

Curriculum Vitae

Angela M. Mossor, Ph.D.

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RESEARCH PROFILE

My research focuses on biomechanics and functional morphology. Recent work has focused on long bone loading, material properties, and locomotor biomechanics in sloths and primates, and currently in arboreal snakes. I have expertise in 3D kinematics, inverse dynamics, strain gauge instrumentation, comparative anatomical dissections, micro-CT analysis, and cadaveric tissue material testing.

EDUCATION

- 2026 Ph.D., Biomedical Sciences, **Kent State University**
Supervisor: Dr. Jesse Young, Ph.D.
Dissertation Title: Suspensory Locomotion and its Effects on Mammalian Long Bone Properties
- 2020 MS, Biological Sciences, **Youngstown State University**
Supervisor: Dr. Michael Butcher, Ph.D.
Thesis Title: A horse of a different color?: Material strength and elasticity of bones and tendons in sloth limbs
- 2018 BS, Biological Sciences, **Youngstown State University**

PROFESSIONAL EXPERIENCE

- 2026-present Postdoctoral Fellow, Department of Ecology, Evolution, and Organismal Biology, Brown University
- 2025-2026 Teaching Assistant, Bitonte College of Dentistry, Northeast Ohio Medical University
- 2021-2026 Teaching Assistant, College of Medicine, Dept. of Biomedical Sciences, Northeast Ohio Medical University
- 2021-2023 Instructor, Anatomy MEDCAMP, Northeast Ohio Medical University
- 2018-2019 Teaching Assistant, Dept. of Biological Sciences, Youngstown State University

HONORS AND AWARDS

- 2025 Division of Comparative Biomechanics Best Student Poster presentation finalist, Society for Comparative and Integrative Biology
- 2023 Kent State University GSS International Travel Award (\$1,000)
- 2019 Cushwa Fellowship

RESEARCH GRANTS

- 2025 NEOMED Musculoskeletal Research Focus Area Research Scholarship (\$3,500)
- 2024 Journal of Experimental Biology Traveling Fellowship (\$3,000)

PUBLICATIONS

- Mossor, A. M.**, Busken, J., Benden, L., Mardovin, E., Bostick, A., Boulinguez-Ambroise, G., Smith, T. D., and Young, J. W. (2026). Born this way: Assessing perinatal limb bone strength in primates. *Anat Rec*.
- Tucker, C. S., **Mossor, A. M.**, Avey-Arroyo, J. A., and Butcher, M. T. Hoffmann's two-toed sloth I: Novel observations of thoracic limb myology in *Choloepus* (Pilosa: Xenarthra). *J. Anatomy*.
- Tucker, C. S., **Mossor, A. M.**, Spainhower, K. B., Avey-Arroyo, J. A., and Butcher, M. T. (2026). Hoffmann's two-toed sloth II: Muscle architectural properties in thoracic limb musculature of *Choloepus* (Pilosa: Xenarthra). *J. Anatomy*.
- Mossor, A. M.**, McKamy, A. J., Young, M. W., Rochté, A.J., Avey-Arroyo, J.A., Nyakatura, J.A., Granatosky, M.C., Butcher, M. T., and Young, J. W. (2025). Three-dimensional limb kinematics in brown-throated three-toed sloths (*Bradypus variegatus*) during suspensory quadrupedal locomotion. *JEZ-A*. doi:10.1002/jez.2911.
- Morgan, D.M., Spainhower, K.B., **Mossor, A.M.**, Avey-Arroyo, J.A., and Butcher, M.T. (2023). Muscle architecture properties indicate a primary role in support for the pelvic limb of three-toed sloths (Xenarthra: Pilosa). *J. Anatomy*. **243**, 448-466. doi:10.1111/joa.13884.
- McKamy, A.J., Young, M.W., **Mossor, A.M.**, Young, J.W., Avey-Arroyo, J.A., Granatosky, M.C., and Butcher, M.T. (2023). Pump the Brakes! The hindlimbs of three-toed sloths control suspensory locomotion (*Bradypus variegatus*, Xenarthra). *J. Exp. Biol.* **226**. doi:10.1242/jeb.245622.
- Young, J.W., Mayerl, C.J., Mannava, A., Lewis, C., Fan, T., Nan, M., Mamone, C., Schapker, N.M., **Mossor, A.M.**, German, R.Z. (2023). Evaluating the precocial-altricial axis of motor skill at birth in a preterm pig model. *ICB*. **63**, 625-640. doi:10.1093/icb/icad013.
- Magrini, S., **Mossor, A.M.**, German, R.Z., and Young, J.W. Factors Influencing Bone Quality in Precocial Mammals: An Infant Pig Model. (2023). *J. Anatomy*. **243**, 174-181. doi:10.1111/joa.13848.
- Mossor, A.M.**, Young, J.W., and Butcher, M.T. (2021). Does a suspensory lifestyle result in increased tensile strength? Organ-level material properties of sloth limb bones. *J. Exp. Biol.* **225**, 1-12. doi:10.1242/jeb.242866.
- Mossor, A.M.**, Austin, B.L., Avey-Arroyo, J.A., and Butcher, M.T. (2020). A Horse of a Different Color?: Tensile Strength and Elasticity of Sloth Flexor Tendons. *IOB*. doi:10.1093/iob/obaa032.

In Review

- Mossor, A.M.**, McKamy, A.J., Young, M.W., Rochté, A.J., Avey-Arroyo, J.A., Granatosky, M.C., Butcher, M.T., and Young, J.W. Evaluating bone loading patterns in brown-throated three-toed sloths (*Bradypus variegatus*) during suspensory locomotion. *J. Morphology*.
- Patel, A., Howe, S.P., **Mossor, A.M.**, and Young, J.W. Functional constraints on trabecular bone morphology: Testing design principles with 3D-printed lattices. *Peer J*.

In Prep

- Mossor, A.M.**, Benden, L., Dickinson, E., Granatosky, M.C., and Young, J.W. Limbs in Tension: Evaluating cadaveric bone strain patterns in tree sloths and primates. To be submitted to *Bio Letters*.

PRESENTATIONS

**** Indicates poster presentation**

Mossor, A. M., Benden, L., Dickinson, E., Granatosky, M. C., and Young, J. W. Going out on a limb: Evaluating bone strain adaptations in suspensory primates and sloths. American Association of Biological Anthropologists. 2026.

****Johnstone, R. E., Mossor, A. M.**, Chadwell, B. A., and Young, J. W. Kinematics adjustments to locomotion on narrow and compliant supports in squirrel monkeys (*Saimiri boliviensis*) and marmosets (*Callithrix jacchus*). American Association of Biological Anthropologists. 2026.

Mossor, A. M., Benden, L., Dickinson, E., Granatosky, M. C., and Young, J. W. Cadaveric bone strain patterns in sloths and primates during suspensory postures. Society for Integrative and Comparative Biology. 2026.

Mossor, A. M., Benden, L., Dickinson, E., Granatosky, M. C., Hartstone-Rose, A., and Young, J. W. Suspensory locomotion and its effects on long bone material properties. American Association of Biological Anthropologists. 2025.

****Mossor, A.M.**, McKamy, A. J., Young, M.W., Rochté, A.J., Avey-Arroyo, J.A., Dickinson, E., Granatosky, M.C., Butcher, M.T., and Young, J.W. Bend, don't break! Using sloths to evaluate bone loading and properties in a suspensory mammal. Society for Comparative and Integrative Biology. 2025.

Mossor, A.M., McKamy, A.J., Young, M.W., Granatosky, M.C., Butcher, M.T., Young, J.W. Determining bone loading during suspensory locomotion in tree sloths via an inverse dynamics model. Kent State Graduate Student Symposium. 2024.

Mossor, A. M., Busken, J., Boulinguez-Ambroise, G., Smith T., and Young, J.W. Assessing Perinatal Limb Bone Strength in Leaping and Quadrupedal Primates. American Association of Biological Anthropologists. 2024.

Mossor, A.M., McKamy, A.J., Young, M.W., Granatosky, M.C., Butcher, M.T., Young, J.W. Inverse dynamics model for suspensory locomotion in brown-throated three-toed sloths (*Bradypus variegatus*). Society for Comparative and Integrative Biology. 2024.

Mossor, A.M., McKamy, A.J., Young, M.W., Granatosky, M.C., Butcher, M.T., Young, J.W. Long bone loading during suspensory locomotion in brown-throated three-toed sloths (*Bradypus variegatus*). International Congress of Vertebrate Morphology. 2023.

Mossor, A.M., McKamy, A.J., Young, M.W., Granatosky, M.C., Butcher, M.T., Young, J.W. Comparative three-dimensional limb kinematics during suspensory locomotion in tree sloths. Society for Integrative and Comparative Biology. 2023.

Mossor, A.M., McKamy, A.J., Young, M.W., Granatosky, M.C., Butcher, M.T., Young, J.W. Comparative three-dimensional limb kinematics during suspensory locomotion in tree sloths. Northeast Ohio Medical University Fall Research Symposium. 2022.

Mossor, A.M., Boulinguez-Ambroise, G., Smith, T.D., and Young, J.W. Ontogeny and interlimb comparisons: perinatal limb bone strength in leaping and quadrupedal primates. Society for Comparative and Integrative Biology. 2022.

Mossor, A.M., Young, J.W., Butcher, M.T. Does a suspensory lifestyle result in increased tensile strength? Organ-level material properties of sloth limb bones. Society for Comparative and Integrative Biology. 2021.

Mossor, A.M., Austin, B.L., Avey-Arroyo, J.A., and Butcher, M.T. Are sloths horses hanging upside down?: Suspensory adaptations of sloth flexor tendons. Society for Comparative and Integrative Biology. 2020.

Mossor, A.M., Avey-Arroyo, J.A., and Butcher, M.T. A horse of a different color?: Tensile strength of bones and tendons in sloth limbs. International Congress of Vertebrate Morphology. 2019.

****Marshall, S.K., Mossor, A.M.**, Spainhower, K.B., Sinn, B.T., Diggins, T.P., and Butcher, M.T. Phylogenetic and functional evaluation of Xenarthran hindlimb structure. Society for Comparative and Integrative Biology. 2019.

****Nyaboke, R., Mossor, A.**, Osborne, N., Silvis, V., and Walker, G. The expression of Sarcomeric proteins during myogenesis in the C2C12 myogenic cells. The American Society for Cell Biology/The European Molecular Biology Organization. 2017.

INVITED LECTURES

In person

Mossor, A. M. (2024). Life upside down: evaluating limb modifications and kinematics in tree sloths. College of Osteopathic Medicine, New York Institute of Technology.

Virtual

Mossor, A. M. (2026). Take it Slow: The adaptive life history of tree sloths. Science Museum of Virginia.

TEACHING POSTS

2026-present Human Anatomy 1 Instructor | Brown University

- a. *Enrollment*: 160
- b. *Role*: Instructor, provided cadaveric-based instruction and review to small groups of medical students (dissection based lab). Developed and led in class lecture on pelvis gross anatomy.
- c. *Contact Hours*:
- d. *Prosection Hours*:

2026 Gross Anatomy Laboratory Teaching Assistant, Anatomy, Physiology, and Pathophysiology | Northeast Ohio Medical University

- e. *Enrollment*: 52
- f. *Role*: Teaching assistant, provided cadaveric-based instruction and review to small groups of dental students (dissection based lab)
- g. *Contact Hours*: 20

2025-2026 Gross Anatomy Laboratory Teaching Assistant, Head and Neck Anatomy | Northeast Ohio Medical University

- a. *Enrollment*: 52
- b. *Role*: Teaching assistant, provided cadaveric-based instruction and review to small groups of dental students (dissection based lab)
- c. *Contact Hours*: 50

2025-2026 Gross Anatomy Laboratory Teaching Assistant, Biomedical Sciences Foundations | Northeast Ohio Medical University

- a. *Enrollment*: 52
- b. *Role*: Teaching assistant, provided cadaveric-based instruction and review to small groups of dental students (dissection based lab)
- c. *Contact Hours*: 8

2022-2026 Gross Anatomy Laboratory Teaching Assistant, Gastrointestinal, Endocrine and Reproductive Systems | Northeast Ohio Medical University

- a. *Enrollment*: 220

- b. *Role:* Teaching assistant, provided cadaveric-based instruction and review to small groups of medical students
 - c. *Contact Hours:* 10
- 2021-2026 Gross Anatomy Laboratory Teaching Assistant, Cardiovascular, Pulmonary, and Renal Systems | Northeast Ohio Medical University
 - a. *Enrollment:* 220
 - b. *Role:* Teaching assistant, provided cadaveric-based instruction and review to small groups of medical students (dissection based lab)
 - c. *Contact Hours:* 12
- 2021-2026 Gross Anatomy Laboratory Teaching Assistant, Body and Brain | Northeast Ohio Medical University
 - a. *Enrollment:* 220
 - b. *Role:* Teaching assistant, provided cadaveric-based instruction and review to small groups of medical students (prosection based lab)
 - c. *Contact Hours:* 52
 - d. *Prosection Hours:* 30
- 2021-2026 Histology Laboratory Teaching Assistant, Body and Brain | Northeast Ohio Medical University
 - a. *Enrollment:* 220
 - b. *Role:* Teaching assistant for Team-Based Learning Sessions (led half of TBL sessions as instructor in partnership with faculty) and participated in review sessions
 - c. *Contact Hours:* 25
- 2019 Laboratory Teaching Assistant, Intro to Human Gross Anatomy | Youngstown State University
 - a. *Enrollment:* 30
 - b. *Role:* Teaching assistant, provided anatomical model based instruction to undergraduate students
 - c. *Contact Hours:* 36
- 2019 Laboratory Teaching Assistant, Gen Bio Molecules and Cells | Youngstown State University
 - a. *Enrollment:* 60
 - b. *Role:* Teaching assistant for laboratory based instruction, created exams
 - c. *Contact Hours:* 36
- 2018 Laboratory Teaching Assistant, Behavioral Neuroscience | Youngstown State University
 - a. *Enrollment:* 15
 - b. *Role:* Teaching assistant, performed and guided students on surgical techniques with rats, conducted behavioral experiments
 - c. *Contact Hours:* 36
- 2018 Laboratory Teaching Assistant, Gen Bio Organisms and Ecology | Youngstown State University
 - a. *Enrollment:* 60
 - b. *Role:* Teaching assistant for laboratory based instruction, created exams
 - c. *Contact Hours:* 36

STUDENT MENTORSHIP

Joshua Wooddell (Northeast Ohio Medical University, Medical Student)

- Gross anatomical dissections
- Materials testing

Andrew Bostick (Northeast Ohio Medical University, Medical Student)

- Materials testing

Ethan Mardovin (Northeast Ohio Medical University, Medical Student)

- Gross anatomical dissections
- Strain gauge experiments
- Materials testing

Aidan Kraan (Northeast Ohio Medical University, Medical Student)

- Gross anatomical dissections
- Strain gauge experiments

Chance Thompson (Kent State University, Undergraduate Student)

- Gross anatomical dissections
- Strain gauge experiments

Lorna Benden (Kent State University, Undergraduate Student)

- Gross anatomical dissections
- Analyzing micro-CT scans
- Materials testing
- Strain gauge experiments

Chris Mamone (Northeast Ohio Medical University, Medical Student)

- Gross anatomical dissections

Jeremy Busken (University of Akron, Undergraduate Student)

- Gross anatomical dissections
- Analyzing micro-CT scans
- Materials testing

Samantha Magrini (Kent State University, Ph.D. Student)

Factors Influencing Bone Quality in Precocial Mammals: An Infant Pig Model.

- Gross anatomical dissections
- Analyzing micro-CT scans
- Materials testing

Choose Ohio First Students (Youngstown State University, Undergraduate Students)

- Gross anatomical dissections
- Materials testing
- Statistics and graphing

LEADERSHIP AND SERVICE

Service

2024 Research Presentation (Crestview, High School Students)

2022 Gross Anatomy Lab Visit (Gilmore Academy, High School Students)

Leadership

2022-2025 Kent State University Biomedical Sciences Student Advisory Council

MEDIA

2022 The Insane Biology of Sloths (YouTube)

PROFESSIONAL DEVELOPMENT

Field Work

2022 Live animal data collection (kinematics and kinetics), Sloth Sanctuary of Costa Rica
2019 Gross anatomical dissections, Sloth Sanctuary of Costa Rica
2018 Gross anatomical dissections, Sloth Sanctuary of Costa Rica

Workshops

2024 qPCR Workshop, Northeast Ohio Medical University
2024 Phylogenetic Comparative Methods Workshop

PROFESSIONAL MEMBERSHIP

Society for Integrative and Comparative Biology (2018-present)
American Association of Biological Anthropologists (2023-present)

EXTERNAL REVIEWER

Scientific Reports; Journal of Human Evolution; Journal of Morphology; Zoology

COLLABORATORS

Dr. Michael Butcher, Ph.D., Youngstown State University
Dr. John Nyakatura, Ph.D., H.U. Berlin
Dr. Richard Blob, Ph.D., Clemson University
Dr. Michael Granatosky, Ph.D., University of Tennessee
Dr. Hazel Marie, Ph.D., Youngstown State University
Judy Avey-Arroyo, Sloth Sanctuary of Costa Rica
Dr. Adam Hartstone-Rose, North Carolina State University
Dr. Tim Smith, Slippery Rock University
Dr. Henry Astley, University of Akron