Megan K. Freiler
Department of Entomology
University of Minnesota
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EDUCATION

Indiana University, Bloomington, IN
PhD, Evolution, Ecology, and Behavior with minor in Animal Behavior, 2023
Thesis: *Social environment modulates the function and neuroendocrine regulation of electrocommunication signals across species of apteronotid fishes*
Advisor: G. Troy Smith

Washington University in St. Louis, St. Louis, MO
AB, Ecology and Evolution with minor in Philosophy–Neuroscience–Psychology, Research Emphasis in Biology and College Honors, 2016
Thesis: *Enlarged brains result in increased energetic demands both across species and within highly encephalized species of weakly electric mormyrid fishes*
Advisor: Bruce Carlson

Organization for Tropical Studies, Duke University, Costa Rica
Tropical Biology on a Changing Planet Semester Program in Costa Rica, 2015

APPOINTMENTS

University of Minnesota, St. Paul, MN
Postdoctoral Associate, Entomology, 2025-present
Advisors: Karen Mesce

University of Minnesota, St. Paul, MN
Postdoctoral Associate, Ecology, Evolution and Behavior, 2024
Advisors: Mark Bee and Alexander Baugh

TEACHING EXPERIENCE

University of Minnesota
EEB-4330W – Animal Communication
Instructor of Record

Indiana University
BIOL-L376 – Biology of Birds
Associate Instructor, Spring 2023
BIOL-L340 – Biology of Sexual Diversity

Associate Instructor, Fall 2020, Fall 2022

BIOL-Z460 – Animal Behavior

Associate Instructor, Spring 2019

BIOL-L318 – Evolution

Associate Instructor, Fall 2018, Fall 2021

BIOL-L104 – Biology of the Senses

Associate Instructor, Fall 2017

BIOL-L113 - Introduction to Biology Laboratory

Head Associate Instructor, Spring 2017

Assistant Associate Instructor, Fall 2016

PEER-REVIEWED PUBLICATIONS

†Indicates undergraduate co-author

1. **Freiler, M.K.,** Deckard, M.L.†, Proffitt, M.R., and Smith, G.T. (2024) Differential expression of steroid-related genes across electrosensory brain regions in two sexually dimorphic species of electric knifefish. *General and Comparative Endocrinology* 355: 114549.
2. **Freiler, M.K.** and Smith, G.T. (2023) Neuroendocrine mechanisms contributing to the coevolution of sociality and communication. *Frontiers in Neuroendocrinology* 70: 101077.
3. **Freiler, M.K.,*** Proffitt, M.R.,* and Smith, G.T. (2022) Electrocommunication signals and aggressive behavior vary among male morphs in an apteronotid fish, *Compsaraia samueli. Journal of Experimental Biology* 225 (12): jeb243452.
   **both authors contributed equally to this work*
4. Sukhum, K.V., **Freiler, M.K.,** and Carlson, B.A. (2019) Intraspecific energetic trade-offs and costs of encephalization vary from interspecific relationships in three species of mormyrid electric fishes. *Brain, Behavior, and Evolution:* 10.1159/000501233
5. Sukhum, K.V., **Freiler, M.K.**, Wang, R., and Carlson, B.A. (2016) The costs of a big brain: Extreme encephalization results in higher energetic demand and reduced hypoxia tolerance in weakly electric African fishes. *Proceedings of the Royal Society B: Biological Sciences* 283: 20162157.

AWARDS AND FELLOWSHIPS (Total: $85,809)

Society for Behavioral Neuroendocrinology Travel Award, 2024 ($500)

Postdoctoral Association Career Development Award, University of Minnesota, 2024 ($1000)

Nominee, Division of Comparative Endocrinology Aubrey Gorbman Award for Best Student Oral Presentation, Society for Integrative and Comparative Biology, 2024

Center for the Integrative Study of Animal Behavior (CISAB) Fellowship, Summer 2023 ($5,000)

William J. Rowland Mentoring Award, Center for the Integrative Study of Animal Behavior (CISAB), 2023 ($750)

Indiana University's Graduate and Professional Student Government Research Award, Spring 2022 ($1,000)
Center for the Integrative Study of Animal Behavior (CISAB) Fellowship, Spring 2022 ($10,883)
Department of Biology Louise Constable Hoover Fellowship, Summer 2021 ($2,000)
Center for the Integrative Study of Animal Behavior (CISAB) Fellowship, Spring and Summer 2021 ($15,383)
Society for Neuroethology Heiligenberg Student Travel Award, 2020 ($1900)
Indiana University Provost's Travel Award for Women in Science, 2020 (*returned - COVID)*
Society for Integrative and Comparative Biology Grant-in-Aid of Research, 2020 ($1,000)
Indiana Academy of Science Senior Research Grant, 2019 ($1,477)
Indiana University Biology Enrichment Travel Fund, 2019, 2022 ($300)
Common Themes in Reproductive Diversity (CTRD) NIH Training Fellowship, 2019-2020 ($24,816)
Indiana University Graduate Recruitment Fellowship, Spring 2018 ($12,500)
Summer Career Center Stipend, Washington University in St. Louis, 2015 ($3,000)
HHMI Summer Undergraduate Research Fellowship (SURF), 2014 ($4,000)

MENTORING EXPERIENCE

Swarthmore College Undergraduates
Liam Halstead (2024)
University of Minnesota Undergraduates
Alex Kozak (2024)
Indiana University Undergraduates
Marie Renahan (Spring 2020–Spring 2022), *Honors Thesis in Neuroscience*
Mikayla Deckard (Fall 2018–Spring 2022), *Honors Thesis in Human Biology*
Alyssa Saunders (Fall 2018–Spring 2021), *Honors Thesis in Biology*
Center for the Integrative Study for Animal Behavior NSF-REU Summer Interns
Vivian Huynh, 2021
Brandi Pessman, 2018
Grascen Shidemantle, 2017

INVITED LECTURES

Social and neuroendocrine regulation of electric signaling across apteronotid fishes (March 2024). Ecology, Evolution, and Behavior: Behavior Group. University of Minnesota.
Electrocommunication and neuromodulator receptor expression in electrosensory brain regions covary with species and social context (June 2023). Electric Fish Seminar Series – Virtual.
Social context differentially modulates communication and steroid production across electric fish species that vary in sociality (October 2022). Evolution, Ecology, and Behavior Colloquium, University of Illinois Urbana-Champaign.

Social context modulates steroids and electrocommunication signals in electric fish (April 2022). EEB Brown Bag Seminar, Indiana University.
The evolution of social behavior (November 2018). BIOL-L318 – Evolution, Indiana University.
The electric and magnetic senses (December 2017). BIOL-L104 – Biology of the Senses, Indiana University.

ORAL PRESENTATIONS

1. Freiler M.K. and Smith G.T. (July 2024) Neuromodulator receptor gene expression in electrosensory brain regions varies across species of electric knifefishes. Electric Fish Satellite Meeting, Berlin, Germany.
2. Freiler M.K., Deckard M.L., Proffitt M.R., and Smith G.T. (June 2024) Differential expression of steroid-related genes across electrosensory brain regions in two sexually dimorphic species of apteronotid electric knifefishes. Society for Behavioral Neuroendocrinology. Columbus, OH.
3. Freiler M.K. and Smith G.T. (January 2024) Electrocommunication and steroid hormones covary with individual condition across knifefishes. Society for Integrative and Comparative Biology. Seattle, WA.
4. Freiler M.K., Deckard M.L., Proffitt M.R., and Smith G.T. (November 2023) Differential expression of steroid-related genes across electrosensory brain regions in two sexually dimorphic species of electric knifefish. Sensorium. University of Chicago. Chicago, IL.
5. Freiler M.K. and Smith G.T. (March 2023) Individual condition and steroid levels covary with sociality and context in electric knifefishes. Animal Behavior Conference. Center for the Integrative Study of Animal Behavior, Indiana University. Bloomington, IN.
6. Freiler M.K., and Smith G.T. (July 2022) Electrocommunication and steroid hormone production vary with social context across electric knifefishes. Electric Fish Satellite Meeting, Lisbon, Portugal.
7. Freiler M.K., Proffitt M.R., and Smith G.T. (January 2021) Electrocommunication signals and aggression are temporally linked in an electric fish with male morphological variation. Society for Integrative and Comparative Biology. Virtual.
8. Freiler M.K., Proffitt M.R., and Smith G.T. (July 2020) Function of electrocommunication signals in an apteronotid fish with variation in male morphology. Animal Behavior Society. Virtual.

POSTER PRESENTATIONS
†Indicates undergraduate co-author

1. Freiler M.K. and Smith G.T. (July 2024) Neuromodulator receptor gene expression in electrosensory brain regions varies across species of electric knifefishes. International Congress for Neuroethology, Berlin, Germany.

2. **Freiler M.K.,** and Smith G.T. (July 2022) Electrocommunication and steroid hormone production vary with social context across electric knifefishes. International Congress for Neuroethology, Lisbon, Portugal.
3. **Freiler M.K.,** †Deckard, M.L., Proffitt, M.R., and Smith G.T. (July 2022) Steroid-related genes are expressed in electrosensory brain regions in two apteronotid species that differ in sexual dimorphism. Electric Fish Satellite Meeting, Lisbon, Portugal.
4. **Freiler M.K.** and Smith G.T. (June 2022) Social context modulates signaling and steroid hormone production in a species of electric knifefish (*Apteronotus albifrons*). Society for Behavioral Neuroendocrinology. Atlanta, GA.
5. **Freiler M.K.** and Smith G.T. (May 2022) Social context modulates steroid hormone production in a species of electric fish (*Apteronotus albifrons*). Brains and Behavior Retreat, Georgia State University. Atlanta, GA.
6. **Freiler M.K.** and Smith G.T. (March 2021) Social complexity is a weak predictor of signal variation and complexity in apteronotid weakly electric fishes. Animal Behavior Conference, Indiana University. Virtual.
7. **Freiler M.K.** and Smith G.T. (July 2019) Social context modulates sex-specific electrocommunication and steroid levels in an apteronotid fish. Animal Behavior Society, University of Illinois-Chicago. Chicago, IL.
8. **Freiler M.K.** and Smith G.T. (July 2019) Social experience modulates sex-specific electrocommunication but not steroid hormones in a territorial apteronotid fish. Society for Behavioral Neuroendocrinology, Indiana University. Bloomington, IN.
9. **Freiler M.K.** and Smith G.T. (March 2019) Social experience modulates sex differences in communication in a territorial species of electric fish. Animal Behavior Conference. Center for the Integrative Study of Animal Behavior, Indiana University. Bloomington, IN.
10. **Freiler M.**, Sukhum K., and Carlson B. (April 2017) Large brain evolution generates energetic and behavioral constraints across and within highly encephalized species of weakly electric mormyrid fishes. Animal Behavior Conference. Center for the Integrative Study of Animal Behavior, Indiana University. Bloomington, IN.
11. **Freiler M.**, Sukhum K., and Carlson B. (March 2017) Large brain evolution generates energetic and behavioral constraints across and within highly encephalized species of weakly electric mormyrid fishes. Midwest Ecology and Evolution Conference. University of Illinois. Urbana-Champaign, IL.
12. **Freiler M.**, Sukhum K., and Carlson B. (April 2016) Enlarged brains result in increased energetic demands both across species and within highly encephalized species of weakly electric mormyrid fishes. Undergraduate Research Symposium. Washington University in St. Louis. St. Louis, MO.
13. **Freiler M.**, Sukhum K., and Carlson B. (November 2015) How intraspecific variation in metabolism and hypoxia tolerance relates to brain size in *Brevimyrus niger*. Midstates Consortium Undergraduate Research Symposium in the Biological Sciences and Psychology. Washington University in St. Louis. St. Louis, MO.
14. **Freiler M.**, Sukhum K., and Carlson B. (October 2015) How intraspecific variation in metabolism and hypoxia tolerance relates to brain size in *Brevimyrus niger*.

Undergraduate Research Symposium. Washington University in St. Louis. St. Louis, MO.

15. **Freiler M.**, Sukhum K., and Carlson B. (November 2014) Energetic costs and reduced hypoxia tolerance from large brain size evolution in mormyrids. Midstates Consortium Undergraduate Research Symposium in the Biological Sciences and Psychology. University of Chicago. Chicago, IL.
16. **Freiler M.**, Sukhum K., and Carlson B. (October 2014) Energetic costs and reduced hypoxia tolerance as a result of large brain size evolution in mormyrids. Undergraduate Research Symposium. Washington University in St. Louis. St. Louis, MO.

CONTRIBUTED PRESENTATIONS

1. †Renahan M., **Freiler M.K.,** and Smith G.T. (March 2022) The effect of a serotonin-modulating drug on social behavior and aggression in a species of weakly electric fish. Animal Behavior Conference. Center for the Integrative Study of Animal Behavior, Indiana University. Bloomington, IN.
2. †Huynh V.L., **Freiler M.K.,** and Smith G.T. (March 2022) Function of chirping during social interactions in *Sternarchorhynchus* spp. Animal Behavior Conference. Center for the Integrative Study of Animal Behavior, Indiana University. Bloomington, IN.
3. †Deckard M.L., **Freiler M.K.,** Proffitt, M.R., and Smith G.T. (March 2022) Expression of steroid-related genes in sensory brain regions of two species of apteronotids that differ in sexual dimorphism. Animal Behavior Conference. Center for the Integrative Study of Animal Behavior, Indiana University. Bloomington, IN.
4. †Saunders A.N., **Freiler M.K.**, and Smith G.T. (March 2021) A comparison of chirping as an agonistic signal in gregarious and territorial species of weakly electric fish. Animal Behavior Conference, Center for the Integrative Study of Animal Behavior, Virtual.
5. †Deckard M.L., **Freiler M.K.,** Proffitt, M.R., and Smith G.T. (March 2021) Steroid-related genes are expressed in the sensory brain regions of two species of apteronotids that differ in sexual dimorphism. Animal Behavior Conference, Center for the Integrative Study of Animal Behavior, Virtual.
6. Proffitt M.R., **Freiler M.K.,** and Smith G.T. (July 2020) Communication signals of a weakly electric fish (*C. samueli*) differ between artificial and natural contexts. Animal Behavior Society, Virtual.
7. †Pessman B., **Freiler M.K.,** and Smith G.T. (July 2019) Vasotocin and social experience affect aggression and electrocommunication in a weakly electric fish (*Apteronotus albifrons*). Animal Behavior Society, University of Illinois-Chicago. Chicago, IL.
8. Proffitt M.R., **Freiler M.K.,** and Smith G.T. (March 2019) Characterization of behavioral and physiological differences between two different male morphs of a weakly electric fish *Compsaraia samueli*. Animal Behavior Conference. Center for the Integrative Study of Animal Behavior, Indiana University. Bloomington, IN.
9. Sukhum K.V., **Freiler M.K.**, Wang R., and Carlson B.A. (June 2016) The evolution of extreme encephalization results in higher energetic demand and reduced hypoxia

tolerance in weakly electric African fishes (Mormyridae). Society for the Study of Evolution. Austin, TX.

10. Sukhum K.V., **Freiler M.,** Wang R., and Carlson B.A. (November 2014) The costs of extreme encephalization: Bigger brains result in increased energetic demand and reduced hypoxia tolerance in weakly electric African fishes. J.B. Johnston Club for Evolutionary Neuroscience. Washington, DC.

UNIVERSITY SERVICE AND OUTREACH

Center for the Integrative Study of Animal Behavior (CISAB) Steering Committee, Indiana University

Graduate Student Representative, 2018–2023

Foundations in Science and Mathematics Summer Courses for High School Students, Indiana University

Admin, 2019–2022

Introductory Biology Instructor, 2017–2020

Center for the Integrative Study of Animal Behavior (CISAB) Animal Behavior Conference Planning Committee, Indiana University

Program Committee Chair, 2019-2023

Program Committee Member, 2017-2018

Biology Graduate Recruitment Weekend Planning Committee, Indiana University

Hosting Committee, 2019-2020

Transportation Committee, 2017

Science Fest, Indiana University

Volunteer, 2016-2020

Journal Club for Undergraduates in Biological Engineering and Sciences (JCUBES), Washington University in St. Louis

President, 2015–2016

Executive Member, 2013–2016

JOURNAL REVIEWER

Animal Behaviour, Biology Letters, Journal of Comparative Psychology

RELEVANT TRAINING AND WORKSHOPS

DEI Luncheon, Society for Behavioral Neuroendocrinology, 2024

LGBTQ+ Safe Space Training, Indiana University, 2021

Communicating Across Differences (CAD) Summer Workshop, The University of Texas MD Anderson Cancer Center, 2021

PROFESSIONAL SOCIETIES

Society for Behavioral Neuroendocrinology, International Society for Neuroethology, Society for Integrative and Comparative Biology, Animal Behavior Society