Djuna von Maydell

djuna@mit.edu | djunamay | Cambridge, USA | Citizenship: USA, Germany

Education

PhD candidate, Massachusetts Institute of Technology — *Cambridge, USA*
Program in Computationally-Enabled Integrative Neuroscience (CEIN) (GPA: 5.0/5.0)
Department of Brain and Cognitive Sciences — 2019 - present
Dissertation advisor: Dr. Li-Huei Tsai

B.Sc. with Extramural Year, King's College London — *London, UK*
Hon B.Sc. Biomedical Science (genetics and biochemistry) with Extramural Year — 2014 - 2018
First Class Honors (Best Academic Performance Award)

Awards and Fellowships

2022	**MIT Prize for Open Data**: $2,500 prize and invited talk in recognition of open data project. *[MIT News]*	*MIT*
2021	**Halis Fellowship**: departmental award to fund my studies and research for 1 year	*MIT*
2021	**Broshy Fellowship**: departmental award to fund my studies and research for 1 year	*MIT*
2019	**University of Oxford 4-Year Wellcome Trust Studentship (Declined):** To fund my PhD studies in neuroscience for 4 years at Oxford	*Oxford*
2019	**Final Year Biomedical Science Prize for The Best Academic Performance**: Awarded for the highest overall degree score out of >200 students in the Biomedical Science program	*KCL*

First-Authored Publications

[1] Blanchard J*, A. Akay L*, Davila-Velderrain J*, **von Maydell D***, [...], Tsai LH. APOE4 impairs myelination via cholesterol dysregulation in oligodendrocytes. *Nature* **611**, 769–779 (2022). ***Research Article*** [PDF]
Code and data: [code] [datasets] [OSF]
Press coverage: [Nature News] [News and Views] [MIT News]

[2] **von Maydell D***, Jorfi M*. The interplay between microglial states and major risk factors in Alzheimer's disease through the eyes of single- cell RNA-sequencing: beyond black and white. *J Neurophysiol.* **122**, 1291-1296 (2019). ***Neuro Forum Review Article*** [PDF]

[3] **von Maydell D***, Jorfi M*. A synergistic engineering approach to build human brain spheroids. *Methods Mol Biol.* **2258**, 151-169 (2021). ***Book Chapter*** [PDF]

'*' denotes equal contribution

Research Experience

Research Technician II, Harvard Medical School — *Cambridge, MA*
Genetics and Aging Research Unit — 10/2018 - 07/2019
- advised by Professors Rudolph E. Tanzi and Doo Yeon Kim
- analysis of transcriptional data from 3D cell culture model of Alzheimer's disease

Research Intern, Broad Institute of Harvard and MIT — *Cambridge, MA*
The Getz Lab, Gtex Group — 08/2018 - 09/2018
- evaluated differential gene expression model biases and susceptibility to GTEx data heterogeneity

Undergraduate Researcher, King's College London *London*
Institute of Pharmaceutical Science, Pharmaceutical Biophysics Group 09/2017 – 12/2017
- advised by Professor James A. Mason
- **Honors Thesis:** Stratification of Cervico-Vaginal 1H NMR Metabolomics Data Reveals Biomarkers of Spontaneous Preterm Birth

Extramural Year Student, Harvard Medical School *Cambridge, MA*
Genetics and Aging Research Unit 08/2016 - 07/2017
- advised by Professors Rudolph E. Tanzi and Doo Yeon Kim
- **Thesis:** Exploring Pathogenic Cascades in Alzheimer's Disease (AD) by Transcriptomic Analysis of 3D Cultured Human Neurons and Dissecting the Role of Individual Aβ Species on AD Pathogenesis in a 3D Culture Model of AD

Research Intern *Cambridge, MA*
Genetics and Aging Research Unit 07/2015 - 08/2015
- anaylsis of family-based genetic association study data

Teaching Experience

9.000: Introduction to Psychological Science *MIT*
Teaching Assistant to Professor John Gabrielli Spring Semester 2022
- held weekly recitations, graded homeworks
- undergraduate introductory survey class

9.014: Quantitative Methods and Computational Models in Neuroscience *MIT*
Teaching Assistant to Professor Mehrdad Jazayeri Fall Semester 2020
- held office hours, helped students work through in-class problems, graded problem sets
- graduate-level course covering linear systems and operations, dimensionality reduction, Bayesian approaches, descriptive and generative models, classification and clustering, dynamical systems

Co-Authored Publications

[1] Victor MB, Leary N, Meharene HS, Bozzelli PL, Samaan G, Murdock MH, **von Maydell D**, Effenberger AH, Cerit O, Wen HL, Liu L, Welch G, Bonner M, Tsai LH. Lipid Accumulation Induced by APOE4 Impairs Microglial Surveillance of Neuronal-Network Activity. *Cell Stem Cell.* **29**, 1197- 1212 (2022). ***Research Article***

[2] Flaviani F, Hezelgrave NL, Kanno T, Prosdocimi EM, Chin-Smith EC, Ridout AE, **von Maydell D**, Mistry V, Wade WG, Shennan AH, Dimitrakopoulou K, Seed PT, Mason JA, Tribe RM. Cervicovaginal microbiome, metabolome and innate immune defense as predictors of preterm birth risk in an ethnically diverse cohort of women. *JCI Insight.* **6(16):**e149257 (2021). ***Research Article***

[3] Kwak SS*, Washicosky KJ*, Brand E, **von Maydell D**, Aronson J, Kim S, Capen, DE, Cetinbas M, Sadreyev R, Ning S, Bylykbash E, Xia W, Choi SJ, Tanzi RE, Kim DY. Amyloid-β42/40 ratio drives tau pathology in 3D human neural cell culture models of Alzheimer's disease. *Nat Commun.* **11**, 1377 (2020). ***Research Article***

Posters and Talks

[1] "ABCA7 loss of function induces DNA damage in neurons," *CSHL Neurodegenerative Diseases Biology and Therapeutics*, Cold Spring Harbor, NY, November 2022. ***Poster*** [PDF]

[2] "Deep learning spatial augmentation of single-cell transcriptomic data," *CSHL Biology of Genomes*, Virtual, May 2021. ***Poster*** [PDF]

[3] "APOE4 impairs myelination via cholesterol dysregulation in oligodendrocytes: Dissecting mechanisms of APOE4 risk using the ROSMAP cohort," *ROSMAP Investigator's Meeting*, Virtual, July 2022 and May 2021. ***Talk***

[4] "How does APOE4 impair cellular function in the brain?" *MIT BCS Champions of the Brain*, Virtual, November 2021. ***Talk***

[5] "Learning spatial relationships from single-cell transcriptomics," *MIT BCS Champions of the Brain Fellows Event*, Virtual, October 2020. ***Talk***

Other Activities

- **Sanford HealthHack 2020, 1st place** (12,000 dollar prize money; completed together with Guillaume Leclerc)
- **Resource for Easing Friction and Stress** student peer supporter mediator, 09/2020-present
- **MIT cycling team co-treasurer** (elected position), 06/2020 - present
- **MIT cycling racing team member**, 2019 - present
- **Flute** - private lessons and band/orchestra memberships, 2004-2018

References

- **Li-Huei Tsai, Ph.D.**
  Picower Professor of Neuroscience
  Massachusetts Institute of Technology
  lhtsai@mit.edu
- **Rudolph E. Tanzi, Ph.D.**
  Professor of Neurology
  Harvard Medical School
  tanzi@helix.mgh.harvard.edu
- **A. James Mason, DPhil**
  Professor of Membrane Biochemistry
  King's College London
  james.mason@kcl.ac.uk
- **Lars Bertram, MD**
  Professor of Genome Analytics
  University of Lübeck
  lars.bertram@uni-luebeck.de