

Katharine E. Criswell

Curriculum Vitae

The University of Cambridge
Department of Zoology
Downing Street, Cambridge CB2 3EJ
kc518@cam.ac.uk
www.katecriswell.com

EDUCATION

- 2016 Doctor of Philosophy, University of Chicago, Department of Organismal Biology and Anatomy, Biological Sciences Division
Advisor: Professor Michael I. Coates
Dissertation title: Evolution and development of the vertebral column in jawed vertebrates
- 2014 Master of Science, University of Chicago
Integrative Biology - Department of Organismal Biology and Anatomy
Advisor: Professor Michael I. Coates
- 2011 Master of Science, The University of Texas at Austin
Geosciences/Vertebrate Paleontology, Jackson School of Geosciences
Advisor: Professor Christopher J. Bell
Thesis title: The comparative osteology and phylogenetic relationships of lepidosirenid lungfishes
- 2008 Bachelor of Science, *magna cum laude*, Shippensburg University
Geoenvironmental Studies major, Anthropology minor, Geographic Information Systems certificate

APPOINTMENTS

- 2017 - present Royal Society-Shooter International Fellow, Gillis Lab, Department of Zoology, University of Cambridge
- 2011 - 2016 PhD student, Department of Organismal Biology and Anatomy, University of Chicago
- 2008-2011 Masters student, Jackson School of Geosciences, The University of Texas at Austin
- 2009 - 2010 Research Assistant, Non-vertebrate Paleontology Laboratory and Texas Natural History Collections, The University of Texas at Austin
- 2007 Research Experiences for Undergraduates Intern, The Academy of Natural Sciences of Drexel University

GRANTS AND AWARDS

- 2017 Marine Biological Laboratory Whitman Center Early Career Investigator Award (\$9,669)
- 2016 Royal Society-Shooter International Fellowship (£66,000)
- 2015 University of Chicago Graduate Council Travel Award (\$500)

- 2015 Society of Vertebrate Paleontology Patterson Fieldwork Grant (with Marion Chevris and Tetsuto Miyashita) (\$2,400)
- 2015 National Science Foundation Doctoral Dissertation Improvement Grant (\$12,825.50)
- 2014 Company of Biologists Traveling Fellowship (£2,000)
- 2014 University of Chicago/Marine Biological Laboratory Graduate Research Award (\$10,000)
- 2014 Marine Biological Laboratory Embryology Post-Course Research Award (\$1,578)
- 2014 Society of Vertebrate Paleontology Wood Award (\$1,200)
- 2014 Society of Vertebrate Paleontology Jackson School of Geosciences Travel Award (\$600)
- 2014 Paleontological Society Kenneth E. and Annie Caster Student Research Grant (\$800)
- 2014 University of Chicago Hinds Fund Award (\$1,000)
- 2013 Jones-Fenleigh Memorial Fund Award (£300)
- 2012 University of Chicago Biological Sciences Division Student Travel Award (\$500)
- 2009 Ronald K. DeFord Field Scholarship Fund (\$380)
- 2009 University of Texas Analytical Fees Award (\$1,000)
- 2009 Ernest L. and Judith W. Lundelius Endowment in Vertebrate Paleontology (\$500)
- 2008 University of Texas Off-Campus Research Fund (\$245)

PEER-REVIEWED PUBLICATIONS

- Coates, M. I., J. A. Finarelli, I. J. Sansom, P. S. Andreev, **K. E. Criswell**, K. Tietjen, M. L. Rivers, and P. J. La Riviere. 2018. An early chondrichthyan and the evolutionary assembly of a shark body plan. *Proceedings of the Royal Society B*. 285:20172418.
- Criswell, K. E.**, M. I. Coates, and J. A. Gillis. 2017. Embryonic origin of the gnathostome vertebral skeleton. *Proceedings of the Royal Society B* 284:20172121.
- Gillis, J. A., E. Alsema, and **K. E. Criswell**. 2017. A trunk neural crest origin of dermal denticles in a cartilaginous fish. *PNAS* 114:13200-13205.
- Criswell, K. E.**, M. I. Coates, and J. A. Gillis. 2017. Embryonic development of the axial column in the little skate, *Lencoraja erinacea*. *Journal of Morphology* 278:300-320.
- Coates, M. I., R. W. Gess, J. A. Finarelli, **K. E. Criswell**, and K. Tietjen. 2017. A symmoriiform chondrichthyan braincase and the origin of chimaeroid fishes. *Nature* 541:208-211.
- Stocker, M. R., S. J. Nesbitt, **K. E. Criswell**, W. G. Parker, L. M. Witmer, T. B. Rowe, R. Ridgely, and M. A. Brown. 2016. A dome-headed stem-archosaur exemplifies convergence among dinosaurs and their distant relatives. *Current Biology* 26:2674-2680.
- Criswell, K. E.** 2015. The comparative osteology and phylogenetic relationships of African and South American lungfishes. *Zoological Journal of the Linnean Society* 174:801-858.
- Molineux, A., L. Zachos, **K. E. Criswell**, and T. Risien. 2012. GIS, the key to collections management of a large research archive. *Collection Forum* 26:60-69.
- Downs, J. P., **K. E. Criswell**, and E. B. Daeschler. 2011. Mass mortality of juvenile placoderms (*Bothriolepis* sp.) from the Catskill Formation (Upper Devonian, Famennian Stage), Tioga

County, Pennsylvania. Proceedings of the Academy of Natural Sciences of Philadelphia 161:191-203.

CONFERENCE PRESENTATIONS

- Criswell, K.E.**, M. I. Coates, and J. A. Gillis. 2017. Axial skeletal development in the little skate, *Leucoraja erinacea*. Poster presentation at the British Society for Developmental Biology meeting at the University of Warwick.
- Criswell, K. E.**, M. I. Coates, and J. A. Gillis. 2017. The evolutionary and embryonic origins of the gnathostome vertebral skeleton. Oral presentation at the Society for Integrative and Comparative Biology meeting in New Orleans, Louisiana.
- Criswell, K. E.**, M. I. Coates, R. K. Ho, and J. A. Gillis. 2016. Vertebral skeletal development in the little skate, *Leucoraja erinacea*, a cartilaginous fish. Poster presentation at the Society for Developmental Biology meeting in Boston, Massachusetts.
- Criswell, K. E.**, M. I. Coates, and J. A. Gillis. 2015. Evolution and development of the chondrichthyan vertebral column: the embryonic origin of centra. Oral presentation at the annual Society of Vertebrate Paleontology meeting in Dallas, TX.
- Criswell, K. E.**, J. A. Gillis, and M. I. Coates. 2015. Evolution and development of the chondrichthyan vertebral column. Oral presentation at the 13th International Symposium on Early and Lower Vertebrates in Melbourne, Victoria, Australia.
- Criswell, K. E.**, M. I. Coates, and J. A. Gillis. 2015. The evolutionary and embryonic origins of chondrichthyan centra. Oral presentation at the Interdisciplinary Approaches to Fish Skeletal Biology meeting in Tavira, Portugal.
- Criswell, K. E.** and M. I. Coates. 2015. Vertebral column evolution and development: homoplasy in the vertebrate centrum. Oral presentation at the annual Society for Integrative and Comparative Biology meeting in West Palm Beach, Florida.
- Criswell, K.** and M. Coates. 2014. Convergence and complexity in chondrichthyan vertebral columns. Oral presentation at the annual Society of Vertebrate Paleontology meeting in Berlin, Germany.
- Criswell, K. E.**, J. A. Finarelli, and M. I. Coates. 2014. Gills, structure, and feeding mode: specialization in a remarkable early gnathostome. Oral presentation at the annual Society for Integrative and Comparative Biology meeting in Austin, Texas.
- Criswell, K. E.**, M. I. Coates, and M. LaBarbera. 2013. Drag forces and wake production in the spine brush complex of stethacanthid sharks. Poster presentation at the annual Society of Vertebrate Paleontology meeting in Los Angeles, California.
- Criswell, K. E.** J. A. Finarelli, M. Friedman, R. Garwood, and M. I. Coates. 2013. Cranial characters and early holocephalan evolution: insights from *Deltoptychius*. Poster presentation at the annual Symposium of Vertebrate Palaeontology and Comparative Anatomy meeting in Edinburgh, United Kingdom.
- Criswell, K. E.**, J. A. Finarelli, M. Friedman, R. Garwood, and M. I. Coates. 2013. *Deltoptychius*: skeletal morphology and building a new character set for holocephalan phylogeny. Oral

presentation at the annual meeting of the Society for Integrative and Comparative Biology in San Francisco, California.

Criswell, K. E., J. A. Finarelli, M. Friedman, R. Garwood, and M. I. Coates. 2012. *Deltoptychius*: cranial characters and rethinking early holocephalan phylogeny. Oral presentation at the annual Society of Vertebrate Paleontology meeting in Raleigh, North Carolina.

Criswell, K. E., J. A. Finarelli, and M. I. Coates. 2012. The skeletal morphology of the Lower Carboniferous holocephalan *Deltoptychius* from Bearsden, Scotland. Oral presentation at the annual Geological Society of America North Central Meeting, Dayton, Ohio.

Criswell, K. E. 2011. The phylogenetic relationships and evolutionary history of lepidosirenid lungfishes: a total evidence approach. Oral presentation at the annual Society of Vertebrate Paleontology Meeting, Las Vegas, Nevada.

Criswell, K. E. 2011. The comparative osteology, phylogeny, and biogeography of lepidosirenid lungfish. Oral presentation at the annual Texas Academy of Science Meeting, Austin, Texas.

Criswell, K. E. 2010. Building a comparative morphological atlas for lungfish: new information on the skeletal anatomy of *Tranodis castrensis*. Poster presentation at the annual Society of Vertebrate Paleontology Meeting, Pittsburgh, Pennsylvania.

Criswell, K., A. Molineux, and L. Zachos. 2010. Digital tools for mapping geology and paleontology collections. Oral presentation at the annual Texas Academy of Science Meeting, Stephenville, Texas.

Criswell, K. E., J. P. Downs, and E. B. Daeschler. 2007. Mass mortality of juvenile placoderms (*Bothriolepis* sp.) from the Catskill Formation (Upper Devonian), Tioga County, Pennsylvania. Poster presentation at the annual Society of Vertebrate Paleontology Meeting, Austin, Texas.

TEACHING AND MENTORING EXPERIENCE

2015 Co-led laboratory module on cartilaginous fish development, Embryology Course, Marine Biological Laboratory, Woods Hole, MA

Graduate Instructor, The University of Chicago

2013; 2014 Teaching Assistant Training Course (BSDG 50000)

Graduate Teaching Assistant, The University of Chicago

2014 Chordate Evolution and Biology (BIOS 22250)

2013 Biological Diversity (BIOS 20198)

Graduate Teaching Assistant, The University of Texas at Austin

2011 Principles of Animal Behavior (BIO 359L)

2011 Comparative Vertebrate Anatomy (BIO 478L)

2009 Plate Tectonics and Earth History (GEO 404C)

2008; 2010 The Age of Dinosaurs (GEO 302D)

Teaching Courses and Workshops Attended

2015 Symposium and workshop on syllabus construction

- 2014 Approaches to Teaching in the Darwinian Sciences (EVOL 49401)
 2013 Workshop for Teaching in the College: Two-day workshop focused on methods for teaching undergraduates at the University of Chicago, organized by the Center for Teaching and Learning
 2012 The University of Chicago, Biological Sciences Division, Teaching Assistant Training Course (BSDG 50000)

Undergraduates Mentored at The University of Chicago

Isaac Krone ('17), Ellen Verner ('14), Rachel Folz ('14), Nathan Bartley ('13)

MUSEUM COLLECTIONS EXPERIENCE

- 2009, 2010 Non-vertebrate Paleontology Laboratory
 Experience mapping specimens and cabinets, as well as photographing type specimens.
 2010 Texas Natural History Collections - Ichthyology
 Photographed specimens, performed specimen identifications, and georeferenced collection localities.

PALEONTOLOGICAL EXPERIENCE

Fieldwork

- 2015 Lower Devonian; Battery Point Formation, Gaspésie, Quebec, Canada
 2009 - 2012 Late Triassic; Ghost Ranch Education and Retreat Center, Chinle Formation, Rio Arriba County, New Mexico
 2011 Middle Eocene; Devil's Graveyard Formation, Dalquest Research Site, Brewster County, Texas
 2009 Late Triassic; Dockum Group, Garza County, Texas
 2009 Cretaceous; various formations in Travis County, Texas
 2007 Upper Devonian; Catskill Formation, Tioga County and Red Hill, Clinton County, Pennsylvania

Fossil preparation

- 2009 Paleontological Laboratory Techniques class (Geo 388P) at The University of Texas at Austin: I gained experience working with air scribes, pin vices, glues, and screen washing.

EXTERNAL WORKSHOPS

- 2017 Policy Primer, The Royal Society, London, UK
 2014 Okinawa Institute of Science and Technology Evolution of Complex Systems Winter Course, Okinawa, Japan
 2014 Marine Biological Laboratory Embryology Course, Woods Hole, Massachusetts

INVITED PRESENTATIONS

- The evolutionary and embryonic origins of the gnathostome vertebral skeleton. Marine Biological Laboratory Whitman Awardees Brown Bag Lunch Seminar. 2017.
 The evolutionary and embryonic origins of the gnathostome axial skeleton. University of Cambridge Department of Zoology Evolution and Development Seminar series. 2017.
 Vertebral evolution and development in fishes: how many ways can you build a vertebra? University of Chicago Fish Group Seminar Series. 2016.
 Vertebral development in skates: insights from my trip to Cambridge. University of Chicago Fish Group Seminar Series. 2015.

Tips for Teaching Assistants. Presentation to teaching assistants in the Biological Sciences Division, University of Chicago. 2014
 Three-dimensional visualization of chondrichthyan vertebral development. University of Chicago Fish Group Seminar Series. 2014.
Deltoptychius: skeletal morphology and building a new character set for holocephalan phylogeny. University of Chicago Fish Group Seminar Series. 2012.
 A mass mortality of juvenile placoderms from the Catskill Formation of Tioga County, Pennsylvania. UT Paleo Brown Bag Seminar Series. 2009.

COMMUNITY OUTREACH

2017 Fossil and skeleton display at the Fun Palace event at Nightingale Recreation Ground, Cambridge UK
 2017 Department of Zoology Alumni Day volunteer
 2016 Biological Sciences Division Instagram takeover – sharing photos of my research at the Marine Biological Laboratory
 2016 Assisted with lab tours for the Marine Biological Laboratory Society
 2016 Led lab tours for University of Chicago alumni groups
 2015 Contributor to The Node, a blog about developmental biology sponsored by the journal Development and The Company of Biologists
 2015 Girls Empowered by Math and Science activity day volunteer at Niles West High School in Skokie, IL.
 2013 Field Museum of Natural History outreach – interacted with students from Hubbard High School in the Creatures of Light exhibit
 2013 Science Fair Judge, Young Women’s Leadership Charter School, Chicago, IL
 2010 - 2011 Participated in explore UT events at the Texas Memorial Museum - organized an exhibit on fossil and recent echinoderms and interacted with the public.
 2010 Presentation at the Paleontological Society of Austin monthly meeting - Studies on the evolutionary morphology of lepidosirenid lungfish: building a comparative atlas of skeletal anatomy.

UNIVERSITY AND PROFESSIONAL SERVICE

2017 - Present Co-organizer, University of Cambridge Evolution and Development seminar series
 2014 - 2017 Journal of Vertebrate Paleontology Memoir review committee
 2013 - 2014 Organizer, University of Chicago Darwinian Cluster Fish Group Seminar Series
 2013 - 2014 Co-organizer, Organismal Biology and Anatomy Women in Science group
 2012 - 2014 Member, Biological Sciences Division Dean’s Council, University of Chicago
 2010 - 2011 Member at large, Jackson School of Geosciences Graduate Student Executive Committee
 2011 Technical Session moderator at the Society of Vertebrate Paleontology meeting
 2010 Invited lecture in Geo 302D, The Age of Dinosaurs class, The University of Texas at Austin.

MANUSCRIPT REVIEWS

Zoology Letters, Proceedings of the Royal Society B: Biological Sciences, Evolution and Development, PeerJ, Journal of Morphology, EvoDevo, Zoology

SOCIETY MEMBERSHIPS

Society of Vertebrate Paleontology
 Society for Integrative and Comparative Biology
 British Society for Developmental Biology