# David A.A. Baranger, Ph.D.

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# Education and Work

Washington University in St Louis, St Louis MO (09/2021 - Present) Postdoctoral Research Associate – Arpana Agrawal, Ph.D. Topic: Brain and behavioral correlates of genetic risk for substance use throughout development. University of Pittsburgh, Pittsburgh PA (09/2020 – 08/2021) Postdoctoral Scholar - Anna Manelis, Ph.D. Topic: Machine-learning based prediction of depressive disorders using neuroimaging data. University of Pittsburgh, Pittsburgh PA (09/2018 – 08/2020) Postdoctoral Fellow - Erika Forbes, Ph.D. Topic: Neurodevelopment of reward circuitry in adolescence and associations with depression. Washington University in St Louis, St Louis MO (08/2012 - 08/2018) Ph.D., Neuroscience; Advisors: Ryan Bogdan, Ph.D.; Deanna Barch, Ph.D. Dissertation: Evaluation of neurobiological risk factors for alcohol consumption. National Institute of Mental Health, Bethesda MD (06/2010 - 06/2012) Research Assistant – Joseph Callicott, M.D. Duke University, Durham NC (06/2009 – 05/2010) Research Intern – Joseph McClernon, Ph.D. Wesleyan University, Middletown CT (08/2006 - 05/2010) B.A., Neuroscience and Behavior, Science in Society Program; Student Researcher - Matthew Kurtz, Ph.D. **Research Funding** · 2018 T32 Postdoctoral Fellowship – IMPACT (Innovative Methods in Pathogenesis and Child Treatment) MH018951

- · 2014 National Science Foundation Graduate Research Fellowship (GRF) DGE1143954
- · 2013 T32 Systems and Molecular Neurobiology GM008151

## <u>Awards</u>

· 2018 Society of Biological Psychiatry Predoctoral Travel Fellowship Award

- · 2017 crowdAl Machine Learning OpenSNP Height Prediction Competition 1st Place Award
- · 2017 Spring WUSTL Graduate Student Senate Travel Award
- · 2015 Fine Science & Merlie Traveling Fellowship
- · 2015 Mortimer D. Sackler, M.D., Summer Institute Fellow
- · 2015 WUSTL Graduate Research Symposium 2<sup>nd</sup> Place Poster in Science & Award
- · 2015 International Imaging Genetics Conference 2<sup>nd</sup> Place Poster & Travel Award
- · 2014 International Imaging Genetics Conference 2<sup>nd</sup> Place Poster & Travel Award
- · 2013 Fine Science & Merlie Traveling Fellowship
- · 2010 National Institutes of Health Intramural Research Training Award (IRTA) Fellowship
- · 2008 Summer Undergraduate Research Fellowship (SURF) Cincinnati Children's Hospital

#### **Research Publications**

- 30. **Baranger DAA**, Finsaas MC, Goldstein BL, Vize CE, Lynam DR, Olino TM. <u>Tutorial: Power analyses for interaction</u> <u>effects in cross-sectional regressions</u>. *Advances in Methods and Practices in Psychological Science* (2023). Accepted.
- 29. Miller, A. P., **Baranger, D. A. A.**, Paul, S. E., Hatoum, A. S., Rogers, C., Bogdan, R. & Agrawal, A. <u>Characteristics</u> <u>Associated with Cannabis Use Initiation by Late Childhood and Early Adolescence in the Adolescent Brain Cognitive</u> <u>Development (ABCD) Study.</u> *JAMA Pediatrics* (2023) Epub ahead of print. doi: 10.1001/jamapediatrics.2023.1801
- 28. **Baranger DAA**, Hatoum AS, Polimanti R, Gelernter J, Edenberg HJ, Bogdan R, Agrawal A. <u>Multi-omics cannot</u> replace sample size in genome-wide association studies. *Genes, Brain, and Behavior* (2023) e12846. doi:10.1111/gbb.12846
- Gorelik AJ, Paul SE, Karche, NR, Johnson EC, Nagella I, Blaydon L, Modi H, Hansen IS, Colbert SMC, Baranger DAA, Norton S, Spears I, Gordon B, Wei Z, Hill P, Oltmanns TF, Bjisterbosch JD, Argawal A, Hatoum AS,\* Bogdan R\*. <u>A Phenome-Wide Association Study (Phewas) Of Late Onset Alzheimer Disease Genetic Risk in Children of European Ancestry at Middle Childhood: Results from the ABCD Study.</u> *Behavior Genetics* (2023) 53: 249-264. Doi: 10.1007/s10519-023-10140-3.

- Johnson EC, Paul SE, Baranger DAA, Hatoum AS, Colbert SMC, Lin S, Wolff R, Gorelik AJ, Hansen I, Karcher NR, Bogdan R, Agrawal A. <u>Characterizing Alcohol Expectancies in the ABCD Study: Associations with Sociodemographic Factors, the Immediate Social Environment, and Genetic Propensities</u>. *Behavior Genetics* (2023). 53: 265-278. doi: 10.1007/s10519-023-10133-2.
- Hatoum AS, Colbert SMC, Johnson EC [et al. including Baranger DAA]. <u>Multivariate genome-wide association</u> <u>meta-analysis of over 1 million subjects identifies loci underlying multiple substance use disorders.</u> Nature Mental Health (2023). 1, 210–223. doi: 10.1038/s44220-023-00034-y.
- 24. **Baranger DAA**, Paul SE, Colbert SMC, Karcher NR, Johnson EC, Hatoum AS, Bogdan R. <u>Increased mental health</u> <u>burden associated with prenatal cannabis exposure persists from childhood to early adolescence: Longitudinal</u> <u>results from the Adolescent Brain Cognitive Development (ABCD) study</u>. *JAMA Pediatrics* (2022). 1;176(12):1261-1265. doi: 10.1001/jamapediatrics.2022.3191.
- 23. Vize CE, **Baranger DAA**, Finsaas MC, Goldstein BL, Olino TM, Lynam DR. <u>Moderation Effects in Personality</u> <u>Disorder Research</u>. *Personality Disorders: Theory, Research, and Treatment*. (2022) 14(1), 118–126. doi: 10.1037/per0000582
- Karcher NR, Paul SE, Johnson EC, Hatoum AS, Baranger DAA, Thompson WK, Barch DM, Bogdan R. <u>Psychotic-like experiences and polygenic liability in the ABCD Study</u>. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2022) 7(1), 45-55. doi: 10.1016/j.bpsc.2021.06.012.
- Baranger DAA, Halchenko YO, Satz S, Ragozzino R, Iyengar S, Swartz HA, Manelis A. <u>Protocol for a machine learning algorithm predicting depressive disorders using the T1w/T2w ratio</u>. *MethodsX* (2021) 8, 101595. doi: 10.1016/j.mex.2021.101595.
- Baranger DAA, Halchenko YO, Satz S, Ragozzino R, Iyengar S, Swartz HA, Manelis A. <u>Aberrant levels of cortical</u> myelin distinguish individuals with depressive disorders from healthy controls. *Neuroimage: Clinical* (2021) 32, 102790. doi: 10.1016/j.nicl.2021.102790.
- Hatoum AS, Johnson EC, Baranger DAA, Paul SE, Agrawal A, Bogdan R. <u>Polygenic risk scores for commonly</u> <u>used substances predict brain structural differences in drug naïve children</u>. *Genes, Brain, and Behavior* (2021) 20 (6), e12756. doi: 10.1111/gbb.12756.
- 18. **Baranger DAA**, Lindenmuth M, Nance M, Guyer AE, Keenan K, Hipwell AE, Shaw DS, Forbes EE. <u>The longitudinal</u> <u>stability of fMRI activation during reward processing in adolescents and young adults</u>. *Neuroimage* (2021) 232, 117872. doi: 10.1016/j.neuroimage.2021.117872
- Bondy E, Baranger DAA, Balbona J, Sputo K, Paul SE, Oltmanns T, Bogdan R. <u>Neuroticism and Reward-related</u> <u>Ventral Striatum Activity: Probing Vulnerability to Stress-Related Depression</u>. *Journal of Abnormal Psychology* (2021) 130(3), 223–235. doi: 10.1037/abn0000618.
- Schweinsberg M, Feldman M, Staub N [et al. including Baranger DAA]. <u>Same data, different conclusions: Radical</u> dispersion in empirical results when independent analysts operationalize and test the same hypothesis. Organizational Behavior and Human Decision Processes (2021) 165(1) 228-249. doi: 10.1016/j.obhdp.2021.02.003.
- 15. Johnson EC, Demontis D, Thorgeirsson TE, [et al. including **Baranger DAA**]. <u>Genome-wide association study meta-</u> analysis of cannabis use disorder in over 380,000 individuals reveals distinct genetic architectures of cannabis use and use disorder. *The Lancet Psychiatry* (2020) 7(12) 1032-1045. doi: 10.1016/S2215-0366(20)30339-4.
- 14. **Baranger DAA**, Few LR, Sheinbein D, Agrawal A, Oltmanns TF, Knodt AR, Barch DM, Hariri AR, Bogdan R. <u>Borderline personality disorder traits are not associated with brain structure in two large independent samples</u>. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2020) 5(7) 669-677. doi: 10.1016/j.bpsc.2020.02.006.
- Baranger DAA, Demers CH, Elsayed NM, Knodt AR, Radtke SR, Desmarais A, Few LR, Agrawal A, Heath AC, Barch DM, Squeglia LM, Williamson DE, Hariri AR, Bogdan R. <u>Convergent evidence for predispositonal effects of</u> <u>brain volume on alcohol consumption</u>. *Biological Psychiatry* (2020) 87(7):645-655. doi: 10.1016/j.biopsych.2019.08.029
- 12. Karcher NR, Barch DM, Demers CH, **Baranger DAA**, Heath AC, Lynskey MT, Agrawal A. <u>Genetic Predisposition vs</u> <u>Individual-Specific Processes in the Association Between Psychotic-like Experiences and Cannabis Use</u>. *JAMA Psychiatry*, (2019) 76(1):87-94. doi:10.1001/jamapsychiatry.2018.2546
- 11. Bogdan R, **Baranger DAA**, Agrawal A. <u>Polygenic risk scores in clinical psychology: Bridging genomic risk to</u> <u>individual differences</u>. *Annual Review of Clinical Psychology*, (2018) 14. doi:10.1146/annurev-clinpsy-050817-084847.
- Sheahan T, Valtcheva M, McIlvried L, Pullen M, Baranger DAA, Gereau IV R. <u>Metabotropic glutamate receptor 2/3</u> (mGluR2/3) activation suppresses TRPV1 sensitization in mouse, but not human sensory neurons. eNeuro (2018) 0412-17.2018; doi: 10.1523/ENEURO.0412-17.2018
- 9. Agrawal A, Chou Y, Carey C, **Baranger DAA**, Zhang B, Sherva R, Wetherill L, Lynskey MT, Bierut L, Degenhardt L, Farrer L, Gelernter J, Hariri AR, Heath A, Kranzler H, Madden PAF, Martin NG, Montgomery G, Porjesz B, Wang

T, Edenberg HJ, Foroud T, Goate AM, Bogdan R, Nelson E. <u>Genomewide association study identifies novel locus</u> for cannabis dependence. *Molecular Psychiatry*, (2017) 23, 1293–1302 doi:10.1038/mp.2017.200

- 8. Michalski LJ, Demers CH, **Baranger DAA**, Barch DM, Harms MP, Burgess G, Bogdan R. <u>Perceived stress is</u> associated with increased rostral middle frontal gyrus cortical thickness: A family-based and discordant sibling investigation. *Genes, Brain, and Behavior*, (2017) 16(8):781-789. doi:10.1111/gbb.12404
- 7. **Baranger DAA**, Margolis S, Hariri AR, Bogdan R. <u>An earlier time of scan is associated with greater threat-related</u> <u>amygdala reactivity</u>. *Social, Cognitive, and Affective Neuroscience*, (2017) 12(8), 1272-1283. doi:10.1093/scan/nsx057
- 6. **Baranger DAA**, Ifrah C, Prather AA, Carey CE, Corral- Frías NS, Conley ED, Hariri AR, Bogdan R. <u>PER1 rs3027172</u> <u>Genotype Interacts with Early Life Stress to Predict Problematic Alcohol Use, but Not Reward-Related Ventral</u> <u>Striatum Activity</u>. *Frontiers in Psychology*, (2016) 7(3), 1–10. doi:10.3389/fpsyg.2016.00464
- 5. Bogdan R, Pagliaccio D, **Baranger DAA**, Hariri AR. <u>Genetic moderation of stress effects on the corticolimbic circuit</u>. *Neuropsychopharmacology* (2015) 41(7), 275–296. doi:10.1038/npp.2015.216
- 4. Arnedo J, Mamah D, **Baranger DAA**, Harms MP, Barch DM, Svrakic D, de Erausquin GA, Cloninger CR. <u>Decomposition of brain diffusion imaging data uncovers latent schizophrenias with distinct patterns of white matter</u> <u>anisotropy</u>. *Neuroimage* (2015) 120, 43-54. doi:10.1016/j.neuroimage.2015.06.083
- 3. Corral-Frías NS, Nikolova YS, Michalski L, **Baranger DAA**, Hariri AR, Bogdan R. <u>Stress-related anhedonia is</u> <u>associated with reward-related ventral striatum reactivity and transdiagnostic psychiatric symptomatology</u>. *Psychological Medicine* (2015) 45(12), 2605–17. doi:10.1017/S0033291715000525
- Callicott JH, Feighery EL, Mattay VS, White MG, Chen Q, Baranger DAA, Berman KF, Lu B, Hongjun S, Ming G, Weinberger DR. <u>DISC1 and SLC12A2 interaction affects human hippocampal function and connectivity</u>. *Journal of Clinical Investigation* (2013) 123(7), 2961-2964. doi:10.1172/JCI67510
- 1. Addicott MA, **Baranger DAA**, Kozink RV, Smoski MJ, Dichter GS, McClernon JF. <u>Smoking withdrawal is associated</u> with increases in brain activation during decision making and reward anticipation. *Psychopharmacology* (2012) 219(2), 563–573. doi:10.1007/s00213-011-2404-3

# Preprints and submitted publications

- 5. **Baranger DAA**, Lindenmuth M, Yoon L, Guyer AE, Keenan K, Hipwell AE, Forbes EE. <u>Accelerated neurodevelopment</u> <u>of reward anticipation processing in adolescent girls with depression.</u> (Submitted)
- 4. Paul SE, Colbert SMC, Gorelik AJ, Hansen IS, Nagella I, Blaydon L, Hornstein A, Johnson EC, Hatoum AS, Baranger DAA, Elsayed NM, Barch DM, Bogdan R, Karcher NR. <u>Phenome-wide Investigation of Behavioral, Environmental, and Neural Associations with Cross-Disorder Genetic Liability in Youth of European Ancestry</u>. *medRxiv* (2023). doi: 10.1101/2023.02.10.232857.
- 3. Norton SA, Voss M, **Baranger DAA**, Bondy E, Rodrigues M, Hansen I, Paul SE, Edershile E, Rodebaugh T, Oltmanns TF, Bogdan R. <u>Reliability of Diurnal Salivary Cortisol Metrics in a Community Sample of Older Adults</u>. (Submitted)
- 2. **Baranger DAA**, Paul SE, Hatoum AS, Bogdan R. <u>Alcohol use and brain structure: Disentangling predispositional and causal contributions in human studies.</u> (Submitted)
- 1. Naret O, **Baranger DAA**, Mohanty SP, Tzovaras BG, Salathé M, Fellay J, with the openSNP and crowdAl community. <u>Phenotype prediction from genome-wide genotyping data: a crowdsourcing experiment</u>. *bioRxiv* (2020) doi: 10.1101/2020.08.25.265900

## **Invited Publications**

1. **Baranger DAA**, Bogdan R. <u>Editorial: Causal, Predispositional, or Correlate? Group Differences in Cognitive</u> <u>Control-Related Brain Function in Cannabis-Using Youth Raise New Questions</u>. *JAACAP*. (2019) 58(7):665-667 doi: 10.1016/j.jaac.2019.05.018

## Scientific Software

InteractionPoweR - https://dbaranger.github.io/InteractionPoweR/

A power analysis software package for interactions (a.k.a. moderation analysis) in cross-sectional datasets, written in R.

## Invited Talks

- 7. **Baranger DAA**. <u>Power analyses for cross-sectional tests of interaction/moderation effects.</u> Washington University in St. Louis, Clinical Science Seminar, Virtual Presentation, October 2022.
- 6. **Baranger DAA**. <u>Multi-omics analyses cannot identify true-positive novel associations from underpowered genome-</u> wide association studies of four brain-related traits. ABCD Genomics Working Group, Virtual Presentation, May 2022

- 5. **Baranger DAA**. <u>Multi-omics analyses cannot identify true-positive novel associations from underpowered genome-</u> wide association studies of four brain-related traits. Washington University School of Medicine, Psychiatry Research Seminar, Virtual Presentation, February 2022.
- 4. **Baranger DAA**. <u>Can omics data replace adequate human sample size? Results from multiple post-GWAS omics methods</u>. How can we leverage AI/ML, and Omics Data to better Understand the Genetics of Addiction? NIDA Virtual Meeting, December 2021.
- 3. **Baranger DAA**. Evaluating Neural and Behavioral Markers of Psychiatric Risk. Developmental Affective Science Collective, University of Pittsburgh, May 2017.
- 2. **Baranger DAA.** Orexin/hypocretin system polygenic risk scores predict amygdala reactivity in two samples. Presented at the 2016 Society of Biological Psychiatry conference, Atlanta, GA, May 2016.
- 1. **Baranger DAA.** Borderline personality disorder traits are not associated with gray matter volume in two large independent samples. Presented at the 2016 Society of Biological Psychiatry conference, Atlanta, GA, May 2016.

#### Selected Conference Abstracts

- 12. **Baranger DAA**, Paul SE, Colbert SMC, Karcher NR, Johnson EC, Hatoum AS, Bijsterbosch JD, Bogdan R. Increased mental health burden associated with prenatal cannabis exposure persists from childhood to early adolescence, but is not mediated by grey matter or rs-fMRI. Presented at the Society of Biological Psychiatry 2023 Annual Meeting, San Diego, CA, April 2023.
- 11. **Baranger DAA**, Hatoum AS, Polimanti R, Gelernter J, Edenberg HJ, Bogdan R, Agrawal A. <u>Multi-omics analyses</u> cannot identify true-positive novel associations from underpowered genome-wide association studies of four brainrelated traits. Presented at the Society of Biological Psychiatry 2022 Annual Meeting, New Orleans, LA, April 2022.
- 10. **Baranger DAA**, Halchenko YO, Satz S, Ragozzino R, Iyengar S, Swartz HA, Phillips ML, Manelis A. <u>Aberrant</u> <u>levels of cortical myelin distinguish individuals with unipolar depression from healthy controls</u>. Presented at the Society of Biological Psychiatry 2021 Annual Meeting, Virtual Meeting, April 2021.
- 9. **Baranger DAA**, Lindenmuth M, Guyer AE, Keenan K, Hipwell AE, Forbes EE. <u>Developmental trajectories of reward</u> <u>anticipation: traumatic experiences & depression</u>. Presented at the 2019 Developmental and Affective Neuroscience Symposium, Pittsburgh, PA, November 2019.
- 8. **Baranger DAA**, Nance M, Lindenmuth M, Hipwell AE, Guyer AE, Shaw DS, Forbes EE. <u>A systematic exploration</u> of the long-term reliability of monetary gain and loss fMRI activation. Presented at the 2019 Society of Biological Psychiatry conference, Chicago, IL, May 2019.
- 7. Baranger DAA, Demers CH, Elsayed NM, Knodt AR, Radtke SR, Desmarais A, Few LR, Agrawal A, Heath AC, Barch DM, Squeglia LM, Williamson DE, Hariri AR, Bogdan R. <u>Convergent evidence for predispositonal effects of brain volume on alcohol consumption</u>. Presented at the 2018 Society of Biological Psychiatry conference, New York, NY, May 2018.
- 6. **Baranger DAA**, Margolis S, Hariri AR, Bogdan R. <u>Evidence for diurnal variation of threat-related amygdala</u> <u>reactivity</u>. Presented at the 2016 International Imaging Genetics Conference, January 2016, Irvine, CA.
- Baranger DAA, Carey CE, Margolis S, Conley EMD, Hariri AR, Bogdan R. <u>A random forest circadian gene-set</u> analysis component interacts with childhood stress to predict bilateral amygdala reactivity to faces. Presented at the 2015 International Imaging Genetics Conference, January 2015, Irvine, CA.
- 4. Baranger DAA, Drabant EMD, Bogdan R, and Hariri AR. <u>PER2 circadian gene functional polymorphism</u> <u>rs11894491 moderates amygdala reactivity in the context of early life stress</u>. Presented at the 2014 Society for Research in Psychopathology meeting, September 2014, Evanston, Illinois.
- Baranger DAA, Ifrah C, Prather AA, Carey CE, Corral- Frías NS, Conley EMD, Hariri AR, Bogdan R, <u>PERIOD1</u> rs3027172 is associated with increased risk for problematic drinking in the context of early life stress. Presented at the 2014 International Imaging Genetics Conference, January 2014, Irvine, CA.
- Baranger DAA, Yates WD, White M, Chgen Q, Rasetti R, Mattay VS, Weinberger DR, Callicott JH; <u>DISC1</u> <u>Leu607Phe and Ser704Cys interact to reduce prefrontal-hippocampal coupling during a working memory task</u>. Presented at the 2012 Society of Biological Psychiatry conference, Philadelphia, PA, May 2012.
- 1. **Baranger DAA**, Feighery EL, Dickinson DD, Rasetti R, Sust S, Zoltick B, Chen Q, Rypma B, Mattay VS, Weinberger DR, Callicott JH; <u>COMT Val158Met polymorphism modulates prefrontal cortical efficiency in a processing speed</u> task. Presented at the 2011 Society for Neuroscience conference, Washington, DC, November 2011.

## <u>Teaching</u>

· Workshop Instructor & Organizer,	2023
Power Analyses for Interaction Effects in Cross-Sectional Samples	
To be held at the 2023 Society for Research in Psychopathology Meeting, St. Louis, MO	
· Guest Lecturer, Topics in Neuroscience	2022, 2023

<ul> <li>University of Pittsburgh – "Alcohol and the brain"</li> <li>Guest Lecturer, Atypical Development in Childhood and Adolescence Rutgers University - "Early life stress, mental health, and brain development"</li> <li>Guest Lecturer, Introduction to Neuroscience</li> </ul>	2021, 2022 2021
<ul> <li>University of Pittsburgh - "Reward and Addiction"</li> <li>Workshop Instructor, Interface of Psychology, Neuroscience, and Genetics</li> <li>3-day workshop on applying modern genetics techniques in mental-health research</li> <li>Developed and lead primary workshop demonstration, and lectured on advanced</li> <li>methods in human statistical genetics</li> </ul>	2017
• Guest Lecturer, Molecular Biology at the Cutting-Edge Washington University in St. Louis - "Neuroimaging and Genetics"	2016, 2017
<ul> <li>Community Member, Washington University Center for the Integration of Research, Teaching, and Learning (WU-CIRTL)</li> <li>Completed annual workshops on evidence-based and inclusive teaching strategies.</li> </ul>	2014 – 2017
· Peer Mentor, BP-ENDURE St. Louis Neuroscience Pipeline	2016
<ul> <li>Bench Mentor, BP-ENDURE St. Louis Neuroscience Pipeline The ENDURE program prepares undergraduates from diverse backgrounds for neuroscience PhD programs.</li> </ul>	2015
<ul> <li>Teaching Assistant, Systems Neuroscience (course instructor: Dr. Lawrence Snyder) Gave guest lecture and demonstration on "Non-invasive Neuroimaging", lead discussions and review sessions</li> </ul>	2014
· Science Tutor, Young Scientist Program: Summer Focus	2013

#### Mentored graduate students

Sarah Paul, Hailey Modi

#### Mentored undergraduate students

Chloé Ifrah\*, Orma Ravindranath, Seth Margolis\*, Daniel Sheinbein\*, Patrick England, Samantha Kahn, Aline Desmarais\*, Sid Dalal\*, Kendall Sputo\*, William Pan, Corey Meehan, Yueyue 'Lydia' Qu.

\* = co-author on at least one manuscript

#### **Professional Service**

<ul> <li>Representative, Center for the Neural Basis of Cognition (CNBC) Postdoctoral Committee</li> <li>Co-organizer, 1<sup>st</sup> Washington University 'BrainHack' Hackathon</li> <li>Student representative, Cognitive, Computational, and Systems Neuroscience (CCSN) Mini-Retreat Committee</li> <li>Student representative, Neuroscience Program Retreat Committee</li> </ul>	2019 – 2021 2017 2014 – 2017 2013 – 2017
Outreach	2019 - 2021
<ul> <li>Freelance Science Communicator, Massive Science</li> <li>Neuroscience Team Leader, Young Scientist Program</li> <li>Organized volunteers and gave demonstrations at Washington University,</li> <li>St. Louis area schools, and public events, for students (K-12) and community members,</li> <li>reaching over 3,000 people.</li> </ul>	2019 - 2021 2012 – 2017
<ul> <li>Volunteer, Youth Exploring Science Weekend neuroscience experience for disadvantaged high school students.</li> </ul>	2012 – 2013
Professional Memberships · Flux Society · Society of Biological Psychiatry	2019 – Present 2018 – Present

#### Ad-Hoc Reviewer

Addiction | Alcoholism: Clinical and Experimental Research | American Journal of Medical Genetics Part B: Neuropsychiatric Genetics | American Journal of Psychiatry | Biological Psychiatry | Biological Psychiatry: Cognitive Neuroscience and Neuroimaging | Biological Psychiatry: Global Open Science | Cognitive, Affective, and Behavioral Neuroscience | Cortex | Developmental Cognitive Neuroscience | Emotion | Genes, Brain, and Behavior | Journal of Addictive Diseases | Journal of

Clinical Psychiatry | Neuroimage | Neuroimage: Clinical | Neuropsychologia | Neuropsychopharmacology | Personality and Individual Differences | PLOS One | Psychosomatic Medicine | Royal Society Open Science | Scientific Reports | Stress and Health | Social, Cognitive, and Affective Neuroscience.

See Web of Science profile