

# Kaleb Sellers- Curriculum Vitae

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I am interested in the biomechanics of evolutionary transitions. I integrate comparative anatomy and the fossil record with computational techniques to reconstruct how functional characters changed their biomechanical loading during major evolutionary shifts.

## Education

- 2015-present Graduate Program in Integrative Anatomy, University of Missouri.  
Department of Pathology and Anatomical Sciences. Advisor: Casey Holliday.
- 2015 MS in Pathology, Department of Pathology and Anatomical Sciences,  
University of Missouri. Thesis: "Computation Modeling of Cranial Forces in *Alligator mississippiensis*." Advisor: Casey Holliday.
- 2012 BS with Honors, Cum Laude, University of Missouri Department of  
Biological Sciences.

## Publications (asterisks indicate undergraduate, high school, or other trainee coauthor)

4. **Sellers KC**, \*Schmiegelow AB, Holliday CM. The Significance of Enamel Thickness in the Teeth of the American Alligator and its Diversity Among Crocodyliforms. (*In review*.) Journal of Zoology.
3. \*Wilken AT, Middleton KM, **Sellers KC**, Cost IN, Holliday CM. (*In review*.) The roles of joint tissues and jaw muscles in palatal biomechanics of the Savannah monitor (*Varanus exanthematicus*) and their significance for cranial kinesis. Journal of Experimental Biology.
2. Cost IN, Middleton KM, **Sellers KC**, Echols MS, Witmer LM, Davis JL, Holliday CM. (*In press*.) Palatal biomechanics and its significance for cranial kinesis in Tyrannosaurus rex. Anatomical Record.
1. **Sellers KC**, Davis JL, Holliday CM, Middleton KM. (2017.) Ontogeny of Bite Force in a Validated Biomechanical Model of the American Alligator. Journal of Experimental Biology 220: 2036-2046.

### Publications (in prep)

Cost IN, **Sellers KC**, \*Rozin RE, \*Spates AT, Middleton KM, Holliday CM. Visualization of Complex Muscle Function of Gape, Ontogeny, and Evolution in Three Dimensions.

Holliday CM, **Sellers KC**, Ross C, Porro L, Witmer LM. The Functional and Evolutionary Significance of the Crocodyliform Pterygomandibular Joint.

### Peer-Reviewed Presentations (asterisks indicate undergraduate/ mentee coauthor)

2018 **Sellers KC**, Middleton KM, Clark JM, and Holliday CM. Cranial Joints and the Evolution of Extreme Feeding Performance in Crocodyliformes. Society of Vertebrate Paleontology.

Holliday CM, \*Herbst E, \*Jacoby M, Smolinsky AN, **Sellers KC**. Morphometric and Modeling Approaches to Understanding the Evolution of Pseudosuchian Mandibular Symphyses. Society of Vertebrate Paleontology.

Holliday CM, \*Cranor C, **Sellers KC**. Crocnet: A Public Resource for Crocodilian Imaging Data and Visualizations. Society of Vertebrate Paleontology.

**Sellers KC**, Middleton KM, Holliday CM. Biomechanics and the Evolution of the Crocodyliform Skull. Society of Integrative and Comparative Biology.

Holliday CM, Cost IN, **Sellers KC**, Middleton KM. Using Ternary Plots to Convey 3D Jaw Muscle Orientation in Space and Time. Society of Integrative and Comparative Biology.

\*Wilken AT, Middleton KM, **Sellers KC**, Holliday CM. Finite Element Analysis of the Savannah Monitor, *Varanus exanthematicus*, and its Implications for Lepidosaur Cranial Kinesis. Society of Integrative and Comparative Biology.

\*Sethi A, **Sellers KC**, Cost IN, McGeachie F, Middleton KM, Holliday CM. 3D Fiber Tracking of Jaw Muscles Reveals a Diversity of Muscle Architecture in the Heads of Reptiles. Society of Integrative and Comparative Biology.

2017 **Sellers KC**, Davis JL, Middleton KM, Holliday CM. Biomechanics and the Evolution of the Crocodyliform Skull. American Association of Anatomists.

\*Wilken AT, Middleton KM, **Sellers KC**, Cost IN, Davis JL, Holliday CM. Modeling Complex Cranial Joints in *Varanus exanthematicus*. American Association of Anatomists.

2016 **Sellers KC**, Davis JL, Middleton KM, Holliday CM. Biomechanics and the Evolution of the Crocodyliform Skull. Society of Vertebrate Paleontology.

- Cost IN, **Sellers KC**, Davis JL, Middleton KM, Witmer LM, Holliday CM. Postural Changes and Kinetic Competency in the Palates of Birds and Other Diapsids. Society of Vertebrate Paleontology.
- Sellers KC**, Davis JL, Middleton KM, Holliday CM. A 3D High-Fidelity Biomechanical Model of the Feeding Apparatus of *Alligator mississippiensis*. International Congress of Vertebrate Morphology.
- Cost IN, \*Spates A, **Sellers KC**, Davis JL, Middleton KM, Witmer LM, Holliday CM. Biomechanics of the Avian Feeding Apparatus. International Congress of Vertebrate Morphology.
- Holliday CM, Tsai HP, Cos IN, **Sellers KC**, Lautenschlager S, Witmer LM. DiceCT and its Applications for Understanding the Reptile Musculoskeletal System. International Congress of Vertebrate Morphology.
- Holliday CM, **Sellers KC**, Tsai HP, Bailleul A, Vickaryous M, Ross C, Porro L, Davis JL, Witmer LM. PMJs and PMJs: Convergence in the craniomandibular joints of crocodyliforms and mammals. Canadian Society of Zoologists.
- \*Spates AT, Cost IN, **Sellers KC**, Middleton KM, Holliday CM. Using Novel Methods to Visualize Jaw Muscle Biomechanics and its Significance for the Evolution of the Avian Feeding Apparatus. American Association of Anatomists.
- \*Schmiegelow AB, **Sellers KC**, Holliday CM. Ontogeny of Enamel Thickness in the Teeth of *Alligator* and its Significance for Crocodyliform Dental Evolution. American Association of Anatomists.
- 2015 **Sellers KC**, Davis JL, Middleton KM, Holliday CM. Ontogeny and Biomechanics of the American Alligator skull. Society of Vertebrate Paleontology.
- Holliday CM, **Sellers KC**, Tsai HP, Vickaryous MK, Ross CF, Porro LB, Davis JL, Witmer LM. PMJs and TMJs: Convergence in the Craniomandibular Joints of Crocodyliforms and Mammals. Society of Vertebrate Paleontology.
- Cost IN, \*Spates A, **Sellers KC**, Davis JL, Middleton KM, Witmer LM, Holliday CM. Biomechanics of the Avian Feeding Apparatus. Society of Vertebrate Paleontology.
- Sellers KC**, \*Jacoby MK Davis JL, Holliday CM. Estimates of Three-Dimensional Cranial Joint Forces in the American Alligator. Society of Integrative and Comparative Biology.

- Holliday CM, **Sellers KC**, Vickaryous MK, Ross CF, Porro LB, Witmer LM, Davis JL. The Functional and Evolutionary Significance of the Crocodyliform Pterygomandibular Joint. Society of Integrative and Comparative Biology.
- \*Jacoby MJ, Gant CS, **Sellers KC**, Holliday CM. Ontogeny of functional correlates of the mandibular symphysis of *Alligator mississippiensis*. Society of Integrative and Comparative Biology.
- 2014 Holliday CM, **Sellers KC**, Davis JL, Middleton KM, Witmer LM. MODELING CRANIAL BIOMECHANICS IN ARCHOSAURS USING 3D COMPUTATIONAL METHODS. Society of Vertebrate Paleontology.
- Harper-Judd J, Holliday CM, Knock M, Butaric LN, George ID, Middleton KM, Moffett EA, Swartz SM, Tsai HP, Warren A, Jorgensen MJ, Maddux SD, Ward CV, \*McEntire A, Cowgill L, Young C, **Sellers KC**, Kennedy R, \*LoPresti E, \*Jacoby M, \*Schmiegelow AB. Dinosaurs & Cavemen Science Expo: Science Outreach Using Interactive and Experiential Anatomical Learning. Society of Vertebrate Paleontology.
- Holliday CM, **Sellers KC**, Davis JL, \*Tea J, \*Miller-Phillips CM, Witmer LM. Modeling cranial biomechanics in archosaurs using 3D computational methods. Federation of American Societies for Experimental Biology.
- Holliday CM, \*Tea J, **Sellers KC**, Witmer LM, Davis JL. Estimating bite force in fossil vertebrates using 3D computational methods. Society of Integrative and Comparative Biology.
- Sellers KC**, \*Miller-Phillips CM, \*Schmiegelow AB, Davis JL, Holliday CM. A three-dimensional model of bite force in *Alligator mississippiensis*. Society of Integrative and Comparative Biology.
- 2013 **Sellers KC** and CM Holliday. Enamel Thickness as an Indicator of Feeding Behavior in Crocodyliforms. PaleoFest, Burpee Museum of Natural History, Rockford, IL.
- Sellers KC** and Holliday CM. Enamel Thickness as an Indicator of Feeding Behavior in Crocodyliforms. Society of Integrative and Comparative Biology.

### Teaching Experience

- 2019 Guest lecture on Macroevolution in Ecology and Evolution.
- 2019 Guest lecture on Central Nervous System for Undergraduate Anatomy.
- 2017-2018 Teaching Assistant for Medical Gross Anatomy Laboratory.

2015-2018 Teaching Assistant for Undergraduate Anatomy Laboratory.

2014-2017 Teaching Assistant for Undergraduate Anatomy Lecture.

### **Outreach, Leadership, and Service**

2018 SciFest at the St. Louis Science Center. St. Louis, MO.

2018 Three high school anatomy class visits to gross anatomy laboratory.

2018 Dinosaurs and Cavemen- Paleontology outreach event for elementary students.  
Multiple hands-on learning stations.

2017 Dinosaurs and Cavemen- Paleontology outreach event for elementary students.  
Multiple hands-on learning stations.

2017 SciFest at the St. Louis Science Center. St. Louis, MO.

2016 Dinosaurs and Cavemen- Paleontology outreach event for elementary students.  
Multiple hands-on learning stations.

2016 Four high school anatomy class visits to gross anatomy laboratory.

2015 Six high school anatomy class visits to gross anatomy laboratory.

2015 Soaring into Science- Rockbridge High School, Columbia, MO.

2015 STEM Showcase- Benton Elementary School, Columbia, MO.

2015 Dinosaurs and Cavemen- Paleontology outreach event for elementary students.  
Multiple hands-on learning stations.

2014 Adventures in Education- Cardiopulmonary anatomy and physiology outreach  
event for elementary and middle school students. Multiple hands-on  
learning stations.

2014 Dinosaurs and Cavemen- Paleontology outreach event for elementary students.  
Multiple hands-on learning stations.

2013 Adventures in Education- Cardiopulmonary anatomy and physiology outreach  
event for elementary and middle school students. Multiple hands-on  
learning stations.

2013 Dinosaurs and Cavemen- Paleontology outreach event for elementary students.  
Multiple hands-on learning stations.

2013 Science Safari- Neuroanatomy outreach event for elementary school students.

2011 Student Member of the Honors College Mission Revision Committee. University of  
Missouri.

2010 Treasurer and Co-Founder of APPLE, a health literacy nonprofit organization.

### **Honors/ Awards**

2019 Gans Foundation Travel Award

2019 Graduate and Professional Council Travel Grant

2018 Graduate and Professional Council Travel Grant

2018 Society of Integrative and Comparative Biology Student Travel Support Award

2018 Graduate and Professional Council Travel Grant

2017 American Association of Anatomists Travel Award

2017 Graduate and Professional Council Travel Grant

2016 University of Missouri Health Sciences Research Day Research Prize

- 2015 Graduate and Professional Council Travel Grant
- 2015 Graduate Student Association Travel Grant
- 2015 Integrative Anatomy Student Association Travel Grant
- 2014 Society of Integrative and Comparative Biology Student Travel Support Award
- 2014 Integrative Anatomy Student Association Travel Grant
- 2013 Society of Integrative and Comparative Biology Student Travel Support Award

**Professional Societies**

- Society of Integrative and Comparative Biology
- Society of Vertebrate Paleontology
- American Association of Anatomists