

# Anusha Allawala

PHD CANDIDATE · BIOMEDICAL ENGINEERING

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## Education

### Brown University

PHD, BIOMEDICAL ENGINEERING

- Thesis Advisors: Dr. David Borton and Dr. Sameer Sheth
- Expected graduation: Spring 2023

Providence, RI

09/2017 - present

### San Jose State University

BS, BIOMEDICAL ENGINEERING

- Thesis Advisor: Dr. Katherine Wilkinson

San Jose, CA

01/2009 - 12/2014

## Research Experience

### Graduate Research Assistant, Carney Institute for Brain Science at Brown University

CO-ADVISORS: DR. DAVID BORTON AND DR. SAMEER SHETH

- Dissertation: "Characterization and modulation of oscillatory dynamics in cognitive control: implications for psychiatric neuromodulation"

Providence, RI

Sept. 2017 - Present

### Research Associate, Circuit Therapeutics, Inc.

PROJECT MANAGER: DR. BARBARA NGUYEN-VU

- Projects: "Optogenetic modulation of the STN and evaluation of motor deficits in parkinsonian rodents"

Menlo Park, CA

March 2015 - July. 2017

### Undergraduate Research Assistant, Dept of Biology

ADVISOR: DR. KATHERINE WILKINSON

- Thesis: "The Characterization of muscle spindle afferents to inflammation in adult male mice"

San Jose, CA

Aug 2012 - Dec 2014

### Undergraduate Research Assistant, Dept of Biology

ADVISOR: DR. KATHERINE WILKINSON

- National Science Foundation Research Experience for Undergraduates (NSF-REU) Program Project: "The use of capsaicin as a pharmacological tool to silence pain receptor afferents"

San Jose, CA

Summer 2013

## Publications

**Allawala A.**, Oswald D., Adkinson J., Tsolaki E., Mathura R., McIntyre C., Noecker A., Chiu K., Malekmohammadi M., Mustakos R., Mathew S., Goodman W., Pouratian N., Bijanki K., Sheth S.A., Borton D.A. Dual-target deep brain stimulation drives differential engagement of networks underlying treatment-resistant depression. *(In preparation for submission)*

Xiao J., Provenza N.R., Asfour J., Myers J., Mathura R.K., Metzger B., Adkinson J.A., **Allawala A.B.**, Pirtle V., Oswald D., Shofty B., Robinson M.E., Mathew S., Goodman W.K., Pouratian N., Schrater P.R., Patel A.B., Tolia A.S., Bijanki K.R., Pitkow X., Sheth S.A. Decoding depression severity from intracranial neural activity. *(In preparation for submission)*

Adkinson J., Tsolaki E., Sheth S.A., Oswald D., Metzger B., McIntyre C., Mathura R.M., Waters A.C., Robinson ME, **Allawala A.**, Noecker A.M., Malekmohammadi M., Chiu K., Mustakos R., Goodman W., Borton D., Pouratian N., Bijanki K. 2022. Imaging versus electrographic connectivity in human mood-related fronto-temporal networks. *Brain Stimulation*. doi: <https://doi.org/10.1016/j.brs.2022.03.002>

**Allawala A.**, Bijanki K., Goodman W., Cohn J.F., Viswanathan A., Yoshor D., Borton D.A., Pouratian N., Sheth S.A. 2021. A novel framework for network-targeted neuropsychiatric deep brain stimulation. *Neurosurgery*. doi: <https://doi.org/10.1093/neuros/nyab112>

Sheth S.A., Bijanki K., Metzger B., **Allawala A.**, Pirtle V., Adkinson J., Myers J., Mathura R., Oswald D., Tsolaki E., Xiao J., Noecker A., Strutt A., Cohn J., McIntyre C., Mathew S., Borton D.A., Goodman W., Pouratian N. 2021. Deep brain stimu-

lation for depression informed by intracranial recordings. *Biological Psychiatry*.  
doi: <https://doi.org/10.1016/j.biopsych.2021.11.007>

Dastin-van Rijn E., Provenza N.R., Calvert J.S., Gilron R., **Allawala A.**, Darie R., Syed S., Matteson E., Vogt G.S., Avendano-Ortega M., Vasquez A.C., Ramakrishnan N., Oswalt D., Bijanki K., Wilt T., Starr P.A., Sheth S.A., Goodman W., Harrison M.T., Borton D.A. 2020. Uncovering biomarkers during therapeutic neuromodulation with PARRM: Period-based Artifact Reconstruction and Removal Method. *Cell Reports Methods*.  
doi: <https://doi.org/10.1016/j.crmeth.2021.100010>

Powell M., Romeo J.A., Gilron R., Provenza N.R., **Allawala A.**, Silva D., Bijanki K., Oswalt D., Adkinson J., Pouratian N., Sheth S.A., Goodman W., Jones S.R., Starr P.A., Borton D.A. 2020. NeuroDAC: An open-source arbitrary biosignal waveform generator. *Journal of Neural Engineering*.  
doi: <https://doi.org/10.1088/1741-2552/abc7f0>

Black C.J., **Allawala A.**, Bloye K., Vanent K.N., Edhi M.M., Saab C.Y., Borton D.A. 2020. Automated, conscious and rapid self-report of nociception in transgenic mice. *Scientific Reports*.  
doi: <https://doi.org/10.1038/s41598-020-70028-8>

Provenza N.R., Matteson E.R., **Allawala A.B.**, Barrios-Anderson A., Sheth S.A., Viswanathan A., McIngvale E., Storch E., Frank M.J., McLaughlin N.C.R., Cohn J.F., Goodman W.K., Borton D.A. 2019. The case for adaptive neuromodulation to treat severe intractable mental disorders. *Frontiers in Neuroscience*.  
doi: <https://doi.org/10.3389/fnins.2019.00152>

Zaytseva D., **Allawala A.**, Franco J.A., Putnam S., Abtahie A.M., Bubalo N., Criddle C.R., Nguyen T.A., Nguyen P., Padmanabhan S., Bremer M., Abramson T., Wilkinson K.A. 2018. Lipopolysaccharide-induced inflammation does not alter muscle spindle afferent mechanosensation or sensory integration in the spinal cord of adult mice. *Physiological Reports*.  
doi: <https://doi.org/10.14814/phy2.13812>

## Presentations

<sup>+</sup> undergraduate mentee

### CONFERENCE PRESENTATIONS

**Allawala A.**, Vartany S., Mathura R., Ritz H., Adkinson J., Gadot R., Shenhav A., Goodman W., Pouratian N., Bijanki K., Borton D., Sheth S.A. 2022. Deep brain stimulation-induced improvement in cognitive control is mediated by theta oscillations: implications for psychiatric neuromodulation. Computational Psychiatry Course (CPC++), New York City, NY. (*Data Blitz Talk, scheduled*)

**Allawala A.**, Adkinson J., Oswalt D., Tsolaki E., Mathura R., McIntyre C., Noecker A., Chiu K., Malekmohammadi M., Mustakos R., Goodman W., Pouratian N., Bijanki K., Sheth S., Borton D. 2022. Dual-target, current-steered deep brain stimulation drives differential engagement of networks in treatment-resistant depression. Eighth Annual BRAIN Investigators Meeting. Virtual. (*Poster, scheduled*)

**Allawala A.**, Adkinson J., Oswalt D., Mathura R., Goodman W., Pouratian N., Bijanki K., Borton D. Sheth S. 2022. Dual-target deep brain stimulation drives differential engagement of networks underlying treatment-resistant depression. American Society for Stereotactic and Functional Neurosurgery, Atlanta, GA. (*Poster, scheduled*)

**Allawala A.**, Adkinson J., Bijanki K., Vartany S., Mathew S., Goodman W., Pouratian N., Sheth S., Borton D. 2021. Modulation of Cognitive Control Network in Treatment-Resistant Depression with Deep Brain Stimulation. Society for Neuroscience Global Connectome, Virtual. (*Poster*)

Vartany S.<sup>+</sup>, **Allawala A.**, Ritz H., Adkinson J. Mathura R., Bijanki K., Shenhav A., Goodman W., Pouratian N., Sheth S., Borton D. 2021. Deep Brain Stimulation in Treatment-Resistant Depression Modulates Oscillations Above 1/f Spectral Noise in Cognitive Control Networks. Neuromatch Conference 4.0

**Allawala A.**, Adkinson J., Myers J., Pirtle V., Goodman W., Mathew S., Pouratian, N., Borton D, Bijanki K., Sheth S. 2020. Domain-Based Conceptualization of Mood-Regulating Networks: Implications for DBS for Depression. American Society for Stereotactic and Functional Neurosurgery, Virtual. (*Poster*)

**Allawala, A.**, Adkinson J., Myers J., Pirtle V., Goodman W., Mathew S., Pouratian N., Borton D.A., Bijanki K., Sheth S.A. 2020. Modulation of the Cognitive Control Network in Treatment-Resistant Depression with Deep Brain Stimulation. Sixth Annual BRAIN Initiative Investigators Meeting, Virtual. (*Poster*)

**Allawala A.**, Black C., Saab C., Borton D.A. 2018. Towards Interneuron Characterization in the Spinal Cord. Society for Neuroscience Annual Meeting. (*Poster*)

Nguyen-Vu T.D., Leung L., **Allawala A.** (presenting author), Arnold C., Zwilling D., Sawatzki R., Kaplitt M. 2016. Optogenetic Inhibition of STN Rescues Motor Defects in Parkinsonian Rodents. Society for Neuroscience Annual Meeting, San Diego, CA. (Poster)

**Allawala A.**, Wilkinson K. 2014. The Characterization of Muscle Sensory Receptors Following Inflammation in Adult Male Mice. Annual Biomedical Research Conference for Minority Students, San Antonio, TX. (Oral Presentation)

**Allawala A.**, Wilkinson K. 2014. The Effect of Inflammation on Muscle Sensory Function in Adult Female Mice. Annual Experimental Biology Meeting, San Diego, CA. (Poster)

**Allawala A.**, Wilkinson K. 2013. The Effect of Inflammation on Muscle Sensory Function in Adult Female Mice. Biomedical Engineering Society Annual Meeting, Seattle, WA (Poster)

## CONFERENCE PROCEEDINGS

**Allawala A.**, Adkinson J., Oswald D., Tsolaki E., Mathura R., McIntyre C., Noecker A., Chiu K., Malekmohammadi M., Mustakos R., Goodman W., Pouratian N., Bijanki K., Borton D., Sheth S. 2022. Dual-target deep brain stimulation drives differential engagement of networks underlying treatment-resistant depression. Biological Psychiatry(Proceedings of the Society for Biological Psychiatry Meeting, New Orleans, LA. doi: <https://doi.org/10.1016/j.biopsych.2022.02.608>

**Allawala A.**, Behnke S., Zaytseva D., Wilkinson K. 2014. Characterization of changes in muscle afferent response to stretch following inflammation in male and female mice. The FASEB Journal. doi: [https://doi.org/10.1096/fasebj.28.1\\_supplement.1128.1](https://doi.org/10.1096/fasebj.28.1_supplement.1128.1)

## Awards, Fellowships, & Grants

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- 2021 - 2027 **F99/K00 - Blueprint D-SPAN Award**, National Institutes of Health
- 2021 **Neuroscience Scholars Program (NSP) Associate**, Society for Neuroscience
- 2020 **Trainee Professional Development Award**, Society for Neuroscience
- 2017 - 2021 **Graduate Research Fellowship Program**, National Science Foundation
- 2014 **Travel Award**, California State University Program for Education and Research in Biotechnology
- 2014 **Honorable Mention, Sally Casanova Pre-doctoral scholarship**, California State University Program for Education and Research in Biotechnology
- 2013 - 2014 **Ronald E. McNair Scholarship**, San Jose State University
- 2013 **Travel Award**, Annual Biomedical Research Conference for Minority Students
- 2013 **Travel Award**, Annual Biomedical Engineering Society (BMES) Meeting
- 2013 **Undergraduate Research Award**, Office of the Provost, San Jose State University
- 2013 **Intuitive Surgical Inc. Scholarship**, San Jose State University
- 2013 **Department Service Award, Department of Biomedical, Chemical and Materials Engineering**, San Jose State University
- 2012 - 2014 **National Science Foundation Engineering Leadership Pathways Scholars Program**, San Jose State University
- 2012 **Barnum-Everett Memorial Scholarship**, San Jose State University
- 2011 **Varian Scholarship**, San Jose State University

## Teaching Experience

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- Fall 2021 **Sheridan Teaching Seminar - Reflective Teaching**, Certificate completion
- Summer 2018 **Biomedical Engineering and Device Design – Brown PreCollege Program**, Course instructor

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## Mentoring

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2020-2022 **Stephanie Vartany**, Undergraduate student, Neuroscience, Brown University  
2019-2021 **Michelle Akerman**, Undergraduate student, Biomedical Engineering, Brown University  
2021 **Ron Gadot**, M3 Medical student, Baylor College of Medicine  
2020 **Venkata Jonnakuti**, MD/PhD Rotation student, Baylor College of Medicine

## Outreach & Professional Development

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### SERVICE AND OUTREACH

2018 - 2022 **Skype a Scientist Program**, Science communicator  
2021 - 2022 **Annual Biomedical Research Conference for Minority Students**, Research Poster Judge  
2020 **Graduate Students of Color Orientation, Brown University**, Panelist: *Department Culture*  
2020 **Leadership Alliance seminar, Brown University**, Panelist: *Pursuing a PhD*  
2018 - 2019 **Peer Mentor & Organizer**, Graduate School Center for Students of Color, Brown University  
2012 - 2013 **Vice President**, Biomedical Engineering Society, San Jose State University Chapter

## Skills

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**SOFTWARE** MATLAB, Python, AutoCAD, Fusion 360, ProE/Creo, Adobe Illustrator, Photoshop

**ELECTRICAL/MECHANICAL** Arduino, soldering, circuit design and analysis

**BIOLOGICAL** Microscopy (Confocal, Bright Field), sectioning on cryostat and microtome, slide preparation, rodent stereotaxic and intraspinal surgery, immunohistochemistry