ELIZABETH B. RILEY

er482@cornell.edu | 607-745-0618

Degrees

Boston University School of Medicine *9/2009 - 9/2015*

Ph.D., Neuroscience and Pharmacology (Advisor: Irina Zhdanova)

Massachusetts Institute of Technology *9/2004 - 6/2008*

B.S., Biological Engineering, minor in Music (Advisor: Drew Endy)

Research Overview

My primary interest is in developing and refining the understanding of modulatory neurotransmitter systems in the brain, especially the locus coeruleus norepinephrine system, including its relationships with neurodegenerative disease, somatic health, psychosocial health, and the evolutionary past. I combine the mechanistic orientation and technical skills I learned as an undergraduate and graduate student with the cognitive and affective neuroscience world I have joined since. In all my work, I strive to generate and extend a sense of community to my colleagues, students, research participants, and the greater world through genuine love of knowledge, ethical leadership, cultural competence, and dedication to diversity.

Positions and Employment

Cornell University

Postdoctoral Fellow (2018-2024) and Research Associate (2024-present) at Affect and Cognition Laboratory

Mentors: Adam Anderson and Eve De Rosa *9/2018 – present*

Postdoctoral Fellow at Attention, Memory and Perception Laboratory

Advisor: Khena Swallow *11/2017 – ongoing collaboration*

VA Boston Healthcare System and Harvard Medical School

Postdoctoral Fellow at Boston Attention and Learning Laboratory

Advisors: Joseph DeGutis and Michael Esterman *9/2015 – 9/2017*

Boston University School of Medicine

Graduate Researcher, Advisor: Irina Zhdanova *9/2011 – 9/2015*

Graduate Researcher, Advisor: Alan Herbert *6/2010 – 12/2011*

Massachusetts Institute of Technology

Undergraduate Researcher (full time during summer), Advisor: Darrell Irvine *6/2007 – 9/2009*

Undergraduate Researcher (full time during summer), Advisor: Drew Endy *6/2006 – 1/2007*

Grants

- Awarded
    - Ruth L. Kirschstein Postdoctoral Individual National Research Service Award (F32AG058479) 2018-2022
    - Veterans Administration Fellowship in Advanced Geriatrics 2015-2017
    - Japan National Institute of Genetics Collaborative Research A 2012 (declined)
    - MIT Undergraduate Research Opportunities Program 2006-2007
- Applied
    - National Institute on Aging R01 (not yet reviewed) 2024
    - Davis Phinney Foundation: Cognition and exercise (under review) 2023
    - Michael J. Fox Foundation: Freezing of Gait in Parkinson's Disease Research Program (program halted) 2023
    - Nature Inclusive Health Research Awards (not awarded) 2022
    - National Institute on Aging R01 AG069468 (reviewed, not awarded) 2021

Awards

- Butler Williams Scholars Program 7/2024
- Community Neuroscience Emerging Scholar Luminary Award 4/2024
- Cornell Postdoc Achievement Award in Community Engagement 9/2022
- Awarded T32 NIGMS Biomolecular Pharmacology Training Grant *9/2010 – 6/2012*
- Myriam Marcelle Znaty Award for Distinguished Achievement in Biological Engineering *6/2008*

Memberships in Professional Societies

Society for Neuroscience

Pavlovian Society

Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment

(Professional Interest Area: Neuromodulatory Subcortical Systems)

Teaching and Mentoring Experience

Cornell University

Research Mentor *9/2018 – present*

- *Oversight of undergraduate students enrolled in HD 4010, BIOG 2990, BIOG 4990, and COGST 4700*
- *Mentorship of Masters' and PhD students in the Affect and Cognition Laboratory*

Guest Lecturer *2022-2023*

- HD 3660
- HD 1125-101
- HD 1125-103

MRI Analysis Instructor *2021-2023*

Boston University School of Medicine

Pharmacology Tutor (SDM MD 530) *9/2012 –12/2013*

Undergraduate Research Opportunity Program Mentor *6/2012 – 6/2015*

Massachusetts Institute of Technology

Terrascope Program Teaching Fellow (Course 12.000, Solving Complex Problems) *9/2005 – 6/2006*

Professional Experience and Service

- Ad-hoc reviewer for Journal of the Neurological Sciences, Experimental Psychology, PLOS One, BMC Psychology, Neurobiology of Aging, Frontiers in Neuroscience, Brain Sciences
- Member of the College of Human Ecology Promoting Justice & Equity Committee
- Recent professional talks and presentations:
    - Community Neuroscience Celebration, on what community neuroscience is
    - Community Neuroscience Initiative, December 2023, on the development of neurodegenerative disease across the lifespan
    - Cornell NeuroSalon, December 2022, summarizing research on far transfer in cognitive training
    - Professional Development Committee, October 2023, on postdoctoral life
    - Cornell MRI Facility User Meeting, May 2023, on recent MRI results
    - Boston University Graduate Program for Neuroscience, March 2023, on postdoctoral life
    - Community Research Recruitment Accelerator, January 2022, on inclusive research methods

Trainees

Undergraduates

Lia Chen (2018-2019)

Stephanie Steinberg (2018-2019)

Nicholas Cicero (2019-ongoing collaboration)

Elizabeth Sharp (2019-2020)

Julio Salas (2019-2020)

Love Nemecek (2019-2020)

Marley Vogel (2020-2022)

Dana Oshiro (2020-2021)

Genevieve Wager (2023-ongoing)

Daniella Granin (2023-ongoing)

Jade Oshodi (2023-ongoing)

Dylan DeFelipe (2023-ongoing)

Graduate students

Mary MacMillan (2021-ongoing)

Saeedeh Sadeghi (2020-2023)

Hetvi Doshi (2021-ongoing)

Senegal Mabry (2021-ongoing)

Aurora Zhao (2022-2023)

Sihan He (2022)

Xinyi Deng (2021-2022)

Publications

(* indicates a trainee)

Senegal Mabry* and **Elizabeth Riley**. Your Black and Blue brain regions and the story they tell about Alzheimer's and Parkinson's disease. In press at Frontiers for Young Minds (2024).

Elizabeth Riley, Nicholas Cicero, Khena M Swallow, Eve De Rosa, Adam K Anderson. Locus coeruleus neuromelanin accumulation and dissipation across the lifespan. bioRxiv 2023.10.17.562814; doi: https://doi.org/10.1101/2023.10.17.562814 (Under revision at Neurobiology of Aging)

Nicholas G. Cicero^, **Elizabeth Riley^**, Khena M. Swallow, Eve De Rosa, Adam Anderson. Attention-dependent coupling with forebrain and brainstem neuromodulatory nuclei changes across the lifespan. bioRxiv 2023 and under revision at The Journal of Neuroscience. https://www.biorxiv.org/content/10.1101/2023.09.29.560190v1.full.pdf (^ co-first author)

Riley, E, *Cicero, NG, Swallow, KM, Anderson, AK, De Rosa, E. Locus Coeruleus BOLD Activity is Reduced in Older Adults and Associated with Changes in Attention and Memory. Available on SSRN and currently under revision at Neurobiology of Aging. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4577991

Brangman, SA, Royal, K, Dillenbeck, C, McNamara, S, Smith, N, De Rosa, E, Anderson, A and **Riley, E.** (2023), Community research liaison role in increasing participation of African Americans in cognitive research: A case study. Alzheimer's and Dementia, 19: e062941. https://doi.org/10.1002/alz.062941

Riley, E, Turker, H, Wang, D, Swallow, K, Anderson, A, De Rosa, E (2023). Nonlinear changes in pupillary orienting responses across the lifespan. GeroScience. *https://doi.org/10.1007/s11357-023-00834-1*

Swallow, K, Broitman, A, **Riley, E**, Turker, H (2022). Grounding the attentional boost effect in events and the efficient brain. Frontiers in Psychology 12:892416. https://doi.org/10.3389/fpsyg.2022.892416

Turker, H, **Riley, E**, Luh, W, Colcombe, S, Swallow, K (2021). Estimates of locus coeruleus function with functional magnetic resonance imaging are influenced by localization approaches and the use of multi-echo data. Neuroimage 236:118047.

Swallow, K, Jiang, Y, **Riley, E.** (2019). Target detection increases pupil diameter and enhances memory for background scenes during multi-tasking. Scientific Reports 9:5255. https://doi.org/10.1038/s41598-019-41658-4

Riley, E., Mitko, A., Stumps, A., Robinson, M., Milberg, W., McGlinchey, R., Esterman, M., & DeGutis, J. (2019). Clinically Significant Cognitive Dysfunction in OEF/OIF/OND Veterans: Prevalence and Clinical Associations. Neuropsychology. Advance online publication. http://dx.doi.org/10.1037/neu0000529

Riley, E, Maymi, V, Pawlyszyn, S, Yu, L and Zhdanova, I (2017). Prenatal cocaine exposure leads to multifaceted disruption of the dopaminergic system and its responses to cocaine. Genes, Brain and Behavior 1601 – 183X. doi: 10.1111/gbb.12436

Riley, E, Esterman, M, Fortenbaugh, F and DeGutis, J (2017). Time-of-day variation in sustained attentional control. Chronobiology International 1-9. doi: 10.1080/07420528.2017.1308951

Kacsprzak, V, Patel, N, **Riley, E**, Kopotiyenko, K and Zhdanova, I (2017). Dopaminergic control of anxiety in young and aged zebrafish. Pharmacology, Biochemistry and Behavior 2017 Jun;157:1-8. doi: 10.1016/j.pbb.2017.01.005

Riley, E, Okabe, H, Germine, L, Wilmer, J, Esterman, M and DeGutis, J (2016). Gender differences in sustained attentional control relate to gender equality across countries. PLOS ONE 12(1): e0170876. doi: 10.1371/journal.pone.0170876

Riley E, Kopotiyenko K and Zhdanova I (2015) Prenatal and acute cocaine exposure affects neural responses and habituation to visual stimuli. Front. Neural Circuits 9:41. doi: 10.3389/fncir.2015.00041

Conference Presentations

(* indicates trainee)

*Mabry S, **Riley E**, Gonzalez M, DeRosa E, Anderson A. (2023) Differences in VTA-SN Anticipatory Brain Responses and Positive Emotions in Parkinson's Disease. Society for Neuroscience.

*Mabry S, **Riley E**, Gonzalez M, DeRosa E, Anderson A. (2023) Heart-based interoceptive awareness is impaired for people living with Parkinson's disease during stress and exercise. Flash Talk, 2nd annual NIH Annual Investigator Meeting on Interoception Research.

Faye L, *Mabry, S, **Riley, E**, Gonzalez, M, Anderson, A, De Rosa, E. (2023) The Role of Exercise in Alleviating Motor Symptoms of Parkinson's Disease, Bronfenbrenner Center for Translational Research Undergraduate Translational Research Symposium

Uwaifo E, *Mabry, S, **Riley, E**, Gonzalez, M, Anderson, A, De Rosa, E. (2023) Examining the Prevalence of Behavioral Changes and Impulse Control Disorder in Parkinson's Disease Patients and its Correlation to Dopaminergic System Activation, Bronfenbrenner Center for Translational Research Undergraduate Translational Research Symposium

Morton L, *Mabry, S, **Riley, E**, Gonzalez, M, Anderson, A, De Rosa, E. (2023) Global Trends in Ecological and Social Determinants of Health and the Disproportionate Rise in Prevalence of Parkinson's Disease, Bronfenbrenner Center for Translational Research Undergraduate Translational Research Symposium

Sanchez M, *Mabry, S, **Riley, E**, Gonzalez, M, Anderson, A, De Rosa, E. (2023) ReActing to Parkinson's Disease, Bronfenbrenner Center for Translational Research Undergraduate Translational Research Symposium

Zhang, Z, **Riley, E**, Anderson, A K, De Rosa, E, and Dai, W (2023). Image normalization effects on the age-related arterial transit time and perfusion changes. The International Society for Magnetic Resonance in Medicine.

*Mabry, S, **Riley E**, Gonzalez M, DeRosa E, Anderson A. (July 2023) The effect of the social evaluative threat on substantia nigra functional connections to stress processing system regions of interest. World Parkinson's Congress Barcelona

Riley, E, Cammarata, C, Anderson, A K and De Rosa, E (2023). Heart rate variability and basal forebrain activity during proactive interference across the lifespan. Society for Neuroscience.

Riley, E, Swallow, K M, Anderson, A K, and De Rosa, E (2023). Locus coeruleus hyperactivity in middle age may be associated with better cognitive performance. Alzheimer's Association International Conference. https://alz.confex.com/alz/2023/meetingapp.cgi/Paper/82666

Zhang, Z, **Riley, E**, Anderson, A K, De Rosa, E, and Dai, W (2022). Potential regulation of cerebral blood flow by the basal forebrain. The International Society for Magnetic Resonance in Medicine.

Riley, E, *Cicero, N, Swallow, K, Anderson, A, De Rosa, E (2022). The relationship between locus coeruleus activity and pupillary responses changes with age. *Open Human Brain Mapping*.

Riley, E, *Cicero, N, Turker, H, Swallow, K, De Rosa, E, Anderson, A (2021). Multimodal evidence that pupillary responses are useful for examining aging in the locus coeruleus. Open Human Brain Mapping

*Cicero, N., **Riley, E.**, Anderson, A., & De Rosa, E. (2021). Attention and memory encoding in healthy aging and implications for cognitive impairment. *The BRAIN Conference*

*Cicero, N., **Riley, E.**, Anderson, A., & De Rosa, E. (2021). Attention and memory encoding in healthy aging and implications for cognitive impairment. *Human Brain Project Student Conference 2021: 5th HBP Student Conference on Interdisciplinary Brain Research*

Turker, H, **Riley, E**, Luh, W, Colcombe, S, Swallow, S (2020). Multi-echo fMRI and Localization Method Affect Functional Estimates of the Locus Coeruleus. *Open Human Brain Mapping*

*Cicero, N., **Riley, E.**, Anderson, A., & De Rosa, E. (2020). Attention and memory encoding in healthy aging and implications for cognitive impairment. *Cornell Undergraduate Research Board, Fall Forum 2020*

*Steinberg, S, **Riley, E**, De Rosa, E (2020). Cerebellar contributions to working memory in young and older adults. *International Neuropsychological Society*

Riley, E, *Steinberg, S, *Chen, L, Swallow, K, De Rosa, E, Anderson, A (2019). Measuring age-related changes in locus coeruleus intensity and its relationship to cognitive aging. *Society for Neuroscience*

Riley, E, Okabe, H, Germine, L, Wilmer, J, Esterman, M, and DeGutis, J (2016). Gender differences in sustained attentional control relate to gender equality across countries. *Psychonomic Society*

Okabe, H, **Riley, E**, Germine, L, Wilmer, J, Esterman, M, and DeGutis, J (2016). Gender differences in sustained attentional control are related to indices of gender inequality across countries. *International Neuropsychological Society*

Riley, E, Kopotiyenko, K and Zhdanova, I (2015). Early cocaine exposure and visual perception. *European Zebrafish Meeting*

Kopotiyenko, K, **Riley, E**, Herbert, A and Zhdanova, I (2012). Early cocaine exposure and responses to visual stimuli. *International Conference on Zebrafish Development*