

**Dr. ALIDA BAILLEUL**  
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INSTITUTE OF VERTEBRATE PALEONTOLOGY AND PALEOANTHROPOLOGY  
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## EDUCATION

- 2015** *Ph.D.*, Earth Sciences, **Montana State University**, Bozeman, MT.  
Title : Osteohistology of cranial sutural fusion in the skulls of archosaurs: implications for maturity assessment in non-avian dinosaurs and for the evolution of skeletal tissues.  
Advisor : Dr. John R. Horner.
- 2010** *M.S.*, Systematics-Evolution-Paleobiodiversity, **Université Paris VI**, Pierre et Marie Curie, Paris, France.
- 2008** *B.S.*, Biology of the Organisms and Ecosystems-Ecology, **Université Paris-Sud XI**, Orsay, France.

## ACADEMIC APPOINTMENTS

- 2018-Present** Postdoctoral Research Fellow, Chinese Academy of Sciences - President's International Fellowship Initiative (CAS-PIFI).  
Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences, Beijing, China.
- 2018-2015** Postdoctoral Research Associate (funded by the National Science Foundation-IOS),  
Department of Pathology and Anatomical Sciences, University of Missouri.
- 2015** Postdoctoral Research Associate, Museum of the Rockies & Department of Cell Biology and Neurosciences, Montana State University.

## PUBLICATIONS (Peer-reviewed)

**2020**

18. **Alida M. Bailleul**, Wenxia Zheng, John R. Horner, Brian K. Hall, Casey M. Holliday, Mary H. Schweitzer. Evidence of proteins, chromosomes and chemical markers of DNA in exceptionally preserved dinosaur cartilage. *National Science Review*, **nwz206**, <https://doi.org/10.1093/nsr/nwz206>

**2019**

17. Min Wang, Jingmai K. O'Connor, **Alida M. Bailleul**, Zhiheng Li. Evolution and distribution of medullary bone: evidence from a new Early Cretaceous enantiornithine bird. *National Science Review*, **nwz214**, <https://doi.org/10.1093/nsr/nwz214>

16. **Alida M. Bailleul**, Zhiheng Li, Jingmai O'Connor, Zhonghe Zhou. 2019. Origin of the avian predentary and evidence of the unique form of cranial kinesis in Cretaceous ornithuromorphs. *Proceedings of the National Academy of Sciences of the United States of America*. <https://doi.org/10.1073/pnas.1911820116>

15. **Alida M. Bailleul**, Jingmai O'Connor, Mary H. Schweitzer. 2019. Dinosaur Paleohistology: review, trends and new avenues of investigation. *PeerJ* **7:e7764**

14. **Alida M. Bailleul**, Jingmai O'Connor, Shukang Zhang, Zhiheng Li, Qiang Wang, Matthew C. Lamanna, Xufeng Zhu, Zhonghe Zhou. 2019. An Early Cretaceous enantiornithine (Aves) preserving an unlaidd egg and probable medullary bone. *Nature Communications 10*: 1275. <https://doi.org/10.1038/s41467-019-09259-x>

2018

13. Jingmai O'Connor, Gregory M. Erickson, Mark Norell, **Alida M. Bailleul**, Han Hu, Zhonghe Zhou. 2018. Medullary bone in an Early Cretaceous enantiornithine (Aves) and discussion regarding its identification in fossils. *Nature Communications 9*: 5169. <https://doi.org/10.1038/s41467-018-07621-z>.

12. Dana Rashid, Kevin Surya, Luis Chiappe, Nathan Carroll, Kimball Garrett, Bino Varghese, **Alida Bailleul**, Jingmai O'Connor, Susan Chapman, and John Horner. 2018. Avian tail ontogeny, pygostyle formation, and interpretation of juvenile Mesozoic specimens. *Scientific Reports 8*: 9014.

2017

11. **Alida M. Bailleul**, Casey M. Holliday. 2017. Joint histology in *Alligator mississippiensis* challenges the identification of synovial joints in fossil archosaurs and inferences of cranial kinesis. *Proceedings of the Royal Society Biological Sciences*. DOI: 10.1098/rspb.2017.0038

10. **Alida M. Bailleul**, Lawrence M. Witmer, Casey M. Holliday. 2016. Functional joint histology in the mallard duck (*Anas platyrhynchos*): new insights on avian cranial kinesis. *Journal of Anatomy*. DOI: 10.1111/joa.12562

2016

9. Aaron R. H. LeBlanc, Robert R. Reisz, David C. Evans, **Alida M. Bailleul**. 2016. Ontogeny Reveals Function and Evolution of the Hadrosaurid Dinosaur Dental Battery. *BMC Evolutionary Biology 16*:152

8. **Alida M. Bailleul**, John R. Horner. 2016. Comparative histology of some craniofacial sutures and skull-base synchondroses in non-avian dinosaurs and their extant phylogenetic bracket. *Journal of Anatomy 229*:252-285.

7. **Alida M. Bailleul**, John B. Scannella, John R. Horner, David C. Evans. 2016. Fusion patterns in the skulls of modern archosaurs reveal that sutures are ambiguous maturity indicators for the Dinosauria. *Plos One 11(2)* : e0147687.

6. John R. Horner, Holly N. Woodward, **Alida M. Bailleul**. Mineralized tissues in dinosaurs interpreted as having formed through metaplasia: a preliminary evaluation. 2016. *Comptes Rendus Palevol 15* (1-2), 183-203.

5. **Alida M. Bailleul**, Catherine Nyssen-Behets, Benoît Lengelé, Brian K. Hall, John R. Horner. 2016. Chondroid bone in dinosaur embryos and nestlings (Ornithischia: Hadrosauridae): insights on the growth of the skull and the evolution of skeletal tissues. *Comptes Rendus Palevol 15* (1-2), 51-66.

2015

4. **Alida M. Bailleul**. 2015. Osteohistology of sutural fusion in the skulls of archosaurs: implications for maturity assessment in non-avian dinosaurs and for the evolution of skeletal tissues. *PhD Thesis, Montana State University*.

- 2013** 3. **Alida M. Bailleul**, Brian K. Hall, John R. Horner. 2013. Secondary cartilage revealed in a non-avian dinosaur embryo. *PLoS ONE* 8(2), e56937.
- 2012** 2. **Alida M. Bailleul**, Brian K. Hall, John R. Horner. 2012. First evidence of dinosaurian secondary cartilage in the post-hatching skull of *Hypacrosaurus stebingeri* (Ornithischia, Lambeosaurinae). *PLoS ONE* 7, e36112.
- 2011** 1. **Alida Bailleul**, Loïc Ségalen, Angela D. Buscalioni, Oscar Cambra-Moo, Jorge Cubo. 2011. Paleohistology and preservation of tetrapods from Las Hoyas (Lower Cretaceous, Spain). *Comptes Rendus Palevol* 10 (5-6), 367-380.

#### AWARDS & FELLOWSHIPS

- 2019** **Award of Major Scientific Achievement (Top 5) of IVPP for 2019**  
Award name in Chinese: 2019年度古脊椎所重大成果如
- 2019** **Outstanding Achievement of the Center of Excellence in Life and Paleoenvironment of the Chinese Academy of Sciences;** for ‘An Early Cretaceous enantiornithine (Aves) preserving an unlaidd egg and probable medullary bone’.  
Award name in Chinese: 中国科学院卓越中心优秀成果
- 2018** **Postdoctoral Fellowship** of the Chinese Academy of Sciences – President’s International Fellowship Initiative (CAS-PIFI).
- 2017** **Postdoctoral Fellow Platform/Oral Presentation Award** -2<sup>nd</sup> place (American Association of Anatomists)
- 2016** **Postdoctoral Fellow Poster Presentation Award** -2<sup>nd</sup> place (American Association of Anatomists)
- 2014** **Brian K. Hall Award** (Best Oral Presentation - Canadian Society of Zoologists)
- 2014** **Harold T. Stearns Fellowship Award** (Geological Society of America)

#### EXTERNAL GRANTS

- 2016** **AAA Short-term Visiting Scholarship** - American Association of Anatomists (\$1000)
- 2014** **Evolving Earth Foundation** Research Grant (\$2870)
- 2014** **Geological Society of America** Research Grant (\$2500)
- 2014** **Jurassic Foundation** Research Grant (\$2280)
- 2013** **Sigma-Xi** Grant-in-Aid of Research (\$400)

#### SELECTED TRAVEL GRANTS

- 2017-2016** American Association of Anatomists Travel Grants
- 2015** Third International Symposium on Paleohistology Travel Grant
- 2014** M.A Fritz Travel Grant for the Advancement of Studies in Paleontology (Royal Ontario Museum)
- 2014** Genomes to Biomes Conference Travel Grant (Canadian Society of Zoologists)
- 2013** College of Letters and Science Student Travel Grant (Montana State University)

#### CURATION EXPERIENCE

- 2017-2015** Curation of the University of Missouri Vertebrate Collections in the Holliday Lab.
- 2015-2013** Curation of the Histology Collections of the Museum of the Rockies.

## TEACHING EXPERIENCE

- 2017** Workshop Attended : Active Learning Strategies (Dr. Cheryl Hill, University of Missouri).
- 2014** Invited Lecture : *'Intermediate skeletal tissues between bone and cartilage'*. Montana State University (for the course 'Comparative Osteology and Histology').
- 2014** BIOB-170IN. Graduate Teaching Assistant at Montana State University for 'Principles of Organismal Diversity (Inquiry-based labs)'
- 2013-2012** BIOB-258. Graduate Teaching Assistant at Montana State University for 'Introduction to Biology and Ecology: Organisms to Populations'

## INVITED SEMINAR

- 2018** *'Skeletal tissues of living reptiles : a window into the lives of extinct dinosaurs.'* First Friday Seminar, February 2018, Oklahoma State University, Tulsa, OK.

## LABORATORY EXPERIENCE

### Paleohistology and extant bone histology (undecalcified ground sections)

- Molding and casting fossil vertebrates (small fossils with sil-putty and larger fossils with fiberglass, plaster and silicone).
- Painting casts to mimic their fossilized aspect and glueing them back into real fossils (i.e., "fossil restoration").
- Histological preparation of undecalcified bones (100-micron thick slides).
- Paleohistological preparation of small and large fossil bones (100-micron thick slides).

### Histology (decalcified, paraffin thin-sections)

- Extant and fossil bone decalcification, wax/paraffin embedding and microtome sectioning (e.g., 5 microns thin-sections).
- Histological staining (e.g., Toluidine blue ; Masson's trichrome, Alcian blue).

### Developmental Biology

- Cryoembedding/Cryosectioning
- Immunohistochemistry on cryosections

### Molecular Paleontology

Training in the lab of Mary Schweitzer by Wenxia Zheng.

- Demineralization of fossil tissues
- Immunohistochemistry on fossil tissues
- Histochemistry on extant tissues
- Isolation of fossil cells

## FIELD EXPERIENCE (PALEONTOLOGY)

- 2017-2016** Paleontological excavation and fossil collection. Hell Creek Fm, Montana, USA, (near Ekalaka).
- 2013** Paleontological expedition and prospection. Khulsangol Fm, Gobi Desert, Mongolia.
- 2010** Paleontological excavation and fossil collection. Field sites of Las Hoyas & Cerro de los

Batallones, Spain.

**2007** Paleontological excavation and fossil collection. Gres des Estous Fm. Esperaza, France.

**2005, 2006, 2008, 2009, 2011**

Paleontological prospection, excavation and fossil collection. Two Medicine Fm, Judith River Fm and Hell Creek Fm, Montana, USA.

## **PRESENTATIONS/PUBLISHED ABSTRACTS**

### **Some Selected Oral presentations**

**Alida M. Bailleul**, Jingmai O'Connor, Zhiheng Li, Qian Wu and Zhonghe Zhou. First histological examination of ovarian follicles in a Cretaceous enantiornithine. Presented at *IMERP (International Meeting of Early-Stage Researchers in Palaeontology)*, Cuenca, Spain, June 2019; *5<sup>th</sup> ISPH (International Symposium on Paleohistology)*, Cape Town, South Africa, August 2019; *VII International Symposium on Dinosaur eggs and babies*; Shiyang City, China; August 2019.

**Alida Bailleul**, Jingmai O'Connor, Hailu You, Daqing Li, Zhonghe Zhou. A new specimen of enantiornithine from the Lower Cretaceous Xiagou Formation with preservation of an unusual mineralized tissue. *Annual Meeting of the Society of Vertebrate Paleontology*, Albuquerque, New Mexico, October 2018.

**Alida Bailleul\***, Jingmai O'Connor, Mary Schweitzer, Wenxia Zheng, Zhonghe Zhou. Histochemical staining of biomineralized and soft-tissues in fossil dinosaurs and birds: new avenues for XXIst Century Paleohistology. *International Paleontological Congress*, Paris, France, July 2018. **\*Keynote Speaker**

**Alida Bailleul**, Jingmai O'Connor, Mary Schweitzer, Wenxia Zheng, Hailu You, Daqing Li, Zhonghe Zhou. Histochemical staining of biomineralized and soft-tissues in fossil dinosaurs and birds. *5th International Conference on Earth Systems*, Shanghai, China, July 2018.

**Alida M. Bailleul**, Casey M. Holliday. Retracing the evolution of the otic joint in birds and fossil theropods through histology: new insights on streptostyly. *Society of Integrative and Comparative Biology Annual Meeting*, Jan 2018, San Francisco, CA.

**Alida M. Bailleul**, John R. Horner, John B. Scannella, Casey M. Holliday. *Tyrannosaurus rex* Shows Histological Evidence for Avian-Style Cranial Kinesis. *4<sup>th</sup> International Symposium on Paleohistology*. July 2017, Trenton, NJ.

**Alida M. Bailleul**, John R. Horner, Casey M. Holliday. *Tyrannosaurus rex* Shows Histological Evidence for Avian-Style Cranial Kinesis. American Association of Anatomists at EB 2017. April 2017, Chicago, IL.

**Alida M Bailleul**, Horner JR, Witmer LM, Holliday CM. Functional cranial joint histology in reptiles and birds and its significance for avian cranial kinesis. *International Congress of Vertebrate Morphology*, 2016, Washington DC.

**Alida M. Bailleul**. Ontogeny of sutural closure in the skulls of extant archosaurs: reconsidering maturity assessment in non-avian dinosaurs. *Annual Meeting of the Society of Vertebrate Paleontology*, 2015, Dallas, TX.

**Alida M. Bailleul**, John R. Horner. Comparative sutural histology of non-avian dinosaurs and their Extant Phylogenetic Bracket. *Third International Symposium on Paleohistology*, 2015, Bonn, Germany.

**Alida M. Bailleul**. Secondary cartilage and chondroid bone in dinosaur embryos: Insights on the evolution of

skeletal tissues. *Genomes to/aux Biomes Conference*, 2014, Montreal, Canada.

**Alida M. Bailleul**, John R. Horner. Sutural closure in the skull of pachycephalosaurs (Ornithischia: Marginocephalia): a preliminary histological study. *Second International Symposium on Paleohistology*, 2013, Bozeman, MT.

**Alida M. Bailleul**, John R. Horner. Early ossification and calcified tissues in the skull of *Hypacrosaurus stebingeri* (Ornithischia, Lambeosaurinae). *International Hadrosaur Symposium*, 2011, Alberta, Canada.

**Alida M. Bailleul**, John R. Horner. Perinatal histomorphogenesis of craniofacial elements of *Hypacrosaurus stebingeri* (Ornithischia, Lambeosauridae): A preliminary study. *First International Symposium on Paleohistology*, 2011, Barcelona, Spain.

**Alida Bailleul**, Loïc Ségalen, Angela D. Buscalioni, Jorge Cubo. Paleohistology and geochemistry of tetrapods from Las Hoyas (Lower Cretaceous, Spain). *International Meeting - "Perspectives On Vertebrate Evolution: Topics And Problems" - To Celebrate The Retirement Of Pr. Armand De Ricqlès*, 2010, Collège de France, Paris, France.

Ronan Allain, **Alida Bailleul**. First revision of the theropod from the Toarcian of Wazzant (High Atlas Mountains, Morocco): the oldest known Tetanurae? *First International Congress on North African Vertebrate Palaeontology*, 2009, Marrakech, Morocco.

#### **Selected Poster presentations**

Jingmai O'Connor, **Alida Bailleul**, Min Wang, and Zhonghe Zhou

Histology of juvenile enantiornithines from the Early Cretaceous Jehol Biota. *5<sup>th</sup> ISPH (International Symposium on Paleohistology)*, Cape Town, South Africa, August 2019

Qian Wu, **Alida Bailleul**, Zhiheng Li, Jingmai O'Connor, and Zhonghe Zhou

Fusion of the scapulocoracoid in the Mesozoic bird *Confuciusornis* and the extant paleognath *Struthio camelus* (common ostrich). *5<sup>th</sup> ISPH (International Symposium on Paleohistology)*, Cape Town, South Africa, August 2019

**Alida M. Bailleul**, Lawrence M. Witmer, John R. Horner, Casey M. Holliday. New histological data on the cranial joints of archosaurs: significance for the evolution and functional inferences of dinosaur cranial kinesis. *76<sup>th</sup> Annual Meeting of the Society of Vertebrate Paleontology*, October 26<sup>th</sup>-29<sup>th</sup> 2016, Salt Lake City, UT.

**Alida M. Bailleul**, Lawrence M. Witmer, Casey M. Holliday. Functional cranial joint histology in *Anas platyrhynchos*: a window to understand avian cranial kinesis. *American Association of Anatomists at EB* 2016. San Diego, CA.

Dana Rashid, **Alida Bailleul**, John R. Horner. The DinoChicken Project: Development and evolution of the avian tail. *Pan-American Society for Evolutionary Developmental Biology*. 2015, Berkeley, CA.

**Alida M. Bailleul**, John B. Scannella, John R. Horner. Ontogeny of cranial sutures in *Alligator mississippiensis*: implications for maturity assessment in non-avian dinosaurs. *73<sup>rd</sup> Annual Meeting of the Society of Vertebrate Paleontology*, October 30<sup>th</sup>-November 2<sup>nd</sup> 2013, Los Angeles, CA.

**Alida M. Bailleul**, John R. Horner. Early ossification and calcified tissues in the skull of *Hypacrosaurus stebingeri* (Ornithischia, Lambeosaurinae): A preliminary study. *Annual Meeting of the Society of Vertebrate Paleontology*, 2011, Las Vegas, NV.

## OUTREACH ORAL PRESENTATIONS

- 2018** Alida Bailleul, 'How slicing-up the skull of *Tyrannosaurus rex* reveals how it ate'. Paleofest, Burpee Museum of Natural history, Rockford, IL, March 2018.
- 2017** Alida Bailleul, 'The skull of *Tyrannosaurus rex* under the microscope.' *5th Annual Dino Shindig* public outreach event (Ekalaka, Montana, July 2017).
- 2016** Alida Bailleul, 'Evolution of cranial kinesis in dinosaurs.' *4th Annual Dino Shindig* public outreach event (Ekalaka, Montana, July 2016).

## PROFESSIONAL MEMBERSHIPS

- Since 2009** Society of Vertebrate Paleontology
- Since 2019** Polynesian Ornithological Society (Société d'Ornithologie de Polynésie)
- Since 2020** World Wildlife Fund

## OTHER SERVICES

- 2018-2016** I participated in outreach events, live auctions or art exhibits promoting art in science using histology slides I made.  
Events: **Science to Art 2017** (KCALS), Kansas City, MO; **Perceived Contrasts**, Tulsa, OK, 2017; **SVP 2017 Paleoart Exhibition**, Calgary; The University of Calgary Paleoart Exhibit, 2017; **PaleoFest 2018**, Burpee Museum of Natural History.
- Public outreach during the NSF-funded *Dinosaurs and Cavemen 2016, 2017 & 2018* (Columbia, MO). (I helped design activities for kids explaining why birds are dinosaurs.
- 2015-Present** Review Editor for *Frontiers in Earth Science* & *Frontiers in Ecology and Evolution*.
- 2015-2010** Paleontology outreach during multiple public events of the Museum of the Rockies.
- 2013** Conference Organization and Abstract Book Editor. Second International Symposium on Paleohistology, Bozeman, MT.
- 2010** Outreach to Elementary Schools (Bozeman, MT). Introduction to Dinosaur Biology and Histology.

## LANGUAGES

French : Bilingual/fluent ; English : Bilingual/fluent ; Spanish : Conversational;  
Chinese/Mandarin : Basic.