

# Dave Matthews

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## EDUCATION

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### **HARVARD UNIVERSITY | PH.D. CANDIDATE**

Organismic and Evolutionary Biology | Cambridge, MA  
Advisor: Dr. George Lauder

2017-Present

### **UNIVERSITY OF MASSACHUSETTS, AMHERST | BS IN BIOLOGY, CERTIFICATE IN MARINE SCIENCE**

College of Natural Sciences | Amherst, MA

2011-2015

Summa cum laude • Commonwealth Honors College, greatest distinction • Biology departmental honors • GPA: 3.99/4.0

## RESEARCH

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### **HYDRODYNAMICS AND EVOLUTION OF FISH MEDIAN FINS | GRADUATE RESEARCHER**

June 2017 – Present | Harvard University | Dr. George Lauder

Combining biomimetic robotics, flow visualization, live fish experiments, and geometric morphometrics to understand the function and evolution of median fins in bony fish.

### **PLASTICITY IN ZEBRAFISH BONE DEVELOPMENT | RESEARCH ASSISTANT**

January 2016 – April 2016 | UMass Amherst | Dr. Craig Albertson and Dr. Maureen Lynch

Worked to develop a method of inducing a plastic osteoblast response in larval zebrafish.

### **EFFECT OF CRANIOFACIAL GENOTYPE ON THE RELATIONSHIP BETWEEN MORPHOLOGY AND SUCTION FEEDING PERFORMANCE | UNDERGRADUATE RESEARCH ASSISTANT**

2013 - 2015 | UMass Amherst | Dr. Craig Albertson

Used high speed video to quantify suction feeding performance in hybrid African cichlids, then genotype each individual at several craniofacial loci. We found that genotype at one soxgb SNP affects the relationship between morphology and suction feeding performance. Published in *Evolution*.

### **INTERSPECIFIC INTERACTIONS IN CHESAPEAKE BAY SALT MARSHES | NSF REU RESEARCH ASSISTANT**

June 2014 - Aug. 2014 | VIMS | Dr. Rom Lipcius

Correlated the shape of marsh edge to the stabilizing presence of mussels in the marsh substrate.

### **REPRODUCTIVE HISTOLOGY OF INVASIVE LIONFISH | FIVE COLLEGE MARINE SCIENCE RESEARCH INTERN**

June 2013 - Aug. 2013 | NOAA | Dr. James Morris

Found and characterized a reproductive abnormality in invasive Atlantic lionfish using histological sections. Manuscript in review.

### **HYDRODYNAMICS OF RAPID ROTATION IN MANTIS SHRIMP RAPTORIAL APPENDAGES |**

**UNDERGRADUATE RESEARCH ASSISTANT**

2011 - 2013 | UMass Amherst | Dr. Sheila Patek

Used high speed videography and a custom MATLAB script to characterize the kinematics of mantis shrimp appendages during feeding strikes. Published in the *Journal of Experimental Biology*.

### **INVASIVE SPECIES MONITORING IN THE BOSTON HARBOR ISLANDS | RESEARCH ASSISTANT**

June 2011 - Aug. 2011 | MIT | Sea Grant

Measured the species composition of intertidal zones on the Boston Harbor Islands, focusing on cohabitation of endemic species and invasive crabs.

## WORK EXPERIENCE

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### TEACHING ASSISTANT

Evolution, Prof. Andrew Berry  
Spring 2020

Evolutionary Human anatomy and physiology,  
Profs. Andy Biewener, Carole Hooven, Ian  
Wallace  
Fall 2018

### AQUARIUM ROOM MANAGER

Patek Lab, UMass Amherst  
2012-2013

## HONORS & AWARDS

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2020 | Commendation for Extraordinary Teaching, Harvard College  
2019&2020 | Chapman Fellowship  
2019 | Certificate of Distinction in Teaching, Derek Bok Center  
2018 | NSF GRFP  
2018 | Honourable mention, Royal Society Publish. Photo. Comp.  
All semesters | Dean's List, UMass Amherst  
2014 - 2015 | Junior Research Fellow, UMass Amherst  
2014 | Theresa Biusu Maravelas Memorial Scholarship  
2014 | Phi Beta Kappa  
2013 | Comm. Honors College Research Assistant Fellowship  
2011 | Eagle Scout, Boy Scouts of America

## PUBLICATIONS

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**Matthews DG**, Morris JA. (2019) Intersex in male invasive Atlantic lionfish, *Pterois* spp. *Aquatic Biology*, 28, 13-19.

**Matthews DG**, Albertson RC. (2017). Effect of Craniofacial Genotype on the Relationship between Morphology and Feeding Performance in Cichlid Fishes. *Evolution*, 71(8), 2050-2061

McHenry MJ, Anderson PSL, Van Wassenbergh S, **Matthews DG**, Summers A, Patek SN. (2016). The hydrodynamics of rapid rotation in mantis shrimp raptorial appendages. *Journal of Experimental Biology*, 219(21), 3399-3411.

## POSTERS AND PRESENTATIONS

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**Matthews DG**, Dial TR, Lauder GV. Upregulated Wnt signaling improves suction feeding in zebrafish.

**Talk** presented at: SICB; January 4, 2020; Austin, TX.

Ruijie Zhu, **Matthews DG**, Wang J, Lauder GV, Dong H, Bart-Smith H. Upregulated Wnt signaling improves suction feeding in zebrafish.

**Talk** presented at: SICB; January 6, 2020; Austin, TX.

**Matthews DG**, Dial TR, Lauder GV. Upregulated Wnt signaling improves suction feeding in zebrafish.

**Talk** presented at: NE Regional SICB; November 2, 2019; Boston, MA.

**Matthews DG**, Dial TR, Lauder GV. Upregulated Wnt signaling improves suction feeding in zebrafish.

**Poster** presented at: Evolution; June 22, 2019; Providence, RI.

**Matthews DG**, Lauder GV. Fish median fin function studied using a simple robotic model.

**Talk** presented at: SICB; January 5, 2019; Tampa Bay, FL.

**Matthews DG**, Albertson RC. Effect of Craniofacial Genotype on the Relationship between Morphology and Feeding Performance in Cichlid Fishes.

**Talk** presented at: SICB; January 4, 2018; San Francisco, CA.

**Matthews DG**, Conith MR, Albertson RC. Facial Morphology Predicts Feeding Performance in Two Trophically Diverse Cichlids.

**Poster** presented at: UMass Undergraduate Life Science Research Symposium; April 14, 2015; Amherst, MA.

**Matthews DG**, Conith MR, Albertson RC. Facial Morphology Predicts Feeding Performance in Two Trophically Diverse Cichlids.

**Talk** given at: Five College Coastal and Marine Science Research Symposium; Nov. 10, 2014; Amherst, MA.

**Matthews DG**, Gilliland S, Lipcius R. Facilitation of marsh pattern formation by Ribbed Mussels (*Geukensia demissa*).

**Talk** given at: Virginia Institute of Marine Science REU Symposium; July 31, 2014; Gloucester Point, VA.

**Matthews DG**, Morris JA. The State of Ovotestis in Atlantic Lionfish.

**Talk** given at: Five College Coastal and Marine Science Research Symposium; Nov. 11, 2013; Amherst, MA.

## EDUCATIONAL SERVICE

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### **INVITED MANUSCRIPT REVIEW**

Ecology and Evolution

### **ASSISTED WITH HMNH MARINE SCIENCE CLASS**

Harvard Museum of Natural History | MA July 2019

Attended a class with elementary school kids, answered their questions about fish, and helped administer an activity with fresh specimens

### **E3 REU STEERING COMMITTEE**

Harvard | MA Spring 2019,2020

Organize and advertise the new ecology and evolution REU program

### **STUDENT INVITED SPEAKER COMMITTEE**

Harvard | MA April 2018 - Present

Organize, invite, and coordinate two departmental seminar speakers per year

### **MUSEUM GALLERY GUIDE AND VOLUNTEER**

#### **TRAINER**

HMNH | MA May 2018 - Present

Share shark biology with Harvard Museum of Natural History visitors for two hours per week. Also train new volunteers.

### **TAUGHT LIONFISH DISSECTION**

NOAA | NC July 2013

Taught URM students from Baltimore about lionfish ecology and anatomy

## EXTRACURRICULARS/

## OTHER INTERESTS

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2017 - Present | SICB Member

2016 - Present | SSI Scuba Instructor

2014 - Present | CPR Certified

Nature photography | Sample at [DaveTheScientist.com](http://DaveTheScientist.com)