

# Anusha Allawala

PHD CANDIDATE · BIOMEDICAL ENGINEERING

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## Education

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### Brown University

PHD BIOMEDICAL ENGINEERING

- Co-advisors: Dr. David Borton and Dr. Sameer Sheth

Providence, RI

09/2017 - present

### San Jose State University

BS BIOMEDICAL ENGINEERING

- Undergrad Research Advisor: Dr. Katherine Wilkinson

San Jose, CA

01/2009 - 12/2014

## Professional Experience

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- 2021- Present **NIH Blueprint Diversity Specialized Predoctoral to Postdoctoral Advancement in Neuroscience (DSPAN) F99/K00 Fellow**, Brown University
- 2017-2021 **NSF Graduate Research Program Fellow**, Brown University
- 2017 **Consultant**, In Vivo Strategies, LLC
- 2015-2017 **Research Associate**, Circuit Therapeutics, Inc.
- 2012-2014 **McNair Scholar and Undergraduate Research Assistant**, San Jose State University

## Publications

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### PUBLISHED

- 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 stimulation 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., Oswald 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/10.1101/2020.10.02.322743>
- Powell M., Romeo J.A., Gilron R., Provenza N.R., **Allawala A.**, Silva D., Bijanki K., Oswald 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. *Journal of Neural Engineering*. 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>

## IN PREP

**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. 2022. Dual-target deep brain stimulation drives differential engagement of networks underlying treatment-resistant depression.

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. 2022. Decoding depression severity from intracranial neural activity.

## Awards, Fellowships, & Grants

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- 2021 - 2027 **F99/K00 - 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
- 2016 **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

## Presentations

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\* *presenting author*; + *mentored undergraduate*

### CONFERENCE PRESENTATIONS

**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., Sheth S., Borton D. 2022. Dual-target, current-steered deep brain stimulation drives differential engagement of networks in treatment-resistant depression. Eight Annual BRAIN Investigators Meeting. Washington, DC. (Poster)

**Allawala A.**, Adkinson J., Oswald 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)

**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,\*\*, **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., **A.Allawala\***, 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., Tzolaki 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)

## Teaching Experience

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Fall 2021 **Sheridan Teaching Seminar - Reflective Teaching**, Certificate completion

*Brown University*

Summer 2018 **Biomedical Engineering and Device Design – Brown PreCollege Program**, Course instructor

*Brown University*

## 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

## Research Experience

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### **Brown University - School of Engineering**

*Providence, RI*

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

*Sept. 2017 - Present*

- Dissertation: “Modulation of oscillatory dynamics in cognitive control using deep-brain stimulation: implications for psychiatric neuromodulation ”

### **Brown University - School of Engineering**

*Providence, RI*

ADVISOR: DR. DAVID BORTON

*Sept. 2017 - Dec. 2018*

- Project (Rotation): “Towards Interneuron Characterization in the Spinal Cord”

**Circuit Therapeutics, Inc. - CNS therapy**

SUPERVISOR: 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*

**San Jose State University - 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*

**San Jose State University - 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*

**Outreach & Professional Development**

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**SERVICE AND OUTREACH**

- 2018 - 2022 **Skype a Scientist Program**, Volunteer
- 2021 - 2022 **Annual Biomedical Research Conference for Minority Students**, Research Poster Judge
- 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** AutoCAD, Fusion 360, MATLAB, Python, 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