Narendra Mukherjee

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Education

Expected: Spring 2019 **Ph.D. in Neuroscience**, *Brandeis University*, Waltham, MA,
Dissertation title: Dynamical structure of cortical taste responses revealed by precisely-timed optogenetic perturbation.
•HHMI International Graduate Fellow (2014-2017)

May 2012 **Integrated BS-MS in Biological Sciences**, *Indian Institute of Science Education and Research*, Kolkata, India,
Dissertation title: Optimality and Courtship Behaviour in Zebrafish, *Danio Rerio*.
•Awarded Director's Gold Medal (best performing student in Biological Sciences)

Publications/Work in Progress

2018 Flores V.F, Parmet T., **Mukherjee N.,** Nelson S., Levitan D., Katz D.B. *The role of the gustatory cortex in incidental experience-evoked enhancement of later taste learning.* ***Learning and Memory.*** **25(11):** 587 - 600

2017 **Mukherjee N.,** Wachutka J., Katz D.B. *Python meets systems neuroscience: affordable, scalable and open-source electrophysiology in awake, behaving rodents.* ***Proceedings of the 16th Python in Science Conference.*** 97 - 104

2016 Sadacca B.F., **Mukherjee N.,** Vladusich T., Li J.X., Katz, D.B., Miller P. *The Behavioral Relevance of Cortical Neural Ensemble Responses Emerges Suddenly.* ***Journal of Neuroscience.*** **36(3):** 655 - 669

2013 Varma V., **Mukherjee N.,** Nisha N.K., Sharma V.K. *Strong (Type 0) phase resetting of activity/rest rhythm of fruit flies, Drosophila melanogaster, at low temperature.* ***Journal of Biological Rhythms.*** **28(6):** 380 - 389

2012 Nisha N.K., **Mukherjee N.,** Sharma V.K. *Robustness of circadian timing systems evolves in fruit flies Drosophila melanogaster as a correlated response to selection for adult emergence in a narrow window of time.* ***Chronobiology International.*** **29(10):** 1312 - 1328

2012 **Mukherjee N.,** Nisha N.K., Yadav P., Sharma V.K. *A model based on oscillatory threshold and build up of a developmental substance can explain gating of adult emergence in fruit flies D. melanogaster.* ***Journal of Experimental Biology.*** **215(17):** 2960 - 2968

NA **Mukherjee N.,** Wachutka J., Katz D.B. *Dynamical structure of cortical taste responses revealed by precisely-timed optogenetic perturbation.* ***In Preparation.***

NA Levitan D., Lin J., Wachutka J., **Mukherjee N.,** Nelson S.B., Katz D.B. *Single and population coding of taste in the gustatory-cortex of awake mice.* ***In Preparation.***

Invited Talks

2018 **Discrete cortical population activity states underlie taste processing and consumption behavior** *Neuroscience Statistics Research Laboratory, Massachusetts Institute of Technology (MIT), Cambridge, MA*

2018 **Openness in Science and Society.** *Indian Institute of Science Education and Research, Kolkata, India*

2017 **Building affordable, scalable and open-source tools to study behaviorally relevant neural population dynamics.** *Center for Depression, Anxiety and Stress Research, McLean Hospital, Belmont, MA*

2017 **Systems neuroscience with Python: peering into the "black box".** *Boston Python Meetup Group, Cambridge, MA*

Selected Poster Presentations

2018 **Mukherjee N.,** Wachutka J., Katz D.B. *Dynamical structure of cortical taste responses revealed by precisely-timed optogenetic perturbation.* ***Computational and Systems Neuroscience (Cosyne) 2018, Denver, CO***

2017 **Mukherjee N.,** Wachutka J., Katz D.B. *Optogenetically perturbing behaviorally relevant stochastic cortical population dynamics.* ***Statistical Analysis of Neuronal Data (SAND8) at Pittsburgh, PA***

2016 **Mukherjee N.,** Wachutka J., Katz D.B. *Perturbing behaviorally relevant cortical population activity states.* ***Annual Meeting of the Society for Neuroscience (SfN) at San Diego, CA***

2014 **Mukherjee N.,** Li J.X., Katz D.B. *Ensemble dynamics in the rat gustatory cortex can precisely predict taste ingestion-rejection decisions.* ***Annual Meeting of the Society for Neuroscience (SfN) at Washington, DC***

2014 **Mukherjee N.,** Li J.X., Katz D.B. *Ensemble dynamics in the rat gustatory cortex can precisely predict taste ingestion-rejection decisions.* ***36th Annual Meeting of the Association for Chemoreception Sciences (AChemS) at Bonita Springs, FL***

Grants and Awards

2017-2019 $29,513 (estimated) towards cloud computing resources on the Jetstream supercomputer of the Extreme Science and Engineering Discovery Environment (XSEDE) of the National Science Foundation (NSF) (as administrator).

2014-2017 $70,000 per year towards tuition and fellowship from the Howard Hughes Medical Institute (HHMI) as part of the International Graduate Students' Fellowship.

2014 Pulin Sampat Memorial Award for the Best Teaching Fellow in the Life Sciences, Brandeis University.

2008-2012 Innovation in Science Pursuit for Inspired Research (INSPIRE) Scholarship for Higher Education (SHE), DST, Govt. of India.

2012 Nominated for the Dr. Shyama Prasad Mukherjee (SPM) Fellowship, CSIR, Govt. of India.

2010, 2011 Summer Research Fellowship, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India.

2010 Rajiv Gandhi Science Talent Research Scholarship, Rajiv Gandhi Foundation, New Delhi and JNCASR (Best project under Summer Research Fellowship, 2010).

2010 Best participant in SERC school in chronobiology 2010, Department of Science and Technology (DST), Govt. of India.

2008, 2009 CSIR Program for Youth on Leadership in Science (CPYLS) associateship at Centre for Cellular and Molecular Biology (CCMB), Hyderabad, CSIR, Govt. of India.

2008 CNR Rao Education Foundation Prize, IISER Kolkata.

Teaching Experience

2016 **NPSY 18a: Introduction to Learning and Behavior**, *Brandeis University, Waltham, MA*, Guest lecturer for section on Machine Learning and Artificial Intelligence.

2016 **BIO 107a: Data Analysis and Statistics Workshop**, *Brandeis University, Waltham, MA*, Teaching Fellow with Prof. Steve Van Hooser.

2014 **NBIO 136b: Computational Neuroscience**, *Brandeis University, Waltham, MA*, Teaching Fellow with Prof. Paul Miller.

2013 **NBIO 45a: The Cognitive and Neurobiological Basis of Memory**, *Brandeis University, Waltham, MA*,
Teaching Fellow with Prof. John Lisman.

Professional Experience

Reviewer	Scipy 2018 Program Committee
Reviewer	An Introductory Course in Computational Neuroscience by Paul Miller, Brandeis University (MIT Press, forthcoming)

Technical Expertise

Experimental	Stereotactic rodent surgeries, chronic implantation of multielectrode bundles, simultaneous electrophysiology and optogenetics in awake rodents.
Hardware	Extensive experience with boards like the Raspberry Pi and Arduino. Built a low-cost, modular, open-source rodent electrophysiology, optogenetics and behavior system with the Raspberry Pi and amplifier chips from Intan Technologies as part of PhD thesis work.
Software	Python and Linux (expert), R and MATLAB (intermediate). Wrote spike sorting and analysis software for the electrophysiology system in Python. Experience with variational Bayesian methods and deep neural networks in *Tensorflow*. Contributor to *pymc3* and *datashader*. Extensive experience working with HPC environments at Brandeis and at XSEDE (Jetstream).

References

Donald B Katz
Professor of Psychology, Brandeis University
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Eve Marder
Victor and Gwendolyn Beinfield Professor of Neuroscience, Brandeis University
marder@brandeis.edu

Leslie C Griffith
Professor of Biology, and Director of the Volen National Center for Complex Systems, Brandeis University
griffith@brandeis.edu

Shantanu Jadhav
Assistant Professor of Psychology, Brandeis University
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