

# **BRIELLE R. FERGUSON**

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## **EDUCATION**

- Ph.D. 2017 Drexel University College of Medicine, Philadelphia, PA, Department of Neurobiology and Anatomy, Neuroscience PhD Program, Biomedical Graduate Studies  
Dissertation: Elucidating the Mediodorsal Thalamic Regulation of Prefrontal Function
- B.A. 2012 University of Virginia, Charlottesville, Virginia,  
Major: Cognitive Science, Concentration: Neuroscience, Minor: Bioethics

## **RESEARCH EXPERIENCE**

- 2017- Postdoctoral Fellow, Stanford University, Palo Alto, CA, Department of Neurology  
Mentor: John Huguenard, Ph.D.
- 2012-2017 Graduate Student Researcher, Drexel University, Department of Neurobiology and Anatomy, Mentor: Wen-Jun Gao, Ph.D.
- 2011-2012 Undergraduate Research Assistant, University of Virginia, Psychology Department  
Mentor: Brian Wiltgen, Ph.D.
- 2011 Undergraduate Research Assistant, University of Virginia, Department of Neurology  
Mentor: Scott Wylie, Ph.D.

## **TEACHING EXPERIENCE**

- 2014-2017 Led lab project for Drexel Neuroscience summer camp for high school students
- 2014 Brain Awareness Week, led demonstrations on the brain for elementary school students
- 2013-2017 Lectured and led neuroscience Gross Anatomy labs for visiting high school students

## **MENTORING/ADVISING EXPERIENCE**

- Dec 2020 Research Assistant Mentor  
I am working with Revathi Kaduru to help her gain more research experience while applying to graduate programs.
- 2016 High School Student Summer Research Mentor  
Supervised Madison Evans in completing a small summer project.

- 2015-2017    Junior Graduate Student Mentor  
Supervised rotation project and provided thesis conceptual and technical guidance for Linda Chamberlain, PhD. Resulted in two poster presentations and one publication.
- 2015            Research Assistant Mentor  
Supervised Mathew Kimock in small project to gain experience while applying for an industry job. Resulted in one poster presentation.
- 2014            Medical Resident Research Mentor  
Supervised medical residents interested in gaining wet-lab research experience as a Co-Principal investigator for the Helen S. Vernik Pilot Grant for Schizophrenia Research.
- 2014            Graduate Student Rotation Mentor  
Supervised Andrew Gargiulo during his rotation in the Gao Lab to learn whole-cell patch clamp electrophysiology for his project studying Locus Coeruleus modulation of the Prefrontal Cortex.

## **PROFESSIONAL SOCIETIES**

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- 2015-            International Behavioral Neuroscience Society
- 2014-            Society for Neuroscience
- 2014-            Molecular and Cellular Cognition Society
- 2013-            Association for Women in Science

## **ACADEMIC AND UNIVERSITY SERVICE**

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- Oct 2020-      Programs Director and Co-Founder for Black In Neuro
- April 2020-    Review Editor for Frontiers in Systems Neuroscience
- April 2020-    Co-Founder and Organizer of Monthly Thalamus Trainee Virtual Meeting  
- an offshoot of the thalamus GRS
- 2018-            Co-President of the Stanford Black Postdoc Association
- 2016-2017     President, Biomedical Sciences Graduate Student Association
- 2016-2017     City Coordinator for the Philadelphia Pint of Science Festival
- 2016-2017     Lead Organizer, Neuroscience Student Mentoring Program
- 2015            Graduate School Representative, Search Committee for Associate Dean of Diversity and Inclusivity
- 2015            4th Year Neuroscience Student Resource Representative

- 2014 Vice President, Biomedical Graduate Minority Association  
 2014-2017 Student representative, Institutional Animal Care and Use Committee (IACUC)  
 2014 Mentor, Graduate Student Association Mentoring Program

## **HONORS, AWARDS, FELLOWSHIPS, AND GRANTS**

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### **Honors and Awards**

- 2020 Forbes 30 Under 30 – Science  
 2018 HHMI Hanna Grey Fellow Semifinalist  
 2017 Leadership Excellence Award, Drexel University  
 2017 Outstanding Promise Award, Drexel University College of Medicine  
 2016 Goldberger-Levine Excellence Award, Biomedical Graduate Studies, Drexel University College of Medicine  
 2016 Barry Waterhouse Platform Presentation Award, Drexel Discovery Day  
 Selected talk: Exploring the neural basis of working memory  
 2015 Biomedical Graduate Studies Fall Travel Award, Drexel University College of Medicine  
 2014 Goldberger-Levine Excellence Award, Biomedical Graduate Studies, Drexel University College of Medicine

### **Fellowships and Grants**

- 2019 NIH/NINDS F32 – Ruth L. Kirschstein National Research Service Award  
 Title: Exploring Shared Mechanisms of Absence Seizures and Selective Attention  
 Direct cost: \$64,576/year for 1.5 years  
 Funding Period: 07/01/2019-10/01/2020
- 2018 Stanford School of Medicine Dean’s Postdoctoral Fellowship  
 Title: Exploring Shared Mechanisms of Absence Seizures and Selective Attention  
 Direct cost: \$31,350/year for 1 year (for stipend and travel)  
 Funding Period: 07/01/2018-06/31/2019
- 2016 NIH/NIMH F31 – Ruth L. Kirschstein National Research Service Award  
 Title: Elucidating the Mediodorsal Thalamic Regulation of Prefrontal Function  
 Direct cost: \$43,576/year for two years  
 Funding Period: 07/01/2016-7/01/2018
- 2015 Dean’s Fellowship for Excellence in Collaborative or Themed Research  
 Title: Elucidating the Mediodorsal Thalamic Regulation of Prefrontal Function  
 Direct cost: \$30,000 (for stipend and travel)  
 Funding period: 07/01/2015-06/30/2016

2014 Helen S. Vernik Pilot Grant for Schizophrenia Research (Drexel University), co-PI  
 Title: Augmenting Inhibition to Alleviate Cognitive Impairment in Schizophrenia  
 Direct cost: \$7,000  
 Funding period: 01/01/2015-06/30/2015

## **PUBLICATIONS**

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**Ferguson BR** and Delevich K. Mediodorsal Thalamus and Prefrontal Cortex: Specialized Partners in Cognitive Control. *Journal Club, J Neurosci.* 2020; Jul;40(29):5515-5517.

Chamberlin L, **Ferguson BR**, McEachern E, Nassar B, Gao WJ. Upregulating a reduced population of prefrontal parvalbumin interneurons to restore cognitive function in schizophrenia, *Schizophrenia Bulletin*, Volume 45, Issue Supplement\_2, April 2019, Pages S262–S263.

Ren J, Friedmann D, Xiong J, Liu CD, **Ferguson BR**, Weerakkody T, DeLoach KE, Ran C, Pun A, Sun Y, Weissbourd B. Anatomically defined and functionally distinct dorsal raphe serotonin sub-systems. *Cell.* 2018; Oct 4;175(2):472-87.

Monaco SA, **Ferguson BR**, Gao WJ. Lithium Inhibits GSK3 $\beta$  and Augments GluN2A Receptor Expression in the Prefrontal Cortex. *Frontiers in cellular neuroscience.* 2018; Feb 1;12:16.

**Ferguson BR**, Gao WJ. PV interneurons: critical regulators of E/I balance for prefrontal cortex-dependent behavior and psychiatric disorders. *Frontiers in neural circuits.* 2018;12.

**Ferguson BR** and Gao WJ. Thalamic control of cognition, social behavior, and anxiety via regulation of GABAergic signaling and E/I balance in the medial prefrontal cortex. *Biological psychiatry.* 2018; 83(8):657-69.

Li ML, Gulchina Y, Monaco SA, Xing B, **Ferguson BR**, Li YC, Li F, Hu XQ, Gao WJ. Juvenile treatment with a novel mGluR2 agonist/mGluR3 antagonist compound, LY395756, reverses learning deficits and cognitive flexibility impairments in adults in a neurodevelopmental model of schizophrenia. *Neurobiology of Learning and Memory.* 2017; 140, 52-61.

**Ferguson BR** and Gao WJ. Development of thalamocortical connections between the mediodorsal thalamus and the prefrontal cortex and its implication in cognition. *Frontiers in Human Neuroscience.* 2015; 8:1027.

Li ML., Yang SS, Xing B, **Ferguson BR**, Gulchina Y, Li YC, Li F, Hu XQ & Gao WJ. LY395756, an mGluR2 agonist and mGluR3 antagonist, enhances NMDA receptor expression and function in the normal adult rat prefrontal cortex, but fails to improve working memory and reverse MK801-induced working memory impairment. *Experimental Neurology*, 2015; 273, 190-201.

## **SELECTED AND INVITED TALKS**

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**Ferguson BR.** Exploring Attention Impairments Across Disease States. Bowdoin College, scheduled for April 20, 2021. Invited Seminar.

**Ferguson BR.** Exploring Attention Impairments Across Disease States. University of California San Francisco: UCSF External Postdoc Seminar Series, scheduled for April 15, 2021. Invited Seminar.

**Ferguson BR.** Building Resilience and Finding Your Passion: My Path to Becoming a Neuroscientist. Amherst College, November 11, 2020. Invited Seminar.

**Ferguson BR.** PV Interneuron Dysfunction Mediates Attention Impairments in Absence Epilepsy. University of Minnesota: Neuroscience Seminar Series, November 6, 2020. Invited Seminar.

**Ferguson BR.** Using Social Media to Amplify Black Voices in Neuro and Build Community. Stanford Medicine, 2020 Diversity In Radiology and Molecular Imaging: What We Need to Know, September 9-11, Stanford, CA, 2020. Invited Keynote.

**Ferguson BR** and Huguenard JR. Exploring Attention Impairments in Absence Epilepsy. Thalamocortical Interactions: Gordon Conference, Feb 16-21, Ventura, CA, 2020. Selected short talk.

## **SELECTED CONFERENCE POSTERS**

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**Ferguson BR** and Huguenard JR. PFC PV Interneurons Facilitate Visual Attention and are Disrupted in a Genetic Model of Absence Epilepsy. 59<sup>th</sup> Annual Meeting of the American College of Neuropsychopharmacology, Dec 6-9, Virtual Meeting, 2020.

**Ferguson BR** and Huguenard JR. Exploring Attention Impairments in Absence Epilepsy. Thalamocortical Interactions: Gordon Conference, Feb 16-21, Ventura, CA, 2020. (Poster and selected short talk)

**Ferguson BR** and Gao WJ. The mediodorsal thalamus regulates PFC-dependent cognition and E/I balance through modulation of PV interneuron activity. 46th Annual Meeting of the Society for Neuroscience, Nov 12-16, San Diego, 2016.

**Ferguson BR**, Gao WJ. Exploring the Neural Basis of Working Memory. October 20, 2016. Invited Platform Presentation. Discovery Day. Drexel University College of Medicine.

**Ferguson BR** and Gao WJ. The mediodorsal thalamus regulates prefrontal function and E/I balance through modulation of PV interneuron activity. Optogenetic Approaches to Understanding Neural Circuits and Behavior, July 17-22, Sunday River, Maine, 2016.

**Ferguson BR** and Gao WJ. Downregulation of mediodorsal thalamic activity reduces GABAergic neurotransmission in the medial prefrontal cortex, and impairs cognitive function. 15th Annual Meeting of the Annual Biomedical Research Conference for Minority Students, Nov 11-14, Seattle, 2015.

**Ferguson BR** and Gao WJ. Downregulation of mediodorsal thalamic activity reduces GABAergic neurotransmission in the medial prefrontal cortex, and impairs cognitive function. 45th Annual Meeting of the Society for Neuroscience, Oct 17-22, Chicago, 2015.

Chamberlin L, **Ferguson BR**, Kimock M, Gao WJ. Probing the Excitation/Inhibition Balance in a Rat Model of Schizophrenia: Targeting Excitatory Pyramidal Cells and Cognitive Dysfunction. October 8, 2015. Discovery Day. Drexel University College of Medicine.

**Ferguson BR** and Gao WJ. Downregulation of mediodorsal thalamic activity reduces GABAergic neurotransmission in the medial prefrontal cortex, disrupting the E/I balance, and impairing cognitive function. Inhibition in the CNS: Gordon Conference, Aug 16-21, Bates College, Maine, 2015.

**Ferguson BR** and Gao WJ. DREADDing the mediodorsal thalamus and prefrontal inhibition: potential partners in executive function. 24th Neuropharmacology Conference: GABAergic Signaling in Health and Disease, Nov. 13-14, Washington DC, 2014.

## **SYMPOSIUMS/WORKSHOPS ATTENDED**

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- 2016 Cold Spring Harbor Workshop: Advanced Techniques in Molecular Neuroscience, July 1st-16th  
2014 Translational Neuroscience in Psychiatry Symposium, April 8th  
2014 Society of Biological Psychiatry Symposium, May 7th

## **REFERENCES**

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John Huguenard, Ph.D.  
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