

Department of Organismal Biology and Anatomy
University of Chicago
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Education

PhD Organismal Biology and Anatomy, University of Chicago. December 2014.

Dissertation: *Evolution and functional morphology of partitioned adductor mandibulae muscles and a novel jaw mechanism in triggerfishes (Teleostei: Balistidae)*

Advisor: Mark Westneat, PhD. Professor, University of Chicago.

B.S. Ecology, Behavior, and Evolutionary Biology, University of California at Los Angeles. 2002-2006.

Research Interests

Evolution and biomechanics of vertebrate feeding

Evolutionary relationship between morphology and behavior

Ecology, evolution, and phylogenetics of coral reef fishes

Field Research Experience

Field Museum collecting expedition to the Palauan Archipelago (September-October, 2008)

I helped to collect, identify, process, and preserve fishes for accession into the Fishes Collection at the Field Museum.

Field Museum collecting expedition to Papua New Guinea (January-February, 2011)

I assisted in collecting, identifying, processing, and preserving fish specimens. Additionally, I helped teach University of Papua New Guinea students and faculty about field collecting and specimen processing techniques.

Collecting excursion and educational outreach in Suva, Fiji (March, 2011)

In addition to some local sampling of fish biodiversity, I developed and delivered a lecture on fish ecomorphology to a group of eleven high school boys in Suva, Fiji. Additionally, I helped Dr. Joshua Drew (Lecturer, Columbia University) with interviewing tribal chiefs about changes to coral reef diversity and health through the years that was later incorporated into the Abbott Hall of Conservation Restoring Earth exhibit at the Field Museum of Natural History.

East Asian and South Pacific Summer Institute Fellowship to Taipei, Taiwan (June-September, 2011)

I collected, processed, fixed, and preserved over 100 fish specimens that I obtained from fish markets and hook and line fishing in the coastal waters of Taiwan. I obtained the necessary permits to have all these specimens legally shipped to the Field Museum of Natural History. I have since curated and accessioned the collections into the active Field Museum of Natural History Fishes Collection.

Teaching Experience

Guest lecture. Vertebrate Feeding Systems, University of Chicago (Callum Ross, PhD, Instructor). February 2013. *I prepared a two-hour lecture about the evolution of form and functioning of triggerfish jaws and led graduate students through a cranial dissection.*

Teaching Assistant, University of Chicago: Comparative Vertebrate Anatomy (Dr. Mark Westneat, Instructor). January 2012-March 2012. *Along with a fellow graduate student, co-taught the laboratory section of vertebrate comparative anatomy. Led dissection activities, gave two-hour lecture about the diversity of fish feeding, prepared and proctored lab practical exams, and critiqued term papers.*

Teaching Assistant, University of Chicago: Biological Diversity (Dr. Michael LaBarbera, Instructor). September-December 2010. *Prepared and delivered brief weekly lectures at the beginning of each lab section, prepared review sessions, and graded and offered feedback for quizzes, tests, and lab reports.*

Teaching Assistant, University of Chicago: Chordate Evolution (Dr. Michael Coates, Instructor). March-June 2010. *Co-taught laboratory section of comparative anatomy lab with another graduate student. Prepared weekly review sessions, gave two, one-hour lectures about the evolution of vertebrate organ systems, prepared and proctored two lab practical exams, assisted in grading term papers, quizzes, and final exams.*

Community Service

Young Scientists Conference, Horace Mann School. February 2013. *Led a series of hands-on activities to introduce the anatomy, physiology, and pathology of human lungs.*

Tour Guide-UCLA alumni group. April 2012. *Planned and led a three-hour guided tour through the Field Museum of Natural History's Collections Resource Center and Evolving Planet Exhibition.*

Project Exploration Dinner with a Dinosaur XII: Earthworm behavior. March 2012. *Assisted Project Exploration program managers with the development and execution of a series of experiments that allowed young children and their families to conduct experiments and learn about earthworm behavior.*

Field Museum Member's Night. March 2012. *Helped develop and employ a natural history scavenger hunt for children.*

Tour Guide-elementary school visitation day. Several times years 2009-present. *Acted as a guide for half-hour tours of the Fishes wet lab and Field Museum of Natural History's Collections Resource Center.*

Project Exploration Sisters 4 Science Mentor/Teacher. Several times yearly April 2009-present. *Prepared and delivered a variety of active-learning activities for middle school aged students interested in biology. See "Professional and Community Service Lectures" for details.*

FMNH Member's Night. Once yearly in April 2009-present. *Helped answer the general public's questions about the biodiversity and conservation research that goes on at the museum and helped orchestrate a museum exhibit-based scavenger hunt geared toward young children.*

Peer Reviewed Publications

- Grubich JR, Westneat MW, **McCord CL**. (2009). Diversity of lionfishes (Pisces: Scorpaenidae) among remote coral reefs of the Palau Archipelago. *Coral Reefs* **28**: 807-807.
- Drew JA, **McCord CL***, Holmes, DD, Mandrecki, JL, Mungkaje AJ, Richardson, AC & Westneat MW. (2011). Biodiversity Inventories and Conservation of the Marine Fishes of Bootless Bay, PNG. *BMC Ecology* **12**: 15.

- **McCord CL** & Westneat, MW (2016). Phylogenetic relationships and evolution of *BMP4* in triggerfishes and filefishes (Balistoidea). *Molecular Phylogenetics and Evolution* **94**: 397-409.
- **McCord CL** & Westneat, MW (2016). Evolutionary patterns of shape and functional diversification in the skull and jaw musculature of triggerfishes (Teleostei: Balistidae). *Journal of Morphology* **277**: 737-752.
- **McCord CL** & Westneat, MW (2016). How to triggerfishes eat? Evolution of variable feeding behavior in balistid fishes. (*in prep*).

Published Abstracts

- **McCord, CL** (2016) Phylogenetics and morphological evolution of butterflyfishes and angelfishes. *Evolution*. 15-minute oral presentation.
- **McCord, CL** (2016) Functional morphology and kinematics of the unique triggerfish jaw apparatus (Teleostei: Balistidae). *Joint Meeting of Ichthyologists and Herpetologists*. 15-minute oral presentation.
- **McCord, CL** & Westneat, MW (2016) Phylogenetics and biodiversity of cranial functional morphology in triggerfishes (Teleostei: Balistidae). *Integrative and Comparative Biology*. 20-minute oral presentation.
- Westneat, MW & **McCord, CL** (2016) FuturePhy: Integration of the Tree of Life with biomechanics data layers. *Integrative and Comparative Biology*. Poster presentation.
- **McCord, CL** & Westneat, MW (2015) Phylogenetics and biodiversity of cranial functional morphology in triggerfishes (Teleostei: Balistidae). *Evolution*. 20-minute oral presentation.
- **McCord, CL*** & Westneat, MW. (2013). How do triggerfishes eat? Evolution of variable feeding behavior in balistid fishes. *Integrative and Comparative Biology*. 20-minute oral presentation.
- **McCord C.** (2012). Diversity of cranial morphology and jaw biomechanics in tetraodontiform fishes. *Integrative and Comparative Biology* **52**: E117. 20-minute oral presentation.
- Westneat MW & **McCord CL.** (2012). Phylogenetics, morphometrics and biomechanics of reef fishes. *Integrative and Comparative Biology* **52**: E348. Poster presentation.
- **McCord C** & Westneat M. (2011). Diversification of triggerfish (Teleostei: Balistidae) cranial shape and jaw biomechanics. *Integrative and Comparative Biology* **51**: E89-E89. 20-minute oral presentation.

*Published using the name Buxman CL.

Professional and Community Service Lectures

- **Benedictine University Evolution Course fieldtrip to Field Museum, Chicago, IL (March, 2016)**
Invited casual lecture: *Fishes Collections at FMNH and the role of natural history museums in conversation efforts*
- **Sisters 4 Science, Chicago, IL (March 2016)**
Fish anatomy and functional morphology
- **Sisters 4 Science, Chicago, IL (January 2016)**
Introduction to the scientific method: Experimental design
- **Associated Colleges of the Chicago Area, Benedictine University, Lisle, IL (November 2015)**
Invited seminar presentation: *Evolution of feeding ecology in triggerfishes*
- **Sisters 4 Science, Chicago, IL (November 2015)**
Evolution, adaptation, and natural selection
- **Sisters 4 Science, Chicago, IL (October 2015)**
Introduction to the scientific method

- **Field Museum Women in Science Panelist, Chicago, IL (October 2015)**
Invited panelist: *Field Museum Women in Science Mixer*
- **Graduate Women in Science Eta Chapter, Chicago, IL (February 2015)**
Perfecting the elevator pitch
- **Sisters 4 Science, Chicago, IL (May 2014)**
How do fishes swim?
- **Sisters 4 Science, Chicago, IL (January 2014)**
Introduction to the scientific method
- **Sisters 4 Science, Chicago, IL (March 2013)**
What do fishes eat? Bones that talk
- **Mann Elementary, Oak Park, IL (October, 2012)**
Anatomy, physiology, and pathology of human lungs
- **Project Exploration All Girl's Expedition, Chicago, IL & Yellowstone National Park (July 2012)**
Astronomy 101; Scatology 101; Skull stories. In addition to preparing and delivering these formal presentation, I also served as a wildlife biology expert, field guide, driver, and chaperone.
- **Sisters 4 Science, Chicago, IL (February 2012)**
Soil microbiology: How and why do plants grow?
- **National Museum of Marine Biology, Kenting Taiwan (August 2011)**
Diversity of cranial shape, jaw biomechanics, and adductor mandibulae muscle partitioning in native Taiwanese tetraodontiform fishes. Invited seminar at the National Aquarium and National Museum of Marine Biology in Kenting, Taiwan. I discussed the results of my summer research in Taiwan.
- **Academia Sinica Biodiversity Research Centre, Taipei Taiwan (July 2011)**
Why subdivide? Partitioning of the jaw adductor muscles and evolutionary neuromechanics of feeding in balistid fishes. Invited talk about my dissertation research findings and research goals while in residence in Taipei, Taiwan.
- **MOTO-IGERT and Project Exploration Motorama, Museum of Science and Industry Chicago, IL (April 2011)**
How do things move?
- **Marist Brothers High School, Suva Fiji (April 2011)**
Trophic ecology and functional morphology of coral reef fishes. I was invited to visit Suva, Fiji with a colleague at the Field Museum, Dr. Josh Drew, and assist with ongoing digital learning efforts through the online WhyReef portal. My lecture and subsequent fish dissection activity was the culminating event of this trip.
- **Sisters 4 Science, Chicago, IL (January 2011)**
Chemical communication and fluid dynamics
- **Junior Paleontologists Summer Youth Program, Chicago, IL (July 2010)**
Fishes, insects, and plants of Yellowstone National Park. In preparation for a weeklong trip to Yellowstone, I gave a lecture about the biodiversity of this national park to fifteen high schoolers.
- **Project Exploration's All Girls Outdoor Expedition, Chicago, IL (February 2010)**
The nervous system and intracellular communication. Brief lecture and hands-on activity during and overnight excursion to the Chicago suburbs with girls from the Sisters 4 Science program.
- **Sisters 4 Science, Chicago, IL (September 2009)**
Functional morphology of fish locomotor systems
- **Sisters 4 Science, Chicago, IL (April 2009)**
Ecomorphology of coral reef fishes. Hands-on activity and brief lecture delivered to disadvantaged middle school aged girls from the south side of Chicago.

Professional Affiliations

- **American Society of Ichthyologists and Herpetologists** (March 2016-present)
- **Society for the Study of Evolution** (November 2014-present)
- **Field Museum Women in Science** (January 2013-present). Member of steering committee.
- **Graduate Women in Science, Sigma Delta Epsilon, Eta chapter, Chicago** (January 2013-present). Chapter Treasurer, Founding Member, Chair of Science Outreach Committee.
- **Society of Integrative and Comparative Biologists** (May 2009-present)

Professional Development

- **Elements of Successful Writing in the Sciences**, mini-course (October-November 2015)
- **Scientific Teaching**, workshop (September, 2015)
- **Elements of Successful Teaching in the Sciences**, mini-course (March-April 2015)

Grants and Awards

- **NSF GFRP** Honorable Mention (2008).
- **Moto-IGERT** research funds award, \$1750 (March 2010-March 2011).
- **Moto-IGERT** travel funds award, \$1000 (January 2011).
- **EAPSI fellowship to C. McCord**, host: Dr. Kwang-Tsao Shao of the Academia Sinica Biodiversity Research Centre, Taiwan (June-August 2011).
- **Hind's Fund award** to C. McCord, \$1000 (July 2011-July 2012).
- **Field Museum Women in Science Fellowship**, \$30,000 stipend (September 2012-September 2013).