

Hannah K Ballard, PhD

Rice University Academy of Fellows

[Google Scholar](#) | [Professional Webpage](#)

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EDUCATION & POSITIONS

- September 2022 **Postdoctoral Research Fellow**, Department of Psychological Sciences, Rice University Academy of Fellows
Focus: Neuroendocrinology, Neuroimaging, Alzheimer's disease
Advisor: Dr. Stephanie L. Leal, Ph.D.
- August 2022 **Ph.D. in Neuroscience**, Texas A&M Institute for Neuroscience, Texas A&M
Focus: Network connectivity, Reproductive Aging, Brain stimulation
Dissertation: Brain networks and behavior in aging females: Impacts of menopause, sex hormones, and sleep patterns
Advisor: Dr. Jessica A. Bernard, Ph.D.
- May 2017 **B.S. in Neuroscience**, Department of Psychology & Neuroscience, Baylor Interdisciplinary Core Honors Program
Focus: Sleep Health, Aging, Cognitive Neuroscience
Advisor: Dr. Michael K. Scullin, Ph.D.

RESEARCH FUNDING

- 2023-2026 **National Institute on Aging (F32AG081117)**
Estrogen Declines with Menopause: Impacts on the Medial Temporal Lobe Network and Emotional Memory in Aging Females at Genetic Risk for Alzheimer's Disease
Role: Principal Investigator
Total funding: \$220,764
- 2022-2024 **Rice University Academy of Fellows (Institutional Postdoctoral Fellowship)**
Estrogen Declines with Menopause: Impacts on the Medial Temporal Lobe Network and Emotional Memory in Aging Females at Genetic Risk for Alzheimer's Disease
Role: Principal Investigator
Total funding: \$125,000

SCHOLARLY WORKS

Published Manuscripts

Google Scholar: h-index = 5, i10-index = 3, citations = 108

2023

Ballard, H.K., Ferguson, L.A., & Leal, S.L. (*in prep*). Findings from the Berkley Aging Cohort Study (BACS).

Hicks, T.H., Magalhães, T.N.C., **Ballard, H.K.**, Jackson, T.B., Cox, S.J., & Bernard, J.A. (2023). Network segregation in aging females and evaluation of the impact of sex steroid hormones. *Frontiers in Human Neuroscience*.
<https://doi.org/10.3389/fnhum.2023.1059091>

Ballard, H.K., Jackson, T.B., Hicks, T.H., Cox, S.J., Symm, A.C., Maldonado, T., & Bernard, J.A. (2023). Hormone-sleep interactions predict cerebellar connectivity and behavior in aging females. *Psychoneuroendocrinology*.
<https://doi.org/10.1016/j.psyneuen.2023.106034>

2022

Ballard, H.K., Jackson, T.B., Symm, A.C., Hicks, T.H., & Bernard, J.A. (2022). Age-related differences in functional network segregation in the context of sex and reproductive stage. *Human Brain Mapping*. <https://doi.org/10.1002/hbm.26184>

Hicks, T.H., **Ballard, H.K.**, Sang, H., & Bernard, J.A. (2022). Age-volume associations in cerebellar lobules by sex and reproductive stage. *Brain Structure and Function*.
<https://doi.org/10.1007/s00429-022-02535-5>

Ballard, H.K., Jackson, T.B., Hicks, T.H., & Bernard, J.A. (2022). The association of reproductive stage with lobular cerebellar network connectivity across female adulthood. *Neurobiology of Aging*.
<https://doi.org/10.1016/j.neurobiolaging.2022.05.014>

2021

Bernard, J.A., **Ballard, H.K.**, & Jackson, T.B. (2021). Cerebellar dentate connectivity across adulthood: A large-scale resting state functional connectivity investigation. *Cerebral Cortex Communications*. <https://doi.org/10.1093/texcom/tgab050>

Ballard, H.K., Eakin, S.M., Maldonado, T., & Bernard, J.A. (2021). Using high-definition transcranial direct current stimulation to investigate the role of the dorsolateral prefrontal cortex in explicit sequence learning. *PLoS ONE* 16(3): e0246849.
<https://doi.org/10.1371/journal.pone.0246849>

Imburgio, M.J.*, **Ballard, H.K.***, Cornwall, A.C., Worthy, D.A., Bernard, J.A., & Orr, J.M. (2021). Preliminary effects of prefrontal tDCS on dopamine-mediated behavior and psychophysiology. *Behavioural Brain Research*, 402.
<https://doi.org/10.1016/j.bbr.2020.113091> *contributed equally

2020

Bernard, J.A., Nguyen, A., Hausman, H., Maldonado, T., **Ballard, H.K.**, Jackson, T.B., Eakin, S.M., Lokshina, Y., & Goen, J.R.M. (2020). Shaky scaffolding: Age differences in cerebellar activation revealed through activation likelihood estimation meta-analysis. *Human Brain Mapping*. <https://doi.org/10.1002/hbm.25191>

2019

Ballard, H.K., Goen, J.R.M., Maldonado, T., & Bernard, J.A. (2019). Effects of cerebellar transcranial direct current stimulation on the cognitive stage of sequence learning. *Journal of Neurophysiology*, *122*(2), 490-499. <https://doi.org/10.1152/jn.00036.2019>

2018

Scullin, M.K., Krueger, M.L., **Ballard, H.K.**, Pruett, N., & Bliwise, D.L. (2018). The effects of bedtime writing on difficulty falling asleep: A polysomnographic study comparing to-do lists and completed activity lists. *Journal of Experimental Psychology: General*, *147*(1), 139-146. <https://doi.org/10.1037/xge0000374>

2017

Scullin, M.K., Gao, C., Krueger, M.L., **Ballard, H.K.**, & Bliwise, D.L. (2017). 0275 Age effects on REM sleep and prospective memory consolidation. *Sleep*, *40*, A101. <https://doi.org/10.1093/sleepj/zsx050.274>

Book Chapters

Ballard, H. K. & Scullin, M. K. (2018). Trouble falling asleep? Write a to-do list. In C. Chen (Ed.), *Brain & Life Research Digest*.

MEDIA COVERAGE

2023 <https://themedicinemaker.com/discovery-development/nih-funds-rice-universitys-alzheimers-in-women-study>

2023 <https://news.rice.edu/news/2023/nih-grant-backs-study-focused-alzheimers-women>

2018 <https://app.criticalmention.com/app/#clip/view/32064075?token=f1efbbcb-001b-41a0-9157-b31190566a8e>

2018 <https://www.bbc.co.uk/sounds/play/b0b2jh7g>

2018 <https://www.forbes.com/sites/alicegwalton/2018/01/14/writing-before-bed-may-help-you-fall-asleep-faster/?sh=53f0ce5236f8>

ORAL PRESENTATIONS

Power analyses for empirical reporting. Scheduled for October 12, 2023. Neuroscience of Memory, Mood, & Aging Lab Educational Training Series.

Estrogen declines with menopause: Impacts on the medial temporal lobe network and emotional memory in aging females at genetic risk for Alzheimer's disease. September 11, 2023. Cognitive, Health, and Affective Tea (CHAT) Seminar Series.

Neuroimaging: Possibilities, Preprocessing, and Plans. August 2, 2023. Neuroscience of Memory, Mood, & Aging Lab Educational Training Series.

Women's health across adulthood. May 25, 2023. Villages at South Hampton Lecture Series.

Interactions between 17beta-estradiol and sleep predict cognitive performance in aging females. April 27, 2023. International Conference on Learning and Memory.

Hormone-sleep interactions predict cerebellar network connectivity and behavioral outcomes in aging females. November 7, 2022. Cognitive, Health, and Affective Tea (CHAT) Seminar Series.

Interactions between sex steroid hormones and sleep patterns during female reproductive aging: Impacts on brain networks and behavior. April 21, 2022. Texas A&M Institute for Neuroscience (TAMIN) Seminar Series.

CONFERENCE PRESENTATIONS

2023

Hicks, T.H., **Ballard, H.K.**, Jackson, T.B., Cox, S.J., & Bernard, J.A. (February 2023). *Congenital left temporal lobe cyst: A case study of rs-fMRI and cognitive performance.* Poster presented at International Neuropsychological Society Conference. San Diego, CA.

2022

Ballard, H.K., Jackson, T.B., Hicks, T.H., Cox, S.J., Miller, A.C., Maldonado, T., & Bernard, J.A. (April 2022). *17β-estradiol-sleep interactions differentially impact cognitive and motor behavior in females and males across adulthood.* Poster presented at the Cognitive Neuroscience Society Annual Meeting. San Francisco, CA.

Hicks, T.H., **Ballard, H.K.**, & Bernard, J.A. (February 2022). *Sex differences in regional cerebellar volume across the adult lifespan: A comparison of linear and quadratic relationships.* Poster presented at the International Neuropsychological Society Conference (Virtual).

2021

Ballard, H.K., Jackson, T.B., Miller, A.C., & Bernard, J.A. (December 2021). *Age-related differences in functional network segregation in the context of sex and reproductive stage.* Poster presented at the Texas A&M Chapter of the Society for Neuroscience Annual Symposium. College Station, TX.

Slonim, T., **Ballard, H.K.**, & Bernard, J.A. (March 2021). *Cerebellar volume in the context of reproductive aging.* Poster presented at the Cognitive Neuroscience Society Annual Meeting (Virtual).

2020

Ballard, H.K., Jackson, T.B., & Bernard, J.A. (May 2020). *The influence of reproductive stage on cerebellar network connectivity across adulthood.* Poster presented at the Cognitive Neuroscience Society Annual Meeting (Virtual).

Bernard, J.A., **Ballard, H.K.**, & Jackson, T.B. (May 2020). *Cerebellar dentate connectivity across adulthood: A large-scale resting state functional connectivity investigation.* Poster presented at the Cognitive Neuroscience Society Annual Meeting (Virtual).

2019

Ballard, H.K., Eakin, S.M., Goen, J.R.M., Maldonado, T., & Bernard, J.A. (April 2019). *The role of the prefrontal-cerebellar circuit in the cognitive stage of sequence learning.* Poster presented at the Texas A&M Institute for Neuroscience Annual Symposium. College Station, Texas.

Bernard, J.A., Buchanan, J., Wright, D., **Ballard, H.K.**, & McCulloch, A. (April 2019). *Non-invasive modulation of the dopaminergic midbrain and the influence on motor learning and retention*. Poster presented at the Texas A&M President's Excellence Symposium. College Station, TX.

Ballard, H.K., Goen, J.R.M., Maldonado, T., & Bernard, J.A. (March 2019). *The effects of cerebellar transcranial direct current stimulation on the cognitive stage of sequence learning*. Poster presented at the Cognitive Neuroscience Society Annual Meeting. San Francisco, CA.

2018

Ballard, H.K., Goen, J.R.M., Maldonado, T., & Bernard, J.A. (December 2018). *The effects of cerebellar transcranial direct current stimulation on the cognitive stage of sequence learning*. Poster presented at the Texas A&M Chapter of the Society for Neuroscience Annual Symposium. College Station, TX.

Ballard, H.K., Goen, J.R.M., Maldonado, T., & Bernard, J.A. (September 2018). *The effects of cerebellar transcranial direct current stimulation on the cognitive stage of sequence learning*. Poster presented at the Association for Research on Memory, Attention, Decision-Making, Intelligence, Language, Learning, and Organization (ARMADILLO) Annual Meeting. Houston, TX.

Imburgio, M.*, **Ballard, H.K.***, Cornwall, A., Worthy, D.A., Bernard, J.A., & Orr, J.M. (September 2018). *tDCS modulation of dopamine systems*. Poster presented at the Association for Research on Memory, Attention, Decision-Making, Intelligence, Language, Learning, and Organization (ARMADILLO) Annual Meeting. Houston, TX. *contributed equally

Ballard, H.K., Imburgio, M., Cornwall, A., Worthy, D.A., Orr, J.M., & Bernard, J.A. (April 2018). *Frontal transcranial direct current stimulation and midbrain function: dopaminergic modulation, striatal connectivity, and behavior*. Poster presented at the Texas A&M Institute for Neuroscience Annual Symposium. College Station, Texas.

2017

Gao, C., Nguyen, S., **Ballard, H.K.**, & Scullin, M.K. (October 2017). *Age effects on REM sleep and prospective memory consolidation*. Poster presented at the Association for Research on Memory, Attention, Decision-Making, Intelligence, Language, Learning, and Organization (ARMADILLO) Annual Meeting. College Station, Texas.

Ballard, H.K., Scott, K., Nguyen, S., Villagran, A., Rowley, C., & Scullin, M. K. (March 2017). *Age effects on REM sleep and prospective memory consolidation*. Poster presented at the Undergraduate Research and Scholarly Achievement Program. Waco, Texas.

2016

Ballard, H.K., Nguyen, S., Rowley, C., & Scullin, M. K. (November 2016). *Writing a to-do list before bed reduces difficulty falling asleep*. Poster presented at the Baylor Undergraduate Research in Science and Technology. Waco, Texas.

Nguyen, S., **Ballard, H.K.**, Rowley, C., & Scullin, M. K. (November 2016). *Absent-minded, generalized, and specific prospective memory encoding*. Poster presented at the Baylor Undergraduate Research in Science and Technology. Waco, Texas.

Lokhandwala, S., Nguyen, S., **Ballard, H.K.**, Rowley, C., & Scullin, M. K. (April 2016).
Writing a to-do list before bed reduces difficulty falling asleep. Poster presented at the
 Undergraduate Research and Scholarly Achievement Program. Waco, Texas. (2nd Place)

CERTIFICATIONS

2023 MRI Level II Operator, Core for Advanced Magnetic Resonance Imaging
 2020 Certificate in Applied Statistics, Texas A&M Department of Statistics
 2018 Certified Teaching Assistant, Texas A&M Teaching Assistant Institute

PROFESSIONAL MEMBERSHIPS

Cognitive Neuroscience Society
 Society for Neuroscience
 National Society of Academic Excellence

PROFESSIONAL ACTIVITIES

2023 Applied for Bright Focus Foundation Dementia Research Fellowship, LOI under review
 2022 Applied for Alzheimer's Association Research Fellowship (AARF), Not funded
 2022 Ad Hoc Manuscript Reviewer, Nature Mental Health
 2022 Applied for NIH Postdoctoral Fellowship (PA-21-048), Awarded
 2021 Ad Hoc Manuscript Reviewer, Cortex
 2020 Applied for NIH Transition to Aging Research Award (RFA-AG-21-022), Not funded
 2019 Applied for National Science Foundation Graduate Research Fellowship, Not funded

TEACHING

Fall 2023 **Guest Instructor**, Memory (PSYC 308)
 Rice University
 Fall 2019 **Teaching Assistant**, Research Methods in Psychology (PSYC 302)
 Texas A&M University - Student Evaluation Rating: 5/5
 2016 **Guest Instructor**, The Science of Sleep (NSC 3375)
 Baylor University

MENTORSHIP

2022-Present **Research Assistant Mentor**
 Neuroscience of Memory, Mood, & Aging Lab
 2022-Present **Graduate Student Mentor**
 Neuroscience of Memory, Mood, & Aging Lab
 Spring 2020 **Undergraduate Mentor**, Psychology Research (PSYC 491)
 Lifespan Cognitive & Motor Neuroimaging Lab
 Fall 2019 **Undergraduate Mentor**, Psychology Research (PSYC 491)
 Lifespan Cognitive & Motor Neuroimaging Lab
 2018-2019 **Research Assistant Mentor** (PSYC 485)
 Lifespan Cognitive & Motor Neuroimaging Lab

- 2016-2017 **Research Assistant Mentor**
Sleep Neuroscience & Cognition Lab
- 2016-2017 **Research Coordinator**
Sleep Neuroscience & Cognition Lab

AWARDS & HONORS

- 2017 Research in Neuroscience, Recognition Award
- 2017 Who's Who Among Students in American Universities and Colleges, Merit Award
- 2016 2nd Place at URSA Program, Poster Presentation Award
- 2013 President's Gold Scholarship, Baylor University
- 2012 Duke University Talent Identification Program, Fellowship

SCIENCE OUTREACH

- 2023 Walk to End Alzheimer's, Volunteer
- 2023 Villages at South Hampton, Volunteer
- 2019 Crestview Retirement Community, Speaker
- 2019 The Langford Retirement Community, Speaker
- 2019 Brain Day at Oakwood Intermediate School, Presenter
- 2018-2019 City of College Station Senior Games, Volunteer
- 2017 Texas A&M Women in Science and Engineering Workshop, Presenter
- 2017 Walk to End Alzheimer's, Volunteer
- 2016-2017 Baylor Autism Resource Center, Volunteer
- 2016 Mayborn Museum Sic 'Em Science Day, Co-Director