Aditya Nair

CONTACT INFORMATION

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EDUCATION

California Institute of Technology
PhD., Computation & Neural Systems

2019-
Present

Primary Advisor: David J Anderson, *Caltech*
Secondary Advisors: Ann Kennedy, *Northwestern*
& Scott W Linderman, *Stanford*

Expected
Graduation
2024

National University of Singapore
B.S., Life Sciences,
Honors with Highest Distinction

2014-
2018

Karolinska Institute
Exchange Semester
Erasmus Scholar

2017

PROFESSIONAL EXPERIENCE

California Institute of Technology
A*STAR National Science Graduate Fellow in Neuroscience,
Advisor: David Anderson.

2019-
Present

In graduate school, I combine theoretical and experimental methods to dissect neural population dynamics in social behaviors such as aggression and mating. I also develop data-driven dynamical systems methods for neuroscience and collaborate closely with experimentalists to apply these tools.

Institute of Molecular and Cell Biology, Singapore
Research Officer, Advisor: Weiping Han.

2018-
2019

As a post-baccalaureate scholar, I studied the co-release of neuromodulators from the basal forebrain cholinergic system using slice electrophysiology and computational modeling.

Nanyang Technological University, Singapore 2017-
Honors Researcher, Advisor: George Augustine. 2018

During the honors year of my undergraduate degree, I studied neuromodulatory inputs to the claustrum and their significance in claustral circuits.

Karolinska Institute, Sweden 2017
Undergraduate Researcher, Advisor: Gilad Silberberg,

As an Erasmus scholar, I created machine learning methods for the automated reconstruction of neuronal morphology from fluorescent images of neurobiotin filled neurons.

National Neuroscience Institute, Singapore 2015-
Undergraduate Researcher, Advisor: Lim Kah Leong, 2017

During the first two years of my undergraduate degree, I explored the role of the Parkin-Lipoprotein Lipase nexus in Parkinson's Disease.

AWARDS AND HONORS	National Science Graduate Scholarship, Agency of Science, Technology and Research, Singapore (A*STAR)	2019-2024
	National University of Singapore Science and Technology Undergraduate Scholarship	2014-2018
	Simons Foundation Award for Best Poster, Gordon Research Conference (GRC) for Modulation of Neural Circuits and Behavior	2019
	Trainee Professional Development Award, Society for Neuroscience (SfN)	2018
	Erasmus Plus Undergraduate Scholarship	2017
	Best Speaker Award, Integrated Science Congress, National University of Singapore	2016

PUBLICATIONS

o **Aditya Nair**, Tomomi Karigo, Bin Yang, Surya Ganguli, Mark J. Schnitzer, Scott W. Linderman, David J. Anderson, and Ann Kennedy. "An approximate line attractor in the hypothalamus encodes an aggressive state." *Cell* 186, no. 1 (2023): 178-193.

o Willcyn Tang, John Thundyil, Grace Gui Yin Lim, Teddy JW Tng, Sean Qing Zhang Yeow, **Aditya Nair**, Chou Chai, Tso-Pang Yao, and Kah-Leong Lim. "Parkin regulates neuronal lipid homeostasis through SREBP2-lipoprotein lipase pathway—implications for Parkinson's disease." *Human Molecular Genetics* (2022).

o Brandon Weissbourd, Tsuyoshi Momose, **Aditya Nair**, Ann Kennedy, Bridgett Hunt, and David J. Anderson. "A genetically tractable jellyfish model for systems and evolutionary neuroscience." *Cell* 184, no. 24 (2021): 5854-5868.

o Kelly LL Wong, **Aditya Nair**, and George J. Augustine. "Changing the cortical conductor's tempo: neuromodulation of the claustrum." *Frontiers in Neural Circuits* 15 (2021): 658228.

o Ana Badimon*, Hayley J. Strasburger*, Pinar Ayata*, Xinhong Chen, **Aditya Nair**, Ako Ikegami, Philip Hwang et al. "Negative feedback control of neuronal activity by microglia." *Nature* 586, no. 7829 (2020): 417-423.

o Miaomiao Mao, **Aditya Nair**, and George J. Augustine. "An automated data extraction and classification pipeline to identify a novel type of neuron within the dorsal striatum based on single-cell patch clamp and confocal imaging data" *Data in brief* 32 (2020): 106148.

o Martin Graf, **Aditya Nair**, Kelly LL Wong, Yanxia Tang, and George J. Augustine. "Identification of mouse claustral neuron types based on their intrinsic electrical properties." *ENeuro* 7, no. 4 (2020).

o Miaomiao Mao, **Aditya Nair**, and George J. Augustine. "A novel type of neuron within the dorsal striatum." *Frontiers in Neural Circuits* 13 (2019): 32.

PREPRINTS AND SUBMITTED WORKS	o **Aditya Nair**, Martin Graf, Yue Yang Teo, and George J. Augustine. "A functional logic for neurotransmitter co-release in the cholinergic forebrain pathway." *PNAS, In Revision*
	o Mengyu Liu*, **Aditya Nair***, Scott W Linderman and David J. Anderson. Periodic hormone-dependent changes in hypothalamic attractor-like dynamics occur during the female reproductive cycle.
CONFERENCE PRESENTATIONS	o **Aditya Nair,** Tomomi Karigo, Bin Yang, Surya Ganguli, Mark J. Schnitzer, Scott W. Linderman, David J. Anderson, and Ann Kennedy. An approximate line attractor in the hypothalamus that encodes an aggressive internal state. *Gordon Research Conference on the Hypothalamus, 2022,* ***Selected for invited talk.***
	o **Aditya Nair,** Tomomi Karigo, Bin Yang, Ann Kennedy, David J. Anderson. Dynamical systems analysis reveals a novel hypothalamic encoding of state in nodes controlling social behavior. *Cosyne 2022.* ***Selected for invited talk. (Top 3% of all submissions)***
	o **Aditya Nair,** Martin Graf, George J. Augustine. Opposing cholinergic gain control of the claustrum. *Society for Neuroscience 49th Annual Meeting, 2019.*
	o **Aditya Nair,** Martin Graf, George J. Augustine. Opposing cholinergic gain control of the claustrum. *Gordon Research Conference on Neuromodulation, 2019,* ***Awarded Simon's Foundation Award for best poster.***
	o **Aditya Nair**, Martin Graf, George J. Augustine. Cell-type specific cholinergic modulation of the claustrum. *Society for Neuroscience 48th Annual Meeting, 2018.* ***Awarded Trainee Professional Development Award, SfN.***
	o **Aditya Nair,** Martin Graf, George J. Augustine. The claustrum receives neuromodulatory input from the basal forebrain. *3rd Society for Claustrum Research Meeting, Salk Institute, 2018.* ***Selected for invited talk.***

TEACHING EXPERIENCE	**Co-organizer and Head TA,** Chen Institute Data Science and AI for Neuroscience Summer School, *Caltech*	2022

I co-organized this summer school for computational neuroscience, creating a curriculum, lecture series and homework notebooks. I was also head TA and assisted participants with course material.

Guest Lecturer, CNS 220: Genetic Dissection of Neural Circuit Function, *Caltech* — 2021, 2022

I teach a section focused on computational approaches to understand cell-type specific computations in social behavior.

COURSES ATTENDED	**Max Plank Florida Institute for Neuroscience Florida,** Advanced Neuroimaging Techniques	2020
	Riken Center for Brain Science, Japan, Summer Program in Neurotechnology	2019

COMMUNITY INVOLVEMNT	**Resident Associate, Blacker House, Caltech**	2021-present

I advise and mentor students who reside in Blacker House at Caltech, focusing on helping students transition into university life and take part in undergraduate research on campus.

	Resident Assistant and Student Mentor, National University of Singapore	2015-2018