Megan K. Freiler

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EDUCATION

2023 **PhD, Evolution, Ecology, and Behavior**, Indiana University
Dissertation: *Social environment modulates the function and neuroendocrine regulation of electrocommunication signals across species of apteronotid fishes*
Advisor: G. Troy Smith

2016 **AB, Ecology and Evolution,** Washington University in St. Louis
Thesis: *Enlarged brains result in increased energetic demands both across species and within highly encephalized species of weakly electric mormyrid fishes*
Advisor: Bruce Carlson

2015 **Tropical Biology on a Changing Planet Semester Program,** Organization for Tropical Studies, Costa Rica

APPOINTMENTS

2025-present **Postdoctoral Associate**, University of Minnesota, Departments of Entomology and Neuroscience
Advisor: Karen Mesce

2024 **Postdoctoral Associate**, University of Minnesota, Department of Ecology, Evolution and Behavior
Advisors: Mark Bee and Alexander Baugh

TEACHING EXPERIENCE

University of Minnesota

Instructor of Record, Animal Communication — Fall 2024

Indiana University

Associate Instructor, Biology of Birds — Spring 2023
Associate Instructor, Biology of Sexual Diversity — Fall 2020, Fall 2022
Associate Instructor, Evolution — Fall 2018, Fall 2021

Associate Instructor, Animal Behavior	Spring 2019
Guest Lecture, Evolution, Evolution of social behavior	Fall 2018
Associate Instructor, Biology of the Senses	Fall 2017
Guest Lecture, Biology of the Senses, Electric and magnetic senses	Fall 2017
Head Associate Instructor, Introduction to Biology Laboratory	Spring 2017
Assistant Associate Instructor, Introduction to Biology Laboratory	Fall 2016

PUBLICATIONS

†Indicates undergraduate co-author

Published

1. **Freiler, M.K.**, †Halstead, L.N., Bee, M.A., and Baugh, A.T. (2026) Experimentally induced sexual behavior in male gray treefrogs activates the HPG but not the HPI axis. *Hormones and Behavior* 177: 105864.
2. **Freiler, M.K.** and Smith, G.T. (2025) Sociality does not predict signal complexity in response to playback in apteronotid weakly electric fishes. *Behavioral Ecology and Sociobiology* 79(7): 1-15.
3. **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.
4. **Freiler, M.K.** and Smith, G.T. (2023) Neuroendocrine mechanisms contributing to the coevolution of sociality and communication. *Frontiers in Neuroendocrinology* 70: 101077.
5. **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*
6. 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* 93(4): 196-205.
7. 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.

In Prep

1. **Freiler, M.K.**, and Smith, G.T. Individual condition and steroid levels covary with sociality and social context in electric knifefishes.
2. **Freiler, M.K.**, and Smith, G.T. Variation in neuromodulator receptor gene expression in sensory brain regions across three species of electric knifefishes that vary in sociality.

AWARDS AND FELLOWSHIPS (Total: $85,809)

2024	Society for Behavioral Neuroendocrinology Travel Award ($500)
2024	Postdoctoral Association Career Development Award, University of Minnesota ($1000)
2024	Nominee, Division of Comparative Endocrinology Aubrey Gorbman Award for Best Student Oral Presentation, Society for Integrative and Comparative Biology
2023	Center for the Integrative Study of Animal Behavior (CISAB) Fellowship ($5,000)
2023	William J. Rowland Mentoring Award, Center for the Integrative Study of Animal Behavior (CISAB) ($750)
2022	Indiana University Biology Enrichment Travel Fund ($300)
2022	Graduate and Professional Student Government Research Award, Indiana University ($1,000)
2022	Center for the Integrative Study of Animal Behavior (CISAB) Fellowship ($10,883)
2021	Louise Constable Hoover Fellowship, Indiana University ($2,000)
2021	Center for the Integrative Study of Animal Behavior (CISAB) Fellowship ($15,383)
2020	Heiligenberg Student Travel Award, Society for Neuroethology ($1900)
2020	Provost's Travel Award for Women in Science, Indiana University (*returned - COVID)*
2020	Grant-in-Aid of Research, Society for Integrative and Comparative Biology ($1,000)
2019	Indiana Academy of Science Senior Research Grant ($1,477)
2019	Indiana University Biology Enrichment Travel Fund ($300)
2019-2020	Common Themes in Reproductive Diversity (CTRD) NIH Predoctoral Training Fellowship ($24,816)
2018	Graduate Recruitment Fellowship, Indiana University ($12,500)
2015	Summer Career Center Stipend, Washington University in St. Louis ($3,000)
2014	HHMI Summer Undergraduate Research Fellowship (SURF) ($4,000)

UNDERGRADUATE MENTORING EXPERIENCE

University of Minnesota

2025-present	Khadija Abbas
2025-present	Kadence Henry
2025-present	Cayden Schaefer
2024	Alexandra Kozak
2024	Animal Communication Lab Field Assistant Coordinator

Swarthmore College

2024 Liam Halstead

Indiana University

2020-2022 Marie Renahan, *Honors Thesis in Neuroscience*
2018-2022 Mikayla Deckard, *Honors Thesis in Human Biology*
2018-2021 Alyssa Saunders, *Honors Thesis in Biology*
2021 Vivian Huynh, Program in Animal Behavior NSF-REU
2018 Brandi Pessman, Program in Animal Behavior NSF-REU
2017 Grascen Shidemantle, Program in Animal Behavior NSF-REU

INVITED TALKS AND SEMINARS

Social and neuroendocrine regulation of electric signaling across apteronotid fishes (2024) Department of Ecology, Evolution, and Behavior: Behavior Group, University of Minnesota.

Electrocommunication and neuromodulator receptor expression in electrosensory brain regions covary with species and social context (2023) Electric Fish Seminar Series, Virtual.

Social context differentially modulates communication and steroid production across electric fish species that vary in sociality (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.

SUBMITTED MEETING PRESENTATIONS

†Indicates undergraduate co-author

Oral Presentations

1. **Freiler M.,** Schlechte E., †Henry K., and Mesce K. (2025) Novel growth of peripheral proprioceptor terminals following nerve cord injury in medicinal leeches. Postdoctoral Retreat, University of Minnesota. Minneapolis, MN.
2. **Freiler M.K.,** †Halstead L.N., Bee M.A., and Baugh A.T. (2025) Experimentally induced mating stimulates gonadal hormones but not glucocorticoids in gray treefrogs. Animal Behavior Society, Baltimore, MD.
3. **Freiler M.K.** and Smith G.T. (2024) Neuromodulator receptor gene expression in electrosensory brain regions varies across species of electric knifefishes. Electric Fish Satellite Meeting, Berlin, Germany.
4. **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 apteronotid electric knifefishes. Society for Behavioral Neuroendocrinology. Columbus, OH.

5. **Freiler M.K.** and Smith G.T. (2024) Electrocommunication and steroid hormones covary with individual condition across knifefishes. Society for Integrative and Comparative Biology. Seattle, WA.
6. **Freiler M.K.,** †Deckard M.L., Proffitt M.R., and Smith G.T. (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.
7. **Freiler M.K.** and Smith G.T. (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.
8. **Freiler M.K.,** and Smith G.T. (2022) Electrocommunication and steroid hormone production vary with social context across electric knifefishes. Electric Fish Satellite Meeting, Lisbon, Portugal.
9. **Freiler M.K.,** Proffitt M.R., and Smith G.T. (2021) Electrocommunication signals and aggression are temporally linked in an electric fish with male morphological variation. Society for Integrative and Comparative Biology. Virtual.
10. **Freiler M.K.,** Proffitt M.R., and Smith G.T. (2020) Function of electrocommunication signals in an apteronotid fish with variation in male morphology. Animal Behavior Society. Virtual.

Poster Presentations

1. **Freiler M.K.** and Smith G.T. (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. (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. (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. (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. (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. (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. (J2019) 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. (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. (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. (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. (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. (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. (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. (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.

Contributed Presentations

1. †Renahan M., **Freiler M.K.,** and Smith G.T. (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. (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. (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. (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. (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. (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. (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. (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. (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. (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.

PROFESSIONAL SERVICE

Committees

College of Food, Agricultural, and Natural Resource Sciences Postdoc Board, University of Minnesota, Budget/Grants and Awards Chair, 2025-present

Postdoc Association Steering Committee, University of Minnesota, Social Committee Member, 2025-present

Center for the Integrative Study of Animal Behavior (CISAB) Steering Committee, Indiana University, Graduate Student Representative, 2018–2023

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

Public Outreach

EEB Mentor Match, Diversity Committee, American Society of Naturalists, 2025

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

Admin, 2019–2022, Introductory Biology Instructor, 2017–2020
Science Fest Volunteer, Indiana University, 2016-2020
Journal Club for Undergraduates in Biological Engineering and Sciences (JCUBES), Washington University in St. Louis
President, 2015–2016, Executive Member, 2013–2016

Ad hoc Reviewer
Animal Behaviour, Biology Letters, Journal of Comparative Psychology

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

RELEVANT TRAINING AND WORKSHOPS

Inclusive STEM Teaching Project, University of Minnesota, 2025
Teaching Assistant and Postdoc Professional Development (TAPD) Program, Center for Educational Innovation (CEI), University of Minnesota, 2025
Ally Training, Animal Behavior Society, 2025
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

REFERENCES

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Entomology and Neuroscience, University of Minnesota
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