

# 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

Aug. 2022 - Present

*East Tennessee State University – Quillen College of Medicine*

*Expected Graduation: Spring 2026*

*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*

## RESEARCH EXPERIENCE

### Graduate Researcher

Aug. 2021 - 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

## 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)

## TEACHING EXPERIENCE

### EAST TENNESSEE STATE UNIVERSITY – QUILLEN COLLEGE OF MEDICINE

**Laboratory 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

**Laboratory 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

## **TECHNICAL SKILLS**

- Advanced imaging: micro-computerized tomography ( $\mu$ CT) 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

## **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

## SERVICE & OUTREACH

### Graduate Student Mentor

2022 - Present

*East Tennessee State University*

- Mentored 6 students (5 undergraduate, 1 master's) in advanced research methodologies and laboratory techniques
- Trained students in µCT image analysis, 3D geometric morphometrics, landmarking procedures, and multivariate statistical approaches
- Supervised undergraduate honors thesis project in geometric morphometrics; student subsequently matriculated to Quillen College of Medicine
- Mentored master's student in statistical analysis for thesis research; student subsequently matriculated to University of Tennessee College of Veterinary Medicine

### 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

## 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)
- Human Anatomy and Physiology Society (HAPS)
- American Association for Anatomy (AAA)

## REFERENCES

Available upon request