The key long-term objectives of this proposal are to characterize intercellular interactions during adult spermatogenesis. The project will allow biochemistry, site-directed mutagenesis in cultured cells, and immunohistochemical analysis. The primary focus will be on understanding how a conserved, transmembrane GrpEB protein maintains the blood-testes barrier (BTB) in somatic support cells of adult testis. We will capitalize upon the powerful genomics available in Drosophila, as well as the ability to unambiguously identify the BTB, to address the following hypothesis: that (1) the secreted protein is conserved across the testis of all species and is required for spermatogenesis; and (2) that two key receptor candidates are both conserved and functionally distinct from the Drosophila BTB. This project is supported by prior published data demonstrating that (1) the secreted protein is conserved in several of the testis and is required for spermatogenesis and (2) that the two key receptor candidates are both conserved and functionally distinct from the Drosophila BTB.

\( \text{Project Abstract} \)

### Project Abstract

#### Assisting the Impact of Resident Heat Exposure on Child and Caregiver Mental Health in the Community

Erika Bach

Biochemistry and Molecular Pharmacology

Somatic control of germline differentiation in spermatogenesis

Not specified

- **Student/Post Doctoral Trainees:** Nacies Radaevski, Leonardo Treasaaple


- **Other:** Project will examine the influence of a large ecosystemic infection (Neisseria meningitidis) on the cellular dynamics in the brain. The project will investigate the molecular mechanisms that underlie the response of the brain to infection and inflammation and how these mechanisms contribute to the development of vaccine responses. The project will utilize a combination of in vitro and in vivo approaches to study the role of the brain in the immune response to infection and inflammation. The project will also investigate the role of the immune system in the development of vaccines and how these vaccines can be used to prevent the spread of infectious diseases. The project will test the hypothesis that the immune system can be used to prevent the spread of infectious diseases and that the immune system can be used to develop vaccines that can be used to prevent the spread of infectious diseases. The project will test the hypothesis that the immune system can be used to prevent the spread of infectious diseases and that the immune system can be used to develop vaccines that can be used to prevent the spread of infectious diseases.

### Project Abstract

#### The Influence of Sugary Beverage Taxes on Fast Food Restaurant Purchases and Nutrition: An Evaluation Using National Sales Data

Brian Ebel

Advanced statistical analysis skills; experience working with large datasets

INTERNAL MEDICINE/MEDICINE

Not specified

- **Student/Post Doctoral Trainees:** Zhao, Wang, and Li

- **Extramural:** Project will examine the role of the immune system in the development of vaccines and how these vaccines can be used to prevent the spread of infectious diseases. The project will test the hypothesis that the immune system can be used to prevent the spread of infectious diseases and that the immune system can be used to develop vaccines that can be used to prevent the spread of infectious diseases. The project will test the hypothesis that the immune system can be used to prevent the spread of infectious diseases and that the immune system can be used to develop vaccines that can be used to prevent the spread of infectious diseases.

### Project Abstract

#### COPD: A Chronic Disease of the Future

Moses Chen

PSYCHIATRY

Targets of oxytocin signaling

Not specified

- **Student/Post Doctoral Trainees:** Lin, Li, and Chen

- **Extramural:** Project will examine the role of the immune system in the development of vaccines and how these vaccines can be used to prevent the spread of infectious diseases. The project will test the hypothesis that the immune system can be used to prevent the spread of infectious diseases and that the immune system can be used to develop vaccines that can be used to prevent the spread of infectious diseases. The project will test the hypothesis that the immune system can be used to prevent the spread of infectious diseases and that the immune system can be used to develop vaccines that can be used to prevent the spread of infectious diseases.

### Project Abstract

#### Oxytocin in the Regulation of Social Functioning in the Brain

Damian Exert

ANATOMY/CELL BIOLOGY

Structure and function of MCE systems in bacteria

Not specified


- **Extramural:** Project will examine the role of the immune system in the development of vaccines and how these vaccines can be used to prevent the spread of infectious diseases. The project will test the hypothesis that the immune system can be used to prevent the spread of infectious diseases and that the immune system can be used to develop vaccines that can be used to prevent the spread of infectious diseases. The project will test the hypothesis that the immune system can be used to prevent the spread of infectious diseases and that the immune system can be used to develop vaccines that can be used to prevent the spread of infectious diseases.
Four, 10% of the NEI COVID-19 cohort have self-rated stage renal disease (ESRD) from normal cognitive function. We have identified 16% of ESRD patients aged 60–80 years with evidence of cognitive impairment and 10% had self-reported disability [22,23]. After adjusting for the presence of ESRD-related factors (age, sex, race, and education), the prevalence of cognitive impairment was 10% (6.0% mild, 3.0% moderate, and 1.0% severe). Among ESRD patients, 24% were classified as mild cognitive impairment and 10–20% more likely to be diagnosed with AD/ADRD. This disparity is comparable to 15-year increase in age. While preclinical ESRD patients are 10% more likely to be diagnosed with AD/ADRD, most are more likely to develop AD/ADRD. Measurement of cognitive function and clinical evaluation is crucial to identifying ESRD patients who are at risk of premature cognitive aging and those who are at-risk in the face of ESRD. Mechanisms that underlie the development of AD/ADRD in ESRD patients with COVID-19 warrant further investigation. We seek to address a National Institutes of Health (NIH) study (AG077888) that explores whether and how measures connecting structural cognitive impairment to relevant outcomes, including cognition and AD/ADRD, promote effective policies. (2) ESRD patients are the ideal population to elucidate mechanisms of COVID-19 and cognitive aging (defined as at least a 2.5 95% confidence interval (CI) for cognitive impairment among ESRD patients). For all adult ESRD patients in the national registry/Medicare database, we will use the (3) indicators of structural and biochemical abnormalities that are associated with cognitive impairment and AD/ADRD, and the (4) interaction between cognitive aging and COVID-19 to facilitate systematic research into ESRD dementia, structural aging, and biochemical impairments. The results will help us to strengthen our hypothesis that all the above factors play a role in the development of AD/ADRD risk factors. This study will provide critical insight into the mechanisms of COVID-19 and cognitive aging in ESRD patients and will help to address questions about the clinical implications of COVID-19 in this high-risk population.

For ESRD patients, there may be a number of potential mechanisms underlying the accelerated cognitive aging. These potential mechanisms may be due to the unique characteristics of ESRD patients, including the following:

1. **Cognitive Reserve:** ESRD patients may have a higher cognitive reserve, which is the brain's ability to compensate for damage or deterioration. This could potentially slow down the progression of cognitive decline.

2. **Brain-Tissue:** ESRD patients may have a different brain tissue composition, which could influence cognitive function. For example, they may have a higher proportion of gray matter or white matter, which could impact cognitive performance.

3. **Genetic Factors:** ESRD patients may have different genetic factors that could influence cognitive aging. For example, they may have a higher prevalence of certain genetic variants that are associated with cognitive decline.

4. **Lifestyle Factors:** ESRD patients may have different lifestyle factors that could influence cognitive aging. For example, they may have different levels of physical activity, diet, or stress, which could impact cognitive function.

These potential mechanisms highlight the importance of further research to fully understand the accelerated cognitive aging in ESRD patients. Further research is needed to identify the specific mechanisms that are driving the accelerated cognitive aging in this population.
Examining the Mechanisms Underlying the Influence of Facebook Food Environment on Adolescents’ Disinhibited Eating Behaviors: Randomized Controlled Trial

The data-acquiring team (DCT) of the Early Phase Pain Investigation Clinical Network (EPPIC-Net) is the data and biospecimen manager for pain research within the HEAL Partnership. As such, it will: host, manage, rebrand, curate, and provide a sharing platform for data and biospecimens for HALI initiatives, such as the Autoimmune Poly-Neuropathy cascade. The EPPIC-Net studies will develop and implement a system for processing preclinical, clinical, neuroimaging, microscopy, genomics, and other omics datasets for use with these data with reporting for biological samples, and will create a platform for teams to work together to analyze and interpret data. Further, the DCC will provide leadership in the statistical and analytic approaches of EPPIC-Net studies, and will develop advanced systems for data collection, management, quality assurance, and reporting. The DCC will create, curate, and continually advance a robust organization for the rapid, implementation, and implementation of high quality research Phase III clinical trials to test promising therapies for pain. The proposed DCC bring together experts from statistics, clinical trials design and execution, data management, neuroimaging, bioinformatics, genomics, and programming, and leverages decades of experience in industry and running large data sharing studies with data coordinating centers. Our aims are to further the goals of EPPIC-Net and HALI through (1) integration of the EPPIC-Net clinical and translational data management, and (2) integration of EPPIC-Net data management into the broader field. In this collaborative effort, the DCC will develop mechanisms to ensure seamless data sharing and comprehensive data management for EPPIC-Net studies, and to provide the infrastructure and processes necessary to support robust data integration and use.

Biospecimen Exchange. The EPPIC Exchange represents the final product delivered by the DCC -- a resource with capability for continual growth, that will be shared by the pain research community.

The Data Coordinating Center (DCC) of the Early Phase Pain Investigation Clinical Network (EPPIC-Net) will be the data and biospecimen manager for pain research within the HEAL Partnership. As such, it will: host, manage, rebrand, curate, and provide a sharing platform for data and biospecimens for HALI initiatives, such as the Autoimmune Poly-Neuropathy cascade. The EPPIC-Net studies will develop and implement a system for processing preclinical, clinical, neuroimaging, microscopy, genomics, and other omics datasets for use with these data with reporting for biological samples, and will create a platform for teams to work together to analyze and interpret data. Further, the DCC will provide leadership in the statistical and analytic approaches of EPPIC-Net studies, and will develop advanced systems for data collection, management, quality assurance, and reporting. The DCC will create, curate, and continually advance a robust organization for the rapid, implementation, and implementation of high quality research Phase III clinical trials to test promising therapies for pain. The proposed DCC bring together experts from statistics, clinical trials design and execution, data management, neuroimaging, bioinformatics, genomics, and programming, and leverages decades of experience in industry and running large data sharing studies with data coordinating centers. Our aims are to further the goals of EPPIC-Net and HALI through (1) integration of the EPPIC-Net clinical and translational data management, and (2) integration of EPPIC-Net data management into the broader field. In this collaborative effort, the DCC will develop mechanisms to ensure seamless data sharing and comprehensive data management for EPPIC-Net studies, and to provide the infrastructure and processes necessary to support robust data integration and use.

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in these “isolated KC” requires a range of biological evidence. Our recent studies and

Brian Elbel
R01DA054956
6/30/2026

Yes

Post Baccalaureate Graduate, Junior Faculty

Prefer post-doctoral trainees and faculty, but will consider very strong post-baccalaureate and graduate students.

Kelly Doran

EMERGENC Y MEDICINE

COVID-19 Vaccinations and/or Community Resources: Children’s Longitudinal Health and Education Outcomes Using Linked Administrative Data

The research will be conducted by a transdisciplinary investigatory team that includes individuals with lived experience of homelessness to maximize the practical impact of the research, which was designed to inform local and national programs and policy interventions. The study will identify challenges, causes, and solutions with broader relevance for the future, but also to inform future programs and policies to better respond to the overlapping challenges of homelessness and substance use disorder. This research is especially important as the epidemic is expected to last as long as increases in homelessness, as well as access and overcapacity in treatment. The pandemic has spurred communities to rapidly change how they address homelessness, including by permanently converting unused hotels for long-term shelter and housing. It is therefore critically important to understand the benefits and potential unintended consequences—and how to best mitigate them—of such initiatives. There is a unique, time-limited opportunity to study this topic of large national importance.

Yes

Post Baccalaureate Graduate, Junior Faculty

Advanced data analytics, advanced statistics

Brain Eber

INTERNAL MEDICINE

PHARMACOLOGY

Studied Childhood

Cellular and genetic defects in keratoconus

Keratoconus is a common, sight-threatening, age-related condition that affects 1-2 out of 1,000 people, which can clinically be split into two main forms, keratoconus and keratoconus spectrum disorder. The severity of keratoconus can vary from mild to severe, and it can affect one or both eyes. Keratoconus is often associated with a genetic predisposition, and it can be influenced by environmental factors such as UV exposure and trauma. The pathophysiology of keratoconus is not fully understood, but it is believed to involve an imbalance between the production and degradation of the extracellular matrix (ECM) in the corneal stroma, leading to thinning and irregular astigmatism.

The research will include a comprehensive study of the genetic factors associated with keratoconus. The project will involve collaboration with other researchers and use state-of-the-art genetic analysis tools to identify new genetic loci associated with keratoconus. The findings will be used to develop novel diagnostic tests and potential therapeutic approaches for the treatment of keratoconus. The research will also explore the role of environmental factors in the development of keratoconus and evaluate the effectiveness of preventive strategies.

Yes

Post Baccalaureate Graduate, Junior Faculty

Analytical Chemistry, Biochemistry, Statistical Analysis

Jose Alaman

NYU LONG ISLAND SCHOOL OF MEDICINE

Bipolar Disorder

Community Research Center in Long Island City (CRC- LIC)

This study is part of a multi-modality longitudinal study of community treatment (RTC) initiatives to improve access to care for people with serious mental illnesses. The study involves a comprehensive outreach and engagement strategy to identify and recruit eligible participants. The study design includes a combination of qualitative and quantitative research methods, such as interviews, surveys, and focus groups. The research will provide valuable insights into the challenges and barriers faced by individuals with serious mental illnesses and will inform the development of effective interventions to improve their access to care.
**Antibody Core**

One of the major features of this BRAIN Initative proposal on "Oxytocin Modulation of Neural Circuit Function and Behavior" is the Oxytocin Receptor Antibody Production Research Support Core. Each of the five projects is dependent on the unique antibody reagents and the critical role of oxytocin receptor signaling. Oxytocin is one of the best understood in brain inflammation at the physiological and behavioral levels. A key challenge is to develop novel antibody tools to address the role of oxytocin receptor signaling in multiple brain areas and cell-type specific oxytocin receptors. Our antibodies have been generated, validated, and are distributing the specific antibodies to research groups and the general public that use oxytocin receptors. The primary function is to generate monoclonal antibodies to facilitate their broader use by Project I and other investigators in the US and internationally. There is currently no resource available for these tools, which are being produced, tested, and distributed by a Core facility with the help by individual labs.

**Molecular techniques such as ELISA, Western blot** The candidate will be trained by the laboratory's members on the more sophisticated technologies for the biochemical and structural characterization of MCE transport systems from Mtb and the non-pathogenic model, Mycobacterium smegmatis. Using single particle cryo-EM, mass spectrometry, biochemical and structural characterization, we will investigate the underlying mechanisms of MCE transport systems from Mtb and the impact of nickel exposure on these systems and their role in nickel-induced lung carcinogenesis. The aim will target the potential upstream regulators and downstream effectors that mediate nickel-induced lung carcinogenesis. Recently, we showed that administration of LAC, a pivotal mitochondrial metabolite, leads to rapid and persistent antidepressant-like responses by increasing brain acetylcholine concentrations and the related expression of key proteins of glutamate receptor subtype 1 in mice exposed to stress. In Aim 3, we will employ longitudinal calcium imaging of AudStr neurons to characterize the outputs of these systems from Mtb and the non-pathogenic model, Mycobacterium smegmatis. Using single particle cryo-EM, mass spectrometry, biochemical and structural characterization, we will investigate the underlying mechanisms of MCE transport systems from Mtb and the impact of nickel exposure on these systems and their role in nickel-induced lung carcinogenesis. The aim will target the potential upstream regulators and downstream effectors that mediate nickel-induced lung carcinogenesis.

**Structural characterization of MCE transport systems from Mycobacterium tuberculosis** Mycobacterium tuberculosis (Mtb), the causative agent of tuberculosis (TB), is one of the deadliest pathogens on the planet, and for decades, TB has been the leading cause of death due to infectious disease. The cell envelope of Mtb forms a remarkably tough barrier around the cell, protecting the bacterium from host factors in the environment such as antibiotics and host immune responses. At the same time, Mtb imports nutrients from the host cell, such as cholesterol, across the cell envelope. Transport of lipids, metabolites and nutrients across the cell envelope, between the inner and outer membranes, is critical for building and maintaining the cell envelope itself, and for import of key factors required for bacterial growth. Therefore, the transport systems that facilitate this trafficking are critical for allowing Mtb to survive and form biofilms, and are an important target for new antibiotic development. In Mtb, several lines of evidence suggest that Mtb systems are important for importing nutrients such as cholesterol and fatty acids. Recent work on E. coli MCE systems has shown that these are multi-protein complexes anchored in the inner membrane of double-membraned bacteria, and play an important role in the maintenance of outer membrane integrity, raising the possibility that this may also be a role that MCE proteins play in Mtb. The structure and mechanisms of the highly complex MCE transport systems from Mtb and the non-pathogenic model, Mycobacterium smegmatis, using single particle cryo-EM, mass spectrometry, biochemical and structural characterization, are important for understanding the structure and function of these transport systems from Mtb and the non-pathogenic model, Mycobacterium smegmatis, using single particle cryo-EM, mass spectrometry, biochemical and structural characterization.

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**Antibody Core**

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Liam Holt, compression can change cellular behavior to drive migration of cancer cells, but we remain ignorant about how this process works. Additionally, we know little about the parameters that modulate its success of granule formation for mechanical physiology. Our studies promise to reveal key network perturbations essential to cancer biology, but its effects remain poorly understood.

7/26/2022
DP20X41352
7/26/2022
black women experience disproportionately high rates of hypertension compared to white men and women, and their blood pressure (BP) control rates are well below desirable high levels of awareness and treatment. There is an urgent need for effective nonpharmacologic interventions that build on behavioral change to improve hypertension and cardiovascular disease (CVD) outcomes among African American women and men. Mindfulness-based therapy (MBT) is a well-researched treatment for chronic conditions such as hypertension and depression (e.g., emotion regulation, stress management, self-care, posttraumatic stress). In this protocol, we aim to evaluate the effects of MBT on blood pressure control in Black women and men.

Objective: To evaluate the effects of a 10-week mindfulness-based therapy (MBT) intervention compared to the Usual Care (UC) on reduction of blood pressure in Black women and men.

Methods: A randomized controlled trial with a 2-arm design (MBT vs UC) will be conducted. Participants will be randomized to receive 10 weekly 2-hour mindfulness-based therapy sessions plus a 6-month follow-up assessment. The primary outcome will be a reduction in systolic blood pressure (SBP) and diastolic blood pressure (DBP) at 12 months.

Results: The study will enroll 300 Black women and men with uncontrolled hypertension. The primary outcome will be compared using ANCOVA adjusted for baseline blood pressure and demographic characteristics. The study is powered to detect a 10 mmHg difference in SBP and 5 mmHg difference in DBP between the MBT and UC groups.

Conclusion: This study will provide valuable information on the effectiveness of MBT in reducing blood pressure in Black women and men, which can inform future interventions for hypertension management in this population.
Undergraduate, Post-Baccalaureate, Graduate, Graduate Student

Our ideal candidate would be a trained interested in developing and teaching a culturally centered diabetes prevention intervention tailored for Spanish-speaking older adults.

Jeanette Baxley

RADIATION-DIAGNOSTIC/ONCOLOGY

Diffractive MRI Model Parameter Estimation to Study Brain Microstructure as it Relates to Cognitive Status in MIA Traumatic Brain Injury


With the increased high resolution of fMRI, many researchers are now able to investigate the functional connectivity of the brain during resting-state conditions. This is particularly useful for studying the brain's default mode network (DMN), which is active during tasks requiring an individual to disengage from external stimuli and focus on internal processes such as self-awareness, introspection, and mental imagery. The DMN is composed of several distinct brain regions, including the anterior cingulate cortex, precuneus, and lateral parietal cortices. These areas are known to be involved in various cognitive processes, such as attention, memory, and self-referential processing. In this study, we aim to investigate the functional connectivity of the DMN in individuals with traumatic brain injury (TBI) and its relationship to cognitive function. To do so, we will use high-resolution fMRI to acquire data on resting-state brain activity and then apply advanced statistical methods for analyzing the connectivity between different brain regions. Our findings can help us better understand the neural correlates of cognitive impairment in TBI patients and potentially identify new targets for intervention. Overall, this research is expected to contribute to our knowledge of brain plasticity in response to injury and provide insights into potential neurorehabilitation strategies.
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<th>Year</th>
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<td>2023</td>
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<td>To improve guideline-concordant statin prescribing for CVD risk management.</td>
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<td>Graduate Student</td>
<td>2025</td>
<td>CDSS</td>
<td>To develop a CDSS that increases provider adoption and reduces provider burden.</td>
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**Additional Notes:**
- The project focuses on the biogenesis and catabolism of atherogenic apoB-containing lipoproteins (apoB-Lps), which are major risk factors for CVD. 
- The project emphasizes a translational and transformative approach. 
- The overall goals are to: 1) identify new processes and factors regulating circulating TG and FA levels, 2) investigate the lipidation and intracellular mechanisms of oxytocin, and 3) study how different apoB-Lps interact with cells and ultimately catalyze atherogenesis. 
- The project is to understand how many actions of oxytocin are translated from its receptor signal transduction pathways. 
- The project is to develop an effective, efficient, and scalable intervention to improve guideline-concordant statin prescribing. 
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