Abuzar Mahmood

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Department of Psychology, Brandeis University

Employment History

Postdoctoral Research Fellow, Tufts Medical Center, MA	2023-Present
Postdoctoral Fellow, Brandeis University, MA	2023-Present
Data Science Intern, Trackstar, NY	2022
Undergraduate Researcher, University of Missouri, MO	2013-17

Education

Ph.D., Neuroscience, Brandeis University, MA 2023
Thesis Advisor: Donald B. Katz
Thesis Title: Multi-region Coordination for Taste Processing in the Rodent Brain

M.S., Neuroscience, Brandeis University, Waltham, MA 2019

B.S., Physics, University of Missouri, Columbia, MO 2017
Minors in Mathematics, Chemistry, Biology, and Computational Neuroscience

Publications

Neuroscience

1. Rohrer, D.M., Nobili, C.C.C.M, Jiang, W., **Mahmood, A.**, Knight, R.A., Gutsell, J., Katz, D.B., Am I Disgust? Exploring Disgust Responses Across Stimuli (In Preparation)
2. Calia-Bogan, V., Steindler, J., Katz, D.B., **Mahmood, A**., Characterizing Intra-State Dynamics of Gustatory Cortical Taste-Evoked Activity (In Preparation)
3. **Mahmood, A.***, Baas-Thomas, N.*, Wang, Y., Katz, D.B., The Ingestive Response Reflects Gustatory Cortical Neural Dynamics (Submitted to eLife), *Co-first authors, BioRxiv: https://doi.org/10.1101/2025.10.01.679845
4. Mukadam, N., **Mahmood, A.**, Cronin-Golomb, A., DeGutis, J., Subjective Cognitive Concerns and Global Metacognitive Bias in Prodromal Parkinson's and Parkinson's Disease without Cognitive Impairment (Accepted at Neuropsychology)
5. **Mahmood, A.**, Steindler, J., Katz, D.B., Perceptual processing of tastes is performed by the amygdala-cortical loop (Accepted at Journal of Neuropshyiology), bioRxiv : https://doi.org/10.1101/2025.07.01.662567
6. **Mahmood, A.** pytau: A Python package for streamlined changepoint model analysis in neuroscience. Journal of Open Source Software, 11(117), 8509, https://doi.org/10.21105/joss.08509
7. **Mahmood, A.**, Steindler, J., Germaine, H., Katz, D.B., Coupled Dynamics of Stimulus-Evoked Gustatory Cortical and Basolateral Amygdalar Activity, Journal of Neuroscience, vol. 43, no. 3, Jan. 2023, pp. 386–404.
8. Stone, B.T., Lin, J.-Y., **Mahmood, A.**, Sanford, A.J., and Katz, D.B. (2022). LiCl-induced sickness modulates rat gustatory cortical responses. PLOS Biology 20, e3001537.
9. Lin, J.-Y., Stone, B.T., Herzog, L.E., Nanu, R., **Mahmood, A**., and Katz, D.B. (2021). The function of groups of neurons changes from moment to moment. Current Opinion in Physiology 20, 1–7.

Cardiovascular Disease and Diabetes

1. Chaudhary, P.K., **Mahmood, A.,** Valencia, D., Reyelt, L., Hines, I., Zhang, Y., et al., Development of Stage-4 Pressure Ulcer Models in Rat (In Preparation)
2. **Mahmood, A.**, Kiet, Duong A., Mansour, A., and Pulakat, L., CNN-assisted semi-automated histological evaluation of interstitial and perivascular fibrosis (In Preparation)
3. **Mahmood, A.***, Mehm, A.*, Mooney, B., DeMarco, V.G., Pulakat, L., Feeding Satiation-Resistant Rat Strain as a Model for Obesity, Diabetes, and Heart Failure (In Preparation), *Co-first authors
4. Belenchia AM, Boukhalfa A, DeMarco VG, Mehm A, **Mahmood, A.**, Liu P, et al. Cardiovascular Protective Effects of NP-6A4, a Drug with the FDA Designation for Pediatric Cardiomyopathy, in Female Rats with Obesity and Pre-Diabetes. Cells. 2023 Jan;12(10):1373.
5. **Mahmood, A.***, Gavini, M.P.*, Belenchia, A.M., Beauparlant, P., Kumar, S.A., Ardhanari, S., et al. (2021). Suppression of Inflammatory Cardiac Cytokine Network in Rats with Untreated Obesity and Pre-Diabetes by AT2 Receptor Agonist NP-6A4. Frontiers in Pharmacology 12. (* Co-first Authors)
6. Lum-Naihe, K., Toedebusch, R., **Mahmood, A.**, Bajwa, J., Carmack, T., Kumar, S.A., et al. (2017). Cardiovascular disease progression in female Zucker Diabetic Fatty rats occurs via unique mechanisms compared to males. Sci Rep 7, 17823.
7. Luck, C., DeMarco, V.G., **Mahmood, A.**, Gavini, M.P., and Pulakat, L. (2017). Differential Regulation of Cardiac Function and Intracardiac Cytokines by Rapamycin in Healthy and Diabetic Rats. Oxidative Medicine and Cellular Longevity 2017, 1–17.
8. Arnold, N., **Mahmood, A.**, Ramdas, M., Ehlinger, P.P., and Pulakat, L. (2017). Regulation of the cardioprotective adiponectin and its receptor AdipoR1 by salt. Can. J. Physiol. Pharmacol. 95, 305–309.
9. Gul, R., **Mahmood, A.**, Luck, C., Lum-Naihe, K., Alfadda, A.A., Speth, R.C., and Pulakat, L. (2015). Regulation of cardiac miR-208a, an inducer of obesity, by rapamycin and nebivolol. Obesity 23, 2251–2259.
10. **Mahmood, A.**, and Pulakat, L. (2015). Differential Effects of β-Blockers, Angiotensin II Receptor Blockers, and a Novel AT2R Agonist NP-6A4 on Stress Response of Nutrient-Starved Cardiovascular Cells. PLOS ONE 10, e0144824.

Support, Fellowships, and Awards

Poster of Distinction, MCRI Annual Retreat	2025
ACCESS-CI Compute Grant, MED250058 NSF (CoPI)	2025
Polak Young Investigator Award, Association for Chemoreception Sciences	2024
Computational Neuroscience Postdoctoral Fellowship, Swartz Foundation	2023-25
Trainee Professional Development Award, Society for Neuroscience	2023
ACCESS-CI Compute Grant, BIO230103 NSF (PI: Mahmood)	2023-25
XSEDE Compute Research Award, NSF	2019-22
First Place, Poster Competition, Volen Center for Complex Systems Retreat	2021
Computational Neuroscience Training Fellowship, NIH	2017-19
Academic Hardware Grant, NVIDIA	2018
Award for Academic Distinction, University of Missouri	2017
First Place, Undergraduate Poster Competition, Missouri LS Week	2016, 2017
Summer Research Fellowship, University of Missouri	2016
Distinction, University of Missouri Cardiovascular Day XXII Poster Competition	2015

Invited Talks

NIMH Computational Neuroscience Journal Club 2026
MaTRIX Laboratory Meeting, Georgia Tech 2025
Mathematical Biology Seminar, Brandeis University 2025
Insights Team Meeting, Appcast Inc. 2025
Systems Neuroscience Journal Club, Harvard Medical School 2025
Swartz Foundation Annual Meeting 2024
Brandeis Neuro Postdoc Symposium 2024
Polak Young Investigator Award Lecture, ACHEMS Annual Meeting 2024
PyMCon Web Series 2023
NIH Blueprint Joint Symposium on Computational Neuroscience 2021

Teaching

Guest Lecturer, Advanced Data Analysis, Brandeis University

- Unsupervised clustering and Hidden Markov Modeling 2021
- Probabilistic Programming and Bayesian Modeling 2021

Teaching Assistant, Applied Statistical Computing in R, Brandeis University 2019
Guest Lecturer and Teaching Assistant, Computational Neuroscience, Brandeis University

- Detecting circuit structure, and Principal Component Analysis 2019

Teaching Assistant, Data Analysis and Statistics Workshop 2018

Mentorship

MCRI, Tufts Medical Center, MA

Alex Mansour, Undergraduate, Data Collection and Analysis 2024-25
Kiet Duong, Undergraduate, Data Collection and Analysis 2024-25
Charles Xu, MD student, Data collection and Analysis 2024
Abigail Wu, Summer Student, Research Science Institute, Data Analysis 2024
Nancy Hassan, Summer Student, Research Science Institute, Data Analysis 2024

Brandeis University, MA

Vincent Calia-Bogan, Undergraduate, Computational Modeling and Analysis 2023-25

- Computational Neuroscience Training Grant Awardee
- Thesis: Investigating intra-state dynamics in gustatory cortex (High Honors)
- First author on manuscript (*In Preparation*)

Hannah Germaine, PhD Rotation Student, Modeling and Data Analysis 2022

- Co-author on 1 published article

Victor Suarez, PhD Rotation Student, Data Analysis 2020
Jessica Steindler, Post-Bac, Hardware construction, surgery, and data collection 2019-21

- Co-author on 2 published articles

Thomas Murdy, Undergraduate, Surgery, data collection, and analysis 2020-21

- Thesis: Investigating the BLA-GC interaction in CTA acquisition (High Honors)

University of Missouri, MO

Paige Beauparlant, Undergraduate, data collection 2017
Laura Perry, Undergraduate, data collection 2017
Jamal Bajwa, Undergraduate, data collection and analysis 2016-17