926776. doi:10.3389/fcell.2022.926776

Annunziata, I., Weesner, J. A., & **d'Azzo, A.** (2021). Isolation of Mitochondria-Associated ER Membranes (MAMs), Synaptic MAMs, and Glycosphingolipid Enriched Microdomains (GEMs) from Brain Tissues and Neuronal Cells. *Methods Mol Biol, 2277*, 357-370. doi:10.1007/978-1-0716-1270-5_22

Bagchi, A., Orr, B. A., Campagne, O., Dhanda, S., Nair, S., Tran, Q., Christensen, A. M., Gajjar, A., Furtado, L. V., Vasilyeva, A., **Boop, F.**, Stewart, C., & Robinson, G. W. (2021). Lorlatinib in a Child with ALK-Fusion-Positive High-Grade Glioma. *N Engl J Med, 385*(8), 761-763. doi:10.1056/NEJMc2101264

Banerjee, S., Mahmud, F., Deng, S., Ma, L., Yun, M. K., Fakayode, S. O., Arnst, K. E., Yang, L., **Chen, H.**, Wu, Z., Lukka, P. B., Parmar, K., Meibohm, B., White, S. W., Wang, Y., Li, W., & **Miller, D. D.** (2021). X-ray Crystallography-Guided Design, Antitumor Efficacy, and QSAR Analysis of Metabolically Stable Cyclopenta-Pyrimidinyl Dihydroquinoxalinone as a Potent Tubulin Polymerization Inhibitor. *J Med Chem, 64*(17), 13072-13095. doi:10.1021/acs.jmedchem.1c01202

Banerjee, S., Yadav, S., Banerjee, S., Fakayode, S. O., Parvathareddy, J., Reichard, W., Surendranathan, S., Mahmud, F., Whatcott, R., Thammathong, J., Meibohm, B., **Miller, D. D.**, Jonsson, C. B., & Dubey, K. D. (2021). Drug Repurposing to Identify Nilotinib as a Potential SARS-CoV-2 Main Protease Inhibitor: Insights from a Computational and In Vitro Study. *J Chem Inf Model, 61*(11), 5469-5483. doi:10.1021/acs.jcim.1c00524

Batschelett, M., Gibbs, S., Holder, C. M., Holcombe, B., **Wheless, J. W.**, & **Narayana, S.** (2022). Plasticity in the developing brain: neurophysiological basis for lesion-induced motor reorganization. *Brain Commun, 4*(1), fcab300. doi:10.1093/braincomms/fcab300

Beasley, M. M., Gunawan, T., **Tunstall, B. J.**, & Kearns, D. N. (2022). Intermittent access training produces greater motivation for a non-drug reinforcer than long access training. *Learn Behav*. doi:10.3758/s13420-022-00512-w

Bourgault, A. M., Voss, J. G., **Stanfill, A. G.**, McCarthy, A. M., Matthews, E. E., Talsma, A., Loerzel, V., Henderson, W. A., Kinser, P. A., & Hershberger, P. E. (2022). Strategies to enhance the success of mid-career nurse scientists. *Nurs Outlook, 70*(1), 127-136. doi:10.1016/j.outlook.2021.06.015

Braden, A. A., Weatherspoon, S. E., Boardman, T., Williard, T., Adkins, A., Gibbs, S. K., **Wheless, J. W.**, & **Narayana, S.** (2022). Image-guided TMS is safe in a predominately pediatric clinical population. *Clin Neurophysiol, 137*, 193-206. doi:10.1016/j.clinph.2022.01.133

Broadbear, J. H., Depoortere, R. Y., Vacy, K., Ralph, D., **Tunstall, B. J.**, & Newman-Tancredi, A. (2021). Discriminative stimulus properties of the 5-HT1A receptor biased agonists NLX-101 and F13714, in rats trained to discriminate 8-OH-DPAT from saline. *Behav Pharmacol, 32*(8), 652-659. doi:10.1097/FBP.0000000000000659

Brown Lobbins, M. L., Scott, I. O., Slominski, A. T., Hasty, K. A., Zhang, S., **Miller, D. D.**, Li, W., Kim, T. K., Janjetovic, Z., Patel, T. S., Myers, L. K., & Postlethwaite, A. E. (2021). 17,20S(OH)2pD Can Prevent the Development of Skin Fibrosis in the Bleomycin-Induced Scleroderma Mouse Model. *Int J Mol Sci, 22*(16). doi:10.3390/ijms22168926

Brown Lobbins, M. L., Slominski, A. T., Hasty, K. A., Zhang, S., **Miller, D. D.**, Li, W., Kim, T. K., Janjetovic, Z., Tuckey, R. C., Scott, I. O., Myers, L. K., & Postlethwaite, A. E. (2021). Modulation by 17,20S(OH)2pD of Fibrosis-Related Mediators in Dermal Fibroblast Lines from Healthy Donors and from Patients with Systemic Sclerosis. *Int J Mol Sci, 23*(1). doi:10.3390/ijms23010367

Buddington, R. K., Yakimkova, T., Adebiyi, A., **Chizhikov, V. V.**, Iskusnykh, I. Y., & Buddington, K. K. (2021). Organ Growth and Intestinal Functions of Preterm Pigs Fed Low and High Protein Formulas With or Without Supplemental Leucine or Hydroxymethylbutyrate as Growth Promoters. *Front Nutr, 8*, 687703. doi:10.3389/fnut.2021.687703

Campos, Y., Nourse, A., Tanwar, A., Kalathur, R., Bonten, E., & **d'Azzo, A.** (2022). Biophysical and functional study of CRL5(Ozz), a muscle specific ubiquitin ligase complex. *Sci Rep, 12*(1), 7820. doi:10.1038/s41598-022-10955-w

Cascino, G. D., Tarquinio, D., **Wheless, J. W.**, Hogan, R. E., Sperling, M. R., Liow, K., Desai, J., Davis, C., Rabinowicz, A. L., Carrazana, E., & Group, D. S. (2021). Lack of observed tolerance to diazepam nasal spray (Valtoco(R)) after long-term rescue therapy in patients with epilepsy: Interim results from a phase 3, open-label, repeat-dose safety study. *Epilepsy Behav, 120*, 107983. doi:10.1016/j.yebeh.2021.107983

Chekuri, A., Logan, E. M., Krauson, A. J., Salani, M., Ackerman, S., Kirchner, E. G., Bolduc, J. M., Wang, X., **Dietrich, P.**, **Dragatsis, I.**, Vandenberghe, L. H., Slaugenhaupt, S. A., & Morini, E. (2022). Selective retinal ganglion cell loss and optic neuropathy in a humanized mouse model of familial dysautonomia. *Hum Mol Genet, 31*(11), 1776-1787. doi:10.1093/hmg/ddab359

Chen, H., Deng, S., Albadari, N., Yun, M. K., Zhang, S., Li, Y., Ma, D., Parke, D. N., Yang, L., Seagroves, T. N., White, S. W., **Miller, D. D.**, & Li, W. (2021). Design, Synthesis, and Biological Evaluation of Stable Colchicine-Binding Site Tubulin Inhibitors 6-Aryl-2-benzoyl-pyridines as Potential Anticancer Agents. *J Med Chem, 64*(16), 12049-12074. doi:10.1021/acs.jmedchem.1c00715

Chen, J., Akomolafe, O. I., **Jiang, J.**, & Peng, C. (2021). Light-Actuated Liquid Crystal Elastomer Prepared by Projection Display. *Materials (Basel), 14*(23). doi:10.3390/ma14237245

Chilakala, S. K., **Parfenova, H.**, & **Pourcyrous, M.** (2021). The effects of sodium bicarbonate infusion on cerebrovascular function in newborn pigs. *Pediatr Res*. doi:10.1038/s41390-021-01876-x

Choi, E. Y., Li, D., Fan, Y., Pasquale, L. R., Shen, L. Q., Boland, M. V., Ramulu, P., **Yousefi, S.**, De Moraes, C. G., Wellik, S. R., Myers, J. S., Bex, P. J., Elze, T., & Wang, M. (2021). Predicting Global Test-Retest Variability of Visual Fields in Glaucoma. *Ophthalmol Glaucoma, 4*(4), 390-399. doi:10.1016/j.ogla.2020.12.001

Clark, R., & **Stanfill, A. G.** (2021). Lessons Learned From Pairing Education-Intensive and Research-Intensive Faculty to Increase Scholarship in Nursing. *Nurs Educ Perspect, 42*(5), 323-324. doi:10.1097/01.NEP.0000000000000822

Clay, M. R., Patel, A., Tran, Q., Hedges, D. J., Chang, T. C., Stewart, E., Charville, G., Cline, C., **Dyer, M. A.**, & Orr, B. A. (2021). Methylation profiling reveals novel molecular classes of rhabdomyosarcoma. *Sci Rep, 11*(1), 22213. doi:10.1038/s41598-021-01649-w

Collyer, J., Xu, F., Munkhsaikhan, U., Alberson, N. F., Orgil, B. O., Zhang, W., Czosek, R. J., **Lu, L.**, Jefferies, J. L., Towbin, J. A., & Purevjav, E. (2022). Combining whole exome sequencing with in silico analysis and clinical data to identify candidate variants in pediatric left ventricular noncompaction. *Int J Cardiol, 347*, 29-37. doi:10.1016/j.ijcard.2021.11.001

Conde-Dusman, M. J., Dey, P. N., Elia-Zudaire, O., Rabaneda, L. G., Garcia-Lira, C., Grand, T., Briz, V., Velasco, E. R., Andero, R., Ninerola, S., Barco, A., Paoletti, P., Wesseling, J. F., Gardoni, F., **Tavalin, S. J.**, & Perez-Otano, I.

(2021). Control of protein synthesis and memory by GluN3A-NMDA receptors through inhibition of GIT1/mTORC1 assembly. *Elife, 10*. doi:10.7554/eLife.71575

Corradi, V., Bukiya, A. N., Miranda, W. E., Cui, M., Plant, L. D., Logothetis, D. E., Tieleman, D. P., Noskov, S. Y., & Rosenhouse-Dantsker, A. (2022). A molecular switch controls the impact of cholesterol on a Kir channel. *Proc Natl Acad Sci U S A, 119*(13), e2109431119. doi:10.1073/pnas.2109431119

Cui, H., Wang, Q., **Miller, D. D.**, & Li, W. (2021). The Tubulin Inhibitor VERU-111 in Combination With Vemurafenib Provides an Effective Treatment of Vemurafenib-Resistant A375 Melanoma. *Front Pharmacol, 12*, 637098. doi:10.3389/fphar.2021.637098

de Jong, T. V., Kim, P., Guryev, V., **Mulligan, M. K.**, **Williams, R. W.**, Redei, E. E., & **Chen, H.** (2021). Whole genome sequencing of nearly isogenic WMI and WLI inbred rats identifies genes potentially involved in depression and stress reactivity. *Sci Rep, 11*(1), 14774. doi:10.1038/s41598-021-92993-4

Deng, T., Li, J., Liu, J., Xu, F., Liu, X., Mi, J., Bergquist, J., Wang, H., Yang, C., **Lu, L.**, Song, X., Yao, C., Tian, G., & Zheng, Q. Y. (2021). Hippocampal Transcriptome-Wide Association Study Reveals Correlations Between Impaired Glutamatergic Synapse Pathway and Age-Related Hearing Loss in BXD-Recombinant Inbred Mice. *Front Neurosci, 15*, 745668. doi:10.3389/fnins.2021.745668

Devlin, P., **Ishrat, T.**, & **Stanfill, A. G.** (2022). A Systematic Review of Inflammatory Cytokine Changes Following Aneurysmal Subarachnoid Hemorrhage in Animal Models and Humans. *Transl Stroke Res*. doi:10.1007/s12975-022-01001-y

Dietrich, P., Alli, S., **Mulligan, M. K.**, Cox, R., Ashbrook, D. G., **Williams, R. W.**, & **Dragatsis, I.** (2022). Identification of cyclin D1 as a major modulator of 3-nitropropionic acid-induced striatal neurodegeneration. *Neurobiol Dis, 162*, 105581. doi:10.1016/j.nbd.2021.105581

Diouf, B., Wing, C., Panetta, J. C., Eddins, D., Lin, W., Yang, W., Fan, Y., Pei, D., Cheng, C., Delaney, S. M., Zhang, W., Bonten, E. J., Crews, K. R., Paugh, S. W., Li, L., Freeman, B. B., 3rd, Autry, R. J., Beard, J. A., Ferguson, D. C., Janke, L. J., Ness, K. K., Chen, T., **Zakharenko, S. S.**, Jeha, S., Pui, C. H., Relling, M. V., Eileen Dolan, M., & Evans, W. E. (2021). Identification of small molecules that mitigate vincristine-induced neurotoxicity while sensitizing leukemia cells to vincristine. *Clin Transl Sci, 14*(4), 1490-1504. doi:10.1111/cts.13012

Edmonston, D. Y., Wu, S., Li, Y., Khan, R. B., **Boop, F. A.**, & Merchant, T. E. (2022). Limited Surgery and Conformal Photon Radiation Therapy for Pediatric Craniopharyngioma: Long-term Results from the RT1 Protocol. *Neuro Oncol*. doi:10.1093/neuonc/noac124

Elliott, K. L., Pavlinkova, G., **Chizhikov, V. V.**, Yamoah, E. N., & Fritzsch, B. (2021). Neurog1, Neurod1, and Atoh1 are essential for spiral ganglia, cochlear nuclei, and cochlear hair cell development. *Fac Rev, 10*, 47. doi:10.12703/r/10-47

Elliott, T., Ridley-Pryor, T., Gienapp, A. J., & **Wheless, J. W.** (2022). Initial Real-World Experience With Cenobamate in Adolescents and Adults: A Single Center Experience. *Pediatr Neurol, 129*, 19-23. doi:10.1016/j.pediatrneurol.2022.01.001

Elshaer, S. L., Bahram, S. H., Rajashekar, P., **Gangaraju, R.**, & El-Remessy, A. B. (2021). Modulation of Mesenchymal Stem Cells for Enhanced Therapeutic Utility in Ischemic Vascular Diseases. *Int J Mol Sci, 23*(1). doi:10.3390/ijms23010249

Erickson, A., Zhou, S., Luo, J., Li, L., Huang, X., Even, Z., Huang, H., Xu, H. M., Peng, J., **Lu, L.**, & Wang, X. (2021). Genetic architecture of protein expression and its regulation in the mouse brain. *BMC Genomics, 22*(1), 875. doi:10.1186/s12864-021-08168-y

Even, A., Morelli, G., Turchetto, S., Shilian, M., Bail, R. L., Laguesse, S., Krusy, N., Brisker, A., Brandis, A., Inbar, S., Chariot, A., Saudou, F., **Dietrich, P.**, **Dragatsis, I.**, Brone, B., Broix, L., Rigo, J. M., Weil, M., & Nguyen, L. (2021). Publisher Correction: ATP-citrate lyase promotes axonal transport across species. *Nat Commun, 12*(1), 6678. doi:10.1038/s41467-021-26998-y

Even, A., Morelli, G., Turchetto, S., Shilian, M., Bail, R. L., Laguesse, S., Krusy, N., Brisker, A., Brandis, A., Inbar, S., Chariot, A., Saudou, F., **Dietrich, P.**, **Dragatsis, I.**, Brone, B., Broix, L., Rigo, J. M., Weil, M., & Nguyen, L. (2021). ATP-citrate lyase promotes axonal transport across species. *Nat Commun, 12*(1), 5878. doi:10.1038/s41467-021-25786-y

Fedinec, A. L., Liu, J., Zhang, R., Harsono, M., **Pourcyrous, M.**, & **Parfenova, H.** (2021). The cold receptor TRPM8 activation leads to attenuation of endothelium-dependent cerebral vascular functions during head cooling. *J Cereb Blood Flow Metab, 41*(11), 2897-2906. doi:10.1177/0271678X211018035

Fu, H., Wang, J., Wang, J., Liu, L., **Jiang, J.**, & Hao, J. (2022). 4R-cembranoid protects neuronal cells from oxygen-glucose deprivation by modulating microglial cell activation. *Brain Res Bull, 179*, 74-82. doi:10.1016/j.brainresbull.2021.12.007

Galor, A., Sanchez, V., Jensen, A., Burton, M., Maus, K., Stephenson, D., Chalfant, C., & **Mandal, N.** (2022). Meibum sphingolipid composition is altered in individuals with meibomian gland dysfunction-a side by side comparison of Meibum and Tear Sphingolipids. *Ocul Surf, 23*, 87-95. doi:10.1016/j.jtos.2021.11.011

Garrud, T. A. C., & **Jaggar, J. H.** (2022). STIMulating blood pressure. *Elife, 11*. doi:10.7554/eLife.77978

Ghazwani, Y., Patay, Z., Sadighi, Z. S., Sparrow, J., Upadhyaya, S., **Boop, F.**, Gajjar, A., & Qaddoumi, I. (2021). Handedness switching as a presenting sign for pediatric low-grade gliomas: An insight into brain plasticity from a short case series. *J Pediatr Rehabil Med, 14*(1), 31-36. doi:10.3233/PRM-190637

Gibbs, S. K., Fulton, S., Mudigoudar, B., **Boop, F. A.**, & **Narayana, S.** (2021). Presurgical language mapping in bilingual children using transcranial magnetic stimulation: illustrative case. *J Neurosurg Case Lessons, 2*(14). doi:10.3171/CASE21391

Goldberg, L. R., Yao, E. J., Kelliher, J. C., Reed, E. R., Wu Cox, J., Parks, C., Kirkpatrick, S. L., Beierle, J. A., Chen, M. M., Johnson, W. E., Homanics, G. E., **Williams, R. W.**, Bryant, C. D., & **Mulligan, M. K.** (2021). A quantitative trait variant in Gabra2 underlies increased methamphetamine stimulant sensitivity. *Genes Brain Behav, 20*(8), e12774. doi:10.1111/gbb.12774

Gray, A. L. H., Sawaya, M. R., Acharyya, D., Lou, J., Edington, E. M., Best, M. D., **Prosser, R. A.**, Eisenberg, D. S., & Do, T. D. (2022). Atomic view of an amyloid dodecamer exhibiting selective cellular toxic vulnerability in acute brain slices. *Protein Sci, 31*(3), 716-727. doi:10.1002/pro.4268

Gu, Q., Xu, F., Orgil, B. O., Khuchua, Z., Munkhsaikhan, U., Johnson, J. N., Alberson, N. R., Pierre, J. F., Black, D. D., Dong, D., Brennan, J. A., Cathey, B. M., Efimov, I. R., Towbin, J. A., Purevjav, E., & **Lu, L.** (2022). Systems genetics analysis defines importance of TMEM43/LUMA for cardiac- and metabolic-related pathways. *Physiol Genomics, 54*(1), 22-35. doi:10.1152/physiolgenomics.00066.2021

Guden, D. S., Temiz-Resitoglu, M., Senol, S. P., Kibar, D., Yilmaz, S. N., Tunctan, B., **Malik, K. U.**, & Sahan-Firat, S. (2021). mTOR inhibition as a possible pharmacological target in the management of systemic inflammatory response and associated neuroinflammation by lipopolysaccharide challenge in rats. *Can J Physiol Pharmacol, 99*(9), 921-934. doi:10.1139/cjpp-2020-0487

Gunturkun, M. H., Flashner, E., Wang, T., **Mulligan, M. K.**, **Williams, R. W.**, Prins, P., & **Chen, H.** (2022). GeneCup: mining PubMed and GWAS catalog for gene-keyword relationships. *G3 (Bethesda), 12*(5). doi:10.1093/g3journal/jkac059

Hama, T., Nagesh, P. K., Chowdhury, P., **Moore, B. M.**, 2nd, Yallapu, M. M., Regner, K. R., & Park, F. (2021). DNA damage is overcome by TRIP13 overexpression during cisplatin nephrotoxicity. *JCI Insight, 6*(22). doi:10.1172/jci.insight.139092

Hawkins, N. A., Nomura, T., Duarte, S., Barse, L., **Williams, R. W.**, Homanics, G. E., **Mulligan, M. K.**, Contractor, A., & Kearney, J. A. (2021). Gabra2 is a genetic modifier of Dravet syndrome in mice. *Mamm Genome, 32*(5), 350-363. doi:10.1007/s00335-021-09877-1

He, Y., Hwang, D. J., Ponnusamy, S., Thiyagarajan, T., Mohler, M. L., Narayanan, R., & **Miller, D. D.** (2021). Exploration and Biological Evaluation of Basic Heteromonocyclic Propanamide Derivatives as SARDs for the Treatment of Enzalutamide-Resistant Prostate Cancer. *J Med Chem, 64*(15), 11045-11062. doi:10.1021/acs.jmedchem.1c00439

He, Y., Yang, C., Wang, Y., Sacher, J. R., Sims, M. M., Pfeffer, L. M., & **Miller, D. D.** (2022). Novel structural-related analogs of PFI-3 (SRAPs) that target the BRG1 catalytic subunit of the SWI/SNF complex increase the activity of temozolomide in glioblastoma cells. *Bioorg Med Chem, 53*, 116533. doi:10.1016/j.bmc.2021.116533

Hitzemann, R., Bergeson, S. E., Berman, A. E., Bubier, J. A., Chesler, E. J., Finn, D. A., Hein, M., Hoffman, P., Holmes, A., Kisby, B. R., Lockwood, D., Lodowski, K. H., McManus, M., Owen, J. A., Ozburn, A. R., Panthagani, P., Ponomarev, I., Saba, L., Tabakoff, B., Walchale, A., **Williams, R. W.**, & Phillips, T. J. (2022). Sex Differences in the Brain Transcriptome Related to Alcohol Effects and Alcohol Use Disorder. *Biol Psychiatry, 91*(1), 43-52. doi:10.1016/j.biopsych.2021.04.016

Hollingsworth, T. J., Hubbard, M. G., Levi, H. J., White, W., Wang, X., Simpson, R., **Jablonski, M. M.**, & Gross, A. K. (2021). Proinflammatory Pathways Are Activated in the Human Q344X Rhodopsin Knock-In Mouse Model of Retinitis Pigmentosa. *Biomolecules, 11*(8). doi:10.3390/biom11081163

Hollingsworth, T. J., Wang, X., White, W. A., Simpson, R. N., & **Jablonski, M. M.** (2022). Chronic Proinflammatory Signaling Accelerates the Rate of Degeneration in a Spontaneous Polygenic Model of Inherited Retinal Dystrophy. *Front Pharmacol, 13*, 839424. doi:10.3389/fphar.2022.839424

Honig, M. G., Del Mar, N. A., Henderson, D. L., O'Neal, D., Doty, J. B., Cox, R., Li, C., Perry, A. M., **Moore, B. M.**, & **Reiner, A.** (2021). Raloxifene Modulates Microglia and Rescues Visual Deficits and Pathology After Impact Traumatic Brain Injury. *Front Neurosci, 15*, 701317. doi:10.3389/fnins.2021.701317

Honig, M. G., Del Mar, N. A., Henderson, D. L., O'Neal, D., Yammanur, M., Cox, R., Li, C., Perry, A. M., **Moore, B. M.**, & Reiner, A. (2022). Raloxifene, a cannabinoid type-2 receptor inverse agonist, mitigates visual deficits and pathology and modulates microglia after ocular blast. *Exp Eye Res, 218*, 108966. doi:10.1016/j.exer.2022.108966

Honig, M. G., Dorian, C. C., Worthen, J. D., Micetich, A. C., Mulder, I. A., Sanchez, K. B., Pierce, W. F., Del Mar, N. A., & **Reiner, A.** (2021). Progressive long-term spatial memory loss following repeat concussive and subconcussive brain injury in mice, associated with dorsal hippocampal neuron loss, microglial phenotype shift, and vascular abnormalities. *Eur J Neurosci, 54*(5), 5844-5879. doi:10.1111/ejn.14711

Honnell, V., Norrie, J. L., Patel, A. G., Ramirez, C., Zhang, J., Lai, Y. H., Wan, S., & **Dyer, M. A.** (2022). Identification of a modular super-enhancer in murine retinal development. *Nat Commun, 13*(1), 253. doi:10.1038/s41467-021-27924-y

Hossain Saad, M. Z., Xiang, L., Liao, Y. S., Reznikov, L. R., & **Du, J.** (2021). The Underlying Mechanism of Modulation of Transient Receptor Potential Melastatin 3 by protons. *Front Pharmacol, 12*, 632711. doi:10.3389/fphar.2021.632711

Hou, R., Yu, Y., Sluter, M. N., Li, L., Hao, J., Fang, J., Yang, J., & **Jiang, J.** (2022). Targeting EP2 receptor with multifaceted mechanisms for high-risk neuroblastoma. *Cell Rep, 39*(12), 111000. doi:10.1016/j.celrep.2022.111000

Howe, K., Dwinell, M., Shimoyama, M., Corton, C., Betteridge, E., Dove, A., Quail, M. A., Smith, M., Saba, L., **Williams, R. W.**, **Chen, H.**, Kwitek, A. E., McCarthy, S. A., Uliano-Silva, M., Chow, W., Tracey, A., Torrance, J., Sims, Y., Challis, R., Threlfall, J., & Blaxter, M. (2021). The genome sequence of the Norway rat, Rattus norvegicus Berkenhout 1769. *Wellcome Open Res, 6*, 118. doi:10.12688/wellcomeopenres.16854.1

Hu, H., Mosca, R., Gomero, E., van de Vlekkert, D., Campos, Y., Fremuth, L. E., Brown, S. A., Weesner, J. A., Annunziata, I., & **d'Azzo, A.** (2021). AAV-mediated gene therapy for galactosialidosis: A long-term safety and efficacy study. *Mol Ther Methods Clin Dev, 23*, 644-658. doi:10.1016/j.omtm.2021.10.007

Huang, X., Sun, J., Majoor, J., Vermeer, K. A., Lemij, H., Elze, T., Wang, M., Boland, M. V., Pasquale, L. R., Mohammadzadeh, V., Nouri-Mahdavi, K., Johnson, C., & **Yousefi, S.** (2021). Estimating the Severity of Visual Field Damage From Retinal Nerve Fiber Layer Thickness Measurements With Artificial Intelligence. *Transl Vis Sci Technol, 10*(9), 16. doi:10.1167/tvst.10.9.16

Ismael, S., Mirzahosseini, G., Ahmed, H. A., Yoo, A., Kassan, M., **Malik, K. U.**, & **Ishrat, T.** (2021). Renin-Angiotensin System Alterations in the Human Alzheimer's Disease Brain. *J Alzheimers Dis, 84*(4), 1473-1484. doi:10.3233/JAD-215051

Ismael, S., Nasoohi, S., Li, L., Aslam, K. S., **Khan, M. M.**, El-Remessy, A. B., **McDonald, M. P.**, Liao, F. F., & **Ishrat, T.** (2021). Thioredoxin interacting protein regulates age-associated neuroinflammation. *Neurobiol Dis, 156*, 105399. doi:10.1016/j.nbd.2021.105399

Ismael, S., Nasoohi, S., Yoo, A., Mirzahosseini, G., Ahmed, H. A., & **Ishrat, T.** (2021). Verapamil as an Adjunct Therapy to Reduce tPA Toxicity in Hyperglycemic Stroke: Implication of TXNIP/NLRP3 Inflammasome. *Mol Neurobiol, 58*(8), 3792-3804. doi:10.1007/s12035-021-02384-z

Ismael, S., Wajidunnisa, **Sakata, K.**, **McDonald, M. P.**, Liao, F. F., & **Ishrat, T.** (2021). ER stress associated TXNIP-NLRP3 inflammasome activation in hippocampus of human Alzheimer's disease. *Neurochem Int, 148*, 105104. doi:10.1016/j.neuint.2021.105104

Iversen, W. L., **Cowan, R. L.**, Atalla, S., Englehart, S. S., Gure, T. R., Moss, K. O., Ryan, C. M., Scharre, D. W., Wright, K. D., & Monroe, T. B. (2022). Treating the most vulnerable: A discursive review of experimental pain in Alzheimer's disease. *Nurs Open, 9*(2), 942-949. doi:10.1002/nop2.922

Iversen, W. L., Monroe, T. B., Atalla, S., Anderson, A. R., **Cowan, R. L.**, Wright, K. D., Failla, M. D., & Moss, K. O. (2022). Promoting successful participation of people living with Alzheimer's disease and related dementias in pain-related neuroimaging research studies. *Front Pain Res (Lausanne), 3*, 926459. doi:10.3389/fpain.2022.926459

Jha, K. A., Rasiah, P. K., Gentry, J., Del Mar, N. A., Kumar, R., Adebiyi, A., **Reiner, A.**, & **Gangaraju, R.** (2022). Mesenchymal stem cell secretome protects against oxidative stress-induced ocular blast visual pathologies. *Exp Eye Res, 215*, 108930. doi:10.1016/j.exer.2022.108930

Jiang, Y., Patton, M. H., & **Zakharenko, S. S.** (2021). A Case for Thalamic Mechanisms of Schizophrenia: Perspective From Modeling 22q11.2 Deletion Syndrome. *Front Neural Circuits, 15*, 769969. doi:10.3389/fncir.2021.769969

Jones, B. C., Erikson, K. M., **Mulligan, M. K.**, Torres-Rojas, C., Zhao, W., Zhuang, D., **Lu, L.**, & **Williams, R. W.** (2021). Genetic differences in ethanol consumption: effects on iron, copper, and zinc regulation in mouse hippocampus. *Biometals, 34*(5), 1059-1066. doi:10.1007/s10534-021-00327-8

Juuri, E., Tikka, P., Domanskyi, A., Corfe, I., Morita, W., **McKinnon, P. J.**, Jandova, N., & Balic, A. (2022). Ptch2 is a Potential Regulator of Mesenchymal Stem Cells. *Front Physiol, 13*, 877565. doi:10.3389/fphys.2022.877565

Kallumadyil, A. M. T., McClenahan, T., De Filippis, S., Vungarala, A., Satyadev, N., **Waters, R. S.**, & Kulkarni, A. L. (2021). Perspectives into the possible effects of the B.1.1.7 variant of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on spermatogenesis. *J Basic Clin Physiol Pharmacol, 33*(1), 9-12. doi:10.1515/jbcpp-2021-0083

Khan, R. B., Patay, Z., Klimo, P., Huang, J., Kumar, R., **Boop, F. A.**, Raches, D., Conklin, H. M., Sharma, R., Simmons, A., Sadighi, Z. S., Onar-Thomas, A., Gajjar, A., & Robinson, G. W. (2021). Clinical features, neurologic recovery, and risk factors of postoperative posterior fossa syndrome and delayed recovery: a prospective study. *Neuro Oncol, 23*(9), 1586-1596. doi:10.1093/neuonc/noab030

Khom, S., Rodriguez, L., Gandhi, P., **Kirson, D.**, Bajo, M., Oleata, C. S., Vendruscolo, L. F., Mason, B. J., & Roberto, M. (2022). Alcohol dependence and withdrawal increase sensitivity of central amygdalar GABAergic synapses to the glucocorticoid receptor antagonist mifepristone in male rats. *Neurobiol Dis, 164*, 105610. doi:10.1016/j.nbd.2022.105610

Kim, S., Kim, Y. E., Song, I., Ujihara, Y., Kim, N., Jiang, Y. H., Yin, H. H., Lee, T. H., & **Kim, I. H.** (2022). Neural circuit pathology driven by Shank3 mutation disrupts social behaviors. *Cell Rep, 39*(10), 110906. doi:10.1016/j.celrep.2022.110906

Kiran, S., Rakib, A., **Moore, B. M.**, & Singh, U. P. (2022). Cannabinoid Receptor 2 (CB2) Inverse Agonist SMM-189 Induces Expression of Endogenous CB2 and Protein Kinase A That Differentially Modulates the Immune Response and Suppresses Experimental Colitis. *Pharmaceutics, 14*(5). doi:10.3390/pharmaceutics14050936

Kirson, D., Spierling Bagsic, S. R., Murphy, J., Chang, H., Vlkolinsky, R., Pucci, S. N., Prinzi, J., Williams, C. A., Fang, S. Y., Roberto, M., & Zorrilla, E. P. (2022). Decreased excitability of leptin-sensitive anterior insula pyramidal neurons in a rat model of compulsive food demand. *Neuropharmacology, 208*, 108980. doi:10.1016/j.neuropharm.2022.108980

Kodali, M. C., **Chen, H.**, & Liao, F. F. (2021). Temporal unsnarling of brain's acute neuroinflammatory transcriptional profiles reveals panendothelitis as the earliest event preceding microgliosis. *Mol Psychiatry, 26*(8), 3905-3919. doi:10.1038/s41380-020-00955-5

Koffman, E. E., Kruse, C. M., Singh, K., Naghavi, F. S., Curtis, M. A., Egbo, J., Houdi, M., Lin, B., Lu, H., Debiec, J., & **Du, J.** (2022). Acid-sensing ion channel 1a regulates the specificity of reconsolidation of conditioned threat responses. *JCI Insight, 7*(4). doi:10.1172/jci.insight.155341

Kozyrev, D. A., Soleman, J., Tsering, D., Keating, R. F., Hersh, D. S., **Boop, F. A.**, Spennato, P., Cinalli, G., Tamburrini, G., Thomale, U. W., Bollo, R. J., Chatterjee, S., Lalgudi Srinivasan, H., Constantini, S., & Roth, J. (2021). Pediatric thalamic incidentalomas: an international retrospective multicenter study. *J Neurosurg Pediatr*, 1-9. doi:10.3171/2021.6.PEDS20976

Kwak, Y. D., Shaw, T. I., Downing, S. M., Tewari, A., Jin, H., Li, Y., Dumitrache, L. C., Katyal, S., Khodakhah, K., Russell, H. R., & **McKinnon, P. J.** (2021). Chromatin architecture at susceptible gene loci in cerebellar Purkinje cells characterizes DNA damage-induced neurodegeneration. *Sci Adv, 7*(51), eabg6363. doi:10.1126/sciadv.abg6363

Lane, A. R., Cogdell, I. C., Jessell, T. M., **Bikoff, J.** B., & Alvarez, F. J. (2021). Genetic targeting of adult Renshaw cells using a Calbindin 1 destabilized Cre allele for intersection with Parvalbumin or Engrailed1. *Sci Rep, 11*(1), 19861. doi:10.1038/s41598-021-99333-6

Li, H., Ibrahim, M. M., **Chen, H.**, Li, W., & **Jablonski, M. M.** (2021). In Silico Screening and In Vivo Evaluation of Potential CACNA2D1 Antagonists as Intraocular Pressure-Reducing Agents in Glaucoma Therapy. *Pharmaceuticals (Basel), 14*(9). doi:10.3390/ph14090887

Li, K., Shen, Y., Miller, M. A., Stabenow, J., **Williams, R. W.**, & **Lu, L.** (2021). Differing susceptibility of C57BL/6J and DBA/2J mice-parents of the murine BXD family, to severe acute respiratory syndrome coronavirus infection. *Cell Biosci, 11*(1), 137. doi:10.1186/s13578-021-00656-8

Li, L., Yasmen, N., Hou, R., Yang, S., Lee, J. Y., Hao, J., Yu, Y., & **Jiang, J.** (2022). Inducible Prostaglandin E Synthase as a Pharmacological Target for Ischemic Stroke. *Neurotherapeutics, 19*(1), 366-385. doi:10.1007/s13311-022-01191-1

Liao, F. F., Lin, G., Chen, X., Chen, L., Zheng, W., Raghow, R., **Zhou, F. M.**, Shih, A. Y., & Tan, X. L. (2021). Endothelial Nitric Oxide Synthase-Deficient Mice: A Model of Spontaneous Cerebral Small-Vessel Disease. *Am J Pathol, 191*(11), 1932-1945. doi:10.1016/j.ajpath.2021.02.022

Liu, A. P. Y., Wu, G., Orr, B. A., Lin, T., Ashford, J. M., Bass, J. K., Bowers, D. C., Hassall, T., Fisher, P. G., Indelicato, D. J., Klimo, P., Jr., **Boop, F.**, Conklin, H., Onar-Thomas, A., Merchant, T. E., Ellison, D. W., Gajjar, A., & Robinson, G. W. (2021). Outcome and molecular analysis of young children with choroid plexus carcinoma treated with non-myeloablative therapy: results from the SJYC07 trial. *Neurooncol Adv, 3*(1), vdaa168. doi:10.1093/noajnl/vdaa168

Lucas, J. T., Jr., Faught, A. M., Hsu, C. Y., Wilson, L. J., Guo, Y., Li, Y., Khan, R., Becksfort, J. B., LeVine, D. A., Ismael, Y., Darrow, K., Moskvin, V. P., Pirlepesov, F., Klimo, P., Elijovich, L., Indelicato, D. J., **Boop, F. A.**, & Merchant, T. E. (2022). Pre- and Posttherapy Risk Factors for Vasculopathy in Pediatric Patients With Craniopharyngioma Treated With Surgery and Proton Radiation Therapy. *Int J Radiat Oncol Biol Phys, 113*(1), 152-160. doi:10.1016/j.ijrobp.2021.12.172

Lukka, P. B., Woods, M., Chhim, R., Phelps, S. J., **Wheless, J. W.**, & Meibohm, B. (2021). Use of Real-World Data and Pharmacometric Modeling in Support of Lacosamide Dosing in Pediatric Patients Under 4 Years of Age. *J Clin Pharmacol, 61*(7), 881-888. doi:10.1002/jcph.1840

Machado, E. R., Annunziata, I., van de Vlekkert, D., Grosveld, G. C., & **d'Azzo, A.** (2021). Lysosomes and Cancer Progression: A Malignant Liaison. *Front Cell Dev Biol, 9*, 642494. doi:10.3389/fcell.2021.642494

MacKay, C. E., Floen, M., Leo, M. D., Hasan, R., Garrud, T. A. C., Fernandez-Pena, C., Singh, P., **Malik, K. U.**, & **Jaggar, J. H.** (2022). A plasma membrane-localized polycystin-1/polycystin-2 complex in endothelial cells elicits vasodilation. *Elife, 11*. doi:10.7554/eLife.74765

Madangopal, R., Ramsey, L. A., Weber, S. J., Brenner, M. B., Lennon, V. A., Drake, O. R., Komer, L. E., **Tunstall, B. J.**, Bossert, J. M., Shaham, Y., & Hope, B. T. (2021). Inactivation of the infralimbic cortex decreases discriminative stimulus-controlled relapse to cocaine seeking in rats. *Neuropsychopharmacology, 46*(11), 1969-1980. doi:10.1038/s41386-021-01067-6

Mangham, W. M., Elijovich, L., Lee-Diaz, J. A., Orr, B. A., Gienapp, A. J., & **Boop, F. A.** (2022). Pre-operative embolization for staged treatment of infantile choroid plexus papilloma. *Childs Nerv Syst, 38*(2), 429-433. doi:10.1007/s00381-021-05212-w

McAfee, S. S., Liu, Y., Sillitoe, R. V., & **Heck, D. H.** (2021). Cerebellar Coordination of Neuronal Communication in Cerebral Cortex. *Front Syst Neurosci, 15*, 781527. doi:10.3389/fnsys.2021.781527

Meena, A. S., Shukla, P. K., Bell, B., Giorgianni, F., Caires, R., Fernandez-Pena, C., Beranova, S., Aihara, E., Montrose, M. H., Chaib, M., Makowski, L., Neeli, I., Radic, M. Z., **Vasquez, V.**, **Jaggar, J. H.**, Cordero-Morales, J. F., & Rao, R. (2022). TRPV6 channel mediates alcohol-induced gut barrier dysfunction and systemic response. *Cell Rep, 39*(11), 110937. doi:10.1016/j.celrep.2022.110937

Merchant, T. E., Edmonston, D. Y., Wu, S., Li, Y., **Boop, F. A.**, & Lustig, R. H. (2022). Endocrine Outcomes after Limited Surgery and Conformal Photon Radiation Therapy for Pediatric Craniopharyngioma: Long-term Results from the RT1 Protocol. *Neuro Oncol*. doi:10.1093/neuonc/noac115

Miller, I., **Wheless, J. W.**, Hogan, R. E., Dlugos, D., Biton, V., Cascino, G. D., Sperling, M. R., Liow, K., Vazquez, B., Segal, E. B., Tarquinio, D., Mauney, W., Desai, J., Rabinowicz, A. L., Carrazana, E., & Group, D. S. (2021). Consistent safety and tolerability of Valtoco((R)) (diazepam nasal spray) in relationship to usage frequency in patients with seizure clusters: Interim results from a phase 3, long-term, open-label, repeat-dose safety study. *Epilepsia Open, 6*(3), 504-512. doi:10.1002/epi4.12494

Millet, J. R. M., Romero, L. O., Lee, J., Bell, B., & **Vasquez, V.** (2022). C. elegans PEZO-1 is a mechanosensitive ion channel involved in food sensation. *J Gen Physiol, 154*(1). doi:10.1085/jgp.202112960

Mirzahosseini, G., Adam, J. M., Nasoohi, S., El-Remessy, A. B., & **Ishrat, T.** (2022). Lost in Translation: Neurotrophins Biology and Function in the Neurovascular Unit. *Neuroscientist*, 10738584221104982. doi:10.1177/10738584221104982

Mirzahosseini, G., Ismael, S., Ahmed, H. A., & **Ishrat, T.** (2021). Manifestation of renin angiotensin system modulation in traumatic brain injury. *Metab Brain Dis, 36*(6), 1079-1086. doi:10.1007/s11011-021-00728-1

Mohamed, I. N., Li, L., Ismael, S., **Ishrat, T.**, & El-Remessy, A. B. (2021). Thioredoxin interacting protein, a key molecular switch between oxidative stress and sterile inflammation in cellular response. *World J Diabetes, 12*(12), 1979-1999. doi:10.4239/wjd.v12.i12.1979

Mondal, K., Porter, H., Cole, J., 2nd, Pandya, H. K., Basu, S. K., Khanam, S., Chiu, C. Y., Shah, V., Stephenson, D. J., Chalfant, C. E., & **Mandal, N.** (2022). Hydroxychloroquine Causes Early Inner Retinal Toxicity and Affects Autophagosome-Lysosomal Pathway and Sphingolipid Metabolism in the Retina. *Mol Neurobiol, 59*(6), 3873-3887. doi:10.1007/s12035-022-02825-3

Mondal, K., Takahashi, H., Cole, J., 2nd, Del Mar, N. A., Li, C., Stephenson, D. J., Allegood, J., Cowart, L. A., Chalfant, C. E., **Reiner, A.**, & **Mandal, N.** (2021). Systemic Elevation of n-3 Polyunsaturated Fatty Acids (n-3-PUFA) Is Associated with Protection against Visual, Motor, and Emotional Deficits in Mice following Closed-Head Mild Traumatic Brain Injury. *Mol Neurobiol, 58*(11), 5564-5580. doi:10.1007/s12035-021-02501-y

Moss, K. O., Wright, K. D., Tan, A., Rose, K. M., Scharre, D. W., Gure, T. R., **Cowan, R. L.**, Failla, M. D., & Monroe, T. B. (2021). Race-Related Differences Between and Within Sex to Experimental Thermal Pain in Middle and Older Adulthood: An Exploratory Pilot Analysis. *Front Pain Res (Lausanne), 2*, 780338. doi:10.3389/fpain.2021.780338

Mozhui, K., Lu, A. T., Li, C. Z., Haghani, A., Sandoval-Sierra, J. V., Wu, Y., **Williams, R. W.**, & Horvath, S. (2022). Genetic loci and metabolic states associated with murine epigenetic aging. *Elife, 11*. doi:10.7554/eLife.75244

Mudigoudar, B., & **Wheless, J. W.** (2022). Sudden Unexpected Death in Epilepsy (SUDEP): How Do We Prevent This Childhood Tragedy? *J Pediatr Pharmacol Ther, 27*(2), 99-101. doi:10.5863/1551-6776-27.2.99

Nagib, M. M., Zhang, S., Yasmen, N., Li, L., Hou, R., Yu, Y., Boda, V. K., Wu, Z., Li, W., & **Jiang, J.** (2022). Inhibition of TRPC3 channels by a novel pyrazole compound confers antiseizure effects. *Epilepsia, 63*(4), 1003-1015. doi:10.1111/epi.17190

Narayana, S., Franklin, C., Peterson, E., Hunter, E. J., Robin, D. A., Halpern, A., Spielman, J., Fox, P. T., & Ramig, L. O. (2022). Immediate and long-term effects of speech treatment targets and intensive dosage on Parkinson's disease dysphonia and the speech motor network: Randomized controlled trial. *Hum Brain Mapp, 43*(7), 2328-2347. doi:10.1002/hbm.25790

Narayana, S., Gibbs, S. K., Fulton, S. P., **McGregor, A. L.**, Mudigoudar, B., Weatherspoon, S. E., **Boop, F. A.**, & **Wheless, J. W.** (2021). Clinical Utility of Transcranial Magnetic Stimulation (TMS) in the Presurgical Evaluation of Motor, Speech, and Language Functions in Young Children With Refractory Epilepsy or Brain Tumor: Preliminary Evidence. *Front Neurol, 12*, 650830. doi:10.3389/fneur.2021.650830

Newkirk, G. S., Guan, D., Dembrow, N., **Armstrong, W. E.**, **Foehring, R. C.**, & Spain, W. J. (2022). Kv2.1 Potassium Channels Regulate Repetitive Burst Firing in Extratelencephalic Neocortical Pyramidal Neurons. *Cereb Cortex, 32*(5), 1055-1076. doi:10.1093/cercor/bhab266

Nguyen, V. N., Motiwala, M., Ha, L., Boom, A. D., & **Boop, F. A.** (2021). C4-T3 Replacement Laminoplasty and Microsurgical Resection of Ependymoma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown), 21*(4), E359-E360. doi:10.1093/ons/opab241

Nicoli, E. R., Annunziata, I., **d'Azzo, A.**, Platt, F. M., Tifft, C. J., & Stepien, K. M. (2021). GM1 Gangliosidosis-A Mini-Review. *Front Genet, 12*, 734878. doi:10.3389/fgene.2021.734878

Norrie, J. L., Nityanandam, A., Lai, K., Chen, X., Wilson, M., Stewart, E., Griffiths, L., Jin, H., Wu, G., Orr, B., Tran, Q., Allen, S., Reilly, C., Zhou, X., Zhang, J., Newman, K., Johnson, D., Brennan, R., & **Dyer, M. A.** (2021). Retinoblastoma from human stem cell-derived retinal organoids. *Nat Commun, 12*(1), 4535. doi:10.1038/s41467-021-24781-7

North, K. C., Bukiya, A. N., & **Dopico, A. M.** (2021). BK channel-forming slo1 proteins mediate the brain artery constriction evoked by the neurosteroid pregnenolone. *Neuropharmacology, 192*, 108603. doi:10.1016/j.neuropharm.2021.108603

North, K. C., Zhang, M., Singh, A. K., Zaytseva, D., Slayden, A. V., Bukiya, A. N., & **Dopico, A. M.** (2022). Cholesterol Inhibition of Slo1 Channels Is Calcium-Dependent and Can Be Mediated by Either High-Affinity Calcium-Sensing Site in the Slo1 Cytosolic Tail. *Mol Pharmacol, 101*(3), 132-143. doi:10.1124/molpharm.121.000392

Parikh, K. A., Merchant, T. E., & **Boop, F. A.** (2022). Suboccipital Microsurgical Resection of Pediatric Ependymoma in the Foramen of Luschka: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown), 22*(1), e51. doi:10.1227/ONS.0000000000000023

Parks, C., Rogers, C. M., Prins, P., **Williams, R. W.**, **Chen, H.**, **Jones, B. C.**, **Moore, B. M.**, 2nd, & **Mulligan, M. K.** (2021). Genetic Modulation of Initial Sensitivity to Delta9-Tetrahydrocannabinol (THC) Among the BXD Family of Mice. *Front Genet, 12*, 659012. doi:10.3389/fgene.2021.659012

Penovich, P., **Wheless, J. W.**, Hogan, R. E., Guerra, C., Cook, D. F., Carrazana, E., & Rabinowicz, A. L. (2021). Examining the patient and caregiver experience with diazepam nasal spray for seizure clusters: Results from an exit survey of a phase 3, open-label, repeat-dose safety study. *Epilepsy Behav, 121*(Pt A), 108013. doi:10.1016/j.yebeh.2021.108013

Perez, H., Abdallah, M. F., Chavira, J. I., Norris, A. S., Egeland, M. T., Vo, K. L., Buechsenschuetz, C. L., Sanghez, V., Kim, J. L., Pind, M., Nakamura, K., Hicks, G. G., Gatti, R. A., Madrenas, J., Iacovino, M., **McKinnon, P. J.**, & Mathews, P. J. (2021). A novel, ataxic mouse model of ataxia telangiectasia caused by a clinically relevant nonsense mutation. *Elife, 10*. doi:10.7554/eLife.64695

Postlethwaite, A. E., Tuckey, R. C., Kim, T. K., Li, W., **Bhattacharya, S. K.**, Myers, L. K., Brand, D. D., & Slominski, A. T. (2021). 20S-Hydroxyvitamin D3, a Secosteroid Produced in Humans, Is Anti-Inflammatory and Inhibits Murine Autoimmune Arthritis. *Front Immunol, 12*, 678487. doi:10.3389/fimmu.2021.678487

Pourcyrous, M., Elabiad, M. T., Rana, D., Gaston, K. P., DeBaer, L., & Dhanireddy, R. (2021). Racial differences in opioid withdrawal syndrome among neonates with intrauterine opioid exposure. *Pediatr Res, 90*(2), 459-463. doi:10.1038/s41390-020-01279-4

Quintana-Feliciano, R., Gobin, C., Kane, L., Sortman, B., Rakela, S., Genovese, A., **Tunstall, B.**, Caprioli, D., Iniguez, S. D., & Warren, B. L. (2021). Food-Seeking Behavior Is Mediated by Fos-Expressing Neuronal Ensembles Formed at First Learning in Rats. *eNeuro, 8*(2). doi:10.1523/ENEURO.0373-20.2021

Rana, D., Garde, K., Elabiad, M. T., & **Pourcyrous, M.** (2022). Whole body massage for newborns: A report on non-invasive methodology for neonatal opioid withdrawal syndrome. *J Neonatal Perinatal Med, 15*(3), 559-565. doi:10.3233/NPM-220989

Rana, M., Kansal, R., Chaib, M., Teng, B., Morrison, M., Hayes, D. N., **Stanfill, A. G.**, Shibata, D., Carson, J. A., Makowski, L., & Glazer, E. S. (2022). The pancreatic cancer immune tumor microenvironment is negatively remodeled by gemcitabine while TGF-beta receptor plus dual checkpoint inhibition maintains antitumor immune cells. *Mol Carcinog, 61*(6), 549-557. doi:10.1002/mc.23401

Rasiah, P. K., Geier, B., Jha, K. A., & **Gangaraju, R.** (2021). Visual deficits after traumatic brain injury. *Histol Histopathol, 36*(7), 711-724. doi:10.14670/HH-18-315

Romano, R. R., Carter, M. A., Dietrich, M. S., **Cowan, R. L.**, Bruehl, S. P., & Monroe, T. B. (2021). Could Altered Evoked Pain Responsiveness Be a Phenotypic Biomarker for Alzheimer's Disease Risk? A Cross-Sectional Analysis of Cognitively Healthy Individuals. *J Alzheimers Dis, 79*(3), 1227-1233. doi:10.3233/JAD-201293

Roy, S., Sleiman, M. B., Jha, P., Ingels, J. F., Chapman, C. J., McCarty, M. S., Ziebarth, J. D., Hook, M., Sun, A., Zhao, W., Huang, J., Neuner, S. M., Wilmott, L. A., Shapaker, T. M., Centeno, A. G., Ashbrook, D. G., **Mulligan, M. K.**, Kaczorowski, C. C., Makowski, L., Cui, Y., Read, R. W., Miller, R. A., **Mozhui, K.**, Williams, E. G., Sen, S., **Lu, L.**, Auwerx, J., & **Williams, R. W.** (2021). Gene-by-environment modulation of lifespan and weight gain in the murine BXD family. *Nat Metab, 3*(9), 1217-1227. doi:10.1038/s42255-021-00449-w

Sabin, N. D., Hwang, S. N., Klimo, P., Jr., Chambwe, N., Tatevossian, R. G., Patni, T., Li, Y., **Boop, F. A.**, Anderson, E., Gajjar, A., Merchant, T. E., & Ellison, D. W. (2021). Anatomic Neuroimaging Characteristics of Posterior Fossa Type A Ependymoma Subgroups. *AJNR Am J Neuroradiol, 42*(12), 2245-2250. doi:10.3174/ajnr.A7322

Salim, C., Kan, A. K., Batsaikhan, E., Patterson, E. C., & **Jee, C.** (2022). Neuropeptidergic regulation of compulsive ethanol seeking in C. elegans. *Sci Rep, 12*(1), 1804. doi:10.1038/s41598-022-05256-1

Salman, M., Ismael, S., Li, L., Ahmed, H. A., Puchowicz, M. A., & **Ishrat, T.** (2021). Endothelial Thioredoxin-Interacting Protein Depletion Reduces Hemorrhagic Transformation in Hyperglycemic Mice after Embolic Stroke and Thrombolytic Therapy. *Pharmaceuticals (Basel), 14*(10). doi:10.3390/ph14100983

Salman, M., Ismael, S., Li, L., Ahmed, H. A., Puchowicz, M. A., & **Ishrat, T.** (2022). Acute Hyperglycemia Exacerbates Hemorrhagic Transformation after Embolic Stroke and Reperfusion with tPA: A Possible Role of TXNIP-NLRP3 Inflammasome. *J Stroke Cerebrovasc Dis, 31*(2), 106226. doi:10.1016/j.jstrokecerebrovasdis.2021.106226

Sasani, T. A., Ashbrook, D. G., Beichman, A. C., **Lu, L.**, Palmer, A. A., **Williams, R. W.**, Pritchard, J. K., & Harris, K. (2022). A natural mutator allele shapes mutation spectrum variation in mice. *Nature, 605*(7910), 497-502. doi:10.1038/s41586-022-04701-5

Schmitt, J. E., DeBevits, J. J., Roalf, D. R., Ruparel, K., Gallagher, R. S., Gur, R. C., Alexander-Bloch, A., Eom, T. Y., Alam, S., Steinberg, J., Akers, W., Khairy, K., Crowley, T. B., Emanuel, B., **Zakharenko, S. S.**, McDonald-McGinn, D. M., & Gur, R. E. (2021). A Comprehensive Analysis of Cerebellar Volumes in the 22q11.2 Deletion Syndrome. *Biol Psychiatry Cogn Neurosci Neuroimaging*. doi:10.1016/j.bpsc.2021.11.008

Segal, E., Moretz, K., **Wheless, J.**, Penovich, P., Lancman, M., Patten, A., & Malhotra, M. (2022). PROVE-Phase IV Study of Perampanel in Real-World Clinical Care of Patients with Epilepsy: Interim Analysis in Pediatric Patients. *J Child Neurol, 37*(4), 256-267. doi:10.1177/08830738211047665

Segal, E., **Wheless, J.**, Moretz, K., Penovich, P., Patten, A., & Malhotra, M. (2022). Perampanel in real-world clinical care of adolescent and adult patients with epilepsy: Results from the retrospective Phase IV PROVE Study. *Seizure, 98*, 87-94. doi:10.1016/j.seizure.2022.02.011

Senko, A. N., Overall, R. W., Silhavy, J., Mlejnek, P., Malinska, H., Huttl, M., Markova, I., Fabel, K. S., **Lu, L.**, Stuchlik, A., **Williams, R. W.**, Pravenec, M., & Kempermann, G. (2022). Systems genetics in the rat HXB/BXH family identifies Tti2 as a pleiotropic quantitative trait gene for adult hippocampal neurogenesis and serum glucose. *PLoS Genet, 18*(4), e1009638. doi:10.1371/journal.pgen.1009638

Sevilis, T., **McDonald, M.**, Avila, A., Heath, G., Gao, L., O'Brien, G., Zaman, M., Heller, A., Masud, M., Mowzoon, N., & Devlin, T. (2022). Telestroke: Maintaining Quality Acute Stroke Care During the COVID-19 Pandemic. *Telemed J E Health, 28*(4), 481-485. doi:10.1089/tmj.2021.0149

Sharp, B. M., Fan, X., Redei, E. E., **Mulligan, M. K.**, & **Chen, H.** (2021). Sex and heredity are determinants of drug intake in a novel model of rat oral oxycodone self-administration. *Genes Brain Behav, 20*(8), e12770. doi:10.1111/gbb.12770

Shrestha, A. P., & **Vaithianathan, T.** (2022). Tracking the dynamics of single fused synaptic vesicle proteins from a single ribbon active zone in zebrafish retinal bipolar cells. *STAR Protoc, 3*(1), 101107. doi:10.1016/j.xpro.2021.101107

Siddiqui, A., **McGregor, A. L.**, **Wheless, J. W.**, Klimo, P., **Boop, F. A.**, & Khan, R. B. (2021). Utility of Epilepsy Surgery in Survivors of Childhood Cancer. *Neuropediatrics, 52*(6), 480-483. doi:10.1055/s-0041-1728653

Simon, M. V., Basu, S. K., Qaladize, B., Grambergs, R., Rotstein, N. P., & **Mandal, N.** (2021). Sphingolipids as critical players in retinal physiology and pathology. *J Lipid Res, 62*, 100037. doi:10.1194/jlr.TR120000972

Singh, P., Song, C. Y., Dutta, S. R., Pingili, A., Shin, J. S., Gonzalez, F. J., Bonventre, J. V., & **Malik, K. U.** (2021). 6beta-Hydroxytestosterone Promotes Angiotensin II-Induced Hypertension via Enhanced Cytosolic Phospholipase A2alpha Activity. *Hypertension, 78*(4), 1053-1066. doi:10.1161/HYPERTENSIONAHA.121.17927

Sluter, M. N., Hou, R., Li, L., Yasmen, N., Yu, Y., Liu, J., & **Jiang, J.** (2021). EP2 Antagonists (2011-2021): A Decade's Journey from Discovery to Therapeutics. *J Med Chem, 64*(16), 11816-11836. doi:10.1021/acs.jmedchem.1c00816

Song, C. Y., Singh, P., Motiwala, M., Shin, J. S., Lew, J., Dutta, S. R., Gonzalez, F. J., Bonventre, J. V., & **Malik, K. U.** (2021). 2-Methoxyestradiol Ameliorates Angiotensin II-Induced Hypertension by Inhibiting Cytosolic Phospholipase A2alpha Activity in Female Mice. *Hypertension, 78*(5), 1368-1381. doi:10.1161/HYPERTENSIONAHA.121.18181

Sperling, M. R., **Wheless, J. W.**, Hogan, R. E., Dlugos, D., Cascino, G. D., Liow, K., Rabinowicz, A. L., Carrazana, E., & Group, D. S. (2022). Use of second doses of Valtoco(R) (diazepam nasal spray) across 24 hours after the initial dose for out-of-hospital seizure clusters: Results from a phase 3, open-label, repeat-dose safety study. *Epilepsia, 63*(4), 836-843. doi:10.1111/epi.17177

Stanfill, A. G., & Cao, X. (2021). Enhancing Research Through the Use of the Genotype-Tissue Expression (GTEx) Database. *Biol Res Nurs, 23*(3), 533-540. doi:10.1177/1099800421994186

Swanson, M. L., Regner, K. R., **Moore, B. M.**, & Park, F. (2022). Cannabinoid Type 2 Receptor Activation Reduces the Progression of Kidney Fibrosis Using a Mouse Model of Unilateral Ureteral Obstruction. *Cannabis Cannabinoid Res*. doi:10.1089/can.2021.0127

Taylor, A. P., Lee, A. S., Goedecke, P. J., Tolley, E. A., Joyner, A. L., & **Heck, D. H.** (2022). Conditional loss of Engrailed1/2 in Atoh1-derived excitatory cerebellar nuclear neurons impairs eupneic respiration in mice. *Genes Brain Behav, 21*(2), e12788. doi:10.1111/gbb.12788

Temiz-Resitoglu, M., Guden, D. S., Senol, S. P., Vezir, O., Sucu, N., Kibar, D., Yilmaz, S. N., Tunctan, B., **Malik, K. U.**, & Sahan-Firat, S. (2022). Pharmacological Inhibition of Mammalian Target of Rapamycin Attenuates

Deoxycorticosterone Acetate Salt-Induced Hypertension and Related Pathophysiology: Regulation of Oxidative Stress, Inflammation, and Cardiovascular Hypertrophy in Male Rats. *J Cardiovasc Pharmacol, 79*(3), 355-367. doi:10.1097/FJC.0000000000001187

Thadathil, N., Xiao, J., Hori, R., Alway, S. E., & **Khan, M. M.** (2021). Brain Selective Estrogen Treatment Protects Dopaminergic Neurons and Preserves Behavioral Function in MPTP-induced Mouse Model of Parkinson's Disease. *J Neuroimmune Pharmacol, 16*(3), 667-678. doi:10.1007/s11481-020-09972-1

Thiele, E. A., Bebin, E. M., Filloux, F., Kwan, P., Loftus, R., Sahebkar, F., Sparagana, S., & **Wheless, J.** (2022). Long-term cannabidiol treatment for seizures in patients with tuberous sclerosis complex: An open-label extension trial. *Epilepsia, 63*(2), 426-439. doi:10.1111/epi.17150

Thomas, K. T., & **Zakharenko, S. S.** (2021). MicroRNAs in the Onset of Schizophrenia. *Cells, 10*(10). doi:10.3390/cells10102679

Thomas, M. H., Gui, Y., Garcia, P., Karout, M., Gomez Ramos, B., Jaeger, C., Michelucci, A., Gaigneaux, A., Kollmus, H., Centeno, A., Schughart, K., Balling, R., Mittelbronn, M., Nadeau, J. H., Sauter, T., **Williams, R. W.**, Sinkkonen, L., & Buttini, M. (2021). Quantitative trait locus mapping identifies a locus linked to striatal dopamine and points to collagen IV alpha-6 chain as a novel regulator of striatal axonal branching in mice. *Genes Brain Behav, 20*(8), e12769. doi:10.1111/gbb.12769

Torres-Rojas, C., Zhao, W., Zhuang, D., O'Callaghan, J. P., **Lu, L.**, **Mulligan, M. K.**, **Williams, R. W.**, & **Jones, B. C.** (2021). Paraquat Toxicogenetics: Strain-Related Reduction of Tyrosine Hydroxylase Staining in Substantia Nigra in Mice. *Front Toxicol, 3*, 722518. doi:10.3389/ftox.2021.722518

Tremblay, M. G., Sibai, D. S., Valere, M., Mars, J. C., Lessard, F., Hori, R. T., **Khan, M. M.**, Stefanovsky, V. Y., LeDoux, M. S., & Moss, T. (2022). Ribosomal DNA promoter recognition is determined in vivo by cooperation between UBTF1 and SL1 and is compromised in the UBTF-E210K neuroregression syndrome. *PLoS Genet, 18*(2), e1009644. doi:10.1371/journal.pgen.1009644

Trotter, C., Kim, H., Farage, G., Prins, P., **Williams, R. W.**, Broman, K. W., & Sen, S. (2021). Speeding up eQTL scans in the BXD population using GPUs. *G3 (Bethesda), 11*(12). doi:10.1093/g3journal/jkab254

Udell, M. E., Ni, J., Garcia Martinez, A., **Mulligan, M. K.**, Redei, E. E., & **Chen, H.** (2021). TailTimer: A device for automating data collection in the rodent tail immersion assay. *PLoS One, 16*(8), e0256264. doi:10.1371/journal.pone.0256264

Van Gelder, R. N., Chiang, M. F., **Dyer, M. A.**, Greenwell, T. N., Levin, L. A., Wong, R. O., & Svendsen, C. N. (2022). Regenerative and restorative medicine for eye disease. *Nat Med, 28*(6), 1149-1156. doi:10.1038/s41591-022-01862-8

Vial, F., McGurrin, P., Attaripour, S., **d'Azzo, A.**, Tifft, C. J., Toro, C., & Hallett, M. (2022). Myoclonus generators in sialidosis. *Clin Neurophysiol Pract, 7*, 169-173. doi:10.1016/j.cnp.2022.05.004

Victor, A. K., Donaldson, M., Johnson, D., Miller, W., & **Reiter, L. T.** (2021). Molecular Changes in Prader-Willi Syndrome Neurons Reveals Clues About Increased Autism Susceptibility. *Front Mol Neurosci, 14*, 747855. doi:10.3389/fnmol.2021.747855

Wang, H., Del Mar, N., Deng, Y., & **Reiner, A.** (2021). Rescue of BDNF expression by the thalamic parafascicular nucleus with chronic treatment with the mGluR2/3 agonist LY379268 may contribute to the LY379268 rescue of enkephalinergic striatal projection neurons in R6/2 Huntington's disease mice. *Neurosci Lett, 763*, 136180. doi:10.1016/j.neulet.2021.136180

Wang, J., **Miller, D. D.**, & Li, W. (2022). Molecular interactions at the colchicine binding site in tubulin: An X-ray crystallography perspective. *Drug Discov Today, 27*(3), 759-776. doi:10.1016/j.drudis.2021.12.001

Wechsler, R. T., **Wheless, J.**, Zafar, M., Huesmann, G. R., Lancman, M., Segal, E., Chez, M., Aboumatar, S., Patten, A., Salah, A., & Malhotra, M. (2022). PROVE: Retrospective, non-interventional, Phase IV study of perampanel in real-world clinical care of patients with epilepsy. *Epilepsia Open, 7*(2), 293-305. doi:10.1002/epi4.12575

Wheless, J., Peters, J., Misra, S. N., Becker, D., Rabinowicz, A. L., Sirven, J., & Carrazana, E. (2022). Comment on "Intranasal midazolam versus intravenous/rectal benzodiazepines for acute seizure control in children: A systematic review and meta-analysis". *Epilepsy Behav, 128*, 108550. doi:10.1016/j.yebeh.2021.108550

Wheless, J. W. (2021). A critical evaluation of midazolam nasal spray for the treatment of patients with seizure clusters. *Expert Rev Neurother, 21*(11), 1195-1205. doi:10.1080/14737175.2021.1890033

Wheless, J. W., Miller, I., Hogan, R. E., Dlugos, D., Biton, V., Cascino, G. D., Sperling, M. R., Liow, K., Vazquez, B., Segal, E. B., Tarquinio, D., Mauney, W., Desai, J., Rabinowicz, A. L., Carrazana, E., & Group, D. S. (2021). Final

results from a Phase 3, long-term, open-label, repeat-dose safety study of diazepam nasal spray for seizure clusters in patients with epilepsy. *Epilepsia, 62*(10), 2485-2495. doi:10.1111/epi.17041

Williams, C., Sakaria, R. P., & **Pourcyrous, M.** (2022). Early-Onset Fulminant Sepsis in a Preterm Neonate due to Streptococcus gallolyticus : A Case Report and Literature Review. *AJP Rep, 12*(1), e117-e122. doi:10.1055/a-1762-0096

Williams, E. G., Pfister, N., Roy, S., Statzer, C., Haverty, J., Ingels, J., Bohl, C., Hasan, M., Cuklina, J., Buhlmann, P., Zamboni, N., **Lu, L.**, Ewald, C. Y., **Williams, R. W.**, & Aebersold, R. (2022). Multiomic profiling of the liver across diets and age in a diverse mouse population. *Cell Syst, 13*(1), 43-57 e46. doi:10.1016/j.cels.2021.09.005

Wu, H. Y., Rong, Y., Bansal, P. K., Wei, P., Guo, H., & **Morgan, J. I.** (2022). TTLL1 and TTLL4 polyglutamylases are required for the neurodegenerative phenotypes in pcd mice. *PLoS Genet, 18*(4), e1010144. doi:10.1371/journal.pgen.1010144

Xu, X., Du, L., **Jiang, J.**, Yang, M., Wang, Z., Wang, Y., Tang, T., Fu, X., & Hao, J. (2021). Microglial TREM2 Mitigates Inflammatory Responses and Neuronal Apoptosis in Angiotensin II-Induced Hypertension in Middle-Aged Mice. *Front Aging Neurosci, 13*, 716917. doi:10.3389/fnagi.2021.716917

Yang, C., Wang, Y., Sims, M. M., He, Y., **Miller, D. D.**, & Pfeffer, L. M. (2021). Targeting the Bromodomain of BRG-1/BRM Subunit of the SWI/SNF Complex Increases the Anticancer Activity of Temozolomide in Glioblastoma. *Pharmaceuticals (Basel), 14*(9). doi:10.3390/ph14090904

Yaw, A. M., Glass, J. D., **Prosser, R. A.**, & Caldwell, H. K. (2022). Paternal Cocaine in Mice Alters Social Behavior and Brain Oxytocin Receptor Density in First Generation Offspring. *Neuroscience, 485*, 65-77. doi:10.1016/j.neuroscience.2022.01.010

Yeomans, D. C., Hanson, L. R., Carson, D. S., **Tunstall, B. J.**, Lee, M. R., Tzabazis, A. Z., Jacobs, D., & Frey, W. H., 2nd. (2021). Nasal oxytocin for the treatment of psychiatric disorders and pain: achieving meaningful brain concentrations. *Transl Psychiatry, 11*(1), 388. doi:10.1038/s41398-021-01511-7

Young, M., Delaney, A., Jurbergs, N., Pan, H., Wang, F., **Boop, F. A.**, & Merchant, T. E. (2022). Radiotherapy alone for pediatric patients with craniopharyngioma. *J Neurooncol, 156*(1), 195-204. doi:10.1007/s11060-021-03908-2

Yu, W., **Mulligan, M. K.**, **Williams, R. W.**, & Meisler, M. H. (2022). Correction of the hypomorphic Gabra2 splice site variant in mouse strain C57BL/6J modifies the severity of Scn8a encephalopathy. *HGG Adv, 3*(1), 100064. doi:10.1016/j.xhgg.2021.100064

Zaso, M. J., **Youngentob, S. L.**, & Park, A. (2021). Characterizing the role of early alcohol reexposure in associations of prenatal alcohol exposure with adolescent alcohol outcomes. *Alcohol Clin Exp Res, 45*(7), 1436-1447. doi:10.1111/acer.14632

Zhang, C., Sajith, A. M., Xu, X., **Jiang, J.**, Phillip Bowen, J., Kulkarni, A., & Hao, J. (2022). Targeting NLRP3 signaling by a novel-designed sulfonylurea compound for inhibition of microglial inflammation. *Bioorg Med Chem, 58*, 116645. doi:10.1016/j.bmc.2022.116645

APPENDIX 3

Neuroscience Seminar Speakers

FY 2021-2022

THE NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

NEUROSCIENCE SEMINAR SERIES SCHEDULE

Fall 2021

Mark Wagner, M.D., FAAFP — October 19, 2021
Seattle Sports and Regenerative Medicine
Host: Students

Title: "***Learning in Neocortex-Cerebellum Network*** "

Heather Mefford, M.D., Ph.D. — October 26, 2021
Member
Department of Cell & Molecular Biology
St. Jude Children's Research Hospital
Host: Dr. Matt Ennis

Title: "***Genetics of Pediatric Epilepsies: from Gene Discovery to Precision Medicine***"

Detlef Heck Ph.D. — November 2, 2021
Professor
Department of Anatomy & Neurobiology
University of Tennessee Health Science Center

Title: "***Cerebellar coordination of rhythms: implications for cerebellar cognitive function***"

Joel Geerling, M.D., Ph.D. — November 9, 2021
Assistant Professor
Department of Neurology

University of Iowa
Host: Dr. Victor Chizhikov

Title: "***Neuroanatomy and Necessity of Neurons in the Parabrachial Nucleus*** "

Ryan LaLumiere, Ph.D. November 30, 2021
Associate Professor
Department of Psychological and Brain Sciences
University of Iowa
Host: Dr. Jianyang Du

Title: "***Frontal Cortical Mechanisms for Inhibiting Drug Seeking in Rodents***"

Sonja Scholz, M.D., Ph.D. December 7, 2021
Investigator
Neurodegenerative Diseases Research Unit
NIH
Host: Jack Tsao

Title: "***Lewy body dementia: from molecular characterization to precision therapy***"

THE NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

NEUROSCIENCE SEMINAR SERIES SCHEDULE

Spring 2022

Sunwhi Kim, Ph.D. — January 25, 2022
Postdoctoral Student
Department of Anatomy and Neurobiology
UTHSC

Title: "***Neural Circuit Pathology Driven by Shank3 Mutation Disrupts Social Behaviors***"

Atulya Iyengar Ph.D. — February 8, 2022
Postdoctoral Research Scholar
Department of Biology
University of Iowa
Host: Dr. Larry Reiter

Title: "***The Excitable Brain: Order & Disorder through the lens of Drosophila Neurogenetics***"

Donald Katz, Ph.D. — February 22, 2022
Professor
Department of Psychology & Neuroscience
Brandeis University
Host: Dr. John Boughter

Title: "***The Dynamic Neural Processing of Tastes*** "

Larry Young, Ph.D. March 8, 2022
Professor
Department of Psychiatry
Emory University
Host: Dr. Jianyang Du

Title: "***Neural Mechanisms of Social Bonding, Social Loss & Empathy: Implications for Autism***"

Jianrong Tang, Ph.D. March 22, 2022
Associate Professor
Department of Pediatric Neurology
Baylor College of Medicine
Host: Dr. Fu-Ming Zhou

Title: "***Deep Brain Stimulation Improves Hippocampal Memory in Mouse Models of Neurodevelopmental Disorders***"

Leandro Vendruscolo, Pharm D., Ph.D. March 29, 2022
Staff Scientist
Neurobiology of Addiction Section
NIH
Host: Dr. Brendan Tunstall

Title: "***Corticosteroid sensitization drives opioid addiction: Looking at opioid addiction from a stress disorder perspective***"

Bo Li, Ph.D. April 5, 2022
Professor
Cold Springs Harbor Laboratory
Host: Dr. Jianyang Du

Title: "***Dissecting the Neural Circuitry Underlying Motivated Behaviors***"

Steven Roth, M.D., FARVO April 12, 2022
Professor
Anesthesia & Ophthalmology
Chicago College of Medicine
Host: Dr. Raja Gangaraju

Title: "***Exosomes as Novel Therapeutics in the Retina***"

Dandan Sun, Ph.D. April 26, 2022
Professor
Department of Neurology
University of Pittsburgh
Host: Dr. Tauhed Ishrat

Title: "***Dynamic Regulation of Microglia Metabolism and Function in CNS Injury and Repair***"

Thimmasettapp Thippeswamy, Ph.D. May 3, 2022
Professor
Department of Biomedical Sciences
College of Veterinarian Medicine
Iowa State University
Host: Dr. Jianxiong Jiang

Title: "***Disease Modification Strategies in Experimental Models of Epilepsy***"

Lindsey Schier, Ph.D. May 10, 2022
Principle Investigator
Department of Biological Sciences
University of Southern California
Host: Dr. Max Fletcher

Title: "***Appealing the "Sweet Tooth:" Glucose Assimilation in the Oral Cavity and Its role in Appetite***"

Ugo Mayor, PhD. May 17, 2022
Ikerbasque Research Professor
Department of Biochemistry and Molecular Biology
University of the Basque Country Leioa, Spain
Host: Dr. Larry Reiter

Title: "***Ube3a-Induced Ubiquitination Changes in the Brain Reveal the Molecular Complexity of Angelman Syndrome***"

APPENDIX 4

Neuroscience News, Events and Graduate Training Flyer

FY 2021-2022

2021 Neuroscience Institute (NI) Postdoctoral Research Support

Purpose and Eligibility: The NI solicits proposals for supplementary funds for postdoctoral fellows or research associates whose mentors are active members of NI. Mentors should be currently funded or working on a no-cost extension of a competitively renewable grant. Faculty currently on NI seed support are ineligible for this award.

Although we try to rotate funding to new applicants, currently funded postdocs or research associates **with no more than one year of NI matching support** are also welcome to apply for one more year.

Support: The NI will provide $10,000-15,000 in matching funds to mentors who are NI members, to be used toward the salary/fringe of each awarded applicant. The precise amount given, and the number of postdocs funded, will be determined during the application evaluation, and depends on the number of quality applicants we receive.

Application:

1. New Applicants: The applicant should provide a cover letter requesting support with a brief overview of the proposed research project, **a 3 page research proposal**, a current CV, and two letters of reference (reference letters can also be emailed directly to NI), one of which must come from the mentor. These documents should be submitted electronically as PDF files. Mentors should provide an updated, brief, NIH-style biosketch attached to their support letter.

2. Renewal applicants: The applicant should submit a cover letter with a 2-page progress report covering the past year's activities (publications, research progress, presentations, etc.). Those applying for renewal must also include a support letter from the mentor commenting on the progress of the applicant, and the mentor should update the brief, NIH-style biosketch.

Review Process and Criteria: The NI Executive Committee will review applications. Criteria include evidence of productivity in neuroscience research, with particular value attached to first author publications.

Deadline: **Jan. 15, 2021**. Awards will run from Feb. 1, 2021-Jan. 31, 2022.

Submission: Please send all materials electronically to:
Brandy Fleming, Program Coordinator
Neuroscience Institute
bflemin3@uthsc.edu
Phone: 448-1286

UT HSC NEUROSCIENCE INSTITUTE

Neuroscience Institute (NI) Pilot/Equipment Support Grants 2022

Goal: The NI solicits applications from UTHSC NI faculty for research projects intended as development funds for new grant submissions.

Method of Support by NI: The NI will provide funds for animals, supplies, small equipment, and salaries for non-tenure track research staff. Support will be for a maximum of 1 year. Applicants may request funds for all three items, or any subset, with the following exceptions: *NI members currently receiving seed funding are ineligible. NI members currently receiving postdoctoral funds are ineligible for further postdoctoral funding, but may request other support, as listed above.*

NI Funding Levels: We anticipate funding 3 applications with a maximum of $15,000 each.

Eligibility and Criteria: All tenure-track NI faculty with primary faculty appointments at UTHSC and an active research program are eligible. Criteria will include:

1. Scientific merit of the proposed project.
2. History of funding and publications of the PI and key collaborators.
3. Justification of the need for supplemental funding.
4. Regarding equipment, matching funds and interest from multiple users will be factors in evaluation.
5. Degree of collaboration and cross-disciplinary interaction.
6. Faculty who are currently in a no-cost extension or who have lost funding (R01 or comparable) within the past year are also eligible. Summary sheets of recently reviewed grants should be included, as well as a brief description of the aims of the planned new submission.

NI Application for Support:

1. Three page electronic application (PDF) that identifies the PI and other key personnel, a brief description of the project, and itemized budget (personnel, equipment, and supplies).
2. The PI and key collaborators should append a recent NIH biosketch that includes current funding, including any other UTHSC support if applicable.
3. A letter from the department chair supporting the application and stating if the submitting PI, or the PI's department, has partnering research funds available.

Review Process: The NI Executive Committee will review applications and a brief, written summary will be sent to the corresponding PI.

***Deadline*: February 4, 2022. Submit electronic (PDF) copies to:**

Brandy Fleming, M.S.
Program Coordinator, NI
Email: bflemin3@uthsc.edu
Phone: 901-448-2684

For questions, please contact Matthew Ennis (mennis@uthsc.edu) or Brandy Fleming (bflemin3@uthsc.edu)

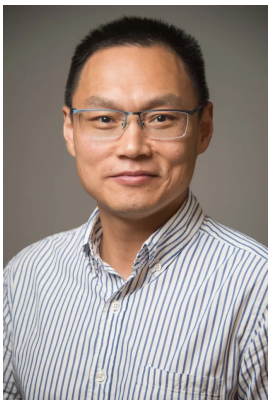
UTHSC Team Receives $1.15 Million To Develop New Anti-Seizure Treatment

Written by Lee Ferguson | December 8, 2021

Contact

Communications and Marketing (https://uthsc.edu/communications-marketing/)
Email: **communications@uthsc.edu (mailto:communications@uthsc.edu)**

A research project that could expand the treatment options for epilepsy has received significant federal funding. Jianxiong Jiang, PhD, associate professor in Pharmaceutical Sciences and Neurobiology at the University of Tennessee Health Science Center, and Wei Li, PhD, Distinguished Professor and director of the UTHSC College of Pharmacy Drug Discovery Center, were recently awarded $1.15 million from the National Institute of Neurological Disorders and Stroke to develop a potential new drug target to treat epileptic seizures.


Jianxiong Jiang, PhD

The grant is also a significant milestone for UTHSC's Office of Research, as it puts the total external dollars generated from CORNET-funded work over the $30 million mark. The CORNET Awards are a seed funding program for interdisciplinary collaborations on new research.

Dr. Jiang and Dr. Li's work answers an urgent unmet need for safer, more effective anti-seizure therapies. Though epilepsy is one of the most common brain disorders, anti-seizure medication currently available provides only symptomatic relief and causes wide-ranging, often unbearable, side effects, with over 30% of patients responding poorly. There is no FDA-approved medication to prevent epilepsy development in at-risk people or to modify disease progression in those already diagnosed.

The project focuses on a protein that is part of a superfamily of ion channels (TRPC3) that helps regulate the epileptic brain in a highly specific manner. The team has previously patented a series of selective TRPC3 inhibitors as potential agents for new anti-seizure therapy. Their goal is to develop a lead TRPC3 inhibitor that is stable and safe, with favorable pharmacodynamic and pharmacokinetic properties. They will test its effectiveness in suppressing acute seizures, preventing epilepsy development, and improving cognitive outcomes.

Wei Li, PhD

"Completion of this project likely will establish a proof-of-concept for TRPC3 inhibition as a new strategy to manage epileptic seizures," said Dr. Jiang, a neuropharmacologist dedicated to epilepsy research for nearly 15 years. Dr. Li, who leads a medicinal chemistry lab, added, "Our study will also pave the way for more extensive lead-optimization in the future, with the ultimate goal to develop a new therapy to prevent epilepsy or modify its progression."

The project title is "Targeting TRPC3 Channels for Epileptic Seizures." Dr. Jiang and Dr. Li are principal investigators. Julio Cordero-Morales, PhD, associate professor in the Department of Physiology, is a co-investigator.

Dr. Li was a 2016 recipient of a CORNET Award, which provided seed money to gather data used to secure this NIH grant. "The CORNET Award to this project was critical for us to jump start this work. It took a while for this project to mature due to unexpected delays, but we are happy to see this great outcome," Dr. Li said. The CORNETs (an acronym for Collaborative Research Network) program was created by Steven Goodman, PhD, vice chancellor for Research at UTHSC, in 2016 to give collaborative research teams the initial funding they need to collect data for larger studies. Over the years, Dr. Goodman has awarded about 63 CORNETs worth a combined $2.26 million. With this latest NIH award, extramurally funded grants stemming from CORNET work total over $30.4 million, a whopping 13.45-fold return on investment.

"It is incredibly gratifying that the CORNET awards, which we created five years ago, have led to the creation of new successful collaborations across traditional boundaries, important and creative biomedical research, and at the same time has contributed over $30 million to UTHSC grants and contracts," Dr. Goodman said. "I want to congratulate Dr. Jianxiong Jiang, Dr. Wei Li, and Dr. Julio Cordero-Morales for receiving this NIH grant award and all of the other CORNET awardees, who have contributed to UTHSC surpassing this $30 million milestone."

2 UTHSC College of Medicine Experts Edit Comprehensive Book on Cholesterol, from Chemistry to Clinical Implications

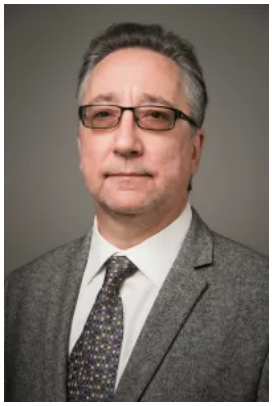
Contact

Communications and Marketing (https://uthsc.edu/communications-marketing/)
Email: **communications@uthsc.edu (mailto:communications@uthsc.edu)**

Written by Jane Roberts | March 9, 2022

Alex Dopico, MD, PhD, and Anna Bukiya, PhD, research collaborators and faculty in the College of Medicine at the University of Tennessee Health Science Center, have just finished editing a comprehensive book on cholesterol.

"Cholesterol: From Chemistry and Biophysics to the Clinic," was published by Elsevier. It will be released in May.



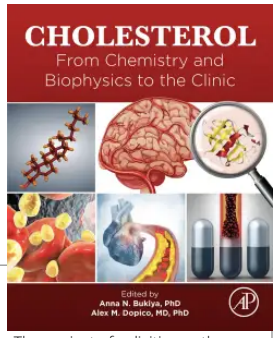
Alex Dopico, MD.

"It was a massive, yet very pleasant effort," said Dr. Dopico, the Van Vleet Chair of Excellence in the department. "It is highly comprehensive, written by specialists in the field representing more than a dozen countries."

The 38-chapter book begins with the chemical and biophysical aspects of cholesterol discoveries. It ends with the latest breakthroughs for tackling health conditions associated with abnormal cholesterol levels.

The project, which included soliciting all the experts, took more than a year.

"It is quite unique because books on cholesterol out there today focus on distinct aspects, whether cholesterol chemistry itself or cholesterol screening and its clinical importance. But to the best of my knowledge, an extensive coverage of such varied topics is not found in a single volume" said Dr. Bukiya, a professor in UTHSC's Department of Pharmacology, Addiction Science, and Toxicology.



The project of soliciting authors and editing the book's 38 chapters took more than a year.

> *"This was the largest book project we have ever done," Bukiya said. "Everybody who works with cholesterol will appreciate it."*

The book, **available for pre-order on Amazon, (https://www.amazon.com/s?k=cholesterol%3A+from+chemistry+and+biophysics+to+the+clinic&crid=23FMRX08IHLLG&sprefix=cholesterol+from+chemistry+and+biophysics+to+the+clinic%** is designed to empower researchers, students, and clinicians to in various disciplines to advance new studies in cholesterol, improve clinical management, and drive drug discovery.

Anna Bukiya, PhD

Bukiya and Dopico have collaborated on many projects, including work in 2020 where they received $2.4 million from the National Institutes of Health to study the molecular mechanisms by which cholesterol modulates blood vessel function in the brain.

For more than 20 years, Dr. Dopico has studied ion channel regulation by a wide variety of lipids, including fatty acids, leukotrienes, glycerophospholipids, and cholesterol itself. In 2009, he received a Merit Award from the National Institute of Alcohol Abuse and Alcoholism for his work on ethanol actions on slo1 channels. Until 2021, he served on the institute's national advisory committee.

Dr. Bukiya's research focuses on lipid modulation of ion channel function in excitable tissues and sensitivity to drugs. Her studies have been consistently funded by the NIH and private foundations. Besides numerous research studies, she has edited one other book and co-edited several others.

Both editors are members of the Biophysical Society, International Drug Abuse Research Society, Research Society on Alcoholism, and American Society for Pharmacology and Experimental Therapeutics.

Share this:

Facebook (https://news.uthsc.edu/2-uthsc-college-of-medicine-experts-edit-comprehensive-book-on-cholesterol-from-chemistry-to-clinical-implications/?share=facebook&nb=1)

Twitter (https://news.uthsc.edu/2-uthsc-college-of-medicine-experts-edit-comprehensive-book-on-cholesterol-from-chemistry-to-clinical-implications/?share=twitter&nb=1)

LinkedIn (https://news.uthsc.edu/2-uthsc-college-of-medicine-experts-edit-comprehensive-book-on-cholesterol-from-chemistry-to-clinical-implications/?share=linkedin&nb=1)

Print (https://news.uthsc.edu/2-uthsc-college-of-medicine-experts-edit-comprehensive-book-on-cholesterol-from-chemistry-to-clinical-implications/#print)

UTHSC's Yousefi Receives $2.2 Million To Develop AI Aimed at Predicting Glaucoma Risk

Written by Lee Ferguson | May 11, 2022

Contact

Communications and Marketing (https://uthsc.edu/communications-marketing/)
Email: **communications@uthsc.edu (mailto:communications@uthsc.edu)**

Siamek Yousefi, PhD, assistant professor in the Department of Ophthalmology and the Department of Genetics, Genomics, and Informatics at the University of Tennessee Health Science Center, is the principal investigator on a $2.2 million award from the National Eye Institute to develop artificial intelligence (AI) to predict genetic risk of glaucoma.

Dr. Siamak Yousefi

Glauoma, a complex blinding disease that causes the degeneration of retinal ganglion cells, is the second-leading cause of blindness worldwide. Current knowledge regarding demographic, ocular, imaging, or genetic factors alone are insufficient to predict the risk of glaucoma accurately. Dr. Yousefi, who is also director of the Data Mining and Machine Learning laboratory at UTHSC, is the principal investigator on a team of interdisciplinary experts using large clinically annotated multimodal glaucoma data. From this, they will develop reliable artificial intelligence tools for identifying individuals at-risk of developing glaucoma and future vision loss.

Dr. Yousefi's co-investigators on the grant are glaucoma experts Louis Pasquale, MD, professor of Ophthalmology at Mount Sinai, and Michael Boland, MD, PhD, medical director of Practice Innovation for Ophthalmology at Massachusetts Eye and Ear.

"Our algorithms, comprised of thousands of lines of coding, will eventually allow eye doctors and clinicians to see instantly the risk of developing glaucoma by sifting through a subject's retinal images, visual field tests, and genetic data and identify the signs that might not be distinguishable to the clinician," Dr. Yousefi said. "Not only crucial for clinical care and glaucoma research, in a nation with a rapidly aging population and a large population of African Americans, our study has critical ramifications for public health as well since age and African ancestry are major risk factors for developing glaucoma."

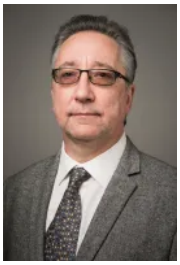
Dr. Yousefi's project, titled "Predicting the risk of glaucoma from structural, functional, and genetic factors using artificial intelligence," is funded for five years.

Tags: **AI (https://news.uthsc.edu/tag/ai/)**, **artificial intelligence (https://news.uthsc.edu/tag/artificial-intelligence/)**, **Glaucoma (https://news.uthsc.edu/tag/glaucoma/)**, **News Releases (https://news.uthsc.edu/tag/news-releases/)**

UTHSC Team Receives $2.19 Million To Study Neurotoxicity of Commonly-Used Chemical Solvent

Written by Lee Ferguson | June 20, 2022

A team of University of Tennessee Health Science Center researchers has been awarded $2.19 million from the National Institute of Environmental Health Sciences for their investigation of the neurotoxic effects of toluene, a common chemical found in many household products.



Dr. Alex Dopico

Alex M. Dopico, MD, Van Vleet Chair of Excellence and professor in the Department of Pharmacology, Addiction Science, and Toxicology (PHAST) in the College of Medicine, and Anna N. Bukiya, PhD, professor in the same department, are principal investigators on the award. Jeff Steketee, PhD, also a professor in the PHAST Department and chair of the Institutional Animal Care and Use Committee, is a co-investigator.

Toluene reaches the brain through inhalation. Intoxication with toluene, whether accidental or following recreational use (e.g., "glue sniffing"), leads to dizziness, blurred vision and even neurological deficits with catastrophic outcomes, including death. A reduction in blood flow to the brain is thought to contribute to these toxic effects, but how and why toluene exposure affects the brain circulation is not known.

Dr. Anna Bukiya

The team hypothesizes that toluene reduces the activity of a protein (the BK channel) located in the cerebral artery muscle cells, causing the brain arteries to constrict upon exposure. Performing tests at the molecular level using computational methods, and in vitro and in vivo evaluation of BK channel function in animal models, the team aims to identify the specific mechanism and site of action in BK channels that makes cerebral arteries constrict in the presence of toluene. Their tests will include delivering new selective drug therapies for early intervention in toluene-induced brain ischemia.

The project, titled "Ionic mechanisms of toluene cerebrovascular actions", is being funded over five years.

Tags: **Alex M. Dopico (https://news.uthsc.edu/tag/alex-m-dopico/)**, **Anna N. Bukiya (https://news.uthsc.edu/tag/anna-n-bukiya/)**, **UTHSC College of Medicine (https://news.uthsc.edu/tag/uthsc-college-of-medicine/)**

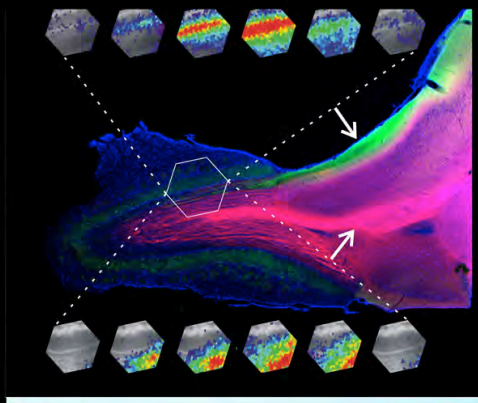
Contact

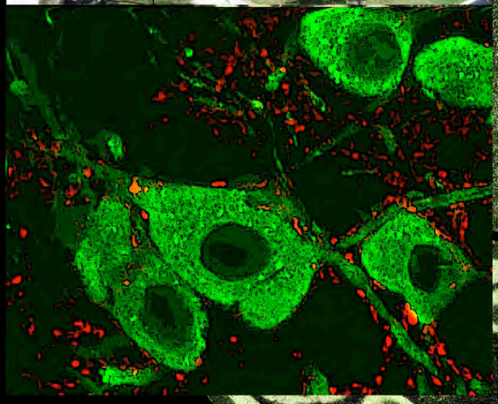
Communications and Marketing (https://uthsc.edu/communications-marketing/)
Email: **communications@uthsc.edu (mailto:communications@uthsc.edu)**

THE NEUROSCIENCE INSTITUTE
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

St. Jude Children's Research Hospital
ALSAC • Danny Thomas, Founder

Graduate Studies in Neuroscience





The Neuroscience Graduate Program is a multidisciplinary, interdepartmental Ph.D. program at the University of Tennessee Health Science Center (UTHSC) and supported by the Neuroscience Institute. Established in 1985, the Neuroscience Institute comprises over 90 faculty from multiple departments and colleges, including Anatomy and Neurobiology, Medicine, Molecular Sciences, Neurology, Neurosurgery, Ophthalmology, Pathology, Pediatrics, Pharmaceutical Sciences, Pharmacology, Physiology, and Surgery. Some faculty hold primary appointments at the world-renowned St. Jude Children's Research Hospital (SJCRH) a short distance away. Our program provides broad training in neurophysiology, neuropharmacology, neuroanatomy, molecular and cellular neuroscience, developmental neurobiology, and behavioral neuroscience.

Basic and clinical Neuroscience research at UTHSC focus on intracellular signaling pathways, neuronal excitability, synaptic transmission, sensory processing and retinal biology, neurological and neurodegenerative disorders, brain tumors, neurogenetics and neural development, and mental and addictive disorders. UTHSC is one of the world's leading centers exploiting novel genetic approaches to explore brain development, function and behavior, and psychiatric and neurodegenerative diseases. Neuroscientists at SJCRH are studying diverse pediatric tumors and diseases in the CNS using cutting-edge molecular, genomic and genetic methods.

Memphis is a culturally diverse metropolitan area of over 2.5 million residents, with the rich traditions of a city on the banks of the Mississippi River. Memphis has more sunny days than Miami, and combines southern heritage and hospitality with contemporary charm. You'll enjoy great dining (world famous barbecue), art galleries and an exiciting nightlife. Memphis is a must for those wanting to visit the birthplace of blues, soul, and rock and roll. Sun Studio, The Rock 'N' Soul Museum, Gibson Guitar Factory and Beale Street entertainment district are just a few blocks from campus, as is the Mississippi River, and downtown. The city is runner and bike-friendly, with a new "greenline" extending to the city center from a 3200 acre urban park (Shelby Farms) that also provides fishing and horseback riding. Memphis is home to FedEx, to the NBA's Memphis Grizzlies, and to the Memphis Zoo, ranked one of the top zoos in the US and home to over 3500 animals on 76 beautifully landscaped acres.

To apply to the Neuroscience Track of our Graduate Program, please go to the Integrated Biomedical Science Program website:
http://www.uthsc.edu/grad/IBS

To find out more about Neuroscience and our program, please visit our website:
http://www.uthsc.edu/neuroscience

THE UNIVERSITY of TENNESSEE HEALTH SCIENCE CENTER