

Katharine E. Criswell

*Curriculum Vitae*

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

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## **CURRENT POSITIONS**

2019-present NERC Research Associate, Department of Zoology, University of Cambridge

2019-present Charles and Katharine Darwin Research Fellow, Darwin College, University of Cambridge

## **PAST POSITIONS**

2017-2019 Royal Society Shooter International Fellow, Department of Zoology, University of Cambridge

## **EDUCATION**

2016 Doctor of Philosophy, University of Chicago - Integrative Biology, Department of Organismal Biology and Anatomy

2014 Master of Science, University of Chicago - Integrative Biology, Department of Organismal Biology and Anatomy

2011 Master of Science, The University of Texas at Austin - Geosciences/Vertebrate Paleontology, Jackson School of Geosciences

2008 Bachelor of Science, *magna cum laude*, Shippensburg University - Geoenvironmental Studies major, Anthropology minor, Geographic Information Systems certificate

## **GRANTS AND AWARDS**

2019 Developmental Dynamics Travel Award for the International Congress of Vertebrate Morphology meeting (\$500)

2018 UK Natural Environment Research Council Standard Grant (Researcher Co-Investigator with Jason Head (PI) and Andrew Gillis (Co-I)): Evolution of axial skeletal regionalization in vertebrates: integrating phylogeny, environment, and developmental mechanisms (£531,983.21)

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 Chevrainis 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

**Criswell KE** and Gillis JA. 2020. Resegmentation is an ancestral feature of the gnathostome vertebral skeleton. *eLife* 2020;9:e51696.

Rawlinson KA, Lapraz F, Ballister ER, Terasaki, M, Rodgers J, McDowell RJ, Girstmair J, **Criswell KE**, Boldogkoi M, Simpson F, Goulding D, Cormie C, Hall B, Lucas RJ, and Telford MJ. 2019. Extraocular, rod-like photoreceptors in a flatworm express xenopsin photopigment. *eLife* 2019;8:e45465.

Coates MI, Finarelli JA, Sansom IJ, Andreev PS, **Criswell KE**, Tietjen K, Rivers ML, and La Riviere PJ. 2018. An early chondrichthyan and the evolutionary assembly of a shark body plan. *Proceedings of the Royal Society B* 285:20172418.

**Criswell KE**, Coates MI, and Gillis JA. 2017. Embryonic origin of the gnathostome vertebral skeleton. *Proceedings of the Royal Society B* 284:20172121.

Gillis JA, Alsema E, and **Criswell KE**. 2017. A trunk neural crest origin of dermal denticles in a cartilaginous fish. *PNAS* 114:13200-13205.

**Criswell KE**, Coates MI, and Gillis JA. 2017. Embryonic development of the axial column in the little skate, *Leucoraja erinacea*. *Journal of Morphology* 278:300-320.

Coates MI, Gess RW, Finarelli JA, **Criswell KE**, and Tietjen K. 2017. A symmoriiform chondrichthyan braincase and the origin of chimaeroid fishes. *Nature* 541:208-211.

Stocker MR, Nesbitt SJ, **Criswell KE**, Parker WG, Witmer LM, Rowe TB, Ridgely R, and Brown MA. 2016. A dome-headed stem-archosaur exemplifies convergence among dinosaurs and their distant relatives. *Current Biology* 26:2674-2680.

**Criswell KE**. 2015. The comparative osteology and phylogenetic relationships of African and South American lungfishes. *Zoological Journal of the Linnean Society* 174:801-858.

Molineux A, Zachos L, **Criswell KE**, and Risien T. 2012. GIS, the key to collections management of a large research archive. *Collection Forum* 26:60-69.

Downs JP, **Criswell KE**, and Daeschler EB. 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.

## TEACHING AND MENTORING EXPERIENCE

2020            Lecture on the evolution of the axial column for Zoology M1: Vertebrate Evolution course, Department of Zoology, Cambridge, with associated student supervisions  
2018            Demonstrations for undergraduate Embryo Zoo laboratory practical  
2018            Mentored Year 12 work placement student in chondrichthyan development  
2015; 2018    Co-led laboratory module on cartilaginous fish development, Embryology Course, Marine Biological Laboratory, Woods Hole, MA  
2014-2016    Mentored UChicago undergraduate Isaac Krone in chondrichthyan paleontology  
2013            Mentored UChicago undergraduate Ellen Verner in chondrichthyan paleontology

*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 University of Chicago Symposium and workshop on syllabus construction  
2014 Approaches to Teaching in the Darwinian Sciences (EVOL 49401)  
2013 University of Chicago Workshop for Teaching in the College  
2012 The University of Chicago Biological Sciences Division Teaching Assistant Training Course (BSDG 50000)

**SELECTED CONFERENCE PRESENTATIONS**

**Criswell KE** and Gillis JA. 2019. Evolution of axial segmentation across vertebrates. Oral presentation at the Society for Integrative and Comparative Biology meeting, Tampa, Florida.

**Criswell KE**, Coates MI, and Gillis JA. 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 KE**, Coates MI, and Gillis JA. 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 KE**, Coates MI, Ho RK, and Gillis JA. 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 KE**, Gillis JA, and Coates MI. 2015. Evolution and development of the chondrichthyan vertebral column. Oral presentation at the 13<sup>th</sup> International Symposium on Early and Lower Vertebrates in Melbourne, Australia.

**Criswell KE**, Coates MI, and Gillis JA. 2015. The evolutionary and embryonic origins of chondrichthyan centra. Oral presentation at the Interdisciplinary Approaches to Fish Skeletal Biology meeting in Tavira, Portugal.

**Criswell KE**. and Coates MI. 2014. Convergence and complexity in chondrichthyan vertebral columns. Oral presentation at the Society of Vertebrate Paleontology meeting in Berlin, Germany.

**Criswell KE**, Finarelli JA, and Coates MI. 2014. Gills, structure, and feeding mode: specialization in a remarkable early gnathostome. Oral presentation at the Society for Integrative and Comparative Biology meeting in Austin, Texas.

**Criswell KE**, Coates MI, and LaBarbera M. 2013. Drag forces and wake production in the spine brush complex of stethacanthid sharks. Poster presentation at the Society of Vertebrate Paleontology meeting in Los Angeles, California.

**Criswell KE**, Finarelli JA, Friedman M, Garwood R, and Coates MI. 2013. Cranial characters and early holocephalan evolution: insights from *Deltoptychius*. Poster presentation at the Symposium of Vertebrate Palaeontology and Comparative Anatomy meeting in Edinburgh, United Kingdom.

**Criswell KE**, Finarelli JA, Friedman M, Garwood R, and Coates MI. 2012. *Deltoptychius*: cranial characters and rethinking early holocephalan phylogeny. Oral presentation at the Society of Vertebrate Paleontology meeting in Raleigh, North Carolina.

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

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

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

**Criswell KE**, Downs JP, and Daeschler EB. 2007. Mass mortality of juvenile placoderms (*Bothriolepis* sp.) from the Catskill Formation (Upper Devonian), Tioga County, Pennsylvania. Poster presentation at the Society of Vertebrate Paleontology Meeting, Austin, Texas.

### **INVITED PRESENTATIONS**

- 2020 Evolution of axial segmentation across vertebrates: insights from a cartilaginous fish. University College London Centre for Integrative Anatomy Symposium.
- 2020 Invited seminar at Euro Evo Devo Meeting, Naples, Italy (postponed to July 2021).
- 2019 Evolution of backbone segmentation across vertebrates. Zoology Postdoc Summer Seminar Series, University of Cambridge.
- 2019 Evolution of axial segmentation across vertebrates: insights from a cartilaginous fish. Symposium speaker at the International Congress of Vertebrate Morphology meeting, Prague, Czech Republic
- 2018 Evolution and segmentation of the backbone in jawed vertebrates. Keynote speaker, Symposium for Biological and Life Sciences, St John's Old Divinity School, University of Cambridge
- 2018 Evolution and development of the axial column in jawed vertebrates. Scientific Colloquium talk, Paleontological Institute, University of Zürich
- 2017 The evolutionary and embryonic origins of the gnathostome axial skeleton. Department of Zoology Evolution and Development Seminar series, University of Cambridge
- 2010 Studies on the evolutionary morphology of lepidosirenid lungfish: building a comparative atlas of skeletal anatomy. Paleontological Society of Austin

### **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; Chinle Formation, Rio Arriba County, New Mexico
- 2011 Middle Eocene; Devil's Graveyard Formation, Brewster County, Texas
- 2009 Late Triassic; Dockum Group, Garza County, Texas
- 2007 Upper Devonian; Catskill Formation, Tioga and Clinton Counties, Pennsylvania

#### *Fossil preparation*

- 2009 Paleontological Laboratory Techniques class (Geo 388P) at The University of Texas at Austin

## **EXTERNAL COURSES**

- 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

## **COMMUNITY OUTREACH**

- 2020 Museum of Zoology Research Stories blog post – Segmentation of the backbone
- 2019 Discovery talk at the Museum of Zoology – Fish inside out: A look inside the Museum of Zoology fish collections
- 2019 Cambridge Science Festival, fish printing (Gyotaku) event at the Cambridge Zoology Museum
- 2017 Fossil and skeleton display at Fun Palace event, Nightingale Recreation Ground, Cambridge UK
- 2017 Department of Zoology Alumni Day volunteer
- 2016 University of Chicago, Biological Sciences Division Instagram takeover – sharing photos of cartilaginous fish research at the Marine Biological Laboratory
- 2016 Assisted with lab tours for the Marine Biological Laboratory Society and for University of Chicago alumni groups
- 2015 Contributor to The Node, a developmental biology blog 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.

## **UNIVERSITY AND PROFESSIONAL SERVICE**

- 2018-2020 Member, Zoology Postdoc Committee
- 2017-2019 Co-organizer, 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

## **MANUSCRIPT REVIEWS**

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

## **SOCIETY MEMBERSHIPS**

Society for Integrative and Comparative Biology, Society of Vertebrate Paleontology