Hannah Weller

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Present Position

University of Helsinki, Postdoctoral researcher, Sept 2023 – present
Integrative Evolutionary Biology Group

- Evolution and development of color pattern robustness in fishes.

Education

PhD **Brown University**, Ecology and Evolutionary Biology 2019 – 2023

M.Sc. **Brown University**, Ecology and Evolutionary Biology 2017 – 2019

B.Sc. **University of Chicago**, Biology (GPA: 3.97) 2012 – 2016

Publications

Predators drive the evolution of ultraviolet colouration in snakes 2024
H.L. Crowell, **H.I. Weller**, J.D. Curlis, A. R. Davis-Rabosky. All authors contributed equally.

https://doi.org/10.1038/ (Nature Communications)

Recolorize: flexible color segmentation of biological images 2024
H.I. Weller, A.E. Hiller, N.P. Lord, S.M. Van Belleghem
https://doi.org/10.1111/ele.14378 (Ecology Letters)

Neural dysregulation and aberrant microglial responses to brain injury following perfluorooctane sulfonate exposure in larval zebrafish 2023
S.E. Paquette, N. Martin, A. Rodd, K.E. Manz, M. Camarillo, E. Allen, **H.I. Weller**, K. Pennell, J. Plavicki
https://doi.org/10.1289/EHP1286 (Environmental Health Perspectives)

Evidence for a selective link between cooperation and individual recognition 2023
J.P. Tumulty, S.E. Miller, S.M. Van Belleghem, **H.I. Weller**, C.M. Jernigan, S. Vincent, R.J. Staudenraus, A.W. Legan, T.J. Polnaszek, F.M.K Uy, A. Walton, M.J. Sheehan

https://doi.org/10.1016/j.cub.2023.11.032 (Current Biology)

Relaxed feeding constraints facilitate the evolution of mouthbrooding in Neotropical cichlids 2022
Weller, H.I., H. López-Fernández, C.D. McMahan, E.L. Brainerd
https://doi.org/10.1086/719235 (The American Naturalist)

Modular lung ventilation in *Boa constrictor* 2022
J.G. Capano, S.M. Boback, **H.I. Weller**, R.L. Cieri, C.F. Zemer, E.L. Brainerd
https://doi.org/10.1242/jeb.243119 (Journal of Experimental Biology)

An XROMM study of intra-oral transport and swallowing in catfish 2020
H.I. Weller, A. Olsen, A.L. Camp, L.P. Hernandez, A.R. Manafzadeh, E.L. Brainerd

https://doi.org/10.1093/iob/obaa018 (Integrative Organismal Biology)

The Evolutionary Continuum of Functional Homodonty to Heterodonty in the Dentition of *Halichoeres* Wrasses 2020

K.E. Cohen, **H.I. Weller**, M.W. Westneat, A.P. Summers

https://doi.org/10.1093/icb/icaa137 (Integrative and Comparative Biology)

Countcolors, an R package for quantification of the fluorescence emitted by *Pseudogymnoascus destructans* lesions on the wing membranes of hibernating bats 2020

H.I. Weller, S.E. Hooper, S.K. Amelon

https://doi.org/10.7589/2019-09-231 (Journal of Wildlife Disease)

Not your father's homodonty—stress, tooth shape, and the functional homodont 2020

K.E. Cohen, **H.I. Weller**, A.P. Summers

https://doi.org/10.1111/joa.13248 (Journal of Anatomy)

Intra-oropharyngeal food transport and swallowing in white-spotted bamboo sharks 2019

N.M. van Meer, **H.I. Weller**, A.R. Manafzadeh, E.B. Kaczmarek, B. Scott, S.W.S. Guskeloo, C.D. Wilga, A.L. Camp, E.L. Brainerd

https://doi.org/10.1242/jeb.201426 (Journal of Experimental Biology)

Quantitative color profiling of digital images with earth mover's distance using the R package colordistance 2019

H.I. Weller, M.W. Westneat

https://doi.org/10.7717/peerj.6398 (PeerJ)

Dirt-sifting Devilfish: Winnowing in the geophagine cichlid *Satanoperca daemon* and evolutionary implications 2017

H.I. Weller, C.D. McMahan, M.W. Westneat

Zoomorphology

Awards And Fellowships

Doctoral Dissertation Enhancement Grant January 2022

- $10,000, Bushnell Fund at Brown University

Dean's Excellence in Teaching Award May 2021

- Awarded for teaching in human anatomy at Brown University Alpert Medical School

Graduate Research Fellowhship April 2019

- $138,000, National Science Foundation

Field Museum Visiting Scientist Scholarship December 2018

- $1,500, Field Museum of Natural History

Presidential Fellowhship May 2017

- $108,000, Brown University

Jeff Metcalf Undergraduate Research Fellowship June 2015

- $5,000, Marine Biological Laboratory

Elected to Phi Beta Kappa Society March 2015

Best Presentation, Undergraduate Research Symposium September 2014

- $150, University of Chicago

Elliott and Eileen Hinkes Research Fellowship June 2014

- $4,000, University of Chicago

Software

recolorize: Simplify and Remap Image Colors for Biological Analysis CRAN repository

colordistance: Distance Metrics for Image Color Similarity CRAN repository

countcolors: Locates and Counts Pixels Within Color Range(s) in Images CRAN repository

Presentations

Weller, H.I., Van Belleghem, S. (April 2024). Talk: recolorize: An R package for flexible colour segmentation of biological images. *Finnish Molecular Ecology Symposium*, Joensuu, Finland.

Weller, H.I., Van Belleghem, S. (July 2023). Invited symposium talk: One way to measure color pattern variation in coral reef fishes. *International Conference for Vertebrate Morphology*, Cairns, Australia.

Weller, H.I., and Van Belleghem, S. (January 2023). Poster: Flexible color segmentation of biological images with the R package recolorize. *Society for Integrative and Comparative Biology*, Austin, TX, USA.

Weller, H.I., Weissman, M., and López-Fernández, H. (January 2023). Talk: Bet-hedging theory helps explain life history differences among mouthbrooding cichlids. *Society for Integrative and Comparative Biology*, Austin, TX, USA.

Weller, H.I. and López-Fernández, H. (September 2022). Invited symposium talk: How (and how much) does feeding influence the evolution of mouthbrooding in Neotropical cichlids? *Encontra Brasileiro de Ictiologia*, Gramado, Brazil.

Weller, H.I., Brainerd, E.L, and López-Fernández, H. (January 2022). Talk: Does feeding mediate life history tradeoffs in mouthbrooding cichlids? *Society for Integrative and Comparative Biology*, virtual conference.

Weller, H.I., Wham, D., Ezray-Wham, B., and Lord, N.P. (August 2021). Talk: Greater than the sum of their parts? Unpacking the "black box" of perceptual similarity using classical color pattern metrics. *Living Light Early Career Researchers*, virtual conference.

Weller, H.I., Schwartz, S.T., Karan, E., and Lord, N.P. (Jan. 2021). Talk: Recolorize: a flexible R package for color classification. *Society for Integrative and Comparative Biology*, virtual conference.

Weller, H.I., López-Fernández, H., McMahan, C.D., and Brainerd, E.L. (Jan. 2020). Talk: The spandrels of Satan's perches: evidence for the co-optation of feeding traits in the convergent evolution of mouthbrooding in Neotropical cichlids. *Society for Integrative and Comparative Biology*, Austin, TX.

Weller, H.I., López-Fernández, H., McMahan, C.D., and Brainerd, E.L. (Oct. 2019). Talk: Does mouthbrooding constrain or complement feeding morphology? *Regional Division of Vertebrate Morphology (Northeast)*, Newton, MA.

Weller, H.I., Olsen, A., Camp, A.L., Hernandez, L.P., Manafzadeh, A.R., and Brainerd, E.L. (Jan. 2019). Talk: 3D-Intra-oral Prey Trajectories Indicate Distinct Phases in how Channel Catfish (Ictalurus punctatus, Siluriformes: Ictaluridae) Swallow Food. *International Congress of Vertebrate Morphology*, Prague, CZ.

Weller, H.I., Cohen, K.E., Gibb, A., and Brainerd, E.L. (Jan. 2019). Poster: Using tethers to measure food transport in a flatfish. *Society for Integrative and Comparative Biology*, Tampa, FL.

Weller, H.I., Olsen, A., Camp, A.L., Hernandez, L.P., Manafzadeh, A.R., and Brainerd, E.L.(Jan. 2019). Talk: An XROMM study of intra-oral transport and swallowing in catfish. *Society for Integrative and Comparative Biology*, Tampa, FL.

Weller, H.I. and Brainerd, E.L. (Oct. 2017). Talk: How do fish swallow food? *Regional Division of Vertebrate Morphology (Northeast)*, Lowell, MA.

Weller, H.I., McMahan, C.D., and Westneat, M.W. (July 2016). Poster: Dirt-sifting devilfish: winnowing in eartheater cichlids. *American Society of Ichthyologists and Herpetologists*, New Orleans, LA.

Invited Lectures And Workshops

Workshop: Statistics for Biologists
University of Washington, Friday Harbor Laboratories
June 2022

- R workshop focusing on practical statistical approaches to messy biological data.

Podcast: Naturalist Selections
American Society of Naturalists
May 2022

- Podcast interview about Weller et al. 2022 on the co-evolution of feeding and mouthbrooding in cichlids.

Workshop: Phylogenetic Comparative Methods in R
University of Washington, Friday Harbor Laboratories
July 2020

- R workshop for graduate-level fish course, focusing on phylogenetic and comparative methods.

A field guide to statistics in organismal biology
University of Washington, Friday Harbor Laboratories
July 2020

- Guest lecture on how to approach novel statistical methods for those without a statistical background.

Mouthbrooding morphologies in Neotropical cichlids
Univ. of California-Davis, Dept. of Ecology and Evolutionary Biology
July 2020

- Virtual seminar. Host: Peter Wainwright.

Special Topics: Light, Color, and Vision in Biology (BIOL 7901/ENTM 7008)
Louisiana State University, Dept. of Biology
April 2020

- Guest lecturer (3 classes). Instructors: Nathan Lord (ENTM) & Brant Faircloth (BIOL).

Workshop: R for Biologists
Louisiana State University, Dept. of Entomology
December 2019

- Organizer. Day-long workshop on data analysis and visualization in R.

Teaching And Outreach

Postdoctoral representative, *University of Helsinki Wellbeing Committee*
Helsinki, Finland
Sept 2023 – present

- Organizing events and awareness campaigns around wellbeing resources (e.g. mental health, mentorship, exercise) for Helsinki Institute of Life Sciences research community.

Local organizer, *Meeting of the European Society of Evolutionary and Developmental Biology, 2024*
Helsinki, Finland
Sept 2023 – June 2024

- Organized outreach events and coordinated conference activities.

Instructor, *Brown University Summer@Brown Program*
Providence, RI, USA
June 2021, July 2022

- Course title: Anatomy, Behavior, and Evolution: Fishy Solutions to Life Underwater
- Proposed, designed, and implemented entire course (2 weeks, 4 hours/day). Intensive high school course including labs, assignments, and mentoring of final project.

Teaching assistant, *Brown University, Alpert Medical School*
Providence, RI, USA
Aug 2019 – Apr 2021

- Course title: Human Anatomy (lecture and lab)
- Guided medical students through cadaver-based human anatomy labs.

- Delivered lectures on pharyngeal arch development and cranial nerve innervation.
- Restructured curriculum for COVID teaching, including remote/small group work and prosection-based staggered labs.

R User Group, Brown University, Dept. of Ecology and Evolutionary Biology — Providence, RI, USA, Sept 2019 – June 2023

- Organized and ran monthly R workshops for graduate and undergraduate students, focusing on techniques for biological analysis.

Marine Science Club, *Paul Cuffee High School* — Providence, RI, USA, Sept 2018 – June 2022

- Collaborated with high school teachers for weekly science activities with high school students.

Teaching Assistent, University of Chicago, Dept. of Biological Sciences — Chicago, IL, USA, Jan 2015 – Apr 2017

- Presenting and supervising lab experiments; writing and grading assignments; lecturing; leading paper discussions and review sessions; guiding dissection-based anatomy labs.
- Courses: Genetic and Developmental Biology (lab & lecture); Multiscale Modeling of Biological Systems (lecture); Molecular Biology of the Cell (lab); Comparative Vertebrate Anatomy (lab & lecture).

Animal care intern, *New England Aquarium — Boston, MA, USA, June 2013 – Sept 2013

- Daily animal care and maintenance; visitor outreach; collection trips.

Mentorship

João Lopes (Master's thesis) — University of Helsinki, Sept 2023 – July 2024

- Co-supervised thesis: Heritability of fluctuating asymmetry in the color pattern of *Chindongo demasoni*.

Mehrnaz Asadnejad — University of Helsinki, June 2024 – present

- Co-supervised thesis: The effect of increased Temperature on phenotypic robustness in a cichlid fish.

Angelina Cho (undergraduate research project) — Brown University, Sept 2021 – June 2023

- Developed automatic video tracking pipeline for the lab using DeepLabCut.

Skills

Programming: R, Python (OpenCV, Scrapy, & BioPython libraries), MATLAB, UNIX, MEL

Software: Latex, Maya, FIJI/ImageJ, Horos, 3DSlicer, XMALab, Mesquite, Pandoc, Microsoft Office

Languages: English (native), French (intermediate), Finnish (basic)