

JANUARY 2025 | ISSUE 15

# BIOMEDICAL GENETICS SECTION

QUARTERLY NEWSLETTER

## Happy New Year!

### Section Updates

**Congratulations to Dr. Nicholas O'Neill  
for Successfully Defending Your Dissertation!**



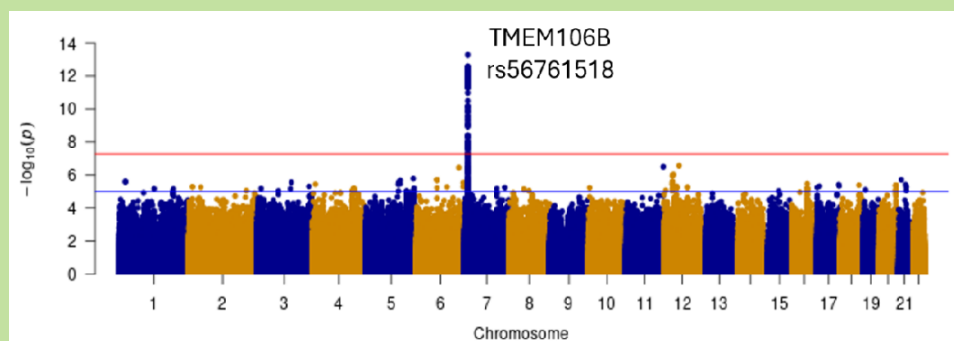
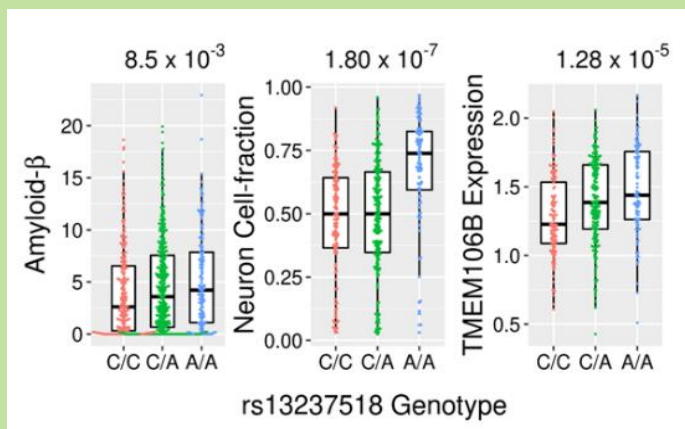
**November 18<sup>th</sup>, 2024**



## Nick's Thesis Abstract

*Alzheimer's disease (AD) is a progressive and complex neurodegenerative disorder characterized by increasing amyloid- $\beta$  (A $\beta$ ) plaque burden, followed by increasing neurofibrillary tau tangles (NFT) and cognitive decline. However, many individuals fall outside of this typical progression, either exhibiting NFTs without A $\beta$  or maintaining cognitive performance despite the presence of AD pathology, i.e., cognitive resilience. AD progression is also associated with changes in cell-type abundance and cell-type-specific activity. This dissertation investigates these topics by integrating AD brain single-nuclei RNA-seq (snRNA-seq)*

*with large-scale bulk RNA-seq datasets and whole genome sequencing datasets generated from the same individuals. We develop an algorithm for bulk cell-type deconvolution using a snRNA-seq reference dataset by adjusting for technical differences specific to snRNA-seq. We then apply this algorithm to examine the relationship between cell-type abundance and AD endophenotypes, including cognitive resilience, in brain regions that are vulnerable or resistant to the disease. In addition, we identify and discuss genetic drivers of changes in cell-type abundance. Finally, we generate highly cell-type-specific AD polygenic risk scores (ct-ADPRS) to investigate the relationship between cell-type activity and AD progression.*





 **Congratulations to Mark Logue on your recent appointment to the title of Professor!**

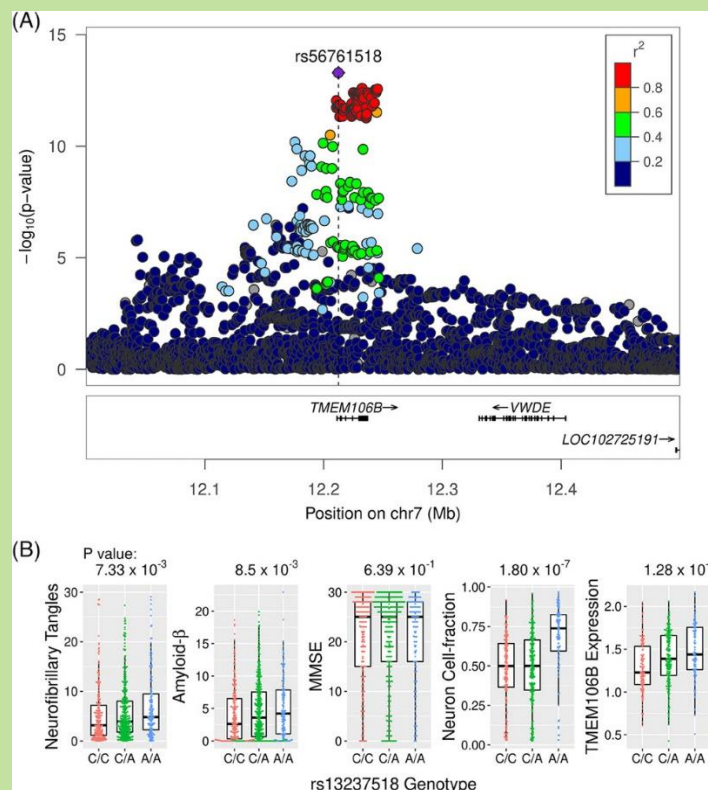


### Read Shoumita Dasgupta's Recent Article:

*Mass deportations don't keep out 'bad genes' – they use scientific racism to justify biased immigration policies*

Read the full article on [theconversation.com](https://theconversation.com) [HERE](#).

## Some Recent Publications



O'Neill N, Stein TD, Olayinka OA, Empawi JA, Hu J, Tong T, Zhang X<sup>†</sup>, Farrer LA<sup>†</sup>,

*Cognitive resilience to Alzheimer disease characterized by cell-type abundance.*

Alzheimer's & Dementia. 2024 Sep 11.

PMID: [39262221](https://pubmed.ncbi.nlm.nih.gov/39262221/)

(<sup>†</sup> senior authors with equal contribution)



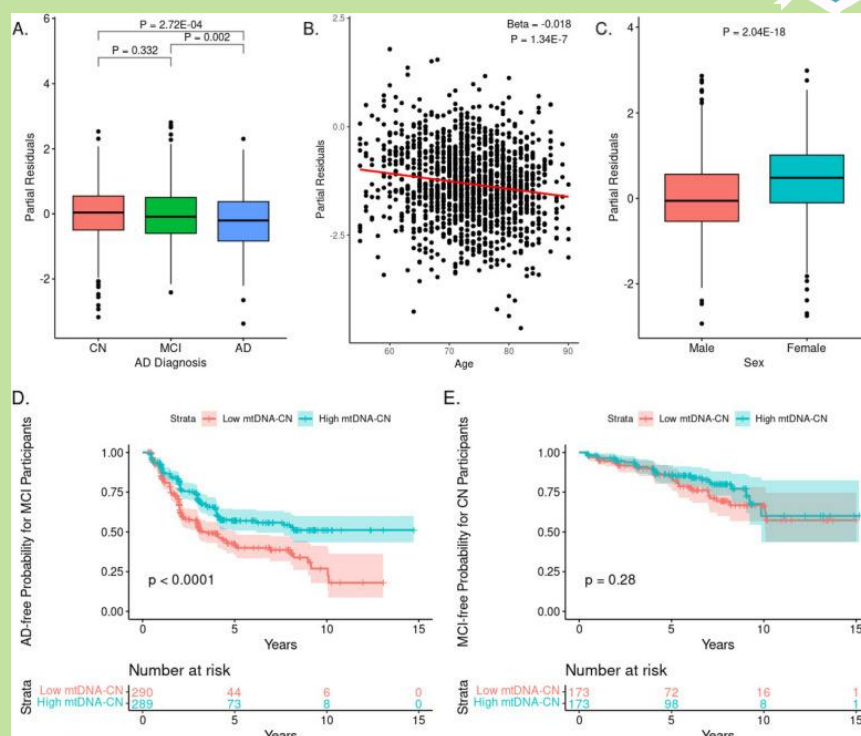
**Tong T, Zhu C, Farrell J, Khurshid Z, Martin ER, Pericak-Vance M, Wang LS, Schellenberg G, Haines J, Qiu W, Lunetta KL, Farrer LA<sup>†</sup> Zhang X<sup>†</sup>.**

*Blood-derived mitochondrial DNA copy number is associated with Alzheimer disease, Alzheimer-related biomarkers, and serum metabolites.*

Alzheimers Res Ther. 2024 Oct 23;16(1):234.

PMID: 39444005

(<sup>†</sup> senior authors with equal contribution)



## BUMC Upcoming Events

### February 12<sup>th</sup>: DoM Faculty & Staff Meeting

Time: 1-2 pm

Hybrid Meeting: Zoom / L-405

Register [HERE](#)





## March 28<sup>th</sup>: DoM Researchers Retreat

*Connect with colleagues in the Department and engage with other investigators surrounding research topics spanning basic, translational, clinical and population health research.*

Register HERE: [https://bostonu.qualtrics.com/jfe/form/SV\\_0UlpV6yfxCyG4aG](https://bostonu.qualtrics.com/jfe/form/SV_0UlpV6yfxCyG4aG)

**March 28, 2025**  
**9.30am-4pm**

**Department of Medicine**  
presents:

# Researchers Retreat

**Where we foster connections between basic, translational, clinical and population health investigators and put research front and center**

- Hear from BU/BMC leadership about their research vision
- Lightning talks, technology Q&A panel, opportunities for translational research
- Participate in round table discussions
- Learn about the resources available to boost your research
- Network with colleagues

Register: [https://bostonu.qualtrics.com/jfe/form/SV\\_0UlpV6yfxCyG4aG](https://bostonu.qualtrics.com/jfe/form/SV_0UlpV6yfxCyG4aG)

**EVANS CENTER**  
FOR INTERDISCIPLINARY BIOMEDICAL RESEARCH

**Location: Computing & Data Sciences Building, 17<sup>th</sup> floor (655 Comm Ave)**

## BUMC News



### September 27<sup>th</sup>, 2024: President Melissa Gilliam Inaugurated as 11<sup>th</sup> President of Boston University

Read the full recap of her first week as president of BU [here](#).



### Your BU Login Will No Longer Be Able to Use the SMS Text or Phone Call Option in Duo Multi-Factor Authentication

Starting **February 4, 2025**, Boston University will disable the text and phone call options for Duo Multi-Factor Authentication (Duo MFA). You will need to use Duo Push via the Duo Mobile App on your mobile device instead. To stay ahead of this change, we are reaching out to you first before this update is communicated to the University.

If you have questions about Duo MFA at Boston University or need help downloading and activating the app, please contact BU IT Help at [ithelp@bu.edu](mailto:ithelp@bu.edu) or call 847-491-4357.



### New DoM Executive Assistant – Lauren Berard

[Lauren](#) will now serve as the executive assistant in Evans 113 and support Sus Waikar, Interim Chair, Rania Omar Burke, Vice Chair of Finance & Administration, and James Hudspeth, Vice Chair of Clinical Affairs.



### IS&T RCS Spring Tutorials Jan. 29 - Feb. 27

#### Data Analysis & High-Performance Computing Tutorials

Tue, Feb 4  
3:00pm - 5:00pm

**INT** **Zoom** [Using GitHub Copilot in RStudio for Code Development \(Hands-on\)](#) **NEW**

Tue, Feb 11  
1:00pm - 3:00pm

**INT** **Zoom** [Deep Learning with PyTorch, Part One \(Hands-on\)](#) **NEW**

Tue, Feb 13  
10:00 - 12:00pm

**INT** **BSC** [MATLAB Performance Optimization \(Hands-on\)](#)



**Thank you to those who attended our Genetics Holiday Party  
2024! Here are some highlights 😊-->**













## 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](#)!