

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

Postdoctoral Research Associate, Washington University in St. Louis, Psychiatry Department  
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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

## Awards

- 2018 Society of Biological Psychiatry Predoctoral Travel Fellowship Award
- 2017 crowdAI Machine Learning OpenSNP Height Prediction Competition 1<sup>st</sup> 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

23. Vize CE, **Baranger DAA**, Finsaas MC, Goldstein BL, Olino TM, Lynam DR. Moderation Effects in Personality Disorder Research. *Personality Disorders: Theory, Research, and Treatment*. (Accepted)
22. Karcher NR, Paul SE, Johnson EC, Hatoum AS, **Baranger DAA**, Thompson WK, Barch DM, Bogdan R. Psychotic-like experiences and polygenic liability in the ABCD Study. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2022) 7(1), 45-55. doi: 10.1016/j.bpsc.2021.06.012.
21. **Baranger DAA**, Halchenko YO, Satz S, Ragozzino R, Iyengar S, Swartz HA, Manelis A. Protocol for a machine learning algorithm predicting depressive disorders using the T1w/T2w ratio. *MethodsX* (2021) 8, 101595. Doi: 10.1016/j.mex.2021.101595.
20. **Baranger DAA**, Halchenko YO, Satz S, Ragozzino R, Iyengar S, Swartz HA, Manelis A. Aberrant levels of cortical myelin distinguish individuals with depressive disorders from healthy controls. *Neuroimage: Clinical* (2021) 32, 102790. doi: 10.1016/j.nicl.2021.102790.
19. Hatoum AS, Johnson EC, **Baranger DAA**, Paul SE, Agrawal A, Bogdan R. Polygenic risk scores for commonly used substances predict brain structural differences in drug naïve children. *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. The longitudinal stability of fMRI activation during reward processing in adolescents and young adults. *Neuroimage* (2021) 232, 117872. doi: 10.1016/j.neuroimage.2021.117872
17. Bondy E, **Baranger DAA**, Balbona J, Sputo K, Paul SE, Oltmanns T, Bogdan R. Neuroticism and Reward-related Ventral Striatum Activity: Probing Vulnerability to Stress-Related Depression. *Journal of Abnormal Psychology* (2021) 130(3), 223–235. doi: 10.1037/abn0000618.
16. Schweinsberg M, Feldman M, Staub N [et al. including **Baranger DAA**]. Same data, different conclusions: Radical 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**]. Genome-wide association study meta-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. Borderline personality disorder traits are not associated with brain structure in two large independent samples. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2020) 5(7) 669-677. doi: 10.1016/j.bpsc.2020.02.006.
13. **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. Convergent evidence for predispositional effects of brain volume on alcohol consumption. *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. Genetic Predisposition vs Individual-Specific Processes in the Association Between Psychotic-like Experiences and Cannabis Use. *JAMA Psychiatry*, (2019) 76(1):87-94. doi:10.1001/jamapsychiatry.2018.2546
11. Bogdan R, **Baranger DAA**, Agrawal A. Polygenic risk scores in clinical psychology: Bridging genomic risk to individual differences. *Annual Review of Clinical Psychology*, (2018) 14. doi:10.1146/annurev-clinpsy-050817-084847.
10. Sheahan T, Valtcheva M, McIlvried L, Pullen M, **Baranger DAA**, Gereau IV R. Metabotropic glutamate receptor 2/3 (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. Genomewide association study identifies novel locus 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. Perceived stress is 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. Evidence for Diurnal Variation of Threat-related Amygdala Reactivity. *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. PER1 rs3027172 Genotype Interacts with Early Life Stress to Predict Problematic Alcohol Use, but Not Reward-Related Ventral Striatum Activity. *Frontiers in Psychology*, (2016) 7(3), 1–10. doi:10.3389/fpsyg.2016.00464
5. Bogdan R, Pagliaccio D, **Baranger DAA**, Hariri AR. Genetic moderation of stress effects on the corticolimbic circuit. *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. Decomposition of brain diffusion imaging data uncovers latent schizophrenias with distinct patterns of white matter anisotropy. *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. Stress-related anhedonia is associated with reward-related ventral striatum reactivity and transdiagnostic psychiatric symptomatology. *Psychological Medicine* (2015) 45(12), 2605–17. doi:10.1017/S0033291715000525
2. Callicott JH, Feighery EL, Mattay VS, White MG, Chen Q, **Baranger DAA**, Berman KF, Lu B, Hongjun S, Ming G, Weinberger DR. DISC1 and SLC12A2 interaction affects human hippocampal function and connectivity. *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. Smoking withdrawal is associated with increases in brain activation during decision making and reward anticipation. *Psychopharmacology* (2012) 219(2), 563–573. doi:10.1007/s00213-011-2404-3

## Invited Publications

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

## Preprints

3. **Baranger DAA**, Hatoum AS, Polimanti R, Gelernter J, Edenberg HJ, Bogdan R, Agrawal A. Multi-omics analyses cannot identify true-positive novel associations from underpowered genome-wide association studies of four brain-related traits. *bioRxiv* (2022) doi: 10.1101/2022.04.13.487655
2. Hatoum AS, Colbert SMC, Johnson EC [et al. including **Baranger DAA**]. Multivariate genome-wide association meta-analysis of over 1 million subjects identifies loci underlying multiple substance use disorders. *MedRxiv* (2022). doi: 10.1101/2022.01.06.22268753
1. Naret O, **Baranger DAA**, Mohanty SP, Tzovaras BG, Salathé M, Fellay J, with the openSNP and crowdAI community. Phenotype prediction from genome-wide genotyping data: a crowdsourcing experiment. *bioRxiv* (2020) doi: 10.1101/2020.08.25.265900

## Publications submitted and in preparation

6. **Baranger DAA**, Paul SE, Colbert SMC, Karcher NR, Johnson EC, Hatoum AS, Bogdan R. Increased mental health burden associated with prenatal cannabis exposure persists from childhood to early adolescence: Longitudinal results from the Adolescent Brain Cognitive Development (ABCD) study. (Submitted)
5. **Baranger DAA**, Paul SE, Hatoum AS, Bogdan R. Alcohol use and brain structure: Disentangling predispositional and causal contributions in human studies. (Submitted)
4. **Baranger DAA**, Lindenmuth M, Guyer AE, Keenan K, Hipwell AE, Forbes EE. Longitudinal change of reward anticipation activation in adolescent girls: evidence for accelerated neurodevelopment in depression.
3. **Baranger DAA**, Goldstein BL, Finsaas MC, Vize C, Lyndam D, Olino TM. Power analyses for interaction effects in cross-sectional regressions.
2. **Baranger DAA**, Jones M, Desmarais A, Winstone J, Corral- Frías NS, Bogdan R. No effect of a within-subject acute stress manipulation on reward learning.
1. Norton SA, Voss M, **Baranger DAA**, Bondy E, Rodrigues M, Hansen I, Paul SE, Edershile E, Rodebaugh T, Oltmanns TF, Bogdan R. Reliability of Diurnal Salivary Cortisol Metrics in a Community Sample of Older Adults.

## Scientific Software

InteractionPowerR - <https://dbaranger.github.io/InteractionPowerR/>

*A power analysis software package for interactions in cross-sectional datasets, written in R.*

## Invited Talks

5. **Baranger DAA**. Multi-omics analyses cannot identify true-positive novel associations from underpowered genome-wide association studies of four brain-related traits. Washington University School of Medicine, Psychiatry Research Seminar, Virtual Presentation, February 2022.
4. **Baranger DAA**. Can omics data replace adequate human sample size? Results from multiple post-GWAS omics methods. 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

11. **Baranger DAA**, Hatoum AS, Polimanti R, Gelernter J, Edenberg HJ, Bogdan R, Agrawal A. Multi-omics analyses cannot identify true-positive novel associations from underpowered genome-wide association studies of four brain-related 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. Aberrant levels of cortical myelin distinguish individuals with unipolar depression from healthy controls. 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. Developmental trajectories of reward anticipation: traumatic experiences & depression. 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. A systematic exploration 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. Convergent evidence for predispositional effects of brain volume on alcohol consumption. Presented at the 2018 Society of Biological Psychiatry conference, New York, NY, May 2018.
6. **Baranger DAA**, Margolis S, Hariri AR, Bogdan R. Evidence for diurnal variation of threat-related amygdala reactivity. Presented at the 2016 International Imaging Genetics Conference, January 2016, Irvine, CA.
5. **Baranger DAA**, Carey CE, Margolis S, Conley EMD, Hariri AR, Bogdan R. A random forest circadian gene-set 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. PER2 circadian gene functional polymorphism rs11894491 moderates amygdala reactivity in the context of early life stress. Presented at the 2014 Society for Research in Psychopathology meeting, September 2014, Evanston, Illinois.
3. **Baranger DAA**, Ifrah C, Prather AA, Carey CE, Corral- Frías NS, Conley EMD, Hariri AR, Bogdan R, PERIOD1 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.
2. **Baranger DAA**, Yates WD, White M, Chgen Q, Rasetti R, Mattay VS, Weinberger DR, Callicott JH; DISC1 Leu607Phe and Ser704Cys interact to reduce prefrontal-hippocampal coupling during a working memory task. 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; COMT Val158Met polymorphism modulates prefrontal cortical efficiency in a processing speed task. Presented at the 2011 Society for Neuroscience conference, Washington, DC, November 2011.

## Teaching

- Guest Lecturer, Atypical Development in Childhood and Adolescence  
*“Early life stress, mental health, and brain development”* 2022
- Guest Lecturer, Introduction to Neuroscience  
*“Reward and Addiction”* 2021
- Workshop Instructor, Interface of Psychology, Neuroscience, and Genetics  
*3-day workshop on applying modern genetics techniques in mental-health research  
Developed and lead primary workshop demonstration, and lectured on advanced  
methods in human statistical genetics* 2017
- Lecturer, Molecular Biology at the Cutting-Edge  
*“Neuroimaging and Genetics”* 2016, 2017
- Community Member, Washington University Center for the Integration of  
Research, Teaching, and Learning (WU-CIRTL) 2014 – 2017
- Peer Mentor, BP-ENDURE St. Louis Neuroscience Pipeline 2016
- Bench Mentor, BP-ENDURE St. Louis Neuroscience Pipeline 2015
- Teaching Assistant, Systems Neuroscience (course instructor: Dr. Lawrence Snyder)  
*Gave guest lecture and demonstration on “Non-invasive Neuroimaging”, lead  
discussions and review sessions* 2014
- Science Tutor, Young Scientist Program: Summer Focus 2013

## Professional Service

- Representative, Center for the Neural Basis of Cognition (CNBC) Postdoctoral Committee 2019 – 2021
- Co-organizer, 1<sup>st</sup> Washington University ‘BrainHack’ Hackathon 2017
- Student representative, Cognitive, Computational, and Systems Neuroscience (CCSN)  
Mini-Retreat Committee 2014 – 2017

- Student representative, Neuroscience Program Retreat Committee 2013 – 2017

### Outreach

- Freelance Science Communicator, Massive Science 2019 - 2021
- Neuroscience Team Leader, Young Scientist Program 2012 – 2017  
*Organized volunteers and gave demonstrations at Washington University, St. Louis area schools, and public events, for students (K-12) and community members, reaching over 3,000 people.*
- Volunteer, Youth Exploring Science 2012 – 2013  
*Weekend neuroscience experience for disadvantaged and minority high school students*

### 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 Memberships

- Flux Society 2019 – Present
- Society of Biological Psychiatry 2018 – Present

### Ad-Hoc Reviewer

American Journal of Medical Genetics Part B: Neuropsychiatric Genetics | 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: Clinical | Neuropsychologia | Neuropsychopharmacology | Personality and Individual Differences | PLOS One | Psychosomatic Medicine | Royal Society Open Science | Stress and Health | Social, Cognitive, and Affective Neuroscience.

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