

MAY 2024 | ISSUE 13

# BIOMEDICAL GENETICS SECTION

QUARTERLY NEWSLETTER

## Section Updates

## Meet the People



**Maria Dudek**

Hello!

My name is Maria Dudek, and I am Program Manager for the FHS-BAP team!

My journey in public health research began with a strong foundation in biology, earning a Bachelor of Science from the University of Massachusetts – Boston in 2014. Since then, I have gained over 10 years of experience in various research settings, honing my skills in project management.

My early research experiences at Brigham and Women's Hospital were foundational. As a Research Assistant, I played a vital role in the VITAL Study, a large-scale clinical trial investigating the impact of vitamin D and omega-3 fatty acids on chronic diseases. This experience honed my skills in subject recruitment, data collection, and adhering to strict protocols.

Building upon this groundwork, I expanded my expertise at the Center for the Study of Traumatic Stress (CSTS). Here, I managed research projects on military mental health and disaster psychiatry. As the sole research assistant for the Army STARRS study, a national investigation into mental health resilience among service members, I independently managed high-level communication and data analysis. This experience solidified my commitment to research that directly impacts the well-being of veterans.



My career trajectory took a significant leap at Evidera by PPD (Thermo Fisher Scientific). As a Research Associate, I gained invaluable experience in project management, overseeing tasks from IRB submissions to data analysis. I co-authored presentations and manuscripts, solidifying my understanding of the research cycle from inception to dissemination.

Prior to joining BU, I moved back to the Boston area. I joined the Mass General Hospital team as a Clinical Research Program Manager. I spearheaded operational aspects of two high-visibility programs – the Mass General Brigham Biobank and the eMERGE study. I led a team of seven, ensuring smooth study operations and recruitment goals were met. I also acted as a liaison between clinical and administrative staff, fostering collaborations and maximizing participant involvement.

Outside of my work, I grew up in Venezuela and moved to the opposite climate of Boston with my family. Here, I met my husband and we embarked on our 7-year adventure in the DC area where we got married and had our two beautiful (and wild!) boys. We are now back in Massachusetts closer to our families and are settled in the South Shore. I enjoy riding my Peloton, playing tennis, and exploring new places with my family.

## **Co-PI Dr. Xiaoling Zhang has received a new NSF grant for her AD and Biomedical Data Machine Learning Project!**



**Award Number (FAIN):** 2347698

**Total Intended Award Amount:** \$599,373

**Start Date:** 05/01/2024

**End Date:** 04/30/2027

**Project Title:** DMS/NIGMS 1: Multilevel stochastic orthogonal subspace transformations for robust machine learning with applications to biomedical data and Alzheimer's disease subtyping

## February 20<sup>th</sup>: Chosun University and BU Sign a Memorandum of Understanding (MOU) for Academic and Research Collaboration



This MOU documented their commitment and desire to enhance collaboration. Both universities aspire to strengthen their partnership and investigate further opportunities to reap mutual advantages by leveraging their resources and networks in the fields of public health and biomedical research.



You can watch the event coverage by YTN, a Korean broadcast channel, in the 2 videos below!

- <https://youtu.be/Qbtjo1XTOH4>
- <https://youtu.be/jCu3mxCWgAM>



## Review articles on brain laterality and therapeutic approaches of major mental diseases by Dr. Sam Thiagalingam & colleagues

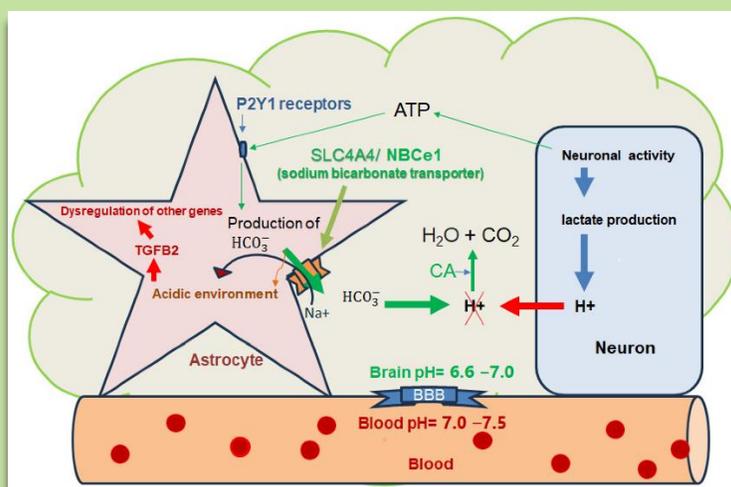
### Brain laterality aberrations in mental disorders

Brain hemisphere asymmetry/laterality is a well-conserved biological feature of normal brain development. Evidence suggest that brain laterality aberrations may be associated with various mental diseases. With respect to potential causes of brain laterality disruption in mental diseases, until the last decade, mutations of genes were known to be associated with the establishment of brain laterality. Recently, Dr. Thiagalingam and colleagues found that the loss of brain asymmetry of transforming growth factor beta-2 (TGFB2) expression due to its altered promoter DNA methylation along with the disruption of lateralized expression of many collagen genes have been linked to SCZ and BD pathogenesis (*American Journal of Medical Genetics Part B: Neuropsychiatric Genetics* 2019, 180, 138-149). A comprehensive literature review on brain laterality disturbances in mental diseases is discussed in this article.

Abdolmaleky HM, Nohesara S, Thiagalingam S. 2024. Epigenome Defines Aberrant Brain Laterality in Major Mental Illnesses. *Brain Sci.* 2024 Mar 7;14(3):261; <https://doi.org/10.3390/brainsci14030261>

### New Therapeutic Approaches for Major Mental Diseases based on modulation of brain pH

Several lines of evidence indicate that normal brain function requires pH homeostasis and it becomes altered in neuropsychiatric diseases such as schizophrenia (SCZ), Alzheimer's disease (AD) and autism. This review article discusses the role of lactate as an essential epigenetic regulatory molecule and the potential for pH-modulating therapies in neuropsychiatric diseases.



Nohesara S, Abdolmaleky HM, Thiagalingam S. 2024. Potential for New Therapeutic Approaches by Targeting Lactate and pH Mediated Epigenetic Dysregulation in Major Mental Diseases. *Biomedicines* Feb 18;12(2):457. doi: 10.3390/biomedicines12020457. <https://www.mdpi.com/2227-9059/12/2/457>



## Can We Find a Cure for Alzheimer's Disease?

*an article featured in BU's Bostonia and The Brink*



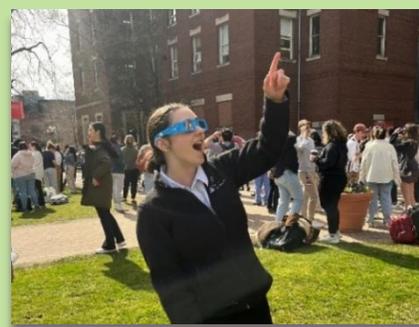
Where some might see grim statistics and an uphill battle, dozens of geneticists, medical scientists, and other researchers at BU see opportunity—a chance to take on one of society's greatest medical challenges. This article explores three approaches, by three different researchers, aimed at improving treatment, diagnosis, and care for people with Alzheimer's. **Read the full article by senior writer Molly Callahan [here](#).**

## April 8<sup>th</sup>: 93% Totality Solar Eclipse in Boston

*You wore your safety glasses, right??*

Some spent the day picnicking on this beautiful day, while others ran around looking for glasses. Thousands of people in the area spent the afternoon outside to tune in for this rare event. And if you missed it, I've got bad news for you—you are going to have to mark your calendar for the year 2079.

Read about the next eclipses in New England [here](#).



## April 11<sup>th</sup>: First In-Person FHS-BAP Annual EAB Meeting

The Framingham Heart Study - Brain Aging Program (FHS-BAP) hosted their annual Executive Advisory Board meeting in-person for the first time ever this year. Dr.'s Rhoda Au, Lindsay Farrer, Gyungah Jun, and Xiaoling Zhang from our section were there as members of the Steering Committee.

Special thanks to FHS-BAP Program Manager, Maria Dudek, for organizing the details of this event!

## May 10<sup>th</sup>: FHS-BAP Symposium

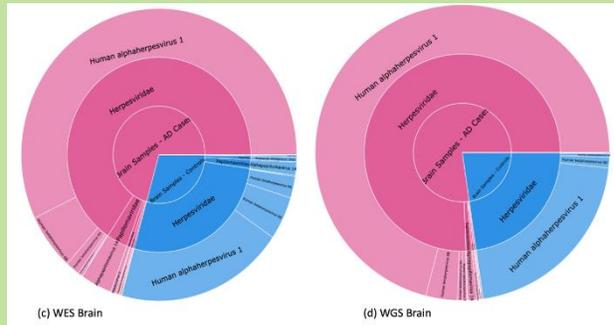
# Inflammation, Immunity and Alzheimer's Disease: From Mechanisms to Potential Therapeutics

<b>Blood and innate immunity in neurodegeneration: Mechanism, imaging, therapeutics</b>	<b>Does complement play a role in anti-amyloid antibody-induced vascular side effects in Alzheimer's disease?</b>	<b>Microglia: Key regulators of inflammatory signaling cascades during neurodegeneration</b>	<b>The link between common, chronic viral infections and Alzheimer's disease</b>	<b>Targeting chronic peripheral inflammation to reduce risk for age-related neurodegenerative diseases</b>	<b>Discovery and development of novel small molecule candidates for altering the neuroinflammation-synaptic dysfunction axis</b>
					
<b>Katerina Akassoglou, MD</b> University of California San Francisco	<b>Cynthia Lemere, PhD</b> Harvard Medical School	<b>Dorothy Schafer, PhD</b> UMass Chan Medical School	<b>Richard Sherva, PhD</b> Boston University	<b>Malú Tansey, PhD</b> University of Florida College of Medicine	<b>Daniel Watterson, PhD</b> Northwestern University

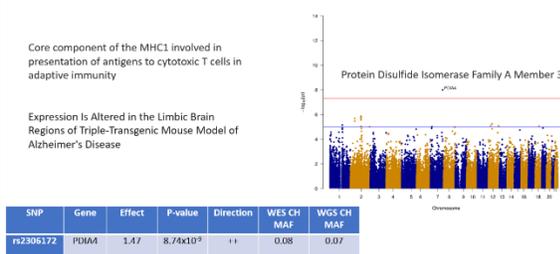
Six esteemed research professionals presented to over 400 virtual attendees on the topic of *Inflammation, Immunity, and AD: From Mechanisms to Potential Therapeutics* in the 4<sup>th</sup> annual FHS-BAP Symposium. Our faculty member, Dr. Rick Sherva, presented *The link between common, chronic viral infections and Alzheimer's disease*.

### Updated WGS results

	Virus	N	Number of Cases	Number of Controls	Odds Ratio	P-Value	Adjusted P-Value
AA	HSV1	5,093	1,902	3,191	1.18	9.46x10 <sup>-7</sup>	9.46x10 <sup>-6</sup>
	EU	10,411	5,988	4,423	1.20	3.23x10 <sup>-7</sup>	3.23x10 <sup>-6</sup>
	Herpes Cluster	10,411	5,988	4,423	2.60	0.001	0.012
	HPV71	10,411	5,988	4,423	0.94	0.003	0.035
	Cumulative Viral Load	10,411	5,988	4,423	0.94	0.004	0.045
HC	HSV1	4,823	2,001	2,822	0.43	5.06x10 <sup>-63</sup>	5.06x10 <sup>-62</sup>
	Hepatitis C	4,823	2,001	2,822	0.88	0.002	0.015
	Herpes Cluster	4,823	2,001	2,822	1.19x10 <sup>-4</sup>	7.04x10 <sup>-49</sup>	7.04x10 <sup>-48</sup>
	TTMV9	4,823	2,001	2,822	0.73	0.002	0.022
Unstratified	HPV71	27,399	10,991	16,408	0.93	3.77x10 <sup>-4</sup>	0.004
	Cumulative Viral Load	27,399	10,991	16,408	0.94	4.24x10 <sup>-5</sup>	4.24x10 <sup>-4</sup>
Korean	TTMV6	2002	1014	988	0.85	0.024	0.24

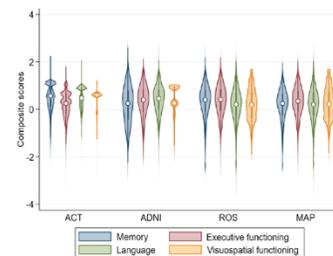


### Meta-Analysis of interaction between HSV-1 and PDIA4 with AD as outcome in WES and WGS of CH group



### Viral DNA predict multiple domains of cognitive function

Virus	Domain	Subset	Effect	P
HSV1	Language	All	-0.345	4.01E-08
HHV6B	Memory	All	-0.15	5.38E-07
Herpes	Memory	All	-0.141	2.66E-06
HSV1	Memory	All	-0.286	4.21E-06
Cumulative	Memory	All	-0.135	8.41E-06
HepC	Language	All	-0.276	1.52E-05
HepC	Exec Func	All	-0.276	1.73E-04
HHV6B	Memory	Controls	-0.158	2.62E-05
HHV6B	Language	Controls	-0.139	6.31E-05
Cumulative	Memory	Controls	-0.147	1.04E-04
Herpes	Language	Controls	-0.132	1.63E-04
Herpes	Memory	Controls	-0.141	1.77E-04
Cumulative	Language	Controls	-0.129	2.33E-04
HSV1	Language	Cases	-0.372	1.86E-06
HepC	Language	Cases	-0.338	7.06E-05



## 2024 ADSP Events:



### ADSP Meeting 2024 (3/27-3/28)

In the ADSP Program meeting at NIH, Dr. Farrer gave an oral presentation, and our PhD students, Zainab, Tong, and Nick, gave a poster presentation.



### ADSP 3<sup>rd</sup> Functional Genomics Meeting (4/29-5/1)

In this Functional Genomics Meeting at Columbia University, NY, PhD student Frank Grenn gave an oral and poster presentation, and postdoc Alex Knyshev had a poster. Pictured above is the ADSP-xQTL group.



## BUMC News and Events

### BUGWU Strike



The BUGWU went on strike March 25<sup>th</sup>, 2024. Contract negotiations are ongoing between BU and the BU Graduate Student Workers Union.

More information about the graduate student workers union strike can be found on [the SEIU 509 webpage](#).

Updates on the negotiations can be found on [the BU office of the Provost site](#).

### 5/23: McCahan Education Day



BUMC faculty, fellows, residents, students, and staff who are interested in educational innovations and scholarship are invited to attend the 19th Annual McCahan Medical Education Day. [Register Here](#).

**Theme:** Building Collaborative Education Research

**Keynote Speaker:** Binyomin Abrams, PhD, Research Associate Professor, Director of General Chemistry, College of Arts & Sciences, Boston University

### 15GB LIMIT on Google Account Storage



If your account exceeds 15GB on **June 1<sup>st</sup>**, Google will automatically prevent you from storing new documents or photos and it will not allow you to create new files or edit existing ones in Google Docs, Sheets, etc. You will retain the ability to view files, delete data, or transfer data to another storage option to get back under your quota and release your account from these restrictions. BUMC-IT recommended alternative storage options can be found [here](#).

### The Compensation Guide – a New Staff Resource



Boston University Human Resources (BUHR) developed a *Compensation Guide* for non-represented staff to provide a foundational understanding around BUHR Compensation structures as well as practices for BU leaders, managers, and non-represented employees. The purpose of this guide is to foster familiarity with different BUHR Compensation procedures that impact staff and ultimately enhance the experience of BU employees. Read the new guide [here](#).



## Chair of DoM, Dr. Tony Hollenberg, appointed President of BMC



Effective June 3<sup>rd</sup>, Dr. Hollenberg will be serving a new role as hospital President.

Dr. Sushrut Waikar, the current Chief of Nephrology, will serve in an interim capacity and be supported by Dr. Hollenberg.

The Department of Medicine will be launching a search this summer for a new Chief and Chair to continue to advance the department's rich history of clinical innovation.

## Resources

**Don't Forget-- Submit an *Announcement Request Form* and share your news in the next issue of the Biomedical Genetics Section Newsletter!**

Do you have exciting news that you want to share in the next issue of our quarterly Biomedical Genetics Section Newsletter? Submit an [Announcement Request Form](#), located on the Resources page of our [website](#)!