Stephanie Marie Smith

Field Museum of Natural History Negaunee Integrative Research Center 1400 South DuSable Lake Shore Drive Chicago, IL 60605-2496 smsmith@fieldmuseum.org stephaniemariesmith.com 740.644.1556 pronouns: she/her

Current position	Research Scientist, Mammalogy Negaunee Integrative Research Center, Field Museum of Natural History
Education	2017: Ph.D., Biology. University of Washington, Seattle, Washington 2012: B.A., Biology. Johns Hopkins University, Baltimore, Maryland
Publications * = student collaborator	*Young, L.A., Smith, S.M. , Shefellbine, S. In revision, 2024. Analysis of bone structure in <i>Peromyscus</i> : Effects of burrowing behavior. <i>The Anatomical Record</i> .
	Smith, S.M. , Angielczyk, K.D., Heaney, L. R. In press, 2024. Small skeletons show size-specific scaling: an exploration of allometry in the mammalian lumbar spine. <i>Proceedings of the Royal Society B: Biological Sciences</i> .
	Smith, S.M. , Rowsey, D.M., Nations, J.A., Angielczyk, K. D., Heaney, L. R. 2023. The roles of phylogeny, body size, and substrate use in trabecular bone variation among Philippine "earthworm mice" (Rodentia, Chrotomyini). <i>Biological Journal</i> <i>of the Linnean Society</i> 140: 1–25. doi: 10.1093/biolinnean/blad033/7216523 **Named "Editor's Choice" for Volume 140, Issue 1.
	[*] Zack, E.H., Smith, S.M., Angielczyk, K.D. 2023. From Fairies to Giants: untangling the effect of body size, phylogeny, and ecology on vertebral bone microstructure of Xenarthran mammals. <i>Integrative Organismal Biology</i> . doi: 10.1093/iob/obad002
	Smith, S.M. , Angielczyk, K.D. 2022. A shrewd inspection of vertebral regionalization in large shrews (Soricidae: Crocidurinae). <i>Integrative Organismal Biology</i> 4: 1-17. doi: 10.1093/iob/obac006
	[*] Zack, E.H., Smith, S.M., Angielczyk, K.D. 2021. Effect of captivity on the vertebral bone microstructure of xenarthran mammals. <i>The Anatomical Record</i> . doi: 10.1002/ar.24817
	Smith, S.M., Stayton, C.T., Angielczyk, K.D. 2021. How many trees to see the forest? Assessing the effects of morphospace coverage and sample size in performance surface analysis. <i>Methods in Ecology and Evolution</i> 00: 1–14. doi: 10.1111/2041-210X.13624
	Crofts, S.B., Smith, S.M. , Anderson, P.S.L. 2020. Beyond description: the many facets of dental biomechanics. <i>Integrative and Comparative Biology</i> 60: 594-607 icaa103. doi: 10.1093/icb/icaa103
	Miller, S.E., Barrow, L.N., Ehlman, S.M., Goodheart, J.A., Greiman, S.E., Lutz, H.L., Misiewicz, T.M., Smith, S.M. , Tan, M., Thawley, C.J., Cook, J.A., Light, J.E. 2020.

Building natural history collections for the 21st century and beyond. Bioscience biaa069. doi: 10.1093/biosci/biaa069

Smith, S.M., Angielczyk, K.D. 2020. Deciphering an extreme morphology: bone microarchitecture of the hero shrew backbone (Soricidae: Scutisorex). Proceedings of the Royal Society B: Biological Sciences 287: 20200457. doi: 10.1098/ rspb.2020.0457

Grossnickle, D.M., Smith, S.M., Wilson, G.P. 2019. Untangling the multiple ecological radiations of early mammals. Trends in Ecology and Evolution. doi: 10.1016/j.tree.2019.05.008

Smith, S. M., Angielczyk, K.D., Schmitz, L., Wang, S.C. 2018. Do bony orbit dimensions predict diel activity pattern in sciurid rodents? The Anatomical Record 301:1774-1787. doi: 10.1002/ar.23900

Smith, S.M., Sprain, C.J., Clemens, W.A., Lofgren, D.L., Renne, P., Wilson, G.P. 2018. Early mammalian recovery after the end-Cretaceous mass extinction: A high-resolution view from McGuire Creek area, Montana, USA. Geological Society of America Bulletin 130:2000-2014. doi: 10.1130/B31926.1

Smith, S. M., Wilson, G.P. 2016. Species discrimination of co-occurring small fossil mammals: A case study of the Cretaceous-Paleogene multituberculate genus Mesodma, Journal of Mammalian Evolution 24: 147–157. doi: 10.1007/s10914-016-9332-2

Symposia

Functional morphology and biomechanics of trabecular bone: Insights across organisms and scales

2023 International Congress of Vertebrate Morphology, Cairns, Queensland, Australia

Co-convened with Michael Doube (City University of Hong Kong) 11 participants, including seven women, representing five countries

* = student collaborator

Selected Meeting Abstracts Smith, S.M., *Amendano, M., *Patel, S., Angielczyk, K.D., Stayton, C.T. How does trabecular structure influence the mechanical properties of tiny mammalian vertebrae? Society for Integrative and Comparative Biology 2024, Seattle, Washington.

> *Bates, C., Jones, K.E., **Smith, S.M.** 2023. The Congo Basin's Mysterious Hero: An investigation into vertebral mobility and the impact of tubercles in Scutisorex. Symposium of Vertebrate Paleontology and Comparative Anatomy 2023, Lincoln, UK.

Smith, S.M., Angielczyk, K.D., Heaney, L.R. 2023. Body size effects on trabecular bone morphology in Philippine cloud forest rodents. International Congress of Vertebrate Morphology 2023, Cairns, Queensland, Australia.

Smith, S.M., Angielczyk, K.D., Heaney, L.R. 2023. Multi-scale morphological effects of body size in a fully arboreal clade of rodents (Muridae: Phloeomyini). Society for Integrative and Comparative Biology 2023, Austin, Texas.

*Ayersman, M., **Smith, S.M.**, *Zack, E.H., Angielczyk, K.D. 2023. Unearthing the influences of body size, ecology, and phylogeny in claw morphology of digging mammals. Society for Integrative and Comparative Biology 2023, Austin, Texas.

*Zack, E.H., **Smith, S.M.**, Angielczyk, K.D. 2023. From Fairies to Giants: impacts of body size and ecology on trabecular bone of Xenarthran vertebrae. Society for Integrative and Comparative Biology Meeting 2023, Austin, Texas.

Smith, S.M., Angielczyk, K.D., Heaney, L.R. 2022. Phylogenetic signal in trabecular bone of the Philippine endemic earthworm-mouse *Chrotomys. Integrative and Comparative Biology* 61: Supplement_1.

Smith, S.M., Heaney, L.R., Angielczyk, K.D. 2021. Living small in the clouds: body size and bone microstructure in Philippine cloud forest rodents. American Society of Mammalogists Virtual Meeting 2021.

Smith, S.M., Angielczyk, K.D. 2021. A deep-learning approach to reduce subjectivity in segmentation of natural history museum skeletal specimens. Tomography for Scientific Advancement North America (ToScANA) Virtual Meeting 2021.

Smith, S.M., Angielczyk, K.D. 2021. Adventures inside shrew vertebrae: Trabecular bone morphology and regionalization in Soricidae. Society for Integrative and Comparative Biology Virtual Meeting 2021.

Smith, S.M., Angielczyk, K.D., Kerbis Peterhans, J.C. 2020. Vertebral number and spinal regionalization in large shrews (Soricidae). *Integrative and Comparative Biology* 60: Supplement_1.

Crofts, S.B., **Smith, S.M.**, Anderson, P.S.L. 2020. Crushing and puncturing: biomechanics of tooth shape. *Integrative and Comparative Biology* 60: Supplement_1.

*Zack, E.H., **Smith, S.M.**, Angielczyk, K.D. 2020. Zoo versus wild: Trabecular bone architecture in captive and wild Xenarthra. *Integrative and Comparative Biology* 60: Supplement_1.

Smith, S.M., Angielczyk, K.D., Heaney, L.R., Kerbis Peterhans, J.C., Luo, Z-X. 2019. Functional morphology of trabecular bone in the lumbar spine of shrews (Mammalia: Soricidae). International Congress of Vertebrate Morphology, Prague, Czechia. *Journal of Morphology* 280: S220. doi: 10.1002/jmor.21003

Smith, S.M. 2019. Non-destructive destructive sampling: The uses and limitations of computed tomography (CT) for traditionally destructive investigations. Society for the Preservation of Natural History Collections, Chicago, IL.

Smith, S. M., *Aranoff, G., Wilson, G.P. 2016. Quantitative dental ecomorphology reveals a wide range of mammalian dietary ecologies in the first one million years following the Cretaceous-Paleogene mass extinction. *Integrative and Comparative Biology* 56:E373.

Smith, S. M., Angielczyk, K. D., Schmitz, L., Wang, S. C. 2012. How well do orbit dimensions predict diel activity in sciurid rodents? *Integrative and Comparative Biology* 52:E163.

Funding and Awards

National Science Foundation

2022: Biological Sciences Directorate, Integrative Organismal Systems full proposal, Physiological and Structural Systems program; "The challenges of living small: functional tradeoffs in the vertebral bone structure of diminutive mammals" [NSF IOS-2223964]. PIs: **S.M. Smith**, K.D. Angielczyk (Field Museum), C.T. Stayton (Bucknell University). **\$484,370** (Field Museum); **\$198,298** (Bucknell)

2018: Postdoctoral Research Fellowship in Biology, Research Using Biological Collections [NSF DBI-1811627]. **\$138,000**

2014: Graduate Research Fellowship Program, Honorable Mention

Argonne National Laboratory Advanced Photon Source (APS)

2021: General User Proposal (GUP) 75346, "Pathological calcification in the backbone of captive anteaters". **Awarded 12 shifts (8hr each) of beam time** to conduct energy dispersive diffraction (EDD) on crystalline structure of pathological anteater bone. Collaborators: S.R. Stock (Northwestern University), J-S. Park (APS), K.D. Angielczyk (Field Museum), and E.H. Zack (University of Chicago)

Field Museum of Natural History

2022: Distinguished Bass Postdoctoral Fellowship 2020: Women in Science Postdoctoral Fellowship 2011: NSF Research Experience for Undergraduates Fellowship

Society of Vertebrate Paleontology

2017: Jackson School of Geosciences Student Travel Grant

University of California Museum of Paleontology

2015 and 2017: Doris O. and Samuel P. Welles Fund

American Philosophical Society

2014: Lewis and Clark Fund for Exploration and Field Research

American Society of Mammalogists

2014: ASM Grants-In-Aid of Research

University of Washington

2017: Burke Museum Vertebrate Paleontology Collections Fellowship
2016: Snyder Award for Vertebrate Zoology
2016: Stephen and Ruth Wainwright Endowed Fellowship for Functional
Morphology
2014: Iuvo Award
2012: Graduate Top Scholar Fellowship

Teaching Experience

Workshop Development

February 2021: Developed and taught two-session online workshop for Principal Investigators and students/colleagues associated with FuncQEE digitization project [NSF PEN-1902105]. Topics: segmentation, manipulation, and 3D modeling of reconstructed µCT data from natural history specimens.

University of Chicago: Guest lectures

BIOS 23262: Mammalian Evolutionary Biology (two or three 50-minute lectures per quarter; Autumn 2019, 2020, 2021, 2022, 2023)

	University of Washington: Teaching Assistant positions * denotes contribution of original lab materials or content Biology 220: Animal and Plant Physiology (3 quarters)* Biology 434: Invertebrate Zoology (1 quarter)* Biology 440: General Mycology (5 quarters)* Biology 442: Mushrooms and Related Fungi (1 quarter) Biology 443: Evolution of Mammals (2 quarters)* Biology 438: Quantitative Methods in Paleobiology (2 quarters)* Biology 448: Mammalogy (1 quarter)* Biology 475: Paleontological Field Methods (2 quarters)*
	University of Washington: Teaching Associate positions Biology 200: Introductory Molecular and Cellular Biology (1 guarter)*
	University of Washington: Guest lectures Biology 443: Evolution of Mammals (two 90-minute lectures) Biology 448: Mammalogy (one 90-minute lecture) Biology 438: Quantitative Methods in Paleobiology (three 90-minute lectures per quarter, 2 quarters) Biology 439: Functional Morphology (one 90-minute lecture)
	University of Washington: Reader/Grader positions Biology 401: Advanced Cell Biology (1 quarter)
Mentorship	2021-present: M. Ayersman (DePaul University) Project title: "Ecomorphology of keratinous claw sheaths in fossorial mammals" Funding: \$2500 (to MA), DePaul University Internship Plus Scholarship Program
	2019–present: E.H. Zack (University of Chicago) Funding: \$2000 (to EHZ), UC University Careers in STEM \$6500 (to EHZ) from UC Biological Sciences Collegiate Division. Products: Honors thesis in Ecology and Evolution (EHZ, 2021); Zack et al. 2021, 2023 (see Publications, above)
	2021: N. Dachota (U.S. Air Force Academy) Internship conducting research on bone morphology of Philippine endemic cloud forest rodents: cleaning and segmenting µCT scans, producing printable 3D models, and taking morphological measurements on rodent vertebral columns.
	2015–2016: G. Aranoff (University of Washington) Project title: "Quantitative Dental Ecomorphology of Early Paleocene Archaic Ungulates" Funding: \$5000 in funding (to GA), Mary Gates Research Fund (UW) Products: oral presentation, UW Undergraduate Research Symposium
Fieldwork	2022–present: Small mammal diversity and pathogen survey in Chicago's south side parks through Biota CAPTURE project, Chicago, IL. PIs: Adam Ferguson and Molly McDonough (Field Museum and Chicago State University).
	2021–2023: Small mammal survey across elevational transect in Santa Catalinas Mountains, southeastern Arizona (pilot data for larger Madrean Sky Islands biogeography and diversity project). PIs: Dakota Rowsey and Nathan Upham (Arizona State University Mammal Collections).
	2018: Small mammal trapping survey to determine conservation status of <i>Sorex merriami</i> in eastern Washington. PI: Kathryn Stanchack (University of Washington Biology).

	2015–2016: mist netting and collection of morphological, tissue, fecal, and behavioral data from neotropical bats, La Selva, Costa Rica. PIs: Leith Leiser- Miller and Sharlene Santana (University of Washington Biology).
	2012–2016: Cretaceous-Paleogene vertebrate fossil collections and prospecting. Hell Creek/Tullock Formations, Montana. PI: Gregory Wilson (University of Washington Biology).
	2010: Eocene vertebrate fossil collections and prospecting. Willwood Formation, Wyoming. PI: Kenneth D. Rose (Johns Hopkins Medical Institutions).
Invited Lectures	2023: Department seminar, Loyola University Chicago Department of Biology
	2023: Research & Collections Lunch and Learn, Natural History Museum of Los Angeles County.
	2023: Special seminar, University of the Philippines Institute of Biology, University of the Philippines, Diliman, Quezon City, Philippines.
	2022: Department seminar, The Ohio State University Department of Ecology, Evolution, and Organismal Biology.
	2021: "Virt" Paleo Seminar, Harvard Museum of Comparative Zoology.
	2020: A. Watson Armour Seminar Series, Field Museum of Natural History.
	2019: University of Chicago Evolutionary Morphology Seminar Series (EvMorph).
Educational Outreach	February 2024: Invited presenter, Field Museum Associates "Love in the Animal Kingdom" event with presentation and Q&A on mating and reproductive morphology in small mammals.
	April 2023: Interviewee and contributor of recent research to lesson development for BioGraphI (Biologists and Graph Interpretation Network), a group of science faculty who create lessons about graph and data interpretation, featuring scientists from historically excluded groups.
	July 2022: Guest mammals educator, Arizona State University Biocollections' Justice, Equity, Diversity, and Inclusivity program: "Equity and Diversity in Human-Nature Interactions".
	April 2022: Guest on WHYY's "The Pulse" segment: "Museums aren't getting as many animal specimens. Scientists say that's bad." https://whyy.org/segments/ museums-arent-getting-as-many-animal-specimens-scientists-say-thats-bad/
	June 2021: Invited scientist, Summer teacher workshop using 3D vertebrates conducted by oVert TCN (NSF DBI-1701714)/University of Florida. Worked with middle and high school teachers to develop in-classroom learning activities based on my research and use of oVert open-access 3D models of vertebrate anatomy.
	March 2021: Invited presenter, Field Museum Elementary (K-5) Scientist Chat series; online presentation and Q and A with elementary school students, about small mammal adaptations and being a scientist; https://www.youtube.com/ watch?v=qAOuuKPuyPO
	March 2021: Invited guest, Field Museum Discovery Adventures: "What are the weirdest animals in the world?"; online discussion and Q and A about weird animals in conjuction with virtual exhibit visit; 619 viewers during live broadcast alone; https://youtu.be/9Hi_0oJ23Bs?t=598

	October 2020: Invited presenter, Field Museum Meet a Scientist Online (with E.H. Zack); disscussion and Q and A about bone functional morphology and mentorship within the museum community; 2,900 views
	September 2020: Guest on "A Scientist Walks Into A Bar" podcast with Kate Golembiewski; discussion of bones, vertebrate morphological diversity, and hard tissue functional morphology
	September 2020: Invited presenter, Daystar Academy Virtual Field Trip; presentation and Q and A with Chicago second graders about bone morphology, evolution, and function
	May 2020: Invited presenter, Field Museum Instagram Live; discussion and Q and A about soricid natural history, biology, and ecology; 480 viewers during live broadcast alone
	January 2020: Invited presenter, Field Museum "Field Ambassadors" professional development program in museum- and object-based learning for K-12 educators
	October 2018–Present: Mammals educator, Field Museum of Natural History's Behind the Scenes tours, ID Day, Members' Night, and Field Associates Young Professionals events
	August 2012–2016: Field instructor, Discoveries in Geoscience (DIG) Field School. Hell Creek and Tullock Formations, Montana; digfieldschool.org
	November 2012–2018: Mammals educator, Burke Museum of Natural History and Culture's "Meet the Mammals", Behind the Scenes, and "Night Life" events
Service	Associate Editor, Integrative Organismal Biology
	2023: Code of Conduct Safety Ally, Society for Integrative and Comparative Biology Annual Meeting (Austin, Texas).
	2021: Panelist, NSF Integrative Organismal Systems Physiological Mechanisms and Biomechanics review panel.
	Peer review: Integrative Organismal Biology, Current Biology, Evolutionary Biology, Journal of the Royal Society Interface, Journal of Anatomy, Therya, Journal of Vertebrate Paleontology
References	Kenneth D. Angielczyk, Curator of Paleomammalogy Field Museum of Natural History Earth Sciences, Negaunee Integrative Research Center kangielczyk@fieldmuseum.org (312) 665-7639
	Lawrence R. Heaney, Negaunee Curator of Mammals Field Museum of Natural History Mammalogy, Negaunee Integrative Research Center Iheaney@fieldmuseum.org (312) 665-7747
	Sharlene Santana, Professor, Department of Biology Curator of Mammals, Burke Museum University of Washington ssantana@uw.edu (206) 221-6488