

ADAM D. SYLVESTER, PH.D.

CURRICULUM VITAE

Center for Functional Anatomy and Evolution
The Johns Hopkins University School of Medicine
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EDUCATION

- 2001-2006 **Ph.D. in Anthropology**
The University of Tennessee, Knoxville
- 1998-2000 **M.A. in Anthropology**
The University of Tennessee, Knoxville
- 1992-1996 **B.S. in Zoology** (*magna cum laude*)
The University of Tennessee, Knoxville

POSTDOCTORAL TRAINING

- 2007-2009 **Postdoctoral Fellow**
Center for Functional Anatomy and Evolution
The Johns Hopkins University School of Medicine
- 2006-2007 **Postdoctoral Research Associate**
Department of Mechanical, Aerospace, and Biomedical Engineering
The University of Tennessee, Knoxville

PROFESSIONAL APPOINTMENTS

- 2020-Present **Associate Professor**
Center for Functional Anatomy and Evolution
The Johns Hopkins University School of Medicine
- 2019-Present **Director of Graduate Studies**
Center for Functional Anatomy and Evolution
The Johns Hopkins University School of Medicine
- 2015-2020 **Assistant Professor**
Center for Functional Anatomy and Evolution
The Johns Hopkins University School of Medicine

AD SYLVESTER

- 2013-2015 **Lecturer** (equivalent to U.S. Assistant Professor)
School of Life Sciences
University of Glasgow
- 2013-2015 **Adjunct Lecturer**
Institute of Biodiversity, Animal Health and Comparative Medicine
University of Glasgow
- 2009-2013 **Junior Researcher**
Department of Human Evolution
Max Planck Institute for Evolutionary Anthropology

FUNDING

- 2021-2023 **National Institute of Justice: Research and Development in Forensic Sciences for Criminal Justice Purposes (Award Number: 2020-R2-CX-0048)**
Role: Principal Investigator
Collaborators: D Wescott, PI for Texas State University, D Cunningham co-PI for Texas State University, W Zbijewski, co-PI for JHU
Title: Body mass estimation using bone micro- and macro-structure: a practical approach using CT imaging and computer analysis.
\$683,542
- 2019-2021 **National Science Foundation: Division of Behavioral and Cognitive Sciences (Award Number: 1923044)**
Role: Principal Investigator
Collaborators: D Wescott, PI for Texas State University, D Cunningham co-PI for Texas State University
Title: Collaborative Research: Obesity as a Natural Experiment to Investigate Bone Functional Adaptation.
\$255,502
- 2018-2020 **National Science Foundation: Division of Behavioral and Cognitive Sciences, Doctoral Dissertation Research Improvement Grant (Award Number: 1824630)**
Role: Principal Investigator
Collaborator: CM Harper, Ph.D. Candidate JHU, co-PI
Title: External and Internal Structure of Extant and Fossil Hominid Calcanei.
\$31,431

- 2016 **American Association for Anatomy: Innovation Award**
Role: Principal Investigator
Collaborator: J Mussell, Louisiana State University Health Science Center
Title: Anatomy for Every Body
\$50,000
- 2015 **University of Glasgow: Undergraduate Summer Studentship**
Role: Principal Investigator
Collaborator: F Osis, Undergraduate co-PI
Title: Behavioural and skeletal asymmetry in non-human primates.
\$1,500
- 2014-2016 **The Leakey Foundation: Senior Research Grant**
Role: Principal Investigator
Title: Reconstructing walking kinematics from femoral condyle curvature in fossil hominins.
\$13,745
- 2014 **The Carnegie Trust for the Universities of Scotland**
Role: Principal Investigator
Title: Primate walking: connecting skeletal shape and animal movement.
\$4,250
- 2014-2015 **University of Glasgow: Learning and Teaching Development Fund**
Role: co-Principal Investigator
Collaborators: Mancy R, Haydon D,
Title: Development of an integrated curriculum in quantitative skills for biology: background work package.
\$6,900
- 2010-2011 **National Science Foundation: Division of Behavioral and Cognitive Sciences (Award Number: 0962752)**
Role: co-Principal Investigator
Collaborators: Auerbach BM, PI for University of Tennessee, K King, PI
Title: Pelvic shape and differential mortality: obstetric variation among indigenous North American populations.
\$15,186

PUBLICATIONS

Harper CM, Goldstein D, **Sylvester AD**. Comparing and combining sliding semilandmarks and weighted spherical harmonics for shape analysis. *Journal of Anatomy* – Resubmitted.

Llera-Martin CJ, Rose KD, **Sylvester AD**. A morphometric analysis of early Eocene Euprimate tarsals from Gujarat, India. *Journal of Human Evolution* – Resubmitted.

Harper CM, Ruff CB, **Sylvester AD**. 2021. Calcaneal shape variation in human, nonhuman primates, and fossil hominins. *Journal of Human Evolution* 159.

Sylvester AD, Lautzenheiser SG, Kramer PA. 2021. A review of musculoskeletal modelling of human locomotion. *Journal of the Royal Society Interface* 11 (5): doi-org.proxy1.library.jhu.edu/10.1098/rsfs.2020.0060

Sylvester AD, Lautzenheiser SG, Kramer PA. 2021. Muscle forces and the demands of human walking. *Biology Open*. 10 (7): bio058595.

Harper CM, Ruff CB, **Sylvester AD**. 2021. Scaling and relative size of the human, nonhuman ape, and baboon calcaneus. *The Anatomical Record*. doi.org/10.1002/ar.24642

Zelazny K, **Sylvester AD**, Ruff CB. 2021. Bilateral asymmetry and developmental plasticity of the humerus in modern humans. *American Journal of Physical Anthropology* 174: 418-433.

Harper CM, Ruff CB, **Sylvester AD**. 2021. Gorilla calcaneal morphological variation and ecological divergence. *American Journal of Physical Anthropology* 174: 49-65.

Harper CM, **Sylvester AD**, McAfee RK, Cooke SB. 2021. A novel method for quantifying femoral neck anteversion: A case study with extinct sloths. *The Anatomical Record* 304: 266-278.



Terhune CE, **Sylvester AD**, Scott JE, Ravosa MJ. 2020. Internal architecture of the mandibular condyle of rabbits is related to dietary resistance during growth. *Journal of Experimental Biology* 223 (7). Cover Article.

Lautzenheiser SG, **Sylvester AD**, Kramer PA. 2020. Estimating the in vivo location of the talus from external surface landmarks. *American Journal of Physical Anthropology* 171: 354-360.

DeSilva JM, Carlson KJ, Claxton AG, Harcourt-Smith WEH, McNutt EJ, **Sylvester AD**, Walker CS, Zipfel B, Churchill SE, Berger LR. 2018. The Anatomy of the Lower Limb Skeleton of *Australopithecus sediba*. *Paleoanthropology* 2018: 357-405.

Canington SL, **Sylvester AD**, Burgess ML, Junno J-A, Ruff CB. 2018. Long bone diaphyseal shape follows different ontogenetic trajectories in captive and wild gorillas. *American Journal of Physical Anthropology* 167: 366-376.

- Auerbach BM, King KA, Campbell RM, Campbell ML, **Sylvester AD**. 2018. Variation in obstetric dimensions of the human bony pelvis in relation to age-at-death and latitude. *American Journal of Physical Anthropology* 167: 628-643.
- Harper CM, **Sylvester AD**. 2018. Effective Mechanical Advantage Allometry of Felid Elbow and Knee Extensors. *The Anatomical Record* 302: 775-784.
- Sylvester AD**, Kramer PA. 2018. Young's Modulus and Load Complexity: Modeling Their Effects on Proximal Femur Strain. *The Anatomical Record* 301: 1189-1202.
- Sylvester AD**, Terhune CE. 2017. Trabecular mapping: Leveraging geometric morphometrics for analyses of trabecular structure. *American Journal of Physical Anthropology* 163: 553-569.
- Auerbach BM, Gooding AF, Shaw CN, **Sylvester AD**. 2017. The relative position of the human fibula to the tibia influence cross-sectional properties of the tibia. *American Journal of Physical Anthropology* 163: 148-157.
- Reeves NM, Auerbach BM, **Sylvester AD**. 2016. Fluctuating and Directional Asymmetry in the Long Bones of Captive Cotton-Top Tamarins (*Saguinus oedipus*). *American Journal Physical Anthropology* 160: 41-51.
- Sylvester AD**. 2015. Femoral condyle curvature is correlated with knee walking kinematics in ungulates. *The Anatomical Record* 298: 2039-2050.
- Sylvester AD**. 2013. A geometric morphometric analysis of the hominid medial tibial condyle. *The Anatomical Record* 296:1518-1525.
- Kramer PA, **Sylvester AD**. 2013. Humans, geometric similarity, and the Froude number: Is "reasonably close" really close enough? *Biology Open* 2: 111-120.
- Sylvester AD**, Pfisterer T. 2012. Quantifying lateral femoral condyle ellipticalness in chimpanzees, gorillas, and humans. *American Journal of Physical Anthropology* 149: 458-467.
- Auerbach BM, **Sylvester AD**. 2011. Allometry and Apparent Paradoxes in Human Limb Proportions: Implications for Scaling Factors. *American Journal of Physical Anthropology* 144: 382-391.
- Sylvester AD**, Mahfouz MR, Kramer PA. 2011. The Effective Mechanical Advantage of A.L. 129-1a for Knee Extension. *The Anatomical Record* 294: 1486-1499.
- Kramer PA, **Sylvester AD**. 2011. The Energetic Cost of Walking: A Comparison of Predictive Methods. *PLoS One* 6(e21290): 1-11.
- Burrows AM, Muldoon KM, **Sylvester AD**. 2011. New Models and Insights into Primate Evolutionary Morphology 1:1-2.

AD SYLVESTER

Sylvester AD, Garofalo E, Ruff C. 2010. Technical Note: A R Program for Automating Bone Cross Section Reconstruction. *American Journal of Physical Anthropology* 142:665-669.

Sylvester AD, Organ JM. 2010. Curvature Scaling in the Medial Tibial Condyle of Large Bodied Hominoids. *The Anatomical Record* 293:671-679.

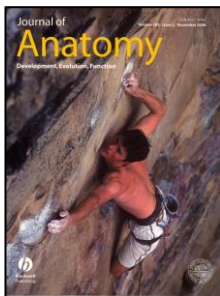
Kramer PA, **Sylvester AD**. 2009. Bipedal Form and Locomotor Function: Understanding the Effects of Size and Shape on Velocity and Energetics. *PaleoAnthropology*: 238-251.

Sylvester AD, Kramer PA, Jungers WL. 2008. Humans are not (quite) isometric. *American Journal of Physical Anthropology* 137: 371-383.

Sylvester AD, Merkl BC, Mahfouz MR. 2008. Assessing A.L. 288-1 femur length using computer-aided three-dimensional reconstruction. *Journal of Human Evolution* 55: 665-671.

Christensen AM, **Sylvester AD**. 2008. Physical matches in bones, shells and teeth: A validation study. *Journal of Forensic Sciences* 53: 694-698.

Sylvester AD, Kramer PA. 2008. Stand and Shuffle: When does it make energetic sense? *American Journal of Physical Anthropology* 135: 484-488.



Sylvester AD, Christensen AM, Kramer PA. 2006. Factors influencing osteological changes in the hands and fingers of recreational rock climbers.

Journal of Anatomy 209: 597-609. [Cover article]

Sylvester AD. 2006. Locomotor decoupling and the origin of hominin bipedalism. *Journal of Theoretical Biology* 242(3): 581-590.

BOOK CHAPTERS

Kramer PA, **Sylvester AD**, Hammerberg AG. 2019. Modeling the Spine Using Finite Element Models: Considerations and Cautions. In PA Kramer, eds. *Spinal Evolution: Morphology, Function, and Pathology of the Spine in Human Evolution*. Springer.

CONFERENCE PRESENTATIONS

Ryan K, **Sylvester AD**, Buck L, Auerbach BM. 2021. Variation and Covariation of Size and Shape of Sphenoidal Sinus in *H. sapiens*. *The FASEB Journal* 35.

Harper C, Ruff CB, **Sylvester AD**. 2021. Calcaneal Allometry in Humans and Nonhuman Primates. *The FASEB Journal* 35.

Goldstein D, **Sylvester AD**. 2021. Carpal Shape Variation between Pan and Gorilla Mirrors that of other Mammals with Similar Body Size Differences. *The FASEB Journal* 35.

Roach CS, Harper CM, Goldstein DB, **Sylvester AD**. 2020. A three-dimensional evaluation of chimpanzee subspecies talar morphology using spherical harmonics. Accepted for the 2020 Meeting of the American Association of Physical Anthropologists Undergraduate Research Symposium.

Huo VR, **Sylvester AD**, Harper CM. 2020. Mechanical advantage of the triceps surae muscle complex in modern humans. Accepted for the 2020 Meeting of the American Association of Physical Anthropologists Undergraduate Research Symposium.

Sylvester AD, Lautzenheiser SG, Kramer PA. 2020. Estimating hip muscle forces during walking using musculoskeletal modeling. Accepted for presentation at the 89th Meetings of the American Association of Physical [Biological] Anthropologists.

Russell CK, Gleiber DS, Wescott DJ, Cunningham DL, **Sylvester AD**. 2020. Trabecular mapping: effects of intra- and inter-observer error on sliding semilandmark placement. Accepted for presentation at the 89th Meetings of the American Association of Physical [Biological] Anthropologists.

Harper CM, Ruff CB, **Sylvester AD**. 2020. Calcaneal external shape of *Australopithecus sediba*. Accepted for presentation at the 89th Meetings of the American Association of Physical [Biological] Anthropologists.

Goldstein DM, **Sylvester AD**. 2020. Reconstructing the A.L. 288-1 distal femur during virtual geometric methods. Accepted for presentation at the 89th Meetings of the American Association of Physical [Biological] Anthropologists.

Llera CJ, Rose KD, **Sylvester AD**. 2020. A morphometric analysis of Eocene primate astragali. Accepted for presentation at the 89th Meetings of the American Association of Physical [Biological] Anthropologists.

Lautzenheiser SG, **Sylvester AD**, Kramer PA. 2020. The influence of foot orientation on side foot forces during walking in a straight line. Accepted for presentation at the 89th Meetings of the American Association of Physical [Biological] Anthropologists.

Lautzenheiser SG, **Sylvester AD**, Kramer PA. 2020. The importance of mediolateral forces on foot rehabilitation after injury. Accepted for presentation at the Meetings of the American Association for Anatomy.

Harper CM, Ruff CB, **Sylvester AD**. 2020. Human calcaneal shape relative to activity and foraging levels. Accepted for presentation at the Meetings of the American Association for Anatomy.

- Goldstein DM, Harper CM, **Sylvester AD**. 2020. A comparison of spherical harmonic and sliding landmark analyses as methods for three-dimensional shape evaluation. Accepted for presentation at the Meetings of the American Association for Anatomy.
- Llera CJ, Rose KD, **Sylvester AD**. 2020. A morphometric analysis of early Eocene euprimate calcanei from Gujarat, India. Accepted for presentation at the Meetings of the American Association for Anatomy.
- Mussell J, **Sylvester AD**. 2020. Anatomy for Every Body. Accepted for presentation at the Meetings of the American Association for Anatomy.
- Kramer PA, Lautzenheiser SG, **Sylvester AD**. 2020. Hip joint and muscle forces in human walking. ASCE Engineering Mechanics Institute International Conference.
- Gleiber DS, Cunningham DL, Wescott DS, Russell CK, **Sylvester AD**. 2019. Investigating the effect of obesity in trabecular structure of the proximal tibia: traditional and sliding semilandmark methods. Tomography for Scientific Advancement (ToScA), North America Symposium, University of Florida.
- Zelazny KG, **Sylvester AD**, Ruff CB. 2019. Choice of size parameter alters interpretation of fossil hominin distal humeral morphology. FASEB J 33: 612.9.
- Goldstein DM, **Sylvester AD**. 2019. Virtual geometric morphometric reconstruction of australopithecine femora: a methodological evaluation. FASEB J 33: 612.12
- Harper CM, **Sylvester AD**, McAfee RK, Cooke SB. 2019. Quantifying femoral neck torsion in extinct and extant sloths. FASEB J 33: 614.1.
- Russell CK, Cunningham DL, Wescott DJ, Gleiber DS, **Sylvester AD**. 2019. Sensitivity of trabecular mapping to sliding semilandmark placement. FASEB J 33: 612.13.
- Ochoa M, Lautzenheiser SG, **Sylvester AD**, Kramer PA. 2019. Anticipating turns: how many steps are affected? Am J Phys Anthropol S68: 179.
- Lautzenheiser SG, **Sylvester AD**, Kramer PA. 2019. Talar forces and moments in turning. Am J Phys Anthropol S68: 138.
- Harper CM, Ruff CB, **Sylvester AD**. 2019. Interspecific variation of calcaneal morphology in gorillas. Am J Phys Anthropol S68: 98.
- Harper CM, **Sylvester AD**. 2018. Allometry of Felid Knee and Elbow Effective Mechanical Advantage. FASEB Journal 32: 780.21.
- Zelazny KG, **Sylvester AD**, Ruff CB. 2018. Difference between Human and Great Ape Distal Humeral Articular Axes. FASEB Journal 32: 364.5.

- Canington SL, Ruff CB, **Sylvester AD**, Dunn RH, Rose KD. 2018. Reconstructing Locomotor Behaviors: Cross-sectional Property Analysis Brings More to the Story of How Earliest Euprimates Moved. *FASEB Journal* 32: 780.17.
- Sylvester AD**, Cosgarea AJ, Tanaka MJ. 2018. Patellar maltracking and the hominin distal femur. *Am J Phys Anthropol* S66: 270.
- Zelazny KG, **Sylvester AD**, Ruff CB. 2018. Morphological Variation in the Distal Humerus of Modern Humans, Apes and Fossil Hominins. *Am J Phys Anthropol* S66: 312.
- Kramer PA, **Sylvester AD**. 2018. Hominin proximal femur morphology: three-dimensional finite element analysis of femoral neck strain. *Am J Phys Anthropol* S66: 146.
- Gooding AF, **Sylvester AD**, Auerbach BM. 2018. Age-related changes in the structural properties of the human tibia. *Am J Phys Anthropol* S66: 103.
- Buti L, Reilly KM, **Sylvester AD**, Benazzi S, Feeney RNM. 2018. Enamel thickness variation in human molars and its importance for the practice of interproximal reduction. *Am J Phys Anthropol* S66: 38.
- Ramos PA, **Sylvester AD**, Taylor AB, Terhune CE. 2017. Trabecular symmetry in the primate temporomandibular joint. *Am J Phys Anthropol* S64: 326.
- Cannington SL, **Sylvester AD**, Burgess ML, Junno J, Ruff CB. 2017. Long bone cross-sectional diaphyseal shape follows different ontogenetic trajectories in captive and wild gorillas. *Am J Phys Anthropol* S64: 136-137.
- Terhune CE, **Sylvester AD**, Coiner-Collier S, Scott JE, McAbee KR, Ravosa, MJ. 2017. Adaptive plasticity in the masticatory apparatus: inferences for form, function and fossils. *Am J Phys Anthropol* S64: 379.
- Sylvester AD**. 2017. Primate femoral condyle curvature: linking shape and locomotion. *Am J Phys Anthropol* S64: 375.
- Lautzenheiser SG, **Sylvester AD**, Kramer PA. 2017. Does shape of the talus predict first metatarsal abduction? *Am J Phys Anthropol* S64: 257-258.
- Squyres N, **Sylvester AD**, Ruff CB. 2016. Shape variation in the Distal Femur of Modern Humans and Hominins. *Am J Phys Anthropol* S62: 300.
- Sylvester AD**, Terhune CE, Taylor AB. 2016. Trabecular mapping: Leveraging sliding landmarks for analyses of bone microstructure. *Am J Phys Anthropol* S62: 309.
- Curran SC, **Sylvester AD**, Terhune C, Gogol S, Hubbard J. 2016. New ecomorphological proxies for paleohabitat reconstructions: Geometric morphometric analyses of cervid joint surface morphology. Annual Meeting of the Paleoanthropology Society.
- Sylvester AD**. 2016. Trabecular mapping of the human distal femur: Leveraging geometric morphometrics for studies of bone microstructure. *FASEB Journal* 30: 1037.2

- Squyres N, **Sylvester AD**, Ruff CB. 2015. Morphological Variation in the Distal Femur of Three Modern Human Populations. *FASEB Journal* 29: 866.5.
- Tyas C, **Sylvester AD**. 2015. Assessing Shape Asymmetry in Human Femora and Humeri. *FASEB Journal* 29: LB25
- Harris E, **Sylvester AD**. 2015. Femoral Condyle Curvature and the Chondral Modeling Theory. *FASEB Journal* 29: LB24.
- Bryce A, Terhune C, **Sylvester AD**. 2015. User Variance in Defining the Trabecular-Cortical Interface Using Micro-CT Images. *FASEB Journal* 29: LB23.
- Sylvester AD**, DeSilva JM, Churchill SE, Berger LR. **2015**. Three-dimensional shape analysis of the distal femur of *Australopithecus sediba*. *Am J Phys Anthropol* S60: 299-300
- Sylvester AD**. 2013. Femoral condyle curvature and walking midstance in mammals. *Folia primatologica* 84: 327.
- Sylvester AD**. 2013. Reconstructing australopithecine midstance using femoral condyle curvature. *Am J Phys Anthropol* S56:268.
- Ouchida M, **Sylvester AD**, Kramer PA. 2012. Using musculoskeletal simulations to model the cost of locomotion: the OpenSim experiment. *Am J Phys Anthropol* S54: 230.
- Sylvester AD**, D'Août K, Kramer PA. 2012. GRF moment arms about the knee in A.L. 288-1. *Am J Phys Anthropol* S54: 281.
- Sylvester AD**. 2012. Quantifying the ellipticalness of the lateral femoral condyle in Gorilla, Pan, and Homo. *The FASEB J* 26:723.9.
- Campbell ML, Campbell RM, Auerbach BM, King KA, **Sylvester AD**. 2011. Survival is in the balance? Asymmetry in obstetric dimensions and mortality. *Am J Phys Anthropol* S52: 102.
- Campbell RM, Campbell ML, **Sylvester AD**, Auerbach BM, King KA. 2011. Quantifying a twisted curve: 3D digitization of sciatic notch shape using a microscribe. *Am J Phys Anthropol* S52: 102.
- Feeney RNM, **Sylvester AD**, Hublin JJ. 2011. Dental tissue allometry in modern human males and females. *Am J Phys Anthropol* S52: 134.
- King KA, Auerbach BM, **Sylvester AD**, Campbell ML, Campbell RM. 2011. Death and the (narrow) maiden: pelvic dimensions, mortality, and obstetric versus thermoregulation. *Am J Phys Anthropol* S52: 186.
- Reeves NK, **Sylvester AD**, Auerbach BM. 2011. Behavioral laterality and skeletal directional asymmetry in cottontop tamarins. *Am J Phys Anthropol* S52: 251.

- Sylvester AD**, Auerbach BM. 2011. Obscuring limb allometry: The geometric mean and limb indices. *Am J Phys Anthropol* S52: 288.
- Reeves N, **Sylvester AD**, Auerbach B. 2011. Patterns of asymmetry in primate long bone dimensions: a widespread pattern? *The FASEB J* 25:188.1.
- Sylvester AD**. 2010. Asymmetry in *Saguinus oedipus* limb bone dimension. *Am J Phys Anthropol* S50: 227.
- Sylvester AD**. 2010. Proximal tibia shape and locomotion. *The FASEB J* 24:171.1.
- Sylvester AD**, Mahfouz MR. 2009. Quantifying relative shape variation in modern human femora and humeri. *The FASEB J* 23:648.4.
- Sylvester AD**, Kramer PA. 2009. Predicting the metabolic energy consumption of human walking with mechanical energy calculations. *Am J Phys Anthropol* S48: 252.
- Garofalo EM, **Sylvester AD**. 2009. A R program for automating bone cross-section reconstruction. *Am J Phys Anthropol* S48: 131-132.
- Sylvester AD**, Mahfouz MR. 2008. The effective mechanical advantage of the australopithecine knee. *Am J Phys Anthropol* S46: 203.
- Kramer PA, **Sylvester AD**. 2008. Humans, geometric similarity and the Froude number: Is “reasonably close” really close enough? *Am J Phys Anthropol* S46: 134.
- Hendrix RB, **Sylvester AD**. 2008. The truth, the whole truth, and nothing but the truth – so help me Darwin: Legal decisions and evolution on the classroom. *Am J Phys Anthropol* S46: 115.
- Sylvester AD**, Merkl BC, Mahfouz MR. 2007. Reconstructing the A.L. 288-1 femur using three-dimensional computer models. *Am J Phys Anthropol* S44:228.
- Merkl BC, **Sylvester AD**, Mahfouz MR. 2007. A three-dimensional shape comparison of A.L. 129-1a and modern human distal femora. *Am J Phys Anthropol* S44:171.
- Mendenall MC, **Sylvester AD**, Kramer PA. 2007. Walking energetics and leg length: Are modern humans geometrically similar? *Am J Phys Anthropol* S44:170.
- Kramer PA, Mendenall MC, **Sylvester AD**. 2007. Geometric similarity in primates as assessed from long bone length. *Am J Phys Anthropol* S44:147.
- Christensen AM, **Sylvester AD**. 2007. Physical Matches of Bone, Shell and Teeth. A validation study. Presented at the American Academy of Forensic Sciences 59th Annual Scientific Meeting, San Antonio, Texas.

- Moore MK, **Sylvester AD**, Merkl BC, Kuhn MJ, Mahfouz MR. 2006. Creating a statistical atlas of the femur from three-dimensional CT data. *Am J Phys Anthropol* S42: 134.
- Sylvester AD**. 2005. Decoupling the shoulders from above-substrate locomotion: a new idea for the origin of hominid bipedalism. *Am J Phys Anthropol* S40: 202.
- Christensen AM, **Sylvester AD**, Kramer PA, Lubke GH. 2005. Factors influencing osteological changes in the hands of rock climbers. *Am J Phys Anthropol* S40: 88.
- Sylvester AD**. 2005. The Decoupling Hypothesis: A new idea for the origin of hominin bipedalism. Abstracts of the PaleoAnthropology Society 2005 Meetings: A25.
- Sylvester AD**. 2004. Geometric modeling of the center of gravity in Pan troglodytes. *Am J Phys Anthropol* S38: 192.
- Sylvester AD**. 2001. Surface area proportions, articular curvature, and the locomotor repertoire of A.L. 288-1. *Am J Phys Anthropol* S32: 146-147.

MEDIA RELEASES / INTERVIEWS

- 2019 Savage Love Letter of the Day, July 19, 2019:
<https://www.thestranger.com/slog/2019/07/19/40763814/reader-advice-roundup-dan-blew-so-many-answers-this-week>
- 2016 “Adam Sylvester on Bones, Movement and Rock Climbing” Article in JHUSOM Fundamentals Newsletter. Interviewed by Catherine Gara.
- 2012 “Das Geheimnis des aufrechten Gangs” [The Secret of Upright Gait]. Interview for X:enius television program by Arte television network (Germany). Documentary about the evolution of human bipedalism.
- 2008 ScienceDaily. “Did walking on two feet begin with a shuffle?” Media coverage of article exploring energetic model for evolution of human bipedalism.
- 2006 “Does climbing guard against arthritis?” Article in *Climbing* magazine by Matt Samet.

RESEARCH EXPERIENCE

- 2011, 2004 National Museum of Natural History, Washington, D.C.
Data collection on primate postcranial skeletons
- 2010 Ditsong National Museum of Natural History, Pretoria, South Africa
High-resolution CT scans of South African hominin fossils
- 2005, 2011 William M. Bass Skeletal Collection, University of Tennessee
Computed tomography of 400+ modern human skeletons

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1998, 2004 Cleveland Museum of Natural History, Cleveland, OH

FIELD EXPERIENCE

2008 Eocene mammals in the Big Horn Basin, WY
1999 Historic archaeology at Ramsey House, Knoxville, TN

RESEARCH FOCUS

Keywords: Biomechanics, Human Gait, Image Analysis, Bone Functional Adaptation, Primate Locomotion, Shape Analysis, Trabecular Bone Analysis

The central theme that unites my research is to understand the effect that forces, both mechanical and evolutionary, have on whole skeletal elements as well as bone tissue in vertebrate animals. My main interests lie in elucidating the details of locomotion in the earliest parts of the human lineage, including the evolution of bipedal walking. I am also interested in the response of bone tissue to atypical mechanical loading in contexts including obesity, dietary alterations, and aging. Much of my work depends on large image datasets, in particular micro-computed tomography. Consequently, I spend considerable effort investigating novel methodologies for quantifying bone microstructure.

TEACHING EXPERIENCE

Johns Hopkins University School of Medicine (2015-Present)

Scientific Foundations of Medicine: Human Anatomy (annually 2015-present): 1st year medical students; Lecturer and laboratory instructor
Summer Anatomy: A course for graduate and undergraduate students (annually 2015-2020): Diverse group of students; Lecturer and laboratory instructor
Foundations in Human Anatomy (annually 2020-present): Ph.D. students in nurse anesthesia program; Lecturer and laboratory Instructor
Geometric Morphometrics (2016, 2018, 2020, 2022): Graduate course in the statistical analysis of biological shape; Instructor
Biomechanics of the Skeleton (2021): Graduate course in biomechanics; Instructor

Johns Hopkins University, Department of Biology

Human Anatomy (2017, 2019): Undergraduate course: Lecturer

University of Glasgow, College of Medical, Veterinary & Life Sciences

Human Form and Function (2013-2015, Lower limb and walking modules): Undergraduate course; Lecturer
Integrated Human (2013-2015, Neuroanatomy, thorax, histology modules): Undergraduate course; Lecturer
Anatomy 3 (2013-2015, Statistics and biomechanics modules, tutorials): Undergraduate course; Lecturer

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Cells and Tissues (2013-2015, Skin and glands modules): Undergraduate course;
Lecturer

Articulation Biomechanics (2015): Undergraduate course; Course coordinator /
lecturer

Dental Anatomy (2014, Oral and Nasal cavity modules): Dental students; Lecturer

The Leipzig School of Human Origins: Max Planck Institute for Evolutionary Anthropology

Gorilla Musculoskeletal Limb Anatomy (2009); Graduate dissection course;
Lecturer and laboratory instructor

Johns Hopkins University School of Medicine (2007-2009)

Scientific Foundations of Medicine: Human Anatomy (2007-2009): 1st year medical
students; Lecturer and laboratory instructor

Introduction to Computer Programming (2009): Graduate course; Instructor

Biomechanics of Primate Locomotion (2009): Graduate course; Instructor

**The University of Tennessee, Knoxville, Department of Mechanical, Aerospace, and
Biomedical Engineering**

Human Gross Anatomy (2007): Lecturer and laboratory instructor

The University of Tennessee, Knoxville, Department of Anthropology

Human Osteology (2000): Laboratory instructor; Graduate teaching assistant

Human Origins, Laboratory (2001, 2002): Undergraduate course; Graduate
teaching assistant; Laboratory instructor

Human Origins, Laboratory (2003): Undergraduate course; Head graduate teaching
assistant; Laboratory instructor

Human Origins (2004, 2005): Undergraduate course; Graduate teaching associate
(Instructor of record)

Human Paleontology (2004): Undergraduate/graduate course; Graduate teaching
assistant; Laboratory instructor

INVITED LECTURES

2021 "Musculoskeletal modeling for anthropologists". AnyBody Technology.
Aalborg, Denmark. [Webinar].

2021 "Forensic Application of Bone Functional Adaptation" Department of
Anthropology, Dartmouth College

2020 "Something to chew on: bone response to dietary manipulations in rabbits"
Department of Anthropology, The University of Tennessee

2018 "Virtual Paleontology: Computation Approaches to Locomotor Evolution"
Department of Anthropology, The University of Tennessee

2018 "Virtual Orthopaedics: Computational Approaches to Joint Disorders"
Ross University School of Medicine.

- 2017 “Beyond the VOI: Analyzing patterns of trabecular structure” Department of Anthropology, Texas State University.
- 2016 “Unlocking the knee of *Australopithecus sediba*” Department of Anthropology, The University of Tennessee, Knoxville, TN
- 2015 “Femoral condyle curvature and mammalian walking” Paleobiology Group, University of Washington, Seattle, WA
- 2012 “Australopiths did not use a ‘bent-hip and bent-knee’ gait” Department of Anthropology, The University of Tennessee
- 2011 “The effective mechanical advantage of australopithecine knee extension” Institute for Systematic Zoology and Evolution, Friedrich-Schiller University, Jena, Germany
- 2010 “Does size matter in hominin locomotion?” Department of Anthropology, The University of Tennessee, Knoxville TN

TRAINEES AND STUDENTS ADVISED

Postdoctoral Fellows

- 2021-Present Allison Machnicki, Ph.D., Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
- 2021-Present Lauren Meckel, Ph.D., Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
- 2020-2021 Christine M. Harper, Ph.D., Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.

Doctoral Student Committee Chair

- 2021-(2026) Kailie Batsche, Ph.D. Dissertation (Untitled). Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
- 2017-(2022) Catherine J. Llera-Martin, Ph.D. Dissertation (Untitled). Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine. NSF GRFP Recipient.
- 2017-(2022) C. Kinley Russell, Ph.D. Dissertation (Untitled). Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.

AD SYLVESTER

- 2016-(2021) Deanna M. Goldstein, Ph.D. Dissertation (Untitled). Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine. Leakey Foundation Grant Recipient.
Current Position: Postdoctoral Fellow, Renaissance School of Medicine at Stony Brook University.
- 2015-2020 Christine M. Harper, Ph.D. Dissertation "External Morphological Variation of Extant and Fossil Hominid Calcanei". Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine. NSF DDRIG Recipient.
Current Position: Assistant Professor, Cooper Medical School of Rowan University.

Doctoral Student Committee Member

- Current Haley Horbaly, Ph.D. Dissertation (Untitled). Department of Anthropology, The University of Tennessee, Knoxville.
- Current Greg Wehrman, Ph.D. Dissertation (Untitled). Department of Anthropology, The University of Tennessee, Knoxville.
- Current Katharine Ryan, Ph.D. Dissertation (Untitled). Department of Anthropology, The University of Tennessee, Knoxville.
- Current Stephanie Canington, Ph.D. Dissertation (Untitled). Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
- Current Devora S. Gleiber, Ph.D. Dissertation (Untitled). Department of Anthropology, Texas State University – San Marcos.
- Current Shelby Garza, Ph.D. Dissertation (Untitled). Department of Anthropology, Texas State University – San Marcos.
- Current Elaine Chu, Ph.D. Dissertation (Untitled). Department of Anthropology, University of Nevada, Reno.
- 2019 Anthony Harper, Ph.D. Dissertation "Craniodental adaptation and homoplasy in early mammals". Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
- 2019 Steven G. Lautzenheiser, Ph.D. Dissertation "Change in direction: forces on the human talus", Department of Anthropology, University of Washington.

AD SYLVESTER

- 2018 C. Loring Burgess, Ph.D. Dissertation "Ontogenetic Changes in Limb Bone Structural Properties and Locomotor Behavior in Pan". Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
- 2016 Nicole Squyres, Ph.D. Dissertation "Shape variation in the distal femur of modern humans and fossil hominins". Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
- 2012 François H.D. Gould, Ph.D. Dissertation "The morphology of the distal femoral articular surface and the evolution of cursoriality in ungulates". Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.

Masters Students

- (2022) Kurt Esenwein, Art as Applied to Medicine, The Johns Hopkins University School of Medicine.
- 2019 Rachel Frigot, M.S, Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
- 2014 Lori Christie, M.Sc. Medical Visualization and Human Anatomy, University of Glasgow.

Undergraduate Students

- 2020 Caley Roach, B.S., Behavioral Biology, The Johns Hopkins University; undergraduate researcher
- 2020 Evan Wang, B.S., Molecular and Cellular Biology, The Johns Hopkins University; undergraduate researcher
- 2020 Vincent Hou, B.S., Molecular and Cellular Biology, The Johns Hopkins University; undergraduate researcher
- 2015 Caitlin Tyas, B.Sc. Honours, University of Glasgow; primary thesis advisor
- 2015 Amy Bryce, B.Sc. Honours, University of Glasgow; primary thesis advisor
- 2015 Emma Harris, B.Sc. Honours, University of Glasgow; primary thesis advisor
- 2015 Laura Williamson, B.Sc. Honours, University of Glasgow; primary thesis advisor
- 2014 Anne Walsh, B.Sc. Honours, University of Glasgow; primary thesis advisor
- 2014 Mhairi Charlton, B.Sc. Honours, University of Glasgow; primary thesis advisor
- 2014 Cameron Morrice, B.Sc. Honours, University of Glasgow; primary thesis advisor

EDUCATIONAL FOCUS

Keywords: Biomechanics, Functional Morphology, Geometric Morphometrics, Statistics, Statistical Analysis of Shape, Image Analysis, Evolution, Anatomy, Paleoanthropology

My educational focus is on functional anatomy, biomechanics, and the statistical analysis of biological shape. My practice is informed by Bloom's taxonomy as well as constructivist theory, in particular Vygotsky's zone of proximal development. My role is as a facilitator to help learners create their own understanding within the context of their unique background and embedded worldview. I practice scaffolded learning in which tasks too complex for the learners to achieve independently are supported through guided experiences with a more skillful facilitator. As students gain independence in an area, the support is systematically removed and new content is introduced.

PROFESSIONAL SERVICE

Departmental and Institutional Service

2021	Member, Search Committee for one senior faculty hire and center Director, Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
2020	Chair, Research Re-Entry Committee, Covid-19 Pandemic, Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
2019-Present	Member, MA/Ph.D. Committee, The Johns Hopkins University School of Medicine.
2019-Present	Chair, Graduate Admissions Committee, Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
2016-2019	Member, Graduate Admissions Committee, Center for Functional Anatomy and Evolution, The Johns Hopkins University School of Medicine.
2014-2015	Board Member, College Ethics Committee, College of Medical, Veterinary and Life Sciences, University of Glasgow (Equivalent to U.S. Institutional Review Board).
2004-2005	Graduate Student Representative to the Faculty: Department of Anthropology, The University of Tennessee
2001-2006	Docent: McClung Museum Education Program, Knoxville, TN. The Origins of Humanity: Searching for Our Fossil Ancestors

AD SYLVESTER

Professional Organization Service

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| 2020 | Local Planning Committee: 90th Meeting of the American Association of Physical [Biological] Anthropologists, Baltimore, MD [Cancelled]. |
| 2013 | Chair: Paleoanthropology Poster Symposium at the 82 nd Meeting of the American Association of Physical Anthropologists, Knoxville, TN |
| 2011 | Organizer: Biological Anthropology Symposium at the Meeting of American Association of Anatomists in Washington, D.C. |
| 2008 | Co-organizer: Teaching Evolution & Promoting Quality Science Education Symposium at the 77 th Meeting of American Association of Physical Anthropologists, Columbus, OH |

Editorial Board

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| 2011 | Guest Editor, special issue of Anatomy Research International: New Models and Insights into Primate Evolutionary Morphology. |
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REVIEWER

Manuscript Reviewer

Acta Ecologica Sinica
American Journal of Physical Anthropology
Anatomical Record
Animals
Clinical Anatomy
Cogent Medicine
Current Biology
International Biomechanics
International Journal of Paleopathology
Journal of Anatomy
Journal of Forensic Sciences
Journal of Human Evolution
Journal of Theoretical Biology
Journal of Vertebrate Paleontology
Naturwissenschaften
Public Library of Science (PLOS ONE)
Physiology and Behavior
Scientific Reports – Nature

Grant Reviewer

The Leakey Foundation
National Science Foundation

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Grant Review Panel

National Science Foundation Behavioral and Cognitive Sciences (3 times)

CONSULTING EXPERIENCE

2005 Consultant: Zimmer Orthopedics

PROFESSIONAL MEMBERSHIPS

2000-Present American Association of Physical Anthropologists
2008-Present American Association of Anatomists

TECHNOLOGY TRANSFER

2010 Freeware: R programs for reconstructing long bone cross-sections and
calculating cross-sectional properties
Available at: www.hopkinsmedicine.org/fae/cbr.htm

AWARDS AND HONORS

2015 Honourable Mention: Most Innovated Teacher, University of Glasgow
Student Teaching Awards
2005 Graduate Student Travel Award, Department of Anthropology
The University of Tennessee
1995 Phi Beta Kappa, Epsilon Chapter, The University of Tennessee