

Kelly J Wallace, PhD

Assistant Professor, Amherst College

Department of Biology, Program in Neuroscience

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RESEARCH INTERESTS

My research investigates how the social environment influences individual behavior and cognition. I integrate ecological, behavioral, physiological, and neuromolecular perspectives.

Keywords: cognitive ecology, social neuroscience, neural activity, cortisol, testosterone, dopamine, vasopressin, oxytocin, *Betta splendens*, *Microtus ochrogaster*, *Gambusia affinis*, *Astatotilapia burtoni*, *Acomys cahirinus*

EDUCATION & EMPLOYMENT

- 2024 – *Assistant Professor*
Amherst College Department of Biology & Program in Neuroscience
- 2021– 2023 *Postdoctoral Fellow*, NSF Postdoctoral Research Fellowship in Biology
Emory FIRST NIH IRACDA Affiliate
Emory University
Sponsor: Dr. Aubrey Kelly (*thekellylab.org*)
- 2021 *Doctor of Philosophy in Ecology, Evolution, and Behavior*
University of Texas at Austin
PhD Advisors: Dr. Hans Hofmann (*cichlid.biosci.utexas.edu*) & Dr. Michael Ryan
- 2015 *Bachelor of Science in Biological Sciences, Minor in Music*
Cornell University
Undergraduate Research Advisor: Dr. Alex Ophir (*ophirlab.com*)

GRANTS & MAJOR AWARDS

Postdoctoral Research Fellowship in Biology, 2020

The National Science Foundation

Ford Foundation Predoctoral Fellowship, 2017

The National Academies of Sciences, Engineering, and Medicine

PUBLICATIONS

(reverse chronological order; indicates undergraduate student mentee)

15. GA Crescencio , OD Femi-Jegede , J Zhang , EA Aquino Vasquez and **KJ Wallace**. An Integrative Brain & Behavior CURE (Course-Based Undergraduate Research Experience) using immunohistochemistry in the fighting fish *Betta splendens*. *Journal of Undergraduate Neuroscience Education* 23(1):A17-A25. (doi.org/10.59390/AFSC6949)

—————*Started as Assistant Professor at Amherst College January 2024*—————

14. **KJ Wallace**, Dupeyron S , Li M , & Kelly AM (2023) Early life social complexity shapes adult neural processing in the communal spiny mouse *Acomys cahirinus*. Psychopharmacology (doi.org/10.1007/s00213-023-06513-5)
13. S Dupeyron & **KJ Wallace** (2023) Quantifying the neural and behavioral correlates of repeated social competition in the fighting fish *Betta splendens*. Fishes 8(8): 384. (doi.org/10.3390/fishes8080384)
12. **KJ Wallace***, EK Chun*, JR Manns, AG Ophir†, AM Kelly† (2023) A test of the Social Behavior Network reveals differential patterns of neural responses to social novelty in bonded, but not non-bonded, male prairie voles. Horm Behav 152: 105362. (doi.org/10.1016/j.yhbeh.2023.105362) (*authors contributed equally)
11. PK Monari, ER Hammond, CL Malone, A Cuarenta, LC Hiura, **KJ Wallace**, L Taylor, DS Pradhan (2023) Leveraging individual power to improve racial equity in academia. Horm Behav 152: 105358. (doi.org/10.1016/j.yhbeh.2023.105358)
10. PS Queller, Y Shirali, **KJ Wallace**, RS DeAngelis, V Yurt, LP Reding, ME Cummings (2022) Complex sexual-social environments produce high boldness and low aggression behavioral syndromes. Front Ecol Evol 10:1050569. (doi.org/10.3389/fevo.2022.1050569)
9. JM Powell, K Inoue, **KJ Wallace**, AW Seifert, LJ Young, AM Kelly (2022) Distribution of vasopressin 1a and oxytocin receptor protein and mRNA in the basal forebrain and midbrain of the spiny mouse (*Acomys cahirinus*). Brain Struct Funct (doi.org/10.1007/s00429-022-02581-z)
8. AM Kelly, BA Fricker, **KJ Wallace** (2022) Protocol for multiplex fluorescent immunohistochemistry in free-floating rodent brain tissues. STAR Protocols 4:101672. (doi.org/10.1016/j.xpro.2022.101672)
7. JA Gonzalez Abreu, A Rosenberg, BA Fricker, **KJ Wallace**, AW Seifert, AM Kelly (2022) Species-typical group size differentially influences reward, but not social, neural circuitry during nonreproductive social interactions. iScience 25(5): 104230 (doi.org/10.1016/j.isci.2022.104230)
6. **KJ Wallace**, KD Choudhary , LA Kutty , DH Le , MT Lee , K Wu , HA Hofmann (2021) Social ascent changes cognition, behavior, and physiology in a highly social cichlid fish. Phil Trans R Soc B 377: 20200448 (doi.org/10.1098/rstb.2020.0448)
5. **KJ Wallace** & HA Hofmann (2021) Decision-making in a social world: integrating cognitive ecology and social neuroscience. Curr Opin Neuro 68:152-158 (doi.org/10.1016/j.conb.2021.03.009)
4. **KJ Wallace** & HA Hofmann (2021) Equal performance but distinct behaviors: *Astatotilapia burtoni* sex differences in a novel object recognition task and spatial maze. Anim Cogn 24: 1057–1073 (doi.org/10.1007/s10071-021-01498-0)
3. **KJ Wallace*** & JM York* (2020) A systems change framework for evaluating academic equity and inclusion in an Ecology and Evolution Graduate Program. Ecol Evol 10(20):10922-10929 (doi.org/10.1002/ece3.6817) (*authors contributed equally to this work)
2. **KJ Wallace**, RT Rausch, ME Ramsey, ME Cummings (2020) Sex differences in cognitive performance and style across domains in mosquitofish (*Gambusia affinis*). Anim Cogn 23: 655–669 (doi.org/10.1007/s10071-020-01367-2)
1. MA Rice, LE Hobbs, **KJ Wallace**, AG Ophir (2017) Cryptic sexual dimorphism in spatial memory and hippocampal oxytocin receptors in prairie voles (*Microtus ochrogaster*). Horm Behav 95: 94–102 (doi.org/10.1016/j.yhbeh.2017.08.003)

SOFTWARE

KJ Wallace (2020) Cowlogdata: an R package to analyze and visualize observations generated by the event logging software CowLog (github.com/kellyjwallace/cowlogdata)

COURSES TAUGHT

Biology 181: Adaptation & The Organism with Lab

Fall 2024, Amherst College

Biology/Neuroscience 313: Social Neuroendocrinology with Lab

Spring 2024, Amherst College (*self-developed*)

Psychology 385: Think Like an Animal: Decision-Making in the Wild!

Fall 2022, Emory University (*self-developed*)

INVITED TALKS

13. Western Mass SfN, Amherst MA, 2025 (Invitation by Paul Katz)

Neural and Behavioral Mechanisms of Territoriality in Betta Fish

13. Winter Animal Behavior, Steamboat Springs CO, 2025 (Invitation by Lauren Ritters)

Neural and Behavioral Mechanisms of Territoriality in Betta Fish

12. Society for Behavioral Neuroendocrinology, Columbus OH, 2024 (Jill Becker)

(Professional Development Keynote) *Pulling Back the Curtain: Considerations of a Job in Academia*

11. Neuro Salon, University of Massachusetts Amherst, 2024 (David Moorman)

*Neural and Behavioral Correlates of Repeated Social Competition in the Fighting Fish *Betta splendens**

—————*Started as Assistant Professor at Amherst College January 2024*—————

10. Genomics Guest Speaker, Loyola University Chicago, 2023 (Sara Lipshutz)

Social Development in Spiny Mice with R data analysis workshop

9. Biology Seminar, Amherst College, 2022 (Ethan Clotfelter)

Decision-making in a social world

8. EEBOB Bio Seminar, Kennesaw State, 2022 (Sarah Guindre-Parker)

Cognition and behavior in the social world of cichlid fish

7. Frontiers in Biology Seminar Series, Duke University, 2022 (Steve Nowicki)

Cognition in a social world: integrating cognitive ecology and social neuroscience

6. Biopsychology Colloquium Series, University of Michigan, 2022 (Jill Becker)

Cognition in a social world: integrating cognitive ecology and social neuroscience

5. EEB Seminar Series, Texas A&M University, 2021 (Gil Rosenthal)

A systems change framework for evaluating academic equity and inclusion in an EEB Program

4. Neuro II: Systems Guest Lecture, Claremont McKenna College, 2020 (Tessa Solomon-Lane)

Learning in a dynamic social world

3. Animal Cognition Graduate Course, University of Cincinnati, 2020 (Elizabeth Hobson)

Astatotilapia burtoni sex differences in a novel object recognition task and spatial maze

2. Animal Behavior Undergrad Guest Lecture, University of Texas at Austin, 2020 (Felicity Muth)

Fish are smarter than we think!

1. Osher Lifelong Learning Institute, University of Texas at Austin, 2020 (Larry Gilbert)

Fish are smarter than we think!

POSTER PRESENTATIONS

18. Society for Behavioral Neuroendocrinology, Columbus OH, 2024

Quantifying the Neural and Behavioral Correlates of Repeated Social Competition in Betta splendens

—————Started as Assistant Professor at Amherst College January 2024—————

17. Society for Behavioral Neuroendocrinology, Tours France, 2023

Early life social complexity shapes adult social processing in the communal spiny mouse

16. Society for Behavioral Neuroendocrinology, Atlanta GA, 2022

The influence of early life social complexity on adult behavior in the Spiny Mouse (A. cahirinus)

15. Society for Integrative & Comparative Biology, Virtual Meeting 2022

A novel method for examining neural responses at two timepoints within an individual

14. Society for Behavioral Neuroendocrinology, Virtual Meeting 2021 *award winner

Cognition in a social world: assessing cognitive variation by sex and dominance status in the social cichlid fish Astatotilapia burtoni

13. Society for Integrative & Comparative Biology, Virtual Meeting 2021

A systems change framework for evaluating academic equity and inclusion in an ecology and evolution graduate program

12. Society for Integrative & Comparative Biology, Austin TX, 2020

Neuroendocrine basis of social competence & cognition in a highly social cichlid fish

11. Janelia Junior Scientist Workshop (Mechanistic Cognitive Neuroscience), HHMI, 2019

Neuroendocrine basis of social competence & cognition in a highly social cichlid fish

10. Society for Behavioral Neuroendocrinology, Indiana University, 2019

Neuroendocrine basis of social competence & cognition in a highly social cichlid fish

9. Spring Symposium in Behavioral Epigenetics, University of Texas at Austin, 2019

Social Competence & Cognition in Dynamic Communities of a Highly Social Cichlid Fish

8. Ecological Integration Symposium, Texas A&M University, 2019 *award winner

Social Competence & Cognition in Dynamic Communities of a Highly Social Cichlid Fish

7. Conference of Ford Fellows, National Academy of Sciences, 2018

Comparative Cognition in Gambusia affinis

6. Spring Symposium in Behavioral Epigenetics, University of Texas at Austin, 2018

Comparative Cognition in Gambusia affinis

5. NSF BEACON Evolution in Action Congress, Michigan State University, 2016

Stress and cognition: an improvement on a numerosity learning assay

4. Annual Meeting of the Animal Behavior Society, University of Missouri, 2016

Stress and cognition: an improvement on a numerosity learning assay

3. Evolution Meeting, University of Texas at Austin, 2016

Stress and cognition: an improvement on a numerosity learning assay

2. Cornell Undergraduate Research Board Fall Forum, Cornell University, 2014

Sex differences in spatial memory, hippocampal volume, and OTR Expression

1. Annual Meeting of the Animal Behavior Society, Princeton University, 2014

Sex differences in spatial memory, hippocampal volume, and OTR Expression

UNDERGRADUATE MENTEE PRESENTATIONS

5. **OD Femi-Jegede & S Zhang.** Amherst College STEM Summer Research Symposium, 2024 (poster)
Quantifying Neural Activities of Betta Splendens and Optimizing IHC Staining

—————*Started as Assistant Professor at Amherst College January 2024*—————

4. **S Dupeyron.** Emory Student Research Symposium, 2022 (poster)

Comparing effects of early life social complexity in spiny mice

3. **M Li.** Society for Behavioral Neuroendocrinology, 2022 (poster)

Parental care and juvenile development under two social conditions in spiny mice

2. **MT Lee & K Wu.** UT Austin Undergraduate Research Forum, 2020 (poster)

*Color discrimination learning in the highly social cichlid fish *Astatotilapia burtoni**

1. **LA Kutty & DH Le.** UT Austin Undergraduate Research Forum, 2020 (poster)

Sex differences in color discrimination learning in a highly social cichlid fish

OTHER ORAL PRESENTATIONS

14. **Emory FIRST IRACDA Seminar, Emory University, 2023**

Characterizing the impact of early life social complexity in spiny mice

13. **Annual Meeting of the Animal Behavior Society, Costa Rica (Virtual), 2022**

Cognition in the social world of cichlid fish

12. **Research Across Psychology, Emory University 2021**

The influence of the early life social environment on cognitive style

11. **Society for Integrative & Comparative Biology, Virtual Meeting 2021**

*Decision-making in a social world: sex and status differences in cognition in *A. burtoni**

10. **Brain Behavior, and Evolution Seminar, University of Texas at Austin, 2020**

Cognition in a dynamic social world

9. **Annual Meeting of the Animal Behavior Society, Virtual Meeting, 2020**

*Sex differences in cognition in the highly social cichlid fish *Astatotilapia burtoni**

8. **Brain Behavior, and Evolution Seminar, University of Texas at Austin, 2020**

Neuroendocrine basis of social competence & cognition in a highly social cichlid fish

7. **Janelia Junior Scientist Workshop on Mechanistic Cognitive Neuroscience, HHMI, 2019**

Neuroendocrine basis of social competence & cognition in a highly social cichlid fish

6. **Brain Behavior, and Evolution Seminar, University of Texas at Austin, 2018**

*Sex differences in Cognitive Style and Domain Relationships in Mosquitofish (*G. affinis*)*

5. **Conference of Ford Fellows, National Academy of Sciences, 2018**

*Sex differences in cognitive style across domains in mosquitofish (*Gambusia affinis*)*

4. **Annual Meeting of the Animal Behavior Society, University of Wisconsin, 2018**

*Sex differences in cognitive style across domains in mosquitofish (*Gambusia affinis*)*

3. **Brain Behavior, and Evolution Seminar, University of Texas at Austin, 2018**

*Comparative cognition in *Gambusia affinis**

2. **Meeting of Poeciliid Biologists, Oklahoma University, 2017** *award winner

*Investigating individual variation in cognition and behavior in *Gambusia affinis**

1. **Brain Behavior, and Evolution Seminar, University of Texas at Austin, 2017**

Investigating individual variation in cognition

SCIENTISTS SUPERVISED

Amherst College:

Elaine Aquino Vasquez (*research technician*)
 Jeremy Spool (*postdoc*)
 Hasun Noh (*undergrad honors thesis*)
 Sasha Heywood (*undergrad honors thesis*)
 Olivia Chima Anyanka
 Ayres Warren
 Dominion Femi-Jegede
 Sura Zhang
 Temidayo Bambe

Emory University:

Solanch Dupeyron (*undergrad honors thesis*)
 Mark Li

University of Texas at Austin:

Matt Armstrong
 Layla Kutty
 Don Le
 Matthew Lee

UNDERGRADUATE HONORS THESES

Hasun Noh 2025

The Characterization of Arginine Vasotocin in a Betta splendens Model of Social Aggression

Sasha Heywood 2025

Effects of repeated intraspecific competition on male Betta splendens behavior and stress

Solanch Dupeyron (Emory University) 2023

Determining how behavior and familiarity tests predict performance of Betta splendens in aggressive social competitions.

Thesis Committee Advisees (Amherst College):

Corlynn Raymond

AWARDS AND HONORS

Postdoctoral Poster Award (Society for Behavioral Neuroendocrinology) 2021
 Travel Award (Society of Behavioral Neuroendocrinology) 2020
 University Graduate Continuing Fellowship (University of Texas at Austin) 2020
 Broadening Participation Award (Society for Integrative & Comparative Biology) 2020
 Junior Scientist Workshop Award (Howard Hughes Medical Institute) 2019
 BEACON Student Travel Fund Award (BEACON Center for Evolution in Action) 2019
 First Place Student Poster Award (Ecological Integration Symposium, Texas A&M) 2019
 IB Doctoral Dissertation Improvement Grant (University of Texas at Austin) 2019
 IB Joint Graduate Program Travel Award (University of Texas at Austin) 2018
 Best Student Presentation Award (7th Meeting of Poeciliid Biologists) 2017
 EcoLabs Research Grant (Texas EcoLabs) 2017
 Graduate School Continuing Fellowship (University of Texas at Austin) 2017
 Diversity Travel Award (Animal Behavior Society) 2016
 EEB Startup Fellowship (University of Texas at Austin) 2016
 Graduate School Mentoring Fellowship (University of Texas at Austin) 2015
 Charles H. Turner Award (Animal Behavior Society) 2014

AFFILIATIONS

Faculty for Undergraduate Neuroscience
Society for Integrative & Comparative Biology
Society for Behavioral Neuroendocrinology

REVIEWER SERVICE

NSF Review Panelist (IOS CAREER)
NSF Ad-Hoc Reviewer (IOS BSC)
Proceedings of the Royal Society B
Hormones & Behavior
Behavioral Ecology
Scientific Reports
Trends in Cognitive Sciences
International Journal of Avian Science
Marine & Freshwater Behaviour and Physiology
Animal Behavior & Cognition
Frontiers in Ecology and the Environment