AARON J. HARDGRAVE

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SUMMARY

Ph.D. candidate in Biomedical Sciences with extensive anatomy teaching experience across undergraduate, graduate, and medical education. Proven expertise in team-based learning, laboratory instruction, and curriculum development for diverse student populations including medical students, occupational therapy students, and biology majors. Skilled in comparative anatomy, functional morphology, and integrating research methodologies into educational settings. Prepared to teach gross anatomy, comparative anatomy, embryology, neuroanatomy, and related biomedical sciences courses.

EDUCATION

Ph.D. Biomedical Sciences (Expected Completion: Spring 2026) Aug. 2021 - Present

East Tennessee State University – Quillen College of Medicine
Dissertation: Functional morphology of eastern newts, *Notophthalmus viridescens*, using microcomputerized tomography (μCT) and 3D geometric morphometrics (GMM)
Advisor: Dr. Richard T. Carter
Concentration: Neuroscience
GPA: 3.86

B.S. Biology Aug. 2017 - May 2021

East Tennessee State University – College of Arts and Sciences
GPA: 3.66

TEACHING EXPERIENCE

EAST TENNESSEE STATE UNIVERSITY – QUILLEN COLLEGE OF MEDICINE

Instructor

Foundations of Medical Knowledge 2 – Anatomy Section Fall 2025

- Co-instructed anatomy laboratory section (84 students) for Year 1 medical students (M1s) covering thoracic, back, and abdominal regions including viscera and musculature
- Facilitated small-group learning sessions and dissection/prosection demonstrations for first-year students
- Integrated clinical case studies with anatomical instruction

Brain, Body, Behavior – Anatomy Section Fall 2025

- Co-instructed anatomy laboratory section (84 students) for Year 2 medical students (M2s) in upper and lower extremity anatomy
- Facilitated small-group learning sessions and dissection/prosection demonstrations for second-year students
- Integrated clinical case studies with anatomical instruction

EAST TENNESSEE STATE UNIVERSITY – COLLEGE OF HEALTH SCIENCES

Instructor

Doctor of Occupational Therapy Program – Anatomy Summer 2025

- Co-instructed anatomy laboratory sections for first-year occupational therapy students (30 students) in upper and lower extremities, abdominal, back, and head and neck.
- Developed and delivered anatomical content tailored to occupational therapy clinical applications
- Facilitated collaborative learning activities with prosection and model-based learning experiences

EAST TENNESSEE STATE UNIVERSITY – COLLEGE OF ARTS AND SCIENCES

Instructor

Biology I for Majors Summer 2025

- Primary instructor (12 lecture hours + 3 lab hours weekly) for high-achieving high school students in intensive five-week residential program (Governor's School for Integration of Biological & Statistical Sciences)
- Developed lecture and laboratory materials covering experimental design, modern techniques (genome isolation, PCR, sequencing), data analysis, and photosynthesis/cellular respiration pathways
- Integrated biological concepts with statistical sciences and quantitative reasoning through applied projects

Biology II for Majors Spring 2025

- Primary instructor for undergraduate majors-level course (6 lecture hours weekly) covering organismal biology, ecology, and evolution
- Delivered lectures on structure and function in multicellular organisms, body plans in animals, reproduction and development, and major physiological systems
- Emphasized application of the process of science and relationship between science and society

Laboratory Instructor

Biochemistry of Macromolecules Lab Fall 2022 - Spring 2024

- Instructed laboratory sections (3 hours weekly) in protein, carbohydrate, lipid, and nucleic acid biochemistry
- Supervised hands-on experimental techniques and data analysis
- Mentored students in scientific writing and laboratory report preparation

Biochemistry of Metabolism Lab Spring 2023 - Spring 2024

- Instructed laboratory sections (3 hours weekly) in metabolic pathways and experimental approaches to studying cellular metabolism
- Guided students through complex biochemical techniques and instrumentation

Comparative Anatomy Dissection Lab Fall 2021

- Instructed undergraduate students (6 hours weekly) in vertebrate dissection and anatomical identification
- Emphasized evolutionary relationships and functional morphology across multiple taxa

Biology for Non-Majors Lab Spring 2021

- Adapted biological concepts for non-science majors
- Created engaging, accessible laboratory activities

Undergraduate Teaching Assistant

Comparative Anatomy Laboratory Fall 2020

- Assisted faculty with laboratory instruction and student assessment
- Prepared specimens and materials for laboratory sessions

SERVICE & OUTREACH

Graduate Student Mentor 2022 - Present
East Tennessee State University

- Mentored graduate and undergraduate students in advanced research methodologies and laboratory techniques
- Provided guidance on μCT image analysis and 3D geometric morphometric approaches

Science Outreach Volunteer 2022 - Present
Johnson City Parks & Recreation Department - Herpetology Camp

- Annual educational presentations on amphibian biology and ecology for children ages 5-13
- Developed age-appropriate interactive activities to promote environmental awareness

Student Selection Committee Member 2025
Governor's School for Integration of Biological & Statistical Sciences, ETSU

- Evaluated high school applicant merit and potential for intensive summer education program
- Participated in holistic review of academic records

COURSES PREPARED TO TEACH

- Gross Human Anatomy (lecture and laboratory)
- Comparative Anatomy (lecture and laboratory)
- Embryology / Developmental Biology
- Neuroanatomy
- Functional Anatomy
- Vertebrate Morphology
- General Biology (majors and non-majors)
- Biochemistry (lecture and laboratory)
- Anatomy & Physiology

RESEARCH EXPERIENCE

Graduate Researcher Aug. 2022 - Present
East Tennessee State University – Dr. Richard T. Carter's Lab

- Dissertation: Functional morphology of eastern newts using μCT and 3D geometric morphometrics
- Developed expertise in advanced imaging techniques (μCT scanning and analysis)
- Proficient in specialized software: Dragonfly, 3DSlicer, R/RStudio, ANSYS SpaceClaim, ANSYS Mechanical
- Assist faculty and students with μCT and geometric morphometric methodologies
- Mentor undergraduate and graduate researchers in laboratory techniques and data analysis

Research Assistant Aug. 2021 - July 2022

East Tennessee State University – Dr. Richard T. Carter's Lab

- Segmented trachea and nasal cavities from μCT scans of bat specimens (Pteropodidae, Phyllostomidae)
- Analyzed frequency paths through nasal cavities to investigate echolocation mechanisms
- Contributed to comparative morphology research integrating form and function

PUBLICATIONS

Adams, R.A., Carter, R.T. and Hardgrave, A.J. (2025), Monkeying around with bat scapulae: Old World fruit bats show arboreal adaptations of primates lacking in New World fruit bats. *J Zool*, 326: 54-64. https://doi.org/10.1111/jzo.70000

Hardgrave, A.J., Kawano, S.M., Carter, R.T. Terrestriality as a Constraint of Vertebral Shape in the Eastern Newt. *(in review at Journal of Anatomy)*

Hardgrave, A.J., Kawano, S.M., Carter, R.T. Effect of Terrestriality on Limb Shape in the Eastern Newt. *(in preparation)*

RESEARCH PRESENTATIONS

National Conferences:

The Society for Integrative and Comparative Biology (SICB)

- Seattle, WA (2024)
- Atlanta, GA (2025)

Regional Conferences:

SICB Southeast Regional Conference (DVM/DCB)

- Blacksburg, VA (2023)
- Harrisonburg, VA (2024)

State Conferences:

Tennessee Herpetology Conference

- Chattanooga, TN (2022)
- Bristol, TN (2024)

University Symposia:

Appalachian Student Research Forum – East Tennessee State University

- Annual presentations (2022, 2023, 2024)

TECHNICAL SKILLS

- Advanced imaging: micro-computerized tomography (μCT) scanning, image segmentation, 3D reconstruction
- Morphometric analysis: 3D geometric morphometrics, statistical shape analysis
- Software proficiency: Dragonfly, 3DSlicer, R/RStudio, ANSYS (SpaceClaim, Mechanical)
- Laboratory techniques: Dissection, specimen preparation
- Curriculum development and assessment design
- Team-based learning facilitation

RELEVANT GRADUATE COURSEWORK

- **Functional Human Anatomy** - Comprehensive study of human anatomical systems
- **Neurodevelopment** - Embryological development with emphasis on neural system formation
- **BMS I, II, III, IV** – Cellular anatomy, physiology, differentiation, and function
- **Introduction to Neuroscience** - Neural anatomy and function
- **Supervised Teaching** - Six semesters of teaching assistantship across multiple courses
- **Scientific Communication I & II** - Professional scientific writing and presentation

PROFESSIONAL MEMBERSHIPS

- Society for Integrative and Comparative Biology (SICB)
- American Association for Anatomy (AAA)

REFERENCES

Available upon request