Danielle M. Blumstein, PhD

Physiology, genomics, ecology, & evolution

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APPOITMENTS

- Research Associate, State Fisheries Genomics Lab, Coastal Oregon Marine Experiment Station, Hatfield Marine Science Center, Oregon State University, October 2024 – May 2025
- Field Team Director, University of Denver, Colorado, May 2024 – September 2024

EDUCATION

- Ph.D., Molecular and Evolutionary Systems Biology. University of New Hampshire. August 2019- May 2024
- M.S., Natural Resources. Wisconsin Cooperative Fishery Research Unit, University of Wisconsin - Stevens Point. August 2017-May 2019
- B.S., Zoology. Michigan State University. August 2013 – May 2017. Concentration: Ecology, Evolution, and Organismal Biology Minor: Environmental Studies and Sustainability

PUBLICATIONS

Blumstein DM and MacManes, MD. 2024. Impacts of dietary fat on multi tissue gene expression in the desert-adapted cactus mouse. Journal of Experimental Biology. *J Exp Biol* 227 (24): jeb247978.

Blumstein DM, Colella, JP, E Linder, and MacManes, MD. 2024. High total water loss driven by low-fat diet in desert-adapted mice, Journal of Mammalogy; gyae093.

Blumstein DM and MacManes, MD. 2024. The multi-tissue gene expression and physiological responses of water deprived Peromyscus eremicus. BMC Genomics 25, 770.

Blumstein DM. 2024. Survival Strategies in Arid Environments: Exploring Desert Adaptations in Peromyscus eremicus. PhD dissertation. University of New Hampshire.

Blumstein DM and MacManes, MD. 2023. When the tap runs dry: The physiological effects of acute experimental dehydration in Peromyscus eremicus. Journal of Experimental Biology. *J Exp* 226 (23): jeb246386.

Colella, JP, ***Blumstein DM***, and MacManes MD. 2021. Disentangling environmental drivers of circadian metabolism in desert-adapted mice. Journal of Experimental Biology. 224 (18): jeb242529.

Blumstein, DM, Campbell, MA, Hale, MC, Sutherland, BJ, McKinney, GJ, Stott, W., & Larson, WA. 2019. Comparative genomic analyses and a novel linkage map for cisco (*Coregonus artedi*) provides insight into chromosomal evolution and rediploidization across salmonids. *G3*, 10(8):2863-2878.

Blumstein DM. 2019. The first haploid linkage map in a coregonid (*Coregonus artedi*) improves knowledge of chromosomal evolution and rediploidization across Salmonids. Master's thesis. University of Wisconsin Stevens Point.

Blumstein DM, Mays D, Scribner KT. 2017. Spatial genetic structure and recruitment dynamics of burbot (*Lota lota*) in Eastern Lake Michigan and Michigan tributaries. *Journal of Great Lakes Research, 44*(1):149156.

Waraniak JM, ***Blumstein DM***, Scribner KT. 2017. Barcoding PCR primers detect larval lake sturgeon (*Acipenser fulvescens*) in diets of piscine predators. *Conservation Genetics Resources*, *10*(2):259-268.

AWARDS (total $42,860)

2023 Dissertation Year Fellowship, University of New Hampshire *$24,560*
2022, 2021 Summer TA Fellowship, University of New Hampshire *$5,000 (2022)*, *$3,150 (2021)*
2022 Charlotte Mangum Student Support Program for SICB Annual Meeting *$150*
2023, 2022, 2020 Molecular, Cellular, and Biomedical Sciences, Department Graduate Student Travel Grant, University of New Hampshire *$200 each*
2023, 2022, 2020, 2019 Graduate Student Travel Grant, University of New Hampshire *$200 each*
2018 Muskie Clubs Alliance of Wisconsin Inc. Scholarship, University of Wisconsin – Stevens Point. *$1,000*
2018 OSCAR Travel Grant, University of Wisconsin – Stevens Point. *$500*
2017 Undergraduate Long-Term Study Abroad Program Scholarship, College of Natural Science, Michigan State University. *$1,000*
2016 Undergraduate Research Support Program Scholarship, College of Natural Science, Michigan State University. *$1,000*
2015 The Rajendra Essay Award, Department of Fisheries and Wildlife, Michigan State University. *$100*
2014 RISE Emerging Leaders Scholarship, College of Natural Resources, Michigan State University. *$500*
2014 Donald F. Koch and Barbara J. Sawyer-Koch Environmental Studies Scholarship, College of Natural Resources, Michigan State University. *$4,000*

TEACHING EXPERIENCE

BISC 580 Conservation Physiology, Guest lecture, Fall 2022, 2023, 2024, University of Mississippi
NR439 Environmental Biology, Guest lecture, Spring 2024, UNH
BIOL 950 Science Communication, panelist, Fall 2022, UNH
GEN 604 Principles of Genetics, TA, Spring 2022, UNH
ZOOL 625 Animal Physiology, Guest lecture, Spring 2022, 2023, UNH
GEN 711 Genomics and Bioinformatics, TA, Spring 2021, UNH
BMS 501 Microbes in Human Disease, TA, Fall 2020, 2021, UNH
Intro to R programming language, Elsawa lab meeting guest, 2021, UNH
Biology 210, Principles of Genetics, Guest lecture, 2018, University of Wisconsin – Stevens Point

MENTORING AND ADVISING

2020-2021 UNH Mechanical Engineering Capstone Advisor (4 Undergraduate Students)
Fall 2019-Spring 2024 UNH Undergraduate research (5 Undergraduate Students)
2016 Undergraduate Advisor, Michigan State University
2016 Undergraduate Tutor (math, biology, genetics, writing), Michigan State University
2014-2017 Residential community recruitment and selection committee, Michigan State University
2014-2017 Residential community student mentor, Michigan State University

WORKSHOPS AND SPECIAL COURSES

2024 Hatfield Marine Science Center, Research Summit, Newport Oregon
2021 RNA-Seq Concepts, Design & Workflows. Common Fund Data Ecosystem, UC Davis
2018 NFS-funded expert workshop for the development of a global experiment to understand Coregonid adaptive response to changing thermal regimes. Thonon – les – Bains, France
2017 RAD Sequencing Workshop. Molecular Conservation Genetics Laboratory, University of Wisconsin – Stevens Point
2016 Microsatellite Genotyping Workshop. Molecular Ecology Laboratory, Michigan State University
2015 Ecology and Plant Systematics Field Courses. Kellogg Biological Station, Michigan. 2014. MDNR Fish Sampling Techniques Course. Gaylord, Michigan

PROFESSIONAL MEMBERSHIPS

The Society for Integrative & Comparative Biology 2021-2023
American Society of Mammologists 2019–2023
Society for the Study of Evolution 2019–2023
UNH Advancing Women in Science 2019–2020
American Fisheries Society 2017-2019

PROFESSIONAL SERVICE

Ad hoc reviewer: Ecological and Evolutionary Physiology (1), Molecular Ecology (2), Transactions of the American Fisheries Society (1)
2023-2024 Elected COLSA Senator, Grad Student Senate, University of New Hampshire
2023 Invited Presenter, Seacoast Sips of Science, University of New Hampshire
2023 Session Chair, 13th International Mammalogical Congress. Anchorage, Alaska
2023 Host for three invited speakers, University of New Hampshire
2022, 2021 Invited Judge College of Life Science and Agriculture Undergraduate Research Conference, University of New Hampshire
2022 Session Chair, The Society for Integrative & Comparative Biology Annual Meeting. Phoenix, Arizona
2022, 2021 Grad student social coordinator in the Department of Molecular, Cellular, Biomedical Sciences, University of New Hampshire
2021 Three Minute Thesis, University of New Hampshire
2019 Skype a Scientist (middle school). Three classes: Actual Living Scientist.
2019 Presenter, Science Sleuths (Preschool). Two class periods: What are fish? University of New Hampshire
2019 Invited Judge Jim and Katie Krause College of Natural Resources Student Research Symposium, University of Wisconsin – Stevens Point
2019 Presenter, STEAM Point Day for Girls (16 middle school students per class). Two class periods: Evolution Board Game. University of Wisconsin – Stevens Point
2018 Invited Judge Jim and Katie Krause College of Natural Resources Student Research Symposium, University of Wisconsin – Stevens Point
2018 Presenter, STEAM Point Day for Boys (16 middle school students per class). Two class periods: Evolution Board Game. University of Wisconsin – Stevens Point
2018 Presenter, STEM Exploration Day at Treehaven (16 middle school students per class). Three class periods: Evolution Board Game. University of Wisconsin – Stevens Point

PRESS

UNH THRIVE Fall 2024: https://colsa.unh.edu/thrive-fall-2024
American Society of Mammalogists: https://www.facebook.com/share/p/2vJHy1ohTZzmXHpw/, https://www.instagram.com/p/DAJKmuMhEoF/
UNH Today: https://www.unh.edu/unhtoday/2024/05/desert-mice-offer-insight-potential-climate-change-adaptations
Inside JEB Feature: https://doi.org/10.1242/jeb.246924
JEB ECR Spotlight: https://doi.org/10.1242/jeb.246936

RESEARCH EXPERIENCE

October 2024 – May 2025 Research Associate
State Fisheries Genomics Lab, Hatfield Marine Science Center, *Oregon State University*
Primary investigator: Dr. Kathleen O'Malley
"Genetic and genomic analysis of reintroduced fish to the productivity of at-risk salmon populations."

May 2024- September 2024 Field Team Director
College of Natural Sciences and Mathematics, University of Denver, Colorado
"Maintenance of a small mammal trapping grid for the capture, handling, and tagging of deer mice for field respirometry"

Aug 2019 – May 2024 Graduate Research Assistant
D*epartment of Molecular, Cellular, and Biomedical Sciences, University of New Hampshire*. Advisor: Dr. Matthew MacManes
"Physiological genomics of desert adaptation in Peromyscus"

Aug 2017- May 2019 Graduate Research Assistant
Wisconsin Cooperative Fisheries Unit, University of Wisconsin – Stevens Point
Advisor: Dr. Wesley Larson
"The first haploid linkage map in a coregonid (*Coregonus artedi*) improves knowledge of chromosomal evolution and rediploidization across Salmonids"

Jan-Apr 2017 International Research Experience
Victoria University of Wellington, New Zealand
Developed an interdisciplinary perspective of interactions between animal health, environmental health, and human health as they apply to culture

Dec 2014-Aug 2017 Undergraduate Laboratory Technician
Department of Fisheries and Wildlife, Michigan State University
Conducted molecular genetics lab work and data analysis on various projects

May-Aug 2016/ May-Aug 2017 Field Technician
MSU/MDNR Black River Sturgeon Hatchery and Research Facility, Onaway, Michigan
Conducted hatchery and field work for research and conservation aquaculture of lake sturgeon

July-Aug 2016 Aquatic Invasive Species Technician
Department of Fisheries and Wildlife, Michigan State University
Assisted in field sampling and lab work to develop eDNA assays to detect presence of aquatic invasive species

May-Dec 2015 Field Technician
Michigan State University Department of Plant Biology Schemske Laboratory, Mammoth Cave National Park, Kentucky
Field sampling and greenhouse rearing of plants for research on the latitudinal biodiversity

Aug 2013-April 2016 Student Intern
RISE Bailey Greenhouse and Urban Farm, Michigan State University
Work in an urban greenhouse to grow organic produce and crop plan for urban farming research

PRESENTATIONS

- Sarah Nicholls, Sarah Couture, ***Blumstein, DM*.,** MacManes MD (2024) Using RNA Sequencing to Examine the Dehydration Response in the Hypothalamus and Pituitary Gland of a Desert-Adapted Mouse (poster). 3rd Joint Congress on Evolutionary Biology. Montreal, QC, Canada
- Sarah Nicholls, Sarah Couture, ***Blumstein, DM*.,** MacManes MD (2024) Using RNA Sequencing to Examine the Dehydration Response in the Hypothalamus and Pituitary Gland of a Desert-Adapted Mouse (poster). Undergraduate Research Conference, University of New Hampshire
- ***Blumstein DM*.,** MacManes MD (2023) When the tap runs dry: The physiological effects of acute experimental dehydration in the desert adapted mouse. American Society of Mammologists, Anchorage, Alaska
- ***Blumstein DM*.,** MacManes MD (2022) When the tap runs dry: The physiological effects of acute experimental dehydration in the desert adapted mouse. Evolution, Cleveland, Ohio
- ***Blumstein DM*.,** MacManes MD (2022) When the tap runs dry: The physiological effects of acute experimental dehydration in the desert adapted mouse. American Society of Mammologists, Tucson, Arizona
- Donatelli C., ***Blumstein, DM*.,** MacManes MD (2022) Changes in gene expression in the cactus mouse (*Peromyscus eremicus)* due to diet composition (poster). Undergraduate Research Conference, University of New Hampshire
- ***Blumstein DM*.,** MacManes MD (2022) When the tap runs dry: The physiological effects of acute experimental dehydration in the desert adapted mouse (poster). Graduate Research Conference, University of New Hampshire
- **Blumstein DM.,** MacManes MD (2022) When the tap runs dry: The physiological effects of acute experimental dehydration in the desert adapted mouse. The Society for Integrative & Comparative Biology Annual Meeting. Phoenix, Arizona
- ***Blumstein DM.*** (2021). When the tap runs dry: The physiological effects of acute experimental dehydration in the desert adapted mouse. Molecular, Cellular, Biomedical Sciences, University of New Hampshire
- ***Blumstein DM*.,** Colella JP., MacManes MD (2021). Food for thought: Evaporative water loss driven by low-fat diet in desert-adapted mice (poster). Annual Meeting of the American Society of Mammologists, Virtual Conference Platform
- ***Blumstein DM.,*** Campbell, MA., Hale, MC., Sutherland, BJ., McKinney, GJ., Stott, W., & Larson, WA. (2019). Comparative genomic analyses and a novel linkage map for cisco (*Coregonus artedi*) provides insight into chromosomal evolution and rediploidization across salmonids. Hubbard Genome Center, University of New Hampshire
- ***Blumstein DM***. (2019). The first haploid linkage map in a coregonid (*Coregonus artedi*) improves knowledge of chromosomal evolution and rediploidization across Salmonids. International Association for Great Lakes Research 62nd Annual Conference on Great Lakes Research. The College at Brockport, State University of New York
- ***Blumstein DM***. (2019). The first haploid linkage map in a coregonid (*Coregonus artedi*) improves knowledge of chromosomal evolution and rediploidization across Salmonids. Master's thesis. University of Wisconsin Stevens Point
- ***Blumstein DM***, Stott W, Larson WA (2019) Development of a genetic linkage map for cisco (*Coregonus artedi*) to facilitate integrated studies of adaptive diversity (poster). 47th Annual Meeting of the Wisconsin Chapter of the American Fisheries Society. Green Bay, Wisconsin
- ***Blumstein DM***, Stott W, Larson WA (2018) Development of a genetic linkage map for cisco (*Coregonus artedi*) to facilitate integrated studies of adaptive diversity. Coastwide Salmonid Genetics Meeting, Mukilteo, Washington

- ***Blumstein DM***, Stott W, Larson WA (2018) Development of a genetic linkage map for cisco (*Coregonus artedi*) to facilitate integrated studies of adaptive diversity. USGS Great Lakes Science Center, Ann Arbor, Michigan. *Invited Seminar*
- ***Blumstein DM***, Stott W, Larson WA (2018) Development of a genetic linkage map for cisco (*Coregonus artedi*) to facilitate integrated studies of adaptive diversity (poster). Midwest Fish and Wildlife Conference. Milwaukee, Wisconsin
- ***Blumstein DM***, Mays D, Scribner KT (2017) Spatial genetic structure and recruitment dynamics of burbot (*Lota lota*) in Eastern Lake Michigan and Michigan tributaries. USGS Great Lakes Science Center, Ann Arbor, Michigan. *Invited Seminar*

SKILLS

Genetics Lab Work:

- 96 well Qiagen/Promega DNA extraction
- Qiagen single tube DNA extraction (tissue, diet samples, eDNA, insects)
- Trizol RNA extraction
- Agarose and polyacrylamide gel electrophoresis
- PCR, qPCR optimization & clean up
- Microsatellite genotyping
- DNA quantification (nanodrop and PicoGreen)
- Plate prep for ABI 3730
- NEB RNAseq library preperation
- RAD (ddRAD, bestRAD) library preparation and data management
- GtSeq library preperation

Computer Skills:

- Advanced bioinformatics skills
- High performance computing with slurm scheduling
- Microsoft Office (Word, Excel, Powerpoint)
- Image J
- Adobe Photoshop
- Coding languages: Python, R statistical software, BASH, Java, HTML

Mammal work:

- Metabolic phenotyping with Sable Systems Field Metabolic System (FMS)
- Mouse colony management
- Small mammal trapping
- Desert mouse identification
- Mouse dissections and tissue extraction for RNA
- Implantation of PIT tags

Fisheries Field Work:

- Morphometric measurements
- Barge and backpack electrofishing
- Kick net, seine net, drift net, fyke net, trap net, and gill net sampling
- Implantation of RFID, PIT, and floy tags
- Tissue sample collection for genetic analyses
- Fish care and fish feeding, fish disease prevention, identification, and treatment

Other Skills:

- Extensive backcountry camping experience
- Graphic design
- Knot tying
- Outdoor rock climbing
- Driving 4WD vehicles, including manual transmission

COURSEWORK

Graduate (University of New Hampshire)

GEN 812: Programming for Bioinformatics
MCBS 913: Applied Bioinformatics
NR 995: Landscape Genetics
LSA 900: College Teaching
ANFS 933: Experimental Design/ Analysis
BIOL 950: Scientific Communication
ANFS 933: Design, Analysis, and Interpretation of Experiments
NR 712: Mammalogy

Graduate (University of Wisconsin – Stevens Point)

CNMT 110: Object-Oriented Programming
DS 700: Data Science
GEOG 641: GIS Programming and Customization
NRES 605: R Programming
NRES 775: Topics in Conservation Genetics
NRES 796: Conservation Biology and Modeling
NRES 797: Research Methods Design & Analysis
WATR 584: Life History of Fishes
WLDL 742: Ecological Data Analysis

Undergraduate (Michigan State University)

FW 101/101L: Fundamentals of Fish and Wildlife
FW 419: Application of GIS in Natural Resources
IBIO 341: Fundamental Genetics
IBIO 445: Evolution
IBIO 492: Interdisciplinary Study Conservation Medicine
IBIO 492L: Advance Research Applied Conservation Medicine
IBIO 493: International Communication Conservation Medicine
MC 391: Selected Topics in Public Affairs Environmental Policy
NSC 192: Environmental Issues Seminar
NSC 292: Application of Environmental Studies
PLB 418: Plant Systematics
ZOL 355/355L: Ecology
ZOL 489: Seminar in Zoo and Aquarium Science

REFERENCES

Matthew MacManes, PhD
Molecular, Cellular, and Biomedical Sciences
University of New Hampshire
PhD Advisor
matthew.macmanes@unh.edu
Phone: 603-862-4052

Rebecca Rowe, PhD
Natural Resources and the Environment
University of New Hampshire
PhD CoAdvisor
rebecca.rowe@unh.edu
Phone: 603-862-2810

David Plachetzki, PhD
Molecular, Cellular, and Biomedical Sciences
University of New Hampshire
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Adam Stuckert, PhD
Department of Biology and Biochemistry
University of Houston
Colleague
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