

Shana M. Augustin, Ph.D.

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Education

- 2019-2022 **Postdoctoral Research Fellowship**
National Institutes of Health, Rockville, MD, USA
National Institute on Alcohol Abuse and Alcoholism (NIAAA)
Laboratory for Integrative Neuroscience
Advisor: Dr. David M. Lovinger
- 2014-2019 **Intramural Research Training Award (IRTA) - Postdoctoral Fellowship**
National Institutes of Health, Rockville, MD, USA
National Institute on Alcohol Abuse and Alcoholism (NIAAA)
Laboratory for Integrative Neuroscience
Advisor: Dr. David M. Lovinger
- 2007-2013 **Doctor of Philosophy, Neurobiology**
University of Chicago, Chicago, IL, USA
Division of Biological Sciences
Department of Neurobiology
Advisors: Drs. Xiaoxi Zhuang and Daniel McGehee
- 2002-2006 **Bachelor of Science (Magna cum laude), Biology**
University of the Virgin Islands, St. Thomas, United States Virgin Islands, USA
Advisors: Drs. Richard Hall and Robert Godfrey

Positions and Employment

- 2022-Present Assistant Professor, Department of Pharmacology, Northwestern University Feinberg School of Medicine, Searle 5-568, 320 East Superior Street, Chicago, IL, 60611
- 2021-2022 Adjunct Assistant Professor, Department of Pharmacology, Northwestern University Feinberg School of Medicine, Searle 5-568, 320 East Superior Street, Chicago, IL, 60611
- 2019-2022 Postdoctoral Research Fellow, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, 5625 Fishers Lane, Rockville, MD 20852
- 2014-2019 Intramural Research Training Award - Postdoctoral Fellow, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, 5625 Fishers Lane, Rockville, MD 20852

Research Interest

My ultimate research goal is to better understand the molecular mechanisms underlying synaptic transmission and how G protein-coupled receptor (GPCR) modulation of synaptic efficacy can ultimately contribute to behavior. Much of my work centers on identifying mediators of synaptic plasticity and/or targeted changes in neurotransmitter release in the basal ganglia that may affect action selection and performance. To do this, members of my lab use a variety of techniques, including slice electrophysiology, pharmacology, mouse genetics, cyclic voltammetry, and behavior.

Honors/Awards

- 2023 NIH Early Career Reviewer (ECR) Program
- 2022 American College of Neuropsychopharmacology Past Travel Awardee URM Travel Award
- 2022 NIDA-Center for Underrepresented Research in Addiction (CURA) Scholar Program
- 2021 American College of Neuropsychopharmacology Travel Award
- 2021 Selected as National Institutes of Health Future Research Leader
- 2021 Northwestern University Interdepartmental Neuroscience - Postdoc Spotlight
- 2021 The Grass Foundation Achievement Award

2020	Named 1 of 1000 inspiring Black Scientists in America – <i>Cell Mentor</i>
2020	Selected for the NIH Summer Research Mentor Award (Amgen Scholar Program)
2019	Society for Neuroscience – Leadership Development Program Fellowship
2019	Society for Neuroscience – Trainee Professional Development Award
2019	29 th Annual ICRS Symposium on the Cannabinoids – Postdoctoral Scientific Achievement Award for presentation – “Role of 2-Arachidonoylglycerol in striatal long-term depression and ethanol preference/drinking behavior”
2019	Max Planck Florida Institute for Neuroscience – Neuroimaging Techniques course Travel Fellowship
2018	Summer Research Mentor Award – NIH Amgen Scholar Program
2015-2017	Society for Neuroscience – Neuroscience Scholar Program (Associate member)
2015	Society for Neuroscience – International Brain Research Organization Travel Award
2012	Selected to present at the NIH Graduate Student Research Symposium
2007-2009	University of Chicago – Training in Neural Systems (NIH/T32 GM07839)
2006-2007	Post-baccalaureate Research Education Program Fellowship, Emory University, Atlanta, GA
2005-2006	National Institutes of Health – Minority Access to Research Careers (MARC) Fellowship
2004-2005	National Institutes of Health – Minority Biomedical Research Support-Research Initiative for Scientific Enhancement (MBRS-RISE) Fellowship

Funding

2019-Present	BRAIN Initiative Advanced Postdoctoral Career Transition Award (K99/R00) - \$797,000.00 “Deep brain live imaging of cAMP and protein kinase A activities underlying synaptic- and circuit-level mechanisms during learned behaviors”
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Publications

Published Manuscripts

1. Salinas AG, Lee JO, **Augustin SM**, Zhang S, Patriarchi T, Tian L, Morales M, Mateo Y, Lovinger DM. Distinct sub-second dopamine signaling in dorsolateral striatum measured by genetically encoded fluorescent sensor. Nature Communication. 14(1): 5915.
2. **Augustin SM**, Gracias AL, Luo G, Anumola RC, Lovinger DM (2023) Striatonigral direct pathway 2-arachidonoylglycerol contributes to ethanol effects on synaptic transmission and behavior Neuropsychopharmacology 48(13):1941-1951.
3. Salinas AG, Nadel JA, Mateo Y, Huynh T, **Augustin SM**, Pacak K, Lovinger DM (2022) Chronic ethanol consumption alters presynaptic regulation of dorsal striatal dopamine release. International Journal of Molecular Sciences. 23(19), 10994.
4. **Augustin SM**, Lovinger DM (2022) Synaptic changes induced by cannabinoid drugs and cannabis use disorder. Neurobiology of Disease 167, 105670.
5. Liput DJ, Nguyen TA, **Augustin SM**, Lee JO, Vogel SS. (2020) A guide to fluorescence lifetime microscopy and Förster’s resonance energy transfer in Neuroscience. Current Protocols in Neuroscience 94, e108.do1:10.1002/cpns.108.
6. **Augustin SM**, Loewinger GC, O’Neal TJ, Kravitz AV, Lovinger DM. (2020) Dopamine D2 receptor signaling on iMSNs is required for initiation and vigor of learned actions. Neuropsychopharmacology 45: 2087-2097.
7. Kupferschmidt DA, **Augustin SM**, Johnson KA, Lovinger DM (2019) Active zone proteins RIM1 α β are required for normal corticostriatal plasticity and action control. Journal of Neuroscience 39(8): 1457-1470.
8. **Augustin SM**, Chancey JH, Lovinger DM (2018) Dual dopaminergic regulation of corticostriatal plasticity by cholinergic interneurons and indirect pathway medium spiny neurons. Cell Reports 24(11):2883-2893.
9. **Augustin SM**, Lovinger DM (2018) Functional relevance of endocannabinoid-dependent synaptic plasticity in the central nervous system. ACS Chemical Neuroscience 9(9):2146-2161.
10. Shonesy BC, Parrish WP, Haddad H, Stephenson JR, Báldi R, Bluett RJ, Marks CR, Centanni SW, Folkes OM, Spiess K, **Augustin SM**, Mackie K, Lovinger DM, Winder DG, Patel S, Colbran RJ (2018) Role of

striatal direct pathway 2-archidonoylglycerol signaling in sociability and repetitive behavior. Biological Psychiatry 84(4):304-315.

11. **Augustin SM**, Beeler JA, McGehee DS, Zhuang X (2014) Cyclic AMP and afferent activity govern bidirectional synaptic plasticity in striatopallidal neurons. Journal of Neuroscience 34(19):6692-9.

Published Lectures

1. **Augustin SM** (2020) Real-time monitoring of striatal GPCR mediated cAMP signaling using genetically encoded fluorescent sensors. LabRoots Neuroscience 2020.
2. **Augustin SM**, Lemos JC (2018) Module 7: Technical considerations for optogenetics experiments. Society for Neuroscience online Optogenetics Training Series, 2018.

Invited Talks (selected)

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| 2023 | Northwestern University – Department of Pharmacology Retreat: Diversifying Science – “Synapses, circuits, and motivated behaviors: striatal neuromodulation of GPCRs” |
| 2023 | Gordon Research Conference – Cannabinoid Functions in CNS, Synaptic Effects of (Endo) cannabinoids - “From circuits to synapses: interactions between alcohol and the endocannabinoid system” |
| 2023 | Wayne State University – Expanded Programming for Interdisciplinary Collaboration to Create Unique Research Missions (EPIC-URM) – “Synapse specific interactions between ethanol and the endocannabinoid system” |
| 2022 | University of Chicago NIDA T32 Annual Retreat
“From circuits to synapses: interactions between alcohol and the endocannabinoid system” |
| 2022 | Division of Neurology at Ann and Robert H. Lurie Children’s Hospital of Chicago - The Interdisciplinary Lecture Series in Neuroscience for The Department of Pediatrics – “From neuronal circuits to synapses: interactions between alcohol and the endocannabinoid system” |
| 2022 | CURA and MINDS – The See Me, Hear Me Conference
“Synapse-specific endocannabinoid circuit map in the Globus Pallidus” |
| 2021 | National Institutes of Health Future Research Leader Conference, virtual conference
“Deep brain optical imaging of subcellular signaling underlying synaptic- and circuit-level mechanisms during learned behaviors” |
| 2021 | Research Society on Alcoholism Symposium- Assessing ethanol effects on cortical and striatal Function with novel fluorescent biosensors, virtual conference
“A tale of two approaches: striatal endocannabinoids and ethanol exposure” |
| 2021 | Princeton University- Princeton Neuroscience Institute
“Striatal neuromodulation of GPCRs and its behavioral implications” |
| 2021 | University of Pittsburgh School of Medicine- Center for the Neural Basis of Cognition
“Dopamine modulation of corticostriatal plasticity and its behavioral implications” |
| 2021 | Oregon Health Science University- Oregon National Primate Research Center
“Endocannabinoid-dependent striatal neuromodulation” |
| 2021 | Vanderbilt University- Biological Sciences Arts & Science
“Striatal GPCR-based neuromodulation and its behavioral implications” |
| 2020 | Northwestern University- Feinberg School of Medicine, Department of Physiology |

- “Striatal neuromodulation of GPCRs and its behavioral implications”
- 2020 University of Texas at Austin- Department of Neuroscience
“Striatal neuromodulation of GPCRs and its behavioral implications”
- 2020 University of California, Los Angeles- Integrative Center for Addiction
“Recap for Staying Connected: A Virtual Postdoctoral Seminar Series”
- 2020 LabRoots Neuroscience 2020 virtual conference – NIH BRAIN initiative: A Multidisciplinary Approach to Neuroscience
“Real-time monitoring of striatal GPCR mediated cAMP signaling using genetically-encoded fluorescent sensors”

Service

External Committee

- 2022 – Present The BRAIN Initiative Meeting- Program Committee
2023 – Present The BRAIN Initiative -Training and Diversity, Equity, Inclusion and Accessibility (DEIA)

Internal Faculty Leadership and Committee

- 2021 – Present Admissions Committee, Northwestern University Interdepartmental Neuroscience program
2022 – Present Qualifying Exam Committee, Northwestern University Interdepartmental Neuroscience program
2022 – Present Thesis Committee, Northwestern University Interdepartmental Neuroscience program

Peer Journal Reviewer/Collaborative Reviewer –

NeuroReport, Journal of Neuroscience, Neuropsychopharmacology, Psychopharmacology

Academic/Research Positions

Instructor

- 2023 CURA and MINDS – The See Me, Hear Me Conference
2018 Online Optogenetics Training Modules, Society for Neuroscience (SFN)
2015,2016 Summer Intern Journal Club, National Institutes of Health (NIH)
2011 – 2013 Science and Technology Outreach and Mentoring Program (grades K-4), University of Chicago

Program Manager (University of Chicago-STEM Education)

- 2013 – 2014 Science and Technology Outreach and Mentoring Program

Research Mentor/Trainer

- 2022 – Present Clinical fellow, Graduate students, Postbaccalaureate students, Visiting students, Augustin lab, Northwestern University Feinberg School of Medicine
2014 – 2022 Visiting Students, Postbaccalaureate Students, Graduate/Undergraduate Students, Guest Researcher, Postdoctoral Fellows, National Institute on Alcohol Abuse and Alcoholism (NIAAA)
2009 – 2013 Graduate/Undergraduate Students, University of Chicago

Professional Membership

- 2022 – Present Research Society on Alcoholism
2022 – Present European Brain and Behaviour Society (EBBS), FENS
2019 – 2021 International Cannabinoid Research Society
2009 – Present Society for Neuroscience