



# Dr. Jacqueline Kinsey Lungmus

(Jac or Jackie, she/her)

## Peter Buck Deep Time Postdoctoral Fellow

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## EDUCATION

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|------|-------|-------------------------|--------------------------|
| 2020 | Ph.D. | Integrative Biology     | University of Chicago    |
| 2016 | M.Sc. | Integrative Biology     | University of Chicago    |
| 2014 | B.A.  | Biological Anthropology | University of Washington |

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## PUBLICATIONS

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Araujo, R., David, R., Benoit, J., **Lungmus, J.K.**, Spoor, F., Stoessel, A., Barrett, P., Maisano, J., Ekdale, E., Orliac, M. and Luo, Z.X. (2021). Inner ear biomechanics reveals Late Triassic origin of mammalian endothermy. *Nature (in review)*

Kulik, Z.T., **Lungmus, J.K.**, Angielczyk, K.D., Sidor, C.A. (2021) Living fast in the Triassic: New data on life history in *Lystrosaurus* (Therapsida:Dicynodontia) from Northern Pangea. *Plos One (accepted)*

Knaus, P.L., van Heteren, A.H., **Lungmus, J.K.**, Sander, P.M. (2021) High blood flow into the femur indicates elevated aerobic capacity in synapsids since the reptile-mammal split. *Frontiers in Ecology and Evolution (accepted)*

**Lungmus, J.K.**, Angielczyk, K.D. (2021) Phylogeny, function and ecology in the deep evolutionary history of the mammalian forelimb. *Proceedings of the Royal Society B* (<https://doi.org/10.1098/rspb.2021.0494>)

Kammerer, C. F., Deutsch, M., **Lungmus, J. K.**, & Angielczyk, K. D. (2020). Effects of taphonomic deformation on geometric morphometric analysis of fossils: a study using the dicynodont *Diictodon feliceps* (Therapsida, Anomodontia). *PeerJ*.

**Lungmus, J.K.**, Angielczyk, K.D., 2019. The antiquity of forelimb ecomorphological diversity in the mammalian stem lineage (Synapsida). *Proceedings of the National Academy of Sciences*.

(<https://doi.org/10.1073/pnas.1802543116>)

Jones, K.E., Angielczyk, K.D., Polly, P.D., Head J.J., Fernandez, V., **Lungmus, J.K.**, Tulga, S., Pierce, S.E., 2018, Fossils reveal the complex evolutionary history of the mammalian stem lineage. *Science*.

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MEDIA COVERAGE:

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**Lungmus and Angielczyk, 2019**

Altmetric score of 178

(top 5% of all research outputs)

<https://www.altmetric.com/details/57236800>

**Lungmus and Angielczyk, 2021**

Altmetric score of 23

<https://www.altmetric.com/details/104407811>

**Jones et al., 2018**

Altmetric score of 207

(top 5% of all research outputs)

<https://www.altmetric.com/details/48697984>

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ABSTRACTS:

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**Lungmus, J.K. 2020**, Evolutionary rate analysis reveals dynamic and variable patterning of forelimb evolution across the deep history of Synapsida. *Journal of Vertebrate Paleontology*, Program and Abstracts, 2020. **Finalist for Romer Prize for Best Student Presentation at SVP Meeting.**

**Lungmus, J.K., Angielczyk, K.D., Luo, Z.X., 2020**, Limb ecometrics show limited applicability for quantifying ecological novelty in the deep evolution of Synapsida. Society for Integrative and Comparative Biology, Austin, Texas, USA.

**Lungmus, J.K., Angielczyk, K.D., 2019**. Can geometric morphometric analyses of limb shape reveal ecomorphological patterns across the evolutionary history of Synapsida? International Congress on Vertebrate Morphology, Prague, Czech Republic.

**Lungmus, J.K., Angielczyk, K.D., 2018**. Morphological disparity across the synapsid forelimb: suborder-level patterns across 80 million years of synapsid evolution. *Journal of Vertebrate Paleontology*, Program and Abstracts, 2018, 172.

**Lungmus, J.K., 2017**. Increased disparity in Therapsida corresponds with the emergence of novel ecomorphologies - Cistecephalidae (Therapsida: Anomodontia) as a case study. Paleontological Association Annual Conference. London, UK.

**Lungmus, J.K., 2017**. Increased limb morphological disparity coincident with the emergence of major synapsid clades and shifts to new morphofunctional types. *Journal of Vertebrate Paleontology*, Program and Abstracts, 2017, 154.

Small, B.J., Pardo, J.D., **Lungmus**, J.K., Douglass, R.J., Schlotterbeck, T., Huttenlocker, A.K., The first vertebrate body fossils from the Carboniferous-Permian Maroon Formation, Colorado, USA. *Journal of Vertebrate Paleontology*, Program and Abstracts, 2017, 195.

**Lungmus**, J.K., Angielczyk, K.D., Morphometric analysis of pelycosaur-grade synapsid pectoral elements reveals decreasing disparity towards Therapsida. *Journal of Vertebrate Paleontology*, Program and Abstracts, 2016, 178.

**Lungmus**, J.K., Angielczyk, K.D. 2016. Functional morphology of the pectoral girdle and forelimbs of a new burrowing cistecephalid dicynodont (Therapsida: Anomodontia). International Congress on Vert. Morphology. Washington, D.C.

Knaus, P. L., Sander, P., Van Heteren, A. H., **Lungmus**, J. K., Flow index of basal Eupelycosauria suggests elevated metabolic rates since the Carboniferous. *Journal of Vertebrate Paleontology*, Program and Abstracts, 2016, 167.

**Lungmus**, J.K., Angielczyk, K.D., Sidor, C.A., Nesbitt, S.J., Smith, R.M., Steyer, J-S., Tabor, N.J., Tolan, S., A new cistecephalid dicynodont (Therapsida: Anomodontia) from the Mid-Zambezi Basin (Zambia) and its fossorial adaptations *Journal of Vertebrate Paleontology*, Program and Abstracts, 2015, 169. **Winner of Colbert Student Poster Prize** (see Awards and Fellowships).

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## TEACHING EXPERIENCE AND TRAINING

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### PEDAGOGICAL TRAINING:

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- 2018 - 2020, earning **College Teaching Certificate** from the University of Chicago and the Chicago Center for Teaching. **Advanced pedagogical training in advanced high school and collegiate teaching**
- 2019, **CCT 50000 1, Course Design and College Teaching, instructor**, teaching graduate students and post-doctoral researchers on effective collegiate teaching, with focuses such as inclusivity in the classroom, philosophy of teaching, and designing courses
- 2018, **BSDG 50001 1, Teaching in the Sciences**, training in pedagogy and designing undergraduate courses with emphasis on teaching in the Biological Sciences
- 2017, **BSDG 5000 1, Teaching Assistantship Training**, training in working effectively as a TA

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### TEACHING EXPERIENCE:

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- 2018, **BSDG 50000 1, Teaching Assistantship Training, graduate instructor**, educating early career researchers in undergraduate teaching at the University of Chicago, emphasis on teaching in the sciences
- 2018, **GEOS 13900, Biological Evolution** (University of Chicago), teaching assistant to Dr D. Jablonski for introductory **evolutionary biology for non-majors**

- 2015, **BIOS 23262, Mammalian Evolutionary Biology** (University of Chicago), teaching assistant to Dr K.D. Angielczyk and Dr Z.X. Luo. Organized lab work and experiments associated with **skeletal biology and wet lab dissection**

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## OUTREACH AND MUSEUM PROGRAMMING

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- 2021 – **FossilFest '21**, annual event at Smithsonian NMNH (run as a virtual event in 2020 and 2021) where I worked as the primary scientific advisor on an outreach event run jointly with the **LocalMotion dance troop** (Alexandria, VA). This event uses dance as a way to inspire engagement with science and help teach interpretation of fossil organisms and was targeted to first generation immigrant students and their parents, conducted and facilitated as a bilingual program.
- Ongoing, participating and helping to coordinate enrichment opportunities for the Smithsonian **NMNH volunteer program**, wherein we discuss scientific topics with the museum volunteers to engage with them and help further their scientific literacy.
- 2017 – 2020, participant and volunteer with the **Field Museum's Women in Science program**, where I served as Women in Science Graduate Fellow, and which aims to set the standard for diversity within the sciences through student internships for aspiring female scientists. (<https://www.fieldmuseum.org/about/employee-groups/women-science>)
- Ongoing - participant scientist with the **Field Museum's Youth Council**, a committee that helps bridge the gap between Field Museum and youth by creating programs and activities for their teenage peers. (<https://www.fieldmuseum.org/our-events/teen-open-house>)
- 2018 - 2019, **Volunteer Scientist at Field Museum of Natural History's "Dozin' with the Dinosaurs"** weekly events, where families spend the night at the Field Museum and are introduced to research at the museum. Ran tables presenting dinosaur paleontology. (<https://www.fieldmuseum.org/our-events/dozin-dinos>)
- 2018, Volunteer Scientist at **"Speak Up For Science"**, the **Field Museum of Natural History's** day of action and advocacy for the importance of scientific research. Organized and ran the tables on paleobiology, showcasing Ice Age mammals from the Midwest.
- 2018, Session leader at **Expanding Your Horizon's (EYH)** annual workshop, introducing girls to female role models in STEM and leading hands-on workshop introducing them to paleontology. (<https://www.eyhchicago.com>)
- 2017 - 2018, participant in **the Field Museum of Natural History's Meet a Scientist** events, where a FMNH scientist presents on their research to visitors of the museum. I present on field work and dicynodonts from Tanzania and Zambia.
- 2017, Session leader at American Association of University Women (**AAUW**) **TechSavvy Event**, exposing middle school girls to female role models in STEM fields. (<https://www.aauw.org/resources/programs/stempacks>)
- 2016, Volunteer at **Field Museum of Natural History's "Identification Day"**, teaching and identifying osteological material for museum guests.

- 2014, **Teaching Assistant for the Discovery in Geosciences (DIG) Field School**, NSF funded program providing certification training for middle school teachers across the country by immersing them in field geology and paleontology. (<https://www.digfieldschool.org>)
- 2011-2014, **Docent at Washington State Burke Museum of Natural History and Culture.**

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## AWARDS AND FELLOWSHIPS

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### GRANTS:

- 2020, awarded **Peter Buck Deep Time Postdoctoral Fellowship** at the Smithsonian National Museum of Natural History (USA) for 2 years of independently proposed postdoctoral research (\$52,000)
- 2017-2018, Recipient of Neuromechanics **GAANN training grant**, University of Chicago (U.S. Department of Education, PI and Director: Prof. Melina Hale)(\$14,000)
- 2017, **Women in Science Graduate Fellowship**, funding for full-time one-year position and stipend as researcher at the Field Museum of Natural History (**FMNH, Chicago**)(\$30,000)
- 2016, **Hinds Endowment Grant**, “Morphological Disparity in Permian Synapsids and the Evolution of High Functional Diversity”, funding for research related travel to museums (\$1,700)

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### ACADEMIC HONORS:

- **Finalist for Romer Prize** from Society of Vertebrate Paleontology. Recognizes outstanding scientific contribution in Vertebrate Paleontology by a predoctoral student.
- 2018, **Richard Baumbach Award** from the Paleontological Society, grant for support of museum-based research
- 2018, Awarded grant from the **Paleontological Society** for support of local conferences, \$1,000 used organizing Great Lakes Student Paleoconference 2018
- 2015, Winner of Edwin H. and Margaret M. **Colbert Prize for best student poster**, “A new cistecephalid dicynodont (Therapsid:Anomodontia) from the Zambezi Basin (Zambia) and its fossorial adaptations”, Society of Vertebrate Paleontology Annual Meeting, Dallas
- 2014, Graduated with **Full College Honors** from the University of Washington, the most advanced honors degree that can be awarded

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## FIELDWORK

- Ongoing since 2015, Permian and Triassic Formations of **W Colorado, USA**, prospecting new localities and reopening historic localities, in collaboration with University of Utah, Natural History Museum of Utah, and University of Southern California

- 2018 - Bodga Mountains Section (Permian – Triassic) of **NW China**. Correlating biostratigraphic data at a continental scale. In collaboration with Missouri University of Science and Technology, the Field Museum of Natural History (FMNH), the University of Washington (UW), and several Chinese academic institutions. Funded by **NSF**, on hold due to ongoing pandemic

- 2018, Permian and Triassic Formations of central **Zambia**, Africa. Prospecting new and historic localities in collaboration with the FMNH, UW, Virginia Polytechnic Institute (VT), funded by **N. Geographic Society**

#### **Geographic Society**

- 2014 & 2018, Chinle Formation (Triassic) of **Petrified Forest National Park**, archosaurimorph (Reptilia) fossils, participant with the UW

- 2017, **Permian and Triassic** Formations of **SW Tanzania**, Africa. Prospecting new and historic localities in collaboration with the FMNH, the UW, VT, Southern Methodist University, and the Museum d'national d'Histoire naturelle (Paris), funded by **NSF**

- 2014, Hell Creek Formation (Cretaceous) of **NE Montana**, participant in Hell Creek Project III, field work collecting dinosaur and mammal fossils, UW, funded by **NSF**

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## **RESEARCH TECHNICAL SKILLS**

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- Proficient in 3D scanning techniques, including photogrammetry and surface scanning
- Extensive experience with micro-computed tomography (Micro CT) scanning technology
- Proficient in CT scan segmentation technology, Mimics
- Experience utilizing 3D printing technology, and using the models for functional morphological research
- Extensive experience in 2D and 3D morphometrics technology
- Proficient in R programs
- Integrative and quantitative analyses of ecology and evolutionary morphology
- Experience building time scaled phylogenies to be included in analyses and to provide phylogenetic correction to morphological data