

Caleb M. Gordon

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CURRICULUM VITAE

EDUCATION

Yale University, New Haven, CT

Doctor of Philosophy: Earth and Planetary Sciences, expected 2023

Thesis: *The developmental evolution of the limb and skull in archosaurs and aquatic reptiles.*

Advisor: Bhart-Anjan S. Bhullar, PhD.

Committee: Bhart-Anjan S. Bhullar, Jacques A. Gauthier, Derek E. G. Briggs, Günter P. Wagner

Bowdoin College, Brunswick, ME

Bachelor of Arts, *Cum Laude*: Biology, Philosophy, 2018

• GPA: 3.88 / 4.00 scale (Biology coursework: 3.94 / 4.00 scale)

• Honors Thesis, Biology: *Identifying a distinct developmental module in the zebrafish dentition.*

Advisor: William Jackman, PhD.

University of St. Andrews, Fife, Scotland

Semester abroad, Fall 2016

The Berkeley Carroll School, Brooklyn, NY

Diploma, *Cum Laude*, 2014, GPA: 3.92 / 4.00 scale

• Science Research and Design Project: *Battling red tides: the potential effects of Artemia salina age on algal population growth.*

RESEARCH INTERESTS

- Marine reptile evolution and development
- Trophic evolution in the Archosauromorpha
- Modularity, evolvability, and the evolution of complexity
- Philosophy of biology and the role of conceptual innovation in scientific discovery
- Biotechnology and the conservation utility of genome-editing

RESEARCH EXPERIENCE

Graduate Student Researcher, *Yale University*, New Haven, CT

Aug 2018 - present

- My research focuses on the developmental evolution of the limb and skull in archosaurs and aquatic reptiles. Additional projects examine conceptual change in biology, and the role of changing open-ocean phosphorus content in the early evolution of Metazoa.

Undergraduate Research Assistant, *Bowdoin College*, Brunswick, ME

June 2017 - May 2018

- For my undergraduate Honors Thesis, I identified a distinct developmental module within the ventral pharyngeal dentition of zebrafish (*Danio rerio*). To do this, I performed CRISPR/Cas9-mediated knockouts in four genes suspected to modularize the zebrafish dentition (*pitx2*, *pbx1a*, *pbx1b*, *eve1*), or observed stable transgenic knockout embryos when available, and assessed the mineralization phenotype and cellular organization of tooth germs in wild type and mutagenized embryos using immunohistochemistry.

Research Intern, *Solvuu*, Brooklyn, NY

Summer 2015

- Reviewed genomics literature for Solvuu executives, and assisted the Mason Lab at Weill

Cornell Medical College (Dept. of Computational Biomedicine with the construction of The Microbe Directory—a searchable annotations database characterizing microbes identified in previous metagenomic studies. To these ends, I performed DNA extraction and alignment work, and annotated over 500 virus species for the database.

Volunteer Lab Assistant, *The Gobler Lab*, Stonybrook University, Long Island, NY

June 2013

- Managed marine algae cultures.

TEACHING/PROFESSIONAL EXPERIENCE

Teaching Fellow, *Yale University*, New Haven, CT

Jan 2019 - present

- Wrote and graded assignments, ran labs, and/or led review sessions for the following courses:
 - History of Life (Derek E. G. Briggs) - Spring 2019
 - Comparative Developmental Anatomy of Vertebrates (Günter P. Wagner) - Spring 2020

Consultant, *Trelify*, Brooklyn, NY

Dec 2016 - Jan 2018

- Assisted with development of Trelify Virtual Internship (VI) platform:
 - Composed and structured content for educational exercises
 - Composed technical specification documents for structuring VI platform content
 - User-tested Trelify products to help document user flows

Project Mentor, *Trelify*, Brooklyn, NY

Summer 2016

- Mentored high school student on acute myeloid leukemia (AML) project through Mason Lab at Weill Cornell Medical College:
 - Tutored client in molecular biology methods, genetics, genomics
 - Guided client through research project by devising and managing task lists
 - Developed project syllabus for Trelify virtual internship platform

Teaching Assistant (BIOL 1109), *Bowdoin College*, Brunswick, ME

Spring 2016

- Graded assignments, tutored students, and ran review sections for Scientific Reasoning in Biology (Vladimir Douhovnikoff)—an accelerated introductory biology course surveying AP-level topics in cellular, molecular, and evolutionary biology, and emphasizing lessons from the primary literature.

Volunteer Biology Teacher, *Artworks for Youth*, Joe Slovo Township, Port Elizabeth, South Africa

July 2013

- Wrote and taught biology curriculum to children aged 14–16 at a public high school.

FIELD WORK

Petrified Forest National Park, AZ, USA

May 2019

- Directors: Marilyn Fox, Alan Gischlick
- Prospected for phytosaur material, and excavated drepanosaur and aetosaur remains for the Division of Vertebrate Paleontology at the Yale Peabody Museum.

South Florida, USA: Southern Glades WMA, Lake Placid, Okeechobee County, Dade County, Key Largo

March 2019

- Directors: Jacques Gauthier, Tasman Rosenfeld

- Squamate specimen collection for the Yale Peabody Museum.
- Taxa collected: Agamids, anoles, chameleons

Kindrogan Field Centre, near Pitlochry, Scotland, United Kingdom

Fall 2016

- Director: Iain Matthews
- Limnological fauna survey

PUBLICATIONS

Caleb M. Gordon, Brian T. Roach, William G. Parker, Derek E. G. Briggs. 2020. Distinguishing regurgitalites and coprolites: A case study using a Triassic bromalite with soft tissue of the pseudosuchian archosaur *Revueltosaurus*. *Palaios* 35(3): 111–121. <https://doi.org/10.2110/palo.2019.099>.

PRESENTATIONS

Caleb M. Gordon, Brian T. Roach, William G. Parker, Derek E. G. Briggs. Distinguishing regurgitalites and coprolites: A case study using a Triassic bromalite containing soft tissue from *Revueltosaurus*. The Society for Vertebrate Paleontology 79th Annual Meeting, 2019. Brisbane Convention & Exhibition Centre, Queensland, Australia. Oral Presentation.

Caleb M. Gordon, Brian T. Roach, Derek E. G. Briggs. A regurgitalite containing *Revueltosaurus* muscle tissue from the Upper Triassic Chinle Formation of Arizona. NE Geobiology Symposium, 2019. Amherst College, MA, USA. Poster.

William R. Jackman, **Caleb M. Gordon**, Amber Rock. Analysis of gene function during zebrafish tooth development using "reporting" knockouts. 13th International Zebrafish Conference, 2018. Madison, WI, USA. Poster.

Caleb M. Gordon, William R. Jackman. Identifying a distinct developmental module in the zebrafish pharynx. Annual Maine Biological and Biomedical Sciences Symposium, 2018. MDI Biological Laboratory, ME, USA. Poster.

Caleb M. Gordon, William R. Jackman. Determining the cellular mechanisms associated with tooth module dissociation in the ventral pharyngeal dentition of zebrafish (*Danio rerio*). President's Summer Research Symposium, 2017. Bowdoin College, ME, USA. Poster.

MUSEUM EXHIBIT CONTRIBUTIONS

Tyrannosaur coprolite, for **T. Rex: The Ultimate Predator**. *American Museum of Natural History*, NY.

Contribution displayed March 2019 - present

- Segmented and produced two panoramic videos of a tyrannosaur coprolite for use in an interactive display on tyrannosaur feeding.
- Contacts: Mark Norell, Terri Foxman

HONORS AND AWARDS

- **Graduate Research Fellowship**, National Science Foundation, Spring 2020
- **Doctoral Pilot Grant**, Yale Institute for Biospheric Studies, Spring 2020
- **Earl Ingerson Fellowship**, Yale University, Dept. Earth and Planetary Sciences, Spring 2019
- **Bateman Fellowship**, Yale University, Dept. Earth and Planetary Sciences, Spring 2018
- **Honorable Mention**, NSF Graduate Research Fellowships Program, Spring 2018
- **Copeland-Gross Biology Prize**, Bowdoin College, Dept. Biology, Spring 2018
- **Life Sciences Fellowship**, Bowdoin College, Dept. Biology, Summer 2017

- **Sarah & James Bowdoin Scholarship**, Bowdoin College, 2014-2015
- **Joshua Chamberlain Scholarship**, Bowdoin College, Summer 2014
- **Scholar Artist Award**, The Berkeley Carroll School, Spring 2014
- **National Silver Medal**, Non-Fiction Writing Portfolio, Scholastic Art & Writing Awards, 2014
- **Maestro Award**, Carnegie Honors Performance Series, Spring 2014
- **Science Department Award**, The Berkeley Carroll School, Spring 2013

EXTRACURRICULARS

Yale: Science in the News (Presenter, Coordinator)

Hobbies: Creative writing; small-time journalism; singing (classical / musical theater).

Bowdoin: Chamber Choir; Literary magazine (Treasurer); Brazilian Jiu Jitsu

Affiliations: The Society of Vertebrate Paleontology; The American Association for the Advancement of Science (AAAS); The Ocean Conservancy; The Safina Center; Greenpeace.

SKILLS

Laboratory Skills: Bird/reptile embryos (windowing, staging); zebrafish embryos (spawning, staging, mounting); antibody labeling; CRISPR/Cas9; DNA extraction; light microscopy; structured illumination microscopy; energy-dispersive x-ray spectroscopy; field-jacketing.

Computer Skills: RStudio; morphometric analysis (R geomorph); VGstudio (CT scan segmentation); PAST (paleontological statistics); ImageJ (image analysis); Geneious (nucleotide sequence analysis); Unix (genomic data analysis); FlowRender (Z-stack visualization); Photoshop; Excel.

References are available upon request.