Curriculum Vitae
MARIA A. SERRAT, PhD

Current Position

Associate Professor
Department of Biomedical Sciences
Joan C. Edwards School of Medicine
Marshall University

Contact Information

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Education

1999 BA Anthropology, Miami University, Oxford, OH

2002 MA Anthropology, Kent State University, Kent, OH (Dr. Owen Lovejoy, Mentor)
Thesis: The surface anatomy, internal structure, and external morphology of the mammalian proximal femur with special reference to its developmental biology

2007 PhD Biological Anthropology, Kent State University (Dr. Owen Lovejoy, Mentor)
Thesis: Environmentally-determined tissue temperature modulates extremity growth in mammals: A potential comprehensive explanation of Allen's rule

Postgraduate Education

2008-09 Cornell University College of Veterinary Medicine (Dr. Cornelia Farnum, Mentor)
Cartilage imaging, *in vivo* multiphoton microscopy

Professional Appointments

2016-pres Associate Professor, Biomedical Sciences, Marshall University School of Medicine
2017-pres Associate Professor, Clinical and Translational Sciences, Marshall University
2015-pres Clinical Associate Professor, Orthopaedics, Marshall University School of Medicine
2015-2016 Associate Professor, Anatomy and Pathology, Marshall University School of Medicine
2014-2016 Assistant Professor, Clinical and Translational Sciences, Marshall University
2013-2015 Clinical Assistant Professor, Orthopaedics, Marshall University School of Medicine
2009-2015 Assistant Professor, Anatomy and Pathology, Marshall University School of Medicine
2008-2009 Postdoctoral Associate, Biomedical Sciences, Cornell University, Ithaca, New York
2007 Postdoctoral Fellow, Anatomy, Northeastern Ohio Universities College of Medicine
2002-2007 Teaching Assistant, Anatomy, Northeastern Ohio Universities College of Medicine
2003-2005 Teaching Fellow, Anthropology, Kent State University, Ohio
2000-2002 Graduate Assistant, Anthropology, Kent State University, Ohio
1998-1999 Research Assistant, Zoology, Miami University, Ohio
1998 Summer Intern, Cleveland Museum of Natural History, Ohio

Leadership and Editorial Positions

2023 Guest Editor, Proceedings of the National Academy of Sciences USA
2023-2025 Chair, Ethics Committee, American Association for Anatomy
2019-2022 Board of Directors, American Association for Anatomy
2021-pres Editorial Board of Frontiers in Physiology, Review Editor for Skeletal Physiology
2020-pres Chair Representative, Association of Anatomy, Cell Biology and Neurobiology Chairpersons

Honors and Awards

2024	Best Block Leader Award, Marshall University School of Medicine Class of 2026
2023	Distinguished Artists and Scholars Award Senior Recipient, Marshall University
2021	Dean's Award for Excellence in Education, Marshall University School of Medicine
2020	Nominated by Sigma Xi as a Scientific Expert for consideration by Biden Administration
2020	Top 5 Leadership Article, American Association for Anatomy https://tinyurl.com/y965anj8
2019	Creativity in Teaching Award, Marshall University School of Medicine Class of 2022
2018	Young Faculty Presentation Award, American Association of Anatomists
2017	APSselect Award for Distinction in Scholarship in the Journal of Applied Physiology; APSselect is a highly selective monthly collection of outstanding scientific discoveries published across 10 American Physiological Society research journals
2017	Outstanding Creativity in Teaching Award, Marshall School of Medicine Class of 2020
2016	Outstanding Creativity in Teaching Award, Marshall School of Medicine Class of 2019
2016	Young Faculty Presentation Award, American Association of Anatomists
2015	Creativity in Teaching Award, Marshall University School of Medicine Class of 2018
2015	Dean's Award for Excellence in Basic Science Research, Marshall School of Medicine
2015	Basmajian Award for Excellence in Teaching Gross Anatomy and Outstanding Accomplishments in Biomedical Research, American Association of Anatomists
2014	Creativity in Teaching Award, Marshall University School of Medicine Class of 2017
2014	Academic Citizenship Excellence Award, Marshall University School of Medicine
2014	Young Faculty Presentation Award, American Association of Anatomists
2012	Excellence in Teaching Award, Marshall University School of Medicine Class of 2015
2011	Association of American Medical Colleges, Early Career Women Seminar Participant
2010	United States Bone and Joint Decade Young Investigator Initiative Participant
2008	Postdoctoral Fellowship Travel Award, American Association of Anatomists
2007	Juan Comas Prize, American Association of Physical Anthropologists
2006	Scholander Award, Runner-Up, American Physiological Society
2006	Excellence in Research, Graduate Student Senate, Kent State University
1999	Outstanding Undergraduate Research in Anthropology, Miami University
1999	Undergraduate Travel Presentation Award, Miami University
1999	Distinguished Student Achievement, Miami University

Professional Memberships

2023	The Honor Society of Phi Kappa Phi
2013	American Society for Bone and Mineral Research
2012	Orthopaedic Research Society
2009	American Physiological Society
2007	American Association for Anatomy
1999	Sigma Xi

Research Specialization and Current Projects

- Growth and development, anatomy, bone elongation, drug delivery
- Cartilage and vascular imaging using *in vivo* multiphoton microscopy
- Temperature enhanced molecular delivery to growth plates
- Mechanisms of diet-induced linear growth acceleration

Research Support

External Research Support

Pending NIH/NIAMS
R01AR083516 07/01/25-06/30/28
Mechanistic Role of Microstructure on the Mechanical Properties of the Growth Plate
Role: Co-investigator (PI Dana Duren, University of Missouri)
The objective of this research is to determine the role of growth plate microstructure on its mechanical properties during different phases of maturation. The proposed aims integrate mechanical testing with growth plate histomorphometry and finite element modeling. My role on the project is to perform growth plate imaging and histomorphometric analyses.
$2,018,143
Submitted 2/3/23 and 6/26/24

Pending NIH/NICHD
R01HD113640-01
Mechanisms of diet-induced IGF-I modulation of bone elongation rate.
Role: PI
Co-investigators: John Kopchick, Darlene Berryman, Cheryl Conover, Seema Kumar, James Denvir, Rebecca Williams
The objective of this research is to determine the mechanisms by which dietary fat regulates IGF-I bioactivity and linear growth prior to the onset of obesity. The proposed aims integrate real-time live animal microscopy with a novel set of in vivo models to test the hypothesis that a high-fat diet increases the bioavailability of IGF-I in growth plates of young mice via a protease-driven decrease in local IGF binding proteins.
$1,850,000
Submitted 2/4/23 and 11/3/2023; New submission pending

2021-25 NIH/NIGMS
1P20GM121299-01A1 (Sundaram) 02/15/18-01/31/25
Appalachian Center for Cellular transport in Obesity Related Disorders (ACCORD)
Role: Administrative Core Support
My role on the Administrative Core is to provide support to project leaders and junior investigators for grant writing, research, and technical inquiries as needed to accomplish the aims of the ACCORD (25% salary).
Phase II Competitive Renewal Submitted May 2024

2024-2025 NASA West Virginia Space Grant Consortium
Role of PAPP-A in diet-enhanced bone elongation
Role: PI Mentor
This project provides a research stipend to Brooklyn Johnson, a Marshall University undergraduate, to test the hypothesis that the IGFBP-4 protease PAPP-A is required for diet enhanced bone elongation. This research is a competitive renewal of Ms. Johnson's 2023-2024 NASA research award.
$5,000

2023-2024 American Association for Anatomy DEI Dissertation Completion Award
Regulation of IGF-1 signaling in diet-induced bone elongation
Role: PI Mentor
This project provides a research stipend to Cassaundra White, a Marshall University graduate student, to test the hypothesis that that a high-fat diet has both direct and indirect effects on IGF-1 stimulated growth through modulation of IGF binding proteins. The intent of the award is to provide support to promote retention of underrepresented minority graduate students who are in their final year of the PhD program.
$37,000 salary plus $4,500 travel and $3,000 professional development over 3 years

2023-2024 NASA West Virginia Space Grant Consortium
Role of PAPP-A in diet-enhanced bone elongation
Role: PI Mentor
This project provides a research stipend to Brooklyn Johnson, a Marshall University undergraduate, to test the hypothesis that the IGFBP-4 protease PAPP-A is required for diet enhanced bone elongation. This research is an extension of our NIH-funded projects to examine mechanisms of linear growth acceleration.
$4,500

2023-24 WV-INBRE Faculty Research Development Award 08/01/23-07/31/24
Thyroxine exposure enhances cranial growth in an avian model.
Role: Mentor
This project provides research funds to Dr. Holly Racine, Assistant Professor at West Liberty University, to test the hypothesis that in utero thyroid hormone exposure alters IGF-I activity in cranial sutures, causing premature fusion and altered cranial growth. This is a competitive renewal of Dr. Racine's 2021-22 WV-INBRE award.

2023 WVCTSI Jumpstart Grant
Establishing a PAPP-A breeding colony to examine mechanisms of diet-induced IGF-I modulation of bone elongation rate.
Role: PI
The overall objective of this project is to test the hypothesis is that a high-fat diet increases the bioavailability of IGF-I in growth plates of young mice via a protease-driven decrease in local IGF binding proteins (IGFBPs). This project will establish a breeding colony of PAPP-A knockout mice, which lack IGFBP-4 proteolysis, to strengthen an NIH R01 submission.
$10,000

2022-23 NASA West Virginia Space Grant Consortium
Regulation of insulin-like growth factor-1 signaling in diet enhanced bone elongation.
Role: PI Mentor
This project provides a research stipend to Cassaundra White, a Marshall University graduate student, to test the hypothesis that that a high-fat diet has both direct and indirect effects on IGF-1 stimulated growth through modulation of IGF binding proteins.
$12,000

2021-22 WV-INBRE Faculty Research Development Award 08/01/21-07/31/22
Thyroxine exposure enhances cranial growth in an avian model.
Role: Mentor
This project provides research funds to Dr. Holly Racine, Assistant Professor at West Liberty University, to test the hypothesis that in utero thyroid hormone exposure alters IGF-I activity in cranial sutures, causing premature fusion and altered cranial growth.

2021-22 NASA West Virginia Space Grant Consortium
Role of IGF binding proteins in site-specific bone growth.
Role: PI Mentor
This project provides a research stipend to Holly Spurlock, a Marshall University undergraduate, to test the hypothesis that heat increases protease activity in skeletal tissues, which reduces IGF binding proteins and increases free IGF-I to enhance bone growth. This research is an extension of our NIH-funded projects to examine mechanisms of linear growth acceleration.
$5,000

2018-21 NIH/NIGMS
1P20GM121299-01A1 (Sundaram) 02/15/18-06/30/21
Appalachian Center for Cellular transport in Obesity Related Disorders (ACCORD)
Subproject title: *Dysregulated growth factor transport and accelerated bone elongation in childhood obesity*
Role: Subproject PI
This mentored project uses *in vivo* multiphoton imaging to study the role of IGF-I transport in linear growth acceleration in juvenile obesity. The hypothesis is that increased IGF-I delivery to growth plates causes the increase in bone elongation rate.
$257,116 (FY 2020)

2020-21 NASA West Virginia Space Grant Consortium
Mechanisms Underlying Environmental Factors that Accelerate Linear Growth in Mice.
Role: PI Mentor
This project provides a research stipend to Darby McCloud, a Marshall University undergraduate, to test the hypothesis that mice exposed to a high-fat diet will exhibit similar effects in weight-bearing and non-weight-bearing bones. This research is a competitive renewal of Ms. McCloud's 2019-2020 NASA research award.
$5,000

2019-20 NASA West Virginia Space Grant Consortium
Mechanisms Underlying Environmental Factors that Accelerate Linear Growth in Mice.
Role: PI Mentor
This project provides a research stipend to Darby McCloud, a Marshall University undergraduate, to test the hypothesis that environmental factors such as warm temperatures and a high-fat diet will exhibit similar changes in growth plate histology consistent with increased bone elongation rate. This research is an extension of our NIH-funded projects to examine mechanisms of linear growth acceleration.
$5,000

2014-19 NIH/NIAMS
R15AR067451-01 09/19/14-06/30/2019
Heat enhanced molecular delivery to growth plates for targeted bone lengthening.
Role: PI
This multidisciplinary project uses *in vivo* multiphoton imaging and unilateral limb heating to study blood flow and molecular transport at cartilage-vascular interfaces of murine tibial growth plates. The hypothesis is that heat localizes delivery of systemic molecules into cartilage plates to promote bone lengthening.
$383,064

2017-18 NASA West Virginia Space Grant Consortium
Modeling obesity-induced linear growth acceleration in mice.
Role: PI Mentor
This project provides a research stipend to Chad Meadows, a Marshall University undergraduate, to test the hypothesis that mice on a high fat diet will exhibit accelerated skeletal growth and diminished bone quality even before the onset of overt obesity. This pilot research characterizes linear growth rate and bone microstructure in obese and non-obese mouse models to support a larger-scale COBRE project.
$5,000

2017 University of Calgary Heritage Youth Researcher Grant 2017
Characterizing obesity-induced alterations in bone microstructure
Role: Co-investigator, PI: Campbell Rolian, University of Calgary
This project provided a research stipend to Rosie Zhao, a Grade 11 Alberta high school student, to test the hypothesis that mice on a high fat diet have diminished bone quality. The goal of this summer project was to perform and analyze micro-CT scans to assess bone microstructural changes that occur during juvenile obesity.
$2,500 summer student stipend

2017 West Virginia STEM+ Family Travel Fund
Heat enhanced bone elongation in growth plates is IGF-I dependent.
Role: PI
This project provided travel funding for a caregiver to accompany my infant daughter and me to the 2017 Annual Meeting of Orthopaedic Research Society in San Diego, CA while my husband was away at the WV State Police Academy. I would otherwise have been unable to present my research at this premier orthopaedic conference.
$800

2015 American Association of Anatomists Symposium Funding
Vascular and connective tissue imaging in situ: returning bone to the skeleton
Role: Chair and Organizer
Travel award to defray expenses for invited speakers to participate in the session.
$4,000

2014-15 American Society for Bone and Mineral Research Grants in Aid Program
Heat enhanced molecular delivery to growth plates for targeted bone lengthening
Role: PI
Co-Is: Rebecca Williams, Todd Milbrandt, David Puleo, Travis Salisbury, Gabriela Ion
Funding from this Grants in Aid Program bridge enabled my lab to continue the research and strengthen an NIH R15 AREA submission. The hypothesis that heat localizes delivery of systemic molecules into cartilage plates to promote bone lengthening is tested using *in vivo* multiphoton imaging and western blotting to assess transport and activation of IGF-I in murine tibial growth plates.
$50,000

2014-15 NASA West Virginia Space Grant Consortium
Temperature effects on limb growth and IGF-I delivery to mouse bones.
Role: PI Mentor
This project provides a research stipend to Miles Gray, a Marshall University undergraduate, to test the hypothesis that localized heat treatment will increase the delivery of growth-essential nutrients to the limbs of developing mice, using fluorescent protein labeling and thin layer chromatography validation techniques. $5,000

2014-15 NASA West Virginia Space Grant Consortium
Unilateral heating to increase IGF-I uptake and bone length in mice.
Role: PI Mentor
This project provides a research stipend to Holly Tamski, a Marshall University graduate student, to test the hypothesis that unilateral heating can be used to increase local delivery of IGF-I to the growth plate to enhance length of the extremities.
$12,000

2013-14 CCTS University of Kentucky Pilot Grant Program (supported by NIH UL1TR000117)
Temperature enhanced bone elongation in growth plates.
Role: PI
This multidisciplinary project supports data collection for a new NIH R15 AREA submission. The project uses *in vivo* multiphoton imaging and unilateral limb heating to test the hypothesis that heat localizes delivery of systemic molecules into cartilage plates to promote bone lengthening.
$25,000

2013-14 NASA West Virginia Space Grant Consortium
Unilateral heating: a novel model to induce differential extremity growth in mice.
Role: PI Mentor
This project provided a research stipend to Jenna Vance, a Marshall University undergraduate, to test the hypothesis that routine application of heat on one side of growing mice will unilaterally increase limb length on the heated side.
$5,000

2011-12 NASA West Virginia Space Grant Consortium Research Initiation Grant
Imaging skeletal growth plates using in vivo multiphoton microscopy.
Role: PI
This project established a platform for live animal imaging using multiphoton microscopy to support bone elongation research at Marshall University.
NASA Technical Monitor: Dr. Jean Sibonga, Johnson Space Center, Bone Mineral Lab
$20,000

2011 WV-INBRE Summer Research Program
Effects of omega-3 fatty acids on bone development.
Role: PI Mentor
This project tested the hypothesis that perinatal exposure to omega-3 fats alters bone length, density, and osteoclast expression in adult mice.
Mentored research project of Rebekah Sine, Alderson-Broaddus College, Philippi, WV
Supported by NIH Grant 5P20RR016477 to the West Virginia IDeA Network for Biomedical Research Excellence. $2,200

2010-11 NASA West Virginia Space Grant Consortium
Effects of temperature and exercise on knee growth plates.
Role: PI Mentor
This project provided a research stipend to Morgan Efaw, a Marshall University undergraduate, to test the hypothesis that warm housing temperature and exercise increase the size of cartilage growth plates in the tibia and femur.
$5,000

2010-11 NASA West Virginia Space Grant Consortium
The roles of temperature and exercise in facilitating wrist bone growth in mice.
Role: PI Mentor
This project provided a research stipend to Laura Mader, a Marshall University undergraduate, to test the hypothesis that warm housing temperature and exercise increase the size of cartilage growth plates in the radius and ulna.
$5,000

2009-12 NSF Major Research Instrumentation Grant MRI-R2 0959012
Acquisition of a Confocal/Multiphoton Microscope to Advance Cellular and Physiological Research at Marshall University
PI: Michael Norton, PhD
Role: Major User and Oversight Committee Member.
This project provided support for a combined confocal/multiphoton system for high-resolution microscopy and *in vivo* imaging at Marshall University's core imaging facility
$930,058

2009 American Association of Anatomists Postdoctoral Fellowship
Exercise and temperature effects on limb elongation: In vivo imaging of the growth plate. Role: Co-PI with C.E. Farnum (postdoctoral mentor)
This study tested the hypothesis that exercise and temperature alter limb elongation by enhancing or reducing nutrient delivery to the growth plate.
$20,000 awarded (returned $6,700)

2005-07 NSF Doctoral Dissertation Improvement Grant, BCS-0524899
Effects of temperature on growth plate physiology in an experimentally-induced mouse model of Allen's rule. Role: Co-PI with C.O. Lovejoy (dissertation mentor)
This research tested the hypothesis that ambient temperature regulates limb length in mammals through changes in vascular supply to growing long bones.
$11,990

2004 Sigma Xi Grant-in-Aid of Research
Variation in mammalian proximal femoral ossification patterns. Role: PI
The goal of this research was to determine whether variation in femoral ossification was related to body size, phylogeny, and/or locomotion in diverse mammals.
$577

<u>Internal Research Support</u>

2015-16 Appalachian Clinical and Translational Science Institute Pilot Grant, Marshall University
Dysregulated growth factor transport and accelerated bone elongation in childhood obesity. Role: PI
This project uses *in vivo* multiphoton imaging to collect pilot data for an NIH COBRE and/or equivalent R01 grant submission on molecular transport and linear growth acceleration in childhood obesity.
$25,000

2013 MU-ADVANCE Path Forward Travel Award, Marshall University
Unilateral heat accelerates bone elongation and lengthens extremities of growing mice.
Role: PI. Funds to present at Orthopaedic Research Society Meeting, New Orleans LA
$1,000

2010-12 MU-ADVANCE Faculty Fellowship, Marshall University
Imaging skeletal growth plates using in vivo multiphoton microscopy. Role: PI
This project established a platform for live animal imaging using multiphoton microscopy to support bone elongation research; collaboration with Dr. R. Williams, a senior faculty mentor from Cornell University with biophysics and imaging expertise.
$40,000

2011 Research Equipment Funding, Marshall University
Imaging skeletal growth plates using in vivo multiphoton microscopy. Role: PI
Obtained cost-share funds from five Marshall University departments (Biomedical Sciences, MU-ADVANCE, Anatomy, Pharmacology/Physiology, and College of Science) to purchase a fluorescence stereomicroscope for Marshall's imaging facility.
$17,359 in kind purchase of fluorescence stereomicroscope for bone imaging research.

2011 MU-ADVANCE Mini Grant, Marshall University
Collaborative Research and Teaching at Cornell University. Funds to travel to Cornell University for a collaborative research and gross anatomy teaching visit, Ithaca, NY.
$1,000

2010 MU-ADVANCE Mini Grant, Marshall University
Multiphoton imaging offers new insights into growth plate regulation. Funds to present research at Gordon Conference on Cartilage Biology and Pathology, Ventura, CA
$1,000

2010 Cell Differentiation and Development Center, Marshall University
Determining how temperature and mechanical loading alter bone growth and gene expression in a bone culture model. Role: PI
$9,000 in purchase of incubators to support tissue culture research.

2009 MU-ADVANCE New Faculty Fellowship, Marshall University
Faculty development initiative to support laboratory setup and student salaries.
$10,000

2009 MU-ADVANCE Mini Grant, Marshall University
Wheel running activity reverses the cold limb phenotype in mice. Funds to present research at International Congress of Vertebrate Morphology, Punta del Este, Uruguay
$1,000

2007 Kent State University Graduate Student Senate International Travel Grant
Effects of temperature on skeletal growth in mice.
For research travel to International Congress of Vertebrate Morphology, Paris, France
$1,000

2004-05 Kent State University Graduate Student Senate Research Grant
Skeletal proportions in mammals: the potential role of growth hormone. Role: PI
This research tested the hypothesis that expression of growth hormone, and/or its mediator IGF-I, correlated with differential growth plate activity in the mouse hindlimb.
$1,800

1998 Miami University Undergraduate Research Grant
Plant foods in high latitude environments: Implications for Neanderthal subsistence.

The goal of this research was to document plant residues on stone tools produced through experimental processing for comparative fossil analysis using SEM. $500.

Peer-reviewed Publications

19. White CA, **Serrat MA**. Dysregulation of insulin-like growth factor-1 signaling in postnatal bone elongation. *Biochemistry and Cell Biology*. May 29. doi: 10.1139/bcb-2023-0025. Online ahead of print. PMID: 37246759. 2023.

18. Kjosness KM, Reno PL, **Serrat MA**. Modified Periodic Acid-Schiff (PAS) is an alternative to Safranin O for discriminating bone-cartilage interfaces. *JBMR Plus*. 7(6):e10742. doi: 10.1002/jbm4.10742. PMID: 37283654. 2023. **Featured as June 2023 Journal Cover**.

17. Machnicki AL, White CA, Meadows CA, McCloud D, Evans S, Thomas D, Hurley J, Crow C, Chirchir H, **Serrat MA**. Altered IGF-I activity and accelerated bone elongation in growth plates precede excess weight gain in a mouse model of juvenile obesity. *Journal of Applied Physiology*. 132(2): 511-526. doi: 10.1152/japplphysiol.00431.2021. PMID: 34989650. 2022.

16. Racine HL, **Serrat MA**. The actions of IGF-1 in the growth plate and its role in postnatal bone elongation. *Current Osteoporosis Reports*. Jun;18(3):210-227. doi: 10.1007/s11914-020-00570-x. PMID: 32415542 PMCID: PMC7299241. 2020.

15. Racine HL, Meadows CM, Ion G, **Serrat MA**. Heat induced limb length asymmetry has functional impact on weight bearing in mouse hindlimbs. *Frontiers in Endocrinology*. Jun 4;9:289. doi: 10.3389/fendo.2018.00289. eCollection 2018. PMID: 29915560. PMCID: PMC5994414. 2018

14. **Serrat MA**, Ion G. Imaging IGF-I uptake in growth plate cartilage using in vivo multiphoton microscopy. *Journal of Applied Physiology*. 123(5):1101-1109. PMID: 28798204. 2017
Featured as Outstanding Scientific Discovery in APS*select* October Collection
https://www.physiology.org/doi/full/10.1152/japplphysiol.00645.2017%40apsselect.2017.4.issue-10

Please note that my career was disrupted by medical issues and family obligations in 2015-2017, as well as COVID-related research delays in 2020-21.

13. **Serrat MA**, Schlierf TJ, Efaw ML, Shuler FD, Godby J, Stanko LM, Tamski, HL. Unilateral heat accelerates bone elongation and lengthens extremities of growing mice. *Journal of Orthopaedic Research*. 33(5): 692-8. PMID: 25639189. 2015

12. **Serrat MA**, Efaw ML, Williams RM. Hindlimb heating increases vascular access of large molecules to murine tibial growth plates measured by in vivo multiphoton imaging. *Journal of Applied Physiology*. 116(4):425-38 PMID: 24371019. PMCID: PMC3921350. 2014

11. **Serrat MA**, Dom AM, Buchanan JT, Williams AR, Efaw ML, Richardson, LL. Independent learning modules enhance student performance and understanding of anatomy. *Anatomical Sciences Education*. 7:406-16. PMID: 24616425. 2014

10. **Serrat MA**. Environmental temperature impact on bone and cartilage growth. *Comprehensive Physiology*. 4(2):621-55. PMID: 24715562. 2014
Invited Authoritative Review (includes new data)

9. **Serrat MA**. Allen's rule revisited: Temperature influences bone elongation during a critical period of postnatal development. *Anatomical Record*. 296(10):1534-45. PMID: 23956063. 2013

8. **Serrat MA**, Williams RM, Farnum CE. Exercise mitigates the stunting effect of cold temperature on limb elongation in mice by increasing solute delivery to the growth plate. *Journal of Applied Physiology*. 109: 1869-1879. PMID: 20930127. PMCID: 3006398. 2010

7. **Serrat MA.** Measuring bone blood supply in mice using fluorescent microspheres. *Nature Protocols.* 4(12): 1749-1758. PMID: 19893510. 2009

6. **Serrat MA**, Williams RM, Farnum CE. Temperature alters solute transport in growth plate cartilage measured by in vivo multiphoton microscopy. *Journal of Applied Physiology*. 106(6): 2016-2025. PMID: 19372302. PMCID: PMC2692772. 2009

5. **Serrat MA**, King D., Lovejoy CO. Temperature regulates limb length in homeotherms by directly modulating cartilage growth. *Proceedings of the National Academy of Sciences USA*. 105(49): 19347-19352. PMID: 19047632. PMCID: PMC2614764. 2008
   Rated 'Must Read' in Faculty of 1000 Biology

4. **Serrat MA**, Lovejoy CO, King D. Age- and site-specific decline in insulin-like growth factor-I receptor expression is correlated with differential growth plate activity in the mouse hindlimb. *Anatomical Record*. 290(4): 375-381. PMID: 17514762. 2007
3. **Serrat MA**, Reno PL, McCollum MA, Meindl RS, Lovejoy CO. Variation in mammalian proximal femoral development: comparative analysis of two distinct ossification patterns. *Journal of Anatomy.* 210(3): 249-258. PMID: 17331175. PMCID: PMC2100278. 2007

2. **Serrat MA**, Vinyard CJ, King D. Alterations in the mechanical properties and composition of skin in human growth hormone transgenic mice. *Connective Tissue Research.* 48(1): 19-26. PMID: 17364663. 2007

1. Reno PL, DeGusta D, **Serrat MA**, Meindl RS, White TD, Eckhardt, RB, Kuperavage AJ, Galik K, Lovejoy CO. Plio-Pleistocene hominid limb proportions: Evolutionary reversals or estimation errors? *Current Anthropology*. 46: 575-588. 2005

Published Abstracts and Formal Research Presentations

80. Lilly CL, **Serrat MA**, Tsuda E, Wyant J, Riffe J, Shaffer K, Elliott E, Pyles L. Odds of developing overweight/obesity based on early height percentiles in a sample of Appalachian school children: Longitudinal results from the CARDIAC project. Poster presentation by Christa Lilly at American Public Health Association Annual Meeting, Minneapolis, MN, 27-30 October 2024.

79. Duren DL, **Serrat MA**, Middleton K, Ma L, Bozynski C, Stylianou A. Age-related changes in microstructural traits of the physis are reflected in its material properties. Poster presentation by Duren/Serrat at American Association for Bone and Mineral Research Annual Meeting, Toronto, ON, 27-30 September 2024.

78. White CA and **Serrat MA**. Excess dietary fat accelerates bone elongation *in vitro* similar to *in vivo* models. **Selected for Podium Presentation** by Cassaundra White at American Association for Anatomy Annual Meeting, Toronto, ON, 22-25 March 2024. **Finalist: Cassaundra White American Association for Anatomy Langman Graduate Platform Presentation Award.**

77. Johnson B and **Serrat MA.** Role of the protease PAPP-A in postnatal bone elongation. Poster presentation by Brooklyn Johnson at the 21st Annual Undergraduate Research Day at the West Virginia Capitol, Charleston, WV, 22 February 2024.

76. **Serrat MA**, Kjosness KM, Reno PL. Modified Periodic Acid-Schiff (PAS) is an alternative to Safranin O for discriminating bone-cartilage interfaces. Poster Presentation at the American Society for Bone and Mineral Research Annual Meeting, Vancouver, BC, 13-15 September 2023.

75. Steele K, Fitchpatrick P, Keeley-Cain L, White CA, Johnson B, **Serrat MA**. Role of the protease PAPP-A in postnatal bone elongation. **Selected for Podium Presentation** by Katherine Steele and Payton Fitchpatrick at 2023 Health Science Research Day, Marshall University School of Medicine, Huntington, WV, 10 Nov 2023.

74. **Serrat MA**. *In vivo* imaging of skeletal growth plates. **Invited Speaker** at 50th Congress of the European Calcified Tissue Society, Liverpool, UK, 15-18 April 2023. https://2023.ectsoc.org/programme/#!sessiondetails/0000007860_0. **Featured speaker in session on Technology Update: Imaging.**

73. **Serrat MA**. Bone growth and obesity. **Invited Speaker** at 50th Congress of the European Calcified Tissue Society, Liverpool, UK, 15-18 April 2023. https://2023.ectsoc.org/programme/#!sessiondetails/0000008050_0. **Featured speaker in session on New Insights into Bone Development.**

72. White CA, Machnicki AL, Keeley-Cain LJ, Beverlin AC, Pigliacampi MA, **Serrat MA**. New insights into the role of the IGF-1 pathway in diet-induced bone elongation. Podium and Poster Presentations by Cassaundra White at American Association for Anatomy Annual Meeting, Washington DC, 25-27 March 2023. **Finalist: Cassaundra White American Association for Anatomy Graduate Poster Presentation Award.**

71. Beverlin AC, Pigliacampi MA, White CA, Keeley-Cain LJ, **Serrat MA**. Multiplexed immunofluorescence of IGF signaling components in growth plate cartilage. Poster Presentation by Allison Beverlin and Marlena Pigliacampi at 2022 Health Science Research Day, Marshall University School of Medicine, Huntington, WV, 28 Oct 2022.

70. White CA, Denvir J, **Serrat MA**. Differential regulation of IGF-1 pathway and accelerated bone elongation in pre-obese juvenile mice. Poster presentation by Cassaundra White at the American Society for Bone and Mineral Research Annual Meeting, Austin, TX, 9-12 September 2022.

69. **Serrat MA**. Tracking bone growth in real time using intravital imaging. **Invited Speaker** at XVth Congress of the International Society of Bone Morphometry, Odense, Denmark, 10-13 July 2022. https://event.sdu.dk/isbmconference2022/programme. **Featured speaker in session on intravital bone imaging.**

68. White CA, Denvir J, **Serrat MA**. Differential regulation of IGF-1 pathway and accelerated bone elongation in pre-obese juvenile mice. Poster Presentation by Cassaundra White at Marshall University Student Research Creativity Symposium, 20 April 2022.

67. Machnicki AL, White CA, **Serrat MA**. Juvenile mice exhibit inverse catch-up growth but retain disorganized growth plates following a high-fat to low-fat diet intervention. Podium Presentation by Allison Machnicki at Annual Experimental Biology Meeting, Philadelphia, PA, 2-5 April 2022. **Finalist: Allison Machnicki American Association for Anatomy Postdoc Platform Presentation Award.**

66. White CA, Denvir J, **Serrat MA**. Differential regulation of IGF-1 pathway and accelerated bone elongation in pre-obese juvenile mice. Poster Presentation (Serrat) at Annual Experimental Biology Meeting, Philadelphia, PA, 2-5 April 2022. Virtual poster by Cassaundra White.

65. Johnson B, Kesler LJEG, White CA, **Serrat MA**. Novel Protocol for Dual Immunofluorescence of Growth Plate Cartilage. Poster Presentation by Grace Kesler and Brett Johnson at 2021 Health Science Research Day, Marshall University School of Medicine, Huntington, WV, 29 Oct 2021.

64. White CA, Machnicki AL, McCloud D, Crow D, **Serrat MA**. High-fat diet alters body composition and serum cytokines without affecting body mass. Poster Presentation by Cassaundra White at 2021 Health Science Research Day, Marshall University School of Medicine, Huntington, WV, 29 October 2021.

63. **Serrat MA**, Machnicki AL, Song CA, Evans S, McCloud D. Mechanisms of linear growth acceleration in childhood obesity. **Chair, Invited Speaker and Organizer** of American Association for Anatomy Symposium (re-programmed from 2020), "The covert health consequences of obesity and hormone signaling: Paradoxical effects on bone and body composition," held at Annual Experimental Biology Meeting, Virtual, 27-30 April 2021.

62. White CA, Machnicki AL, McCloud D, Crow D, **Serrat MA**. High-fat diet alters body composition and serum cytokines before the overt onset of obesity. **Finalist: Cassaundra White American Association for Anatomy Graduate Student Poster Competition**. Narrated poster presentation by Cassaundra White at Annual Experimental Biology Meeting, 27-30 April 2021.

61. Machnicki AL, White CA, Evans S, Meadows CA, Henderson B, DeRosa M, McCloud D, Chirchir H, **Serrat MA.** High-fat diet alters growth plate morphology and bone phenotype before the onset of obesity in juvenile mice. **Allison Machnicki selected as Invited Speaker** at American Association for Anatomy hybrid symposium titled “How does exercise and disease influence bone phenotype and morphology?” held at Annual Experimental Biology Meeting, 27-30 April 2021.

60. **Serrat MA**, Machnicki AL, Song CA, McCloud D. Local modulation of insulin-like growth-factor binding protein-4 regulates bone elongation in juvenile mice. Narrated Poster Presentation at Annual Meeting of Orthopaedic Research Society, Virtual, 13-16 February 2021.

59. **Serrat MA**, Machnicki AL, Song CA, Evans S, McCloud D. Mechanisms of linear growth acceleration in childhood obesity. **Invited Speaker and Organizer** of American Association for Anatomy Symposium, "The covert health consequences of obesity and hormone signaling: Paradoxical effects on bone and body composition," held at Annual Experimental Biology Meeting, San Diego, CA, 4-7 April 2020. Meeting cancelled due to COVID-19.

58. Machnicki AL, Song CA, Evans S, Meadows CA, McCloud D, **Serrat MA**. High-fat diet increases IGF-I activity in skeletal growth plates before the onset of obesity. **Selected for Podium Presentation** by Allison Machnicki at Annual Experimental Biology Meeting, San Diego, CA, 4-7 April 2020. **Finalist: Allison Machnicki American Association for Anatomy Postdoc Platform Presentation Award.** Meeting cancelled due to COVID-19, abstract published.

57. Song CA, Machnicki AL, Evans S, McCloud D, **Serrat MA**. High-fat diet alters serum cytokines before the onset of obesity. **Selected for Podium Presentation** by Cassaundra Song at Annual Experimental Biology Meeting, San Diego, CA, 4-7 April 2020. **Finalist: Cassaundra Song American Association for Anatomy Langman Graduate Student Platform Presentation Award.** Meeting cancelled due to COVID-19, abstract published.

56. Song CA, Machnicki AL, Evans S, McCloud D, **Serrat MA**. High-fat diet alters serum cytokines before the onset of obesity. Podium Presentation by Cassaundra Song at 2020 Health Science Research Day, Marshall University School of Medicine, Huntington, WV, 6 March 2020.

55. McCloud D, **Serrat MA**. Effects of a high-fat diet on the growing skeleton. Poster presentation by Darby McCloud at 2020 Health Science Research Day, Marshall University School of Medicine, Huntington, WV, 6 March 2020.

54. **Serrat MA**, Machnicki AL, Song CA, Evans S, Meadows CA, McCloud D. High-fat diet accelerates bone elongation and increases IGF-I activity in growth plates before the onset of obesity. Poster presentation at Annual Meeting of Orthopaedic Research Society, Phoenix, AZ, 8-11 February 2020.

53. **Serrat MA**, Machnicki AL, Meadows CA, McCloud D, Thomas D, Hurley JD, Ion G. Heat increases IGF-I uptake in growth plate and perichondrium measured by *in vivo* multiphoton imaging. Poster Presentation at Experimental Biology Meeting. Orlando, FL, 6-9 April, 2019.

52. **Serrat MA**, Ion G, Thomas D. Heat increases IGF-I uptake in growth plate and perichondrium of mouse hindlimbs: Implications for human evolution. Poster presentation at American Association of Physical Anthropologists Annual Meeting. Cleveland, OH, 28 27-30 March 2019. **Invited Symposium Participant.**

51. **Serrat MA**, Ion G, Thomas D. Heat increases IGF-I uptake in growth plate and perichondrium measured by *in vivo* multiphoton imaging. Poster presentation at American Society for Bone and Mineral Research Annual Meeting. Montréal, Québec, Canada, 28 Sept - 1 Oct 2018.

50. **Serrat MA**, Racine HL, Meadows CA, Ion G. Heat induced limb length asymmetry has functional impact on weight bearing in mouse hindlimbs. Poster presentation at Experimental Biology Meeting, San Diego, CA, 21-25 April 2018. **Winner: American Association of Anatomists Young Faculty Award.**

49. **Serrat MA** and Ion G. Imaging IGF-I uptake in growth plate cartilage using *in vivo* multiphoton microscopy. Invited podium presentation at Growth Factors Research Interest Group at Annual Meeting of Orthopaedic Research Society, New Orleans, LA, 10-13 March 2018.

48. Meadows CA, **Serrat MA**. The TALLYHO mouse as a model of obesity-induced linear growth acceleration. Poster presentation by Chad Meadows at the 15th Annual Undergraduate Research Day at the West Virginia Capitol, Charleston, WV, 16 February 2018.

47. Meadows CA, Kim JH, Arthur S, Ion G, Racine HL, Kerby JC, **Serrat MA**. The TALLYHO mouse as a model of obesity-induced linear growth acceleration. Poster presentation by Chad Meadows at Experimental Biology Meeting, Chicago, IL, 22-26 April 2017. **Winner: Chad Meadows American Association of Anatomists First Place Undergraduate Poster Competition.**

46. Racine HL, Meadows CA, Ion G, **Serrat MA**. Inhibiting IGF1 activity in the proximal tibial growth plate attenuates the bone-lengthening effects of temperature in hindlimbs of growing mice. **Selected for Podium Presentation** by Holly Racine at 2017 Experimental Biology Meeting. **Finalist: Holly Racine AAA Langman Graduate Student Platform Presentation Award.**

45. Racine HL, Meadows CA, Ion G, **Serrat MA**. Inhibiting IGF1 activity in the proximal tibial growth plate attenuates the bone-lengthening effects of temperature in hindlimbs of growing mice. **Selected for Podium Presentation** by Holly Racine at 2017 Health Science Research Day, Marshall University School of Medicine, Huntington, WV, 24 March 2017.

44. **Serrat MA**, Racine, HL, Meadows CA, Ion G. Heat enhanced bone elongation in growth plates is IGF-I dependent. Poster presentation at Annual Meeting of Orthopaedic Research Society, San Diego, CA, 19-22 March 2017.

43. **Serrat MA**, Racine HL, Ion G, Kerby JC, and Meadows CA. Low dose IGF-I augments the bone-lengthening effect of targeted heat in the mouse hindlimb. Poster presentation at Experimental Biology Meeting, San Diego, CA, 2-6 April 2016. **Winner: American Association of Anatomists Young Faculty Award.**

42. Racine HL, Ion G, Kerby JC, Meadows CA, and **Serrat MA**. Thermal imaging reveals temperature retention in hindlimbs of mice up to 4 hours after targeted intermittent limb heating. Poster presentation by Holly Racine at Experimental Biology Meeting, San Diego, CA, 2-6 April 2016.

41. Racine HL, Ion G, Kerby JC, Meadows CA, and **Serrat MA**. Thermal imaging reveals temperature retention in hindlimbs of mice up to 4 hours after targeted intermittent limb heating. Poster presentation by Holly Racine at Marshall Health Science Research Day, Marshall University School of Medicine, Huntington WV, 11 March, 2016.

40. **Serrat MA**, Ion G, and Hughes K. Low dose IGF-I augments the bone-lengthening effect of targeted heat in the mouse hindlimb. Poster presentation at American Society for Bone and Mineral Research Annual Meeting. Seattle, WA, 9-12 October 2015.

39. **Serrat MA** and Ion G. Imaging IGF-I uptake in growth plate cartilage using *in vivo* multiphoton microscopy. **Chair and Organizer** of American Association of Anatomists Symposium, "Vascular and connective imaging *in situ*: returning bone to the skeleton," held at Annual Experimental Biology Meeting, Boston, MA, 28 March - 1 April 2015.

38. Kerby JC, Gray MX, Tamski HL, Heaberlin AA, Crow A, Ion G, and **Serrat MA**. Heat-enhanced extremity lengthening is growth rate dependent. **Selected for Podium Presentation** by Jenna Kerby at Experimental Biology Meeting, Boston, MA, 28 March - 1 April, 2015. **Winner: Jenna Kerby American Physiological Society Excellence in Professional Student Travel Award.**

37. Ion G and **Serrat MA**. Validating the biological activity of fluorescently-labeled IGF1 for in vivo imaging. Poster presentation at Experimental Biology, Boston, MA, 28 March - 1 April 2015.

36. Tamski HL and **Serrat MA**. Infrared thermal imaging to collect quantitative surface temperatures from mice in unilateral limb heating study. Poster presentation at Experimental Biology Meeting, Boston, MA, 28 March - 1 April 2015.

35. Gray MX and **Serrat MA.** Protein labeling methods to study temperature effects on IGF-I delivery to growing mouse bones. Poster presentation by Miles Gray at the 12th Annual Undergraduate Research Day at the West Virginia Capitol, Charleston, WV, 4 March 2015.

34. Heaberlin A., Crow N., Kerby J., Gray M., Tamski H., Ion G., **Serrat M.A.** Heat Effects on Extremity Lengthening are Growth Rate Dependent. Poster presentation at Rural Health Research Day, Marshall University Joan C. Edwards School of Medicine, Huntington WV, 31 October 2014.

33. Vance JC and **Serrat MA.** Utilization of unilateral heat to increase extremity bone length in mice. Poster presentation by Jenna Vance at the first Research and Practice Day sponsored by the College of Health Professions, Marshall University, Huntington, WV, 25 April 2014. **Winner: Jenna Vance Outstanding Research Presentation.**

32. **Serrat MA** and Williams RM. Hindlimb heating increases vascular access of large molecules to murine tibial growth plates measured by in vivo multiphoton imaging. **Selected for Podium Presentation** at 2014 Experimental Biology meeting, San Diego, CA, 26-30 April 2014. **Winner: American Association of Anatomists Young Faculty Award.**

31. Tamski HL, Stanko LM, Godby J, Efaw ML, Schlierf TJ, Salisbury TB, Ion G, and **Serrat MA.** Validation of a unilateral heating model to increase hindlimb length in growing mice. **Selected for Podium Presentation** by Holly Tamski at 2014 Experimental Biology meeting. **Finalist: Holly Tamski AAA Langman Graduate Student Platform Presentation Award.**

30. Vance JC and **Serrat MA.** Validation of a unilateral heating model to increase extremity length in mice. Poster presentation by Jenna Vance at the 11th Annual Undergraduate Research Day at the West Virginia Capitol, Charleston, WV, 30 January 2014.

29. Tamski HL, Stanko LM, Godby J, **Serrat MA**. Unilateral heat as a potential therapy for limb length inequalities. Poster presentation by Holly Tamski at the 2nd Annual Appalachian Regional Cell Conference, Charleston, WV, 26 October 2013.

28. **Serrat MA**, Schlierf TJ, Efaw ML, Shuler FD, Godby J, Stanko LM, Tamski, HL. Unilateral Heat Accelerates Bone Elongation and Lengthens Extremities of Growing Mice. **Selected for Podium Presentation** at Annual Meeting of Orthopaedic Research Society, New Orleans, LA, 15-18 March 2014.

27. **Serrat MA**. Temperature effects on the growth plate and its vasculature. **Invited Speaker** at American Physiological Society Special Symposium, "Bone Physiology under Environmental Stress," held at Experimental Biology Meeting, Boston, MA, 20-24 April 2013.

26. Shuler FD, **Serrat MA**, Dickherber J, Fortney T, Caughran A. Anatomical evaluation of the retrograde fibular intra-medullary start point. **Poster Finalist** at the 25th Annual Marshall University Joan C. Edwards School of Medicine Research Day. Huntington, WV 19 March 2013.

25. **Serrat MA** and Williams RM. Large molecule delivery to the growth plate increases with limb temperature measured by in vivo multiphoton imaging. *FASEB Journal.* 26: 715.4. 2012

24. Sine RK, Efaw ML, Williams AR, **Serrat MA.** Effects of Omega-3 Fatty Acids on Bone Development. Poster presentation by Rebekah Sine at the 9th Annual Undergraduate Research Day at the West Virginia Capitol, Charleston, WV, 26 January 2012.

23. **Serrat MA**. Multiphoton imaging offers new insights into growth plate regulation. Poster presentation at Gordon Research Conference on Cartilage Biology and Pathology, Ventura, CA, 6-11 March 2011.

22. Mader LE, Efaw ML, Williams AR, **Serrat MA**. Temperature and exercise effects on bone mineral density and growth plate morphology in mice. Poster presentation at the 8th Annual Undergraduate Research Day at the West Virginia Capitol, Charleston, WV, 25 January 2011.

21. **Serrat MA**, Williams RM, Farnum CE. Wheel running activity reverses the cold limb phenotype in mice. Oral presentation at the 9th International Congress of Vertebrate Morphology, Punta del Este, Uruguay, 26-31 July 2010.

20. **Serrat MA**, Williams RM, Farnum CE. Exercise mitigates the stunting effect of cold temperature on limb elongation in mice by increasing solute delivery to the growth plate. *FASEB Journal*. 24: 637.7. 2010.

19. **Serrat MA**, Williams RM, Farnum CE. Temperature effects on solute transport: *In vivo* imaging of the growth plate. *FASEB J*. 23: 649.6. 2009. **Finalist: AAA Postdoctoral Presentation Award**.

18. **Serrat MA**, Farnum CE, Williams RM, Lovejoy CO. Environment influences bone elongation during a critical period of postnatal growth. *American Journal of Physical Anthropology*. Suppl. 44: 364. 2009.

17. **Serrat MA**, Williams RM, Farnum CE. Temperature effects on solute transport: *In vivo* imaging of the growth plate. *Weill Cornell Postdoctoral Research Day*, podium presentation, Dec. 2008

16. **Serrat MA**, King, D. and Lovejoy CO. Effects of temperature on skeletal growth in mice. *Journal of Morphology*. 268(12): 1133. 2007. Oral presentation at the 8th International Congress of Vertebrate Morphology, Paris, France, 16-21 July.

15. **Serrat MA**, King, D. and Lovejoy CO. Effects of rearing temperature on long bone growth in mice: an experimental model for examining Allen's rule. *American Journal of Physical Anthropology*. Suppl. 44: 215. 2007 **Winner: Juan Comas Award**

14. **Serrat MA**, King, D, Lovejoy CO. Effects of temperature on skeletal growth in mice. *The Physiologist*. 49(6): C1-35. 2006 **Winner: Scholander Award**

13. **Serrat MA**, Lovejoy CO, King D. Age- and site-specific decline in IGF-I receptor expression and growth plate activity in the mouse hindlimb. *Integrative and Comparative Biol*. 45(6): 1071. 2005

12. **Serrat MA**, Reno PL, McCollum MA, Meindl RS, Lovejoy CO. Multivariate comparison of divergent ossification patterns of the mammalian proximal femur. *American Journal of Physical Anthropology.* Suppl. 38: 178-179. 2004

11. **Serrat MA**, Reno PL, McCollum MA, Meindl RS, Lovejoy CO. Variation in mammalian proximal femoral ossification patterns. *Journal of Morphology* 60(3): 328. 2004

10. **Serrat MA** and King D. Growth hormone expression in marrow cavities increases osteoblast proliferation in transgenic mice. *Midwest Connective Tissue Conference*. [unpub. abstract]. 2004

9. **Serrat MA**, Reno PL, Rosenman BA, Lovejoy CO. Developmental field fluctuation II: A potential basis for skeletal morphological variation. *American Journal of Physical Anthropology*. Suppl. 36: 189. 2003

8. Reno PL, **Serrat MA**, Meindl RS, Cohn MJ, Lovejoy CO. Hominoids, hindlimbs, and Hox: implications for hominid evolution. *American Journal of Physical Anthropology.* S36: 177. 2003

7. Selby M, Reno P, Meindl R, **Serrat M**, Lovejoy CO. Modules and locomotion in the evolution of the anthropoid hand. *American Journal of Physical Anthropology.* Suppl. 36: 189. 2003

6. **Kriz MA**, Reno PL, McCollum MA, Horton WE, and Lovejoy CO. Comparative analysis of mammalian proximal femoral development. *American Zoologist.* 41(6): 1498-1499. 2002

5. Reno PL, **Kriz MA**, McCollum MA, Lovejoy CO. Scanning electron microscopic analysis of regional histomorphological variation within the physis of the primate proximal femur. *American Journal of Physical Anthropology*. Suppl. 34: 130. 2002

4. **Kriz MA**, Reno PL, Lovejoy, CO. Morphometric variation in proximal femoral development in primates and mammals *American Journal of Physical Anthropology.* Suppl. 34: 97-98. 2002

3. Lovejoy CO, Reno PL, **Kriz MA**, and Rosenman BA. Developmental field fluctuation: a potential basis for skeletal morphological variation. *American Journal of Physical Anthropology.* Suppl. 34: 104. 2002

2. **Kriz M**. and Hamrick, MW. The postcranial evidence for primate superordinal relationships. *American Journal of Physical Anthropology*. Suppl. 32: 93. 2001

1. **Kriz M**. Articular scaling in the hominoid talocrural joint: The compromise between body size and locomotion. *American Journal of Physical Anthropology*. Suppl. 28: 175. 1999

Patent Application

Methods and kits for promoting targeted bone growth. U.S. Patent Application (provisional) No.62/089,515. Filed December 9, 2014

Education Activities

Course Director

2020-pres Gastroenterology and Nutrition (MDC 805)
Joan C. Edwards School of Medicine, Marshall University
Organized and implemented new 6-week course that was designed for the 2020-2021 curriculum. Responsibilities included, but were not limited to: creating and posting the schedule; communicating with faculty by meetings and email to assess content for gaps and redundancies; developing a COVID safety plan to resume in-person anatomy laboratory; creating, managing, and taking attendance at dissection-based laboratories; continuous student and faculty communication regarding deliverables and deadlines; faculty guidance regarding lecture recording and revising exam questions; student and faculty reminders about schedule and (faculty) submitting material on time; managing

student inquiries and concerns; addressing real-time course feedback; timely posting of lecture material and recordings; creating sign-up sheets for in-person activities; coordinating with IT to ensure faculty have needed assistance during each in-person session; posting grades; coordinating assessments; adhering to curriculum committee policies, and managing faculty and course evaluations.

Development of New Teaching Modalities

2023-2024 Introduction to Biostatistics
Joan C. Edwards School of Medicine, Marshall University
Developed independent learning video and handout to introduce M2 students to Biostatistics during GI and Nutrition Course before summer research elective (1 hour)

2020-pres Gross Anatomy, Department of Biomedical Sciences
Joan C. Edwards School of Medicine, Marshall University
Developed COVID Pandemic Lecture Recordings and Independent Learning Material using TechSmith Relay and assisted other faculty members in similar approaches. Recordings incorporate online videos, self-assessment, and demonstration videos along with standard PowerPoint slides. Created content for Flipped Classroom using TopHat Audience Response software to assess independent learning content.
Abdomen (10 hours), Circulation (1 hour), Renal (1 hour)

2019-pres Gross Anatomy, Department of Biomedical Sciences
Joan C. Edwards School of Medicine, Marshall University
Developed and Implemented Cadaver Teaching/ Review Videos for Gross Anatomy
Upper Limb (1 hour); Thorax (1 hour); Abdomen (1 hour); Pelvis (1 hour)

2015-pres Independent Learning Exercise in Renal Development (1 hour)
Integrated Kidney Laboratory for Excretory Block (2 lab hours)

2012-pres Developed and Implemented Independent Learning Modules for Anatomy Curriculum
Inguinal Canal (1 hour) and Brachial Plexus (1 hour)

Team-Taught Courses: Medical

2009-pres Gross Anatomy, Department of Biomedical Sciences
Joan C. Edwards School of Medicine, Marshall University
Laboratory Instructor for multiple regions (average 16-19 labs, 64-76 contact hours)
Laboratory Orientation (4 lecture/lab hours)
Lecturer for Abdomen, Renal and Circulation (12 lecture hours)

2014 Structural Basis for Medical Practice (1st Year Summer Dissection), Anatomy
Joan C. Edwards School of Medicine, Marshall University (average 10 contact hours)
Organize, supervise and evaluate summer student gross anatomy dissections

2013-2014 Surgical Anatomy (4th Year Elective), Department of Anatomy and Pathology
Joan C. Edwards School of Medicine, Marshall University (average 6 contact hours)
Supervise and evaluate surgically-relevant gross anatomy dissections

2007 Human Development and Structure, Department of Anatomy
Northeastern Ohio Universities Colleges of Medicine and Pharmacy
(presently Northeast Ohio Medical University)
Lecturer and Laboratory Instructor

2007 Human Structure for Pharmacy, Department of Anatomy
Northeastern Ohio Universities Colleges of Medicine and Pharmacy
(presently Northeast Ohio Medical University)
Lecturer and Laboratory Instructor

2002-2007 Human Gross Anatomy Laboratory, Department of Anatomy
Northeastern Ohio Universities Colleges of Medicine and Pharmacy
(presently Northeast Ohio Medical University)
Laboratory Instructor

Additional Medical Student Lectures

2003-2007 "Alimentary Tract," Prepared and delivered lecture for Human Development and Structure, Northeastern Ohio Universities Colleges of Medicine and Pharmacy.

2004-2005 "Development of the Body Cavities, Respiratory System and GI tract," Prepared and delivered lecture for Human Development and Structure, Northeastern Ohio Universities Colleges of Medicine and Pharmacy.

Single-Instructor Courses: Undergraduate

2024-2025 Independent Study in Biological Sciences (BSC 485)
Marshall University, Project Mentor for Undergraduate Student Braden Ross

2023-2025 Independent Study in Biological Sciences (BSC 485)
Marshall University, Project Mentor for Undergraduate Student Brooklyn Johnson

2004 Human Gross Anatomy
Primer Course for Physician's / Surgical Physician's Assistants (18hrs)
Cuyahoga Community College, held at N.E. Ohio Universities College of Medicine

2003-2005 Human Evolution
Department of Anthropology, Kent State University

2003 Biostatistics / Quantitative Anthropology
Department of Anthropology, Kent State University

2001-2002 Topics in Human Evolution Laboratory
Department of Anthropology, Kent State University

Graduate/Professional Education Activities

Graduate Teaching

2012-pres Responsible Conduct of Research, Scientific Integrity Course (BMR 644)
Marshall University School of Medicine, Lecturer

2021 Special Topics Research Seminar (ACB 676)
Marshall University School of Medicine, Course Director (Dr. Chris Risher, instructor)

2020 Research in Biomedical Sciences (BMS 813)
Marshall University School of Medicine, Instructor/ research mentor (16 contact hours)

2020 Special Topics Research Seminar (ACB 676)
Marshall University School of Medicine, Course Director (Dr. Louise Risher, instructor)

2018 Obesity and Related Diseases Research Colloquium
Marshall University School of Medicine, Lecturer (2 November 2018)

2018 Special Topics Research Seminar (ACB 676)
Marshall University School of Medicine, Instructor (single-instructor, 16 contact hours)

2009-2022 Neuroscience and Developmental Biology Literature Review (BMR 631)
Marshall University School of Medicine, Lecturer and Participant

2014 Research in Cellular Processes (ACB 650)
Marshall University School of Medicine, Instructor (single-instructor, 16 contact hours)

2014 Physiology (PHS 629)
Marshall University School of Medicine, Circulation Lecture (14 Feb)

2013 Biomechanics Journal Club (BSC 580)
Marshall University, Invited Research Lecture (20 Sept)

2013 Graduate Student Seminar Series (BMS 680)
Marshall University School of Medicine, Seminar Speaker (4 Feb)

2001-2007 Morphological Analysis Seminar (ANTH 68613)
Kent State University, Lecturer, Participant, and Teaching Assistant

2000-2006 Genetics in Development Seminar (ANTH 68095)
Kent State University, Lecturer, Participant, and Teaching Assistant

Graduate Program Membership

2009-pres Neuroscience and Developmental Biology Research Cluster
Marshall University Biomedical Sciences Program, Doctoral Faculty Status

Past and Current Trainees

Trainee Name	Type	Institution	Training Period	Project
Braden Ross	Undergraduate	Marshall University	June 2024-Dec 2024	Research Independent Study: Do mice lacking the protease PAPP-A exhibit diet-enhanced bone elongation?
Joseph Burchett	Medical Student (Class of 2027)	Marshall University School of Medicine	June 2024-Jul 2024	Summer Research Elective: Do mice lacking the protease PAPP-A exhibit diet-enhanced bone elongation?
Katherine Steele	Medical Student (Class of 2026)	Marshall University School of Medicine	June 2023-Jul 2023	Role of the protease PAPP-A in diet-enhanced bone elongation. **Funded by MS1 Summer Stipend Program.**
Payton Fitchpatrick	Medical Student (Class of 2026)	Marshall University School of Medicine	June 2023-Jul 2023	Role of the protease PAPP-A in diet-enhanced bone elongation. **Funded by MS1 Summer Stipend Program.**
Brooklyn Johnson	Undergraduate	Marshall University	Jan 2023-present	PAPP-A protease and diet-enhanced bone growth. **Funded by NASA WV Space Grant Consortium.**
Tyler Blake	Graduate Student (MS)	Marshall University	Sept 2022-Mar 2024	Factors That Influence Small Mammal Long Bone Morphology: An Analysis of the Femora, Tibiae, and Humeri of the Eastern Gray Squirrel (Sciurus Carolinensis). MS thesis committee member.
Marlena Pigliacampi	Medical Student (Class of 2025)	Marshall University School of Medicine	June 2022-Jul 2022	Role of IGF binding protein proteases in site-specific bone growth. **Funded by MS1 Summer Stipend Program.**
Allison Beverlin	Medical Student (Class of 2025)	Marshall University School of Medicine	June 2022-Jul 2022	Role of IGF binding protein proteases in site-specific bone growth. **Funded by MS1 Summer Stipend Program.**
Bella Radant	MD/PhD Student (Class of 2027)	Marshall University School of Medicine	June 2022-present	Research rotation in Biomedical Sciences (Summer 2022); and **Marshall PhD Mentor**.
Holly Racine, PhD	Junior Faculty	West Liberty University	Aug 2021-present	Thyroxine exposure enhances cranial growth in an avian model. **Mentor on WV-INBRE Faculty Research Development Award.**
Holly Spurlock	Undergraduate	Marshall University	Feb 2021-June 2022	Role of IGF binding proteins in site-specific bone growth. **Awarded NASA WV Space Grant Consortium.**

Trainee Name	Type	Institution	Training Period	Project
Grace Kesler	Medical Student (Class of 2024)	Marshall University School of Medicine	June 2021-Jul 2021	Role of IGF binding proteins in site-specific bone growth. **Funded by MS1 Summer Stipend Program.**
Brett Johnson	Medical Student (Class of 2024)	Marshall University School of Medicine	June 2021-Jul 2021	Role of IGF binding proteins in site-specific bone growth. **Funded by MS1 Summer Stipend Program.**
Brandon Henderson	Medical Student (Class of 2023)	Marshall University School of Medicine	May 2020-Jul 2020	High-fat diet effects on bone microstructure. **Funded by MS1 Summer Stipend Program.**
Michael DeRosa	Medical Student (Class of 2023)	Marshall University School of Medicine	May 2020-Jul 2020	High-fat diet effects on bone microstructure. **Funded by MS1 Summer Stipend Program.**
Daniel Crow	Medical Student (Class of 2021)	Marshall University School of Medicine	Feb 2020-Jun 2020	High-fat diet effects on body composition and bone microstructure. Research Elective for BMS 813 course. **Published in Journal of Applied Physiology.**
Sarah Evans	Undergraduate	Marshall University	Jan 2019-Jun 2020	Growth plate immunostaining in a mouse model of obesity. **Published in Journal of Applied Physiology.**
Cassaundra (Song) White	Graduate Student (PhD)	Marshall University	Dec 2018-July 2024	Role of insulin-like growth factor-1 signaling in diet-enhanced bone elongation. **Platform Award Finalist for Experimental Biology 2020 and Anatomy 2023; Poster Finalist EB 2021. Multiple first author publications. Selected for ASBMR Cohort Program 2022. Anatomy Dissertation Award 2023-2024.** *Successfully defended dissertation 6/24/24 and interviewing for postdoctoral researcher positions.*
Allison Machnicki	Postdoctoral Associate	Marshall University School of Medicine	Aug 2018-Jun 2021	Growth factor transport and accelerated bone elongation in childhood obesity. **Published in Journal of Applied Physiology. Platform Award Finalist for Experimental Biology 2020 and 2022 Abstracts.** *Currently Assistant Professor of Anatomy at Philadelphia College of Osteopathic Medicine.*

Trainee Name	Type	Institution	Training Period	Project
John Hurley	Medical Student (Class of 2021)	Marshall University School of Medicine	Aug 2018-Dec 2018	Growth factor transport and accelerated bone elongation in childhood obesity; heat-enhanced bone elongation in growth plates. **Published in Journal of Applied Physiology.**
Darby McCloud	Undergraduate	Marshall University	May 2018-Jul 2021	Mechanisms Underlying Environmental Factors that Accelerate Linear Growth in Mice. **Funded by NASA WV Space Grant Consortium.**
Arrin Brooks	MD/PhD Student (Class of 2022)	Marshall University School of Medicine	Jan 2018-Apr 2022	Grant writing, data analysis and manuscript development as part of ACB 676 Special Topics Research Seminar. PhD committee member.
Dominic Thomas	Medical Student (Class of 2021)	Marshall University School of Medicine	Jan 2018-Aug 2018	Heat enhanced molecular delivery to growth plates for targeted bone lengthening. **Published in Journal of Applied Physiology.**
Evan Childers	Medical Student (Class of 2020)	Marshall University School of Medicine	Jun 2017-Aug 2017	Establishing radiographic landmarks to quantify bone length in a limb heating study. **Funded by MS1 Summer Stipend Program.**
James Gainer	Medical Student (Class of 2020)	Marshall University School of Medicine	Jun 2017-Aug 2017	Establishing radiographic landmarks to quantify bone length in a limb heating study. **Funded by MS1 Summer Stipend Program.**
Sarah Binion	Graduate Student (PhD)	Marshall University	Aug 2016-Oct 2016	Research rotation in biomedical sciences.
Sarah Stevens	Graduate Student (PhD)	Marshall University	Dec 2015-Mar 2016	Research rotation in biomedical sciences.
Rebecca Martin	Graduate Student (PhD)	Marshall University	May 2015-July 2015	Research rotation in biomedical sciences.
Casey Hazlewood	Medical Student (Class of 2018)	Marshall University School of Medicine	Jun 2015-Aug 2015	The TALLYHO mouse as a potential model of obesity-induced skeletal growth acceleration. **Funded by MS1 Summer Stipend Program.**
Chad Meadows	Undergraduate, Medical Student (Class of 2022)	Marshall University	May 2015-Aug 2018, June 2019-Aug 2019	Growth factor transport and accelerated bone elongation in childhood obesity; heat-enhanced bone elongation in growth plates. **Co-authored publications**. **Funded by NASA WV Space Grant Consortium. Winner: First Place Undergraduate Poster at 2017 Experimental Biology Meeting.**
Kaitlynn Hughes	Undergraduate	Marshall University	Nov 2014-July 2015	Temperature effects on limb growth and IGF-I delivery to mouse bones.
Adam Fischer	Graduate Student (PhD)	Marshall University	Aug 2014-May 2015	Grant writing and CV development as part of ACB 650 Research in Cellular Processes Class.

Trainee Name	Type	Institution	Training Period	Project
Nathaniel Crow	Medical Student (Class of 2017)	Marshall University School of Medicine	Jun 2014-Aug 2014	Heat effects on extremity lengthening are growth rate dependent. **Funded by MS1 Summer Stipend Program.**
Aaron Heaberlin	Medical Student (Class of 2017)	Marshall University School of Medicine	Jun 2014-Aug 2014	Heat effects on extremity lengthening are growth rate dependent. **Funded by MS1 Summer Stipend Program.**
Laura Kutz	Graduate Student (PhD)	Marshall University	Apr 2014-May 2014	Research rotation in biomedical sciences.
Angela Marchand	Graduate Student (MS)	Marshall University	Feb 2014-May 2015	Paleohistology of a Fetal Plesiosaur and an Ontogenetic Sequence of the Plesiosaur Long Bone (MS thesis committee member); histology sectioning for thesis.
Miles Gray	Undergraduate	Marshall University	Nov 2013-July 2015	Temperature effects on limb growth and IGF-I delivery to mouse bones. **Funded by NASA WV Space Grant Consortium.** *Currently Anesthesiologist at Marshall Health.*
Holly Tamski Racine	Graduate Student (PhD)	Marshall University	Jul 2013-Dec 2018	Unilateral heating to increase IGF-I uptake and bone length in mice. PhD advisee. **Co-authored publications. Platform Presentation Finalist at 2014 & 2017 Experimental Biology Meetings. Funded by NASA WV Space Grant Consortium.** *Currently Assistant Professor, Biology, West Liberty University.*
Justin Godby	Medical Student (Class of 2017)	Marshall University School of Medicine	Jun 2013-Aug 2013	Unilateral heating: a novel model to induce differential extremity growth in mice. **Funded by MS1 Summer Stipend Program.**
Laura Stanko	Medical Student (Class of 2016)	Marshall University School of Medicine	Jun 2013-Aug 2013	Unilateral heating: a novel model to induce differential extremity growth in mice. **Funded by MS1 Summer Stipend Program.**
Jenna (Kerby) Vance	Undergraduate, Medical Student (Class of 2018)	Marshall University	Jan 2013-Jul 2015, Aug 2017	Utilization of unilateral heat to increase extremity bone length in mice. **Funded by NASA WV Space Grant Consortium 2013-14. Winner: Outstanding Research Presentation at College of Health Professions 2014 Research and Practice Day.**, *Now Emergency Medicine Attending, Wake Forest Baptist Medical.*
Thomas Schlierf	Medical Student (Class of 2014)	Marshall University School of Medicine	Jan 2013-Dec 2013	Unilateral heat accelerates bone elongation and lengthens extremities of growing mice. **2014 Abstract at Orthopaedic Research Society.**

Trainee Name	Type	Institution	Training Period	Project
Jason Dickherber	Medical Student (Class of 2016)	Marshall University School of Medicine	Oct 2012-Jun 2013	Anatomical evaluation of the retrograde fibular intra-medullary start point (co-advised with F. Shuler). **Poster Finalist at 2013 MUSOM Research Day.**
Aaron Dom	Medical Student (Class of 2015)	Marshall University School of Medicine	Jun 2012-Jan 2013	Independent learning modules enhance student performance and understanding of anatomy. **Published in Anatomical Sciences Education.**
James Buchanan	Medical Student (Class of 2015)	Marshall University School of Medicine	Jun 2012-Jan 2013	Independent learning modules enhance student performance and understanding of anatomy. **Published in Anatomical Sciences Education.**
Rebekah Sine	Undergraduate	Alderson-Broaddus College	Jun 2011-July 2011	Effects of omega-3 fatty acids on bone development. **Funded by WV-INBRE Summer Research Program.**
Ross DeChant	Graduate Student (MS)	Marshall University	Sept 2010-May 2011	Multiphoton imaging setup; gross anatomy prosection labeling;
Christopher Hearn	Graduate Student (PhD)	Marshall University	Sept 2010-Sept 2011	Research rotation in biomedical sciences; committee advising.
Scott Schwendiman	Graduate Student (PhD)	Marshall University	April 2010-May 2010	Research rotation in biomedical sciences
Alison Williams	Undergraduate and Graduate (non-thesis) Research Assistant	Marshall University	2010-2013	Research technician training; micro-CT analysis of bone density; Histology methods and in vivo imaging; mouse dissections and harvest. Independent learning modules enhance student performance and understanding of anatomy. **Published in Anatomical Sciences Education.**
Morgan Efaw	Undergraduate and Graduate (non-thesis) Research Assistant	Marshall University	Nov 2009-May 2013	Effects of temperature and exercise on knee growth plates. **Funded by NASA WV Space Grant Consortium.** Unilateral heat accelerates bone elongation and lengthens extremities of growing mice. **2014 Abstract at Orthopaedic Research Society.** Large molecule delivery to the growth plate increases with limb temperature measured by in vivo multiphoton imaging. **Published in Journal of Applied Physiology.** Independent learning modules enhance student performance and understanding of anatomy. **Published in Anatomical Sciences Education.**

Trainee Name	Type	Institution	Training Period	Project
Laura Mader	Undergraduate (pre-medical)	Marshall University	2009-11	Roles of temperature and exercise in facilitating wrist bone growth in mice. **Funded by NASA WV Space Grant Consortium.**
Barbara Linnehan	Undergraduate	Cornell University	2008-10	Effects of environmental temperature and exercise on serum leptin levels with implications for bone quality (co-advised with C. Farnum)
Craig Wang	Undergraduate	Cornell University	2009	Localization of VEGF in mouse growth plates using immunohistochemistry (C. Farnum, PI)
Timothy Vo	Undergraduate	Cornell University	2009	Histological analysis of mouse growth plates using BrdU and EdU incorporation (C. Farnum, PI)
Linell Bigelow	Undergraduate	Cornell University	2008-09	Localization of primary cilia on heart valves using histology and immunohistochemistry (C. Farnum, PI)

Invited Presentations

2024 Endocrine Translation Science Forum Metabolic Bone Day, Cincinnati Children's Hospital Medical Center. Environmental inputs on bone elongation (19 April).

2023 Artists, Scholars, and Innovators Lecture Series, Marshall University
Environmental impacts on bone growth (16 November).

2023 European Calcified Tissue Society 2023 Congress, Liverpool, UK
Featured speaker in Technology Update and New Insights into Bone Development Symposia. (sessions held 15 and 17 April).
https://2023.ectsoc.org/programme.

2022 International Society of Bone Morphometry 2022 Congress, Odense, Denmark
Applications of imaging IGF-I uptake in skeletal growth plates using in vivo multiphoton microscopy. (10-13 July). **Featured speaker in session on intravital bone imaging**.
https://event.sdu.dk/isbmconference2022/programme.

2021 Biomechanics Seminar Series (Virtual), Cornell University
Mechanisms of obesity enhanced bone lengthening in skeletal growth plates (5 April).

2019 Biological Sciences Seminar Series, Marshall University
Mechanisms of linear growth acceleration in childhood obesity (15 November).

2019 Health Sciences Research Retreat, Marshall University School of Medicine
Mechanisms of linear growth acceleration in childhood obesity (23 August).

2018 Phi Delta Epsilon Medical Fraternity, Marshall University School of Medicine. Imaging IGF-I uptake in growth plate cartilage using in vivo multiphoton microscopy. (3 May).

2017 Health Sciences Research Retreat, Marshall University School of Medicine
Progress Update: Growth factor transport and accelerated bone elongation in childhood obesity (18 August).

2016 Health Sciences Research Retreat, Marshall University School of Medicine
Dysregulated growth factor transport and accelerated bone elongation in childhood obesity (26 August).

2014 University of Kentucky CTSA External Advisory Board Retreat. Invited poster presentation of CCTS pilot project: Temperature enhanced bone elongation in growth plates (13 October).

2013 Brock University, Biological Sciences, St. Catharines, ON (Host: Glenn Tattersall)
Allen's Rule and the temperature-limb phenotype: Insights into processes of bone elongation (6 December).

2013 Kopchick Lab, Edison Biotechnology Institute, Ohio University
Temperature enhanced bone elongation in cartilage growth plates (22 January).

2012 Biomedical Sciences Research Retreat, Marshall University School of Medicine
Temperature enhanced bone elongation in cartilage growth plates (24 August).

2011 WV-INBRE Summer Research Program, Marshall University
Building a research career as a new assistant professor (5 July).

2011 MU-ADVANCE Pat Logan Symposium of Scholars, Marshall University
Building a professional career at Marshall with support from MU-ADVANCE (3 March).

2009 Department of Anatomy, Marshall University, Joan C. Edwards School of Medicine
Skeletal variability and the environment: Mechanistic models of human bone elongation (16 February).

2009 Department of Anthropology, New York University
Environmental inputs on limb elongation: an integrative model for human skeletal adaptation (10 February).

2009 Center for Animal Resources and Education, East Campus Facility, Cornell University
Effects of the environment on skeletal growth in mice with relevance to animal husbandry practices (21 January).

2009 Bio-Imaging Group, Cornell University
Temperature effects on solute transport: *In vivo* imaging of the growth plate (19 January).

2009 Anatomy and Neurobiology, Northeastern Ohio Universities College of Medicine
Environmental inputs on bone elongation: *In vivo* imaging of the growth plate (15 January).

2008 Department of Anthropology, Harvard University
Temperature and limb length in mice: A comparative model for human skeletal adaptation (21 February).

2007 Integrative Anatomy, University of Missouri, Columbia
Environmentally-determined tissue temperature modulates extremity growth in mammals: A potential comprehensive explanation of Allen's rule (15 November).

2007 Department of Anatomy, Case Western Reserve University School of Medicine
Effects of temperature on skeletal growth in mice (18 September).

2007 Department of Biomedical Sciences, Cornell University Veterinary College
Environmentally-determined tissue temperature modulates extremity growth in mammals: A potential comprehensive explanation of Allen's rule (18 June).

2007 Department of Anatomy, Northeastern Ohio Universities College of Medicine
Effects of temperature on skeletal growth in mice (24 May).

Press Coverage

2020 "Marshall students receive grants from NASA West Virginia Space Grant Consortium." https://www.herald-dispatch.com/news/marshall-students-receive-grants-from-nasa-west-virginia-space-grant-consortium/article_485403a2-2e76-5f1e-9bee-95f83bbcdfd5.html

2019 "Marshall professor elected to AAA board." https://www.herald-dispatch.com/business/personnel/article_96c5618f-cfe2-5ac7-a681-c0261fbcef1b.html

2019 "Serrat elected to American Association of Anatomists board of directors." https://www.marshall.edu/wamnewsletter/2019/02/serrat-elected-to-american-association-of-anatomists-board-of-directors/

2017 "Marshall University biomedical students shine at national spring meetings." https://jcesom.marshall.edu/news/musom-news/marshall-university-biomedical-students-shine-at-national-spring-meetings/

2015 "Researcher to receive national award from American Association of Anatomists." http://www.marshall.edu/ucomm/university-communications-press-release-2/?pressid=3916

2015 "Marshall School of Medicine researcher to receive national anatomy award; Marshall University represented by multi-disciplinary researchers at Experimental Biology conference." http://jcesom.marshall.edu/news/musom-news/school-of-medicine-researcher-to-receive-national-anatomy-award/

2014 "Serrat continues musculoskeletal research." http://www.herald-dispatch.com/news/marshall/x1753198820/Serrat-continues-musculoskeletal-research

2014 "School of Medicine researcher receives grant to continue musculoskeletal research." http://jcesom.marshall.edu/news/musom-news/marshall-school-of-medicine-researcher-receives-grant-to-continue-musculoskeletal-research/

2014 “MU School of Medicine receives $50,000 grant for orthopaedic research.” http://www.marshallparthenon.com/news/mu-school-of-medicine-receives-50-000-grant-for-orthopaedic-research-1.2864641#.U3LzayhBAfM

2014 “Congratulations to the ASBMR Grants in Aid Program Awardees.” http://www.asbmr.org/Publications/News/NewsDetail.aspx?cid=8e9508d6-369a-4c7d-a81f-518b4cdeaac9#.VCw6uiihgfM

2014 “BMS Ph.D. student and advisor selected for podium presentations, and received notable award recognitions at national science conference.” http://www.marshall.edu/bms/2014/05/27/bms-ph-d-student-and-advisor-selected-for-podium-presentations-and-received-notable-award-recognitions-at-national-science-conference/

2014 “Marshall School of Medicine researchers and students to present their findings at national orthopaedics meeting.” http://jcesom.marshall.edu/news/musom-news/researchers-present-at-ortho-conference/

2014 Sponsored student research at Undergraduate Research Day at the WV Capitol, Highlighted in Herald Dispatch: http://www.herald-dispatch.com/news/x1781485324/MU-students-to-present-work-at-Undergraduate-Research-Day

2013 “Bones heat up research study: Dr. Maria Serrat examines temperature-based bone growth therapies.” http://www.marshall.edu/bms/files/2013/12/BMS-Magazine-2013-Final-for-Web.pdf. **Feature story in Fall 2013 Biomedical Sciences Research Publication.**

2013 “Perspectives in Biomedical Sciences Research: Anatomy of a Bone Physiology Lab” Research presentation on career advice and bone imaging at “Science Cafe”. http://www.asbmb.org/PublicOutreach/Templates/PubOutreachDefault.aspx?id=40020

2012 “Grant allows MU professor to study how temperature effects bone growth.” http://www.marshallparthenon.com/sports/grant-allows-mu-professor-to-study-how-temperature-effects-bone-growth-1.2793649#.UQ6u_o7HMfM

2012 “MU-ADVANCE names faculty fellows, awards mini-grants” http://www.herald-dispatch.com/news/marshall/x1034333354/MU-ADVANCE-names-faculty-fellows-awards-mini-grants?i=0

2011 Sponsored student research at Undergraduate Research Day at the WV Capitol, Highlighted in Parthenon:http://www.marshallparthenon.com/2.6881/marshall-students-prepare-for-annual-undergraduate-research-day-1.2446022#.UQ6vcY7HMfM

2010 “Skeletons in the Closet,” science program for middle school girls http://www.herald-dispatch.com/news/x874709075/Middle-school-girls-attend-math-science-conference

Professional Service

National and International

2023-2025 Anato-Bee National High School Anatomy Competition, Local Host and Coordinator

2024 Ad Hoc Tenure Referee, University of California San Francisco

2023 Guest Editor for Proceedings of the National Academy of Sciences USA

2023-2026 American Association for Anatomy Chairs Committee

2023-2026 American Association for Anatomy Ethics Committee Chair

2023-2024 Grant Reviewer for American Association for Anatomy Predoc Fellowship Award

2021-pres Review Editor for Frontiers in Physiology, Skeletal Physiology

2021-2022 Family Care Awards Subcommittee, Diversity, Equity, Accessibility & Inclusion (DEAI) Program, Federation of American Societies for Experimental Biology (FASEB)

2021-2022 Code of Conduct Task Force, American Association for Anatomy Board of Directors. Subcommittee charged with updating Anti-Harassment Policy and developing a Code of Conduct and Ethics Policy for the American Association for Anatomy.

2021 American Association for Anatomy (AAA) Statement in response to riots at US Capitol. Worked with a small team of AAA Board Members to craft a statement reiterating AAA values and commitment to diversity, equity and inclusion in response to events that unfolded at the US Capitol on January 6, 2021.

2021 Chair and Symposium Organizer for American Association for Anatomy Annual Meeting at Experimental Biology. Selected by competitive proposal application: “The covert health consequences of obesity and hormone signaling: Paradoxical effects on bone and body composition.” (re-programmed from 2020 after competitive review)

2021 Poster Commentator, American Association for Anatomy at Experimental Biology 2021

2020 PhD Thesis Examiner
The University of Adelaide, School of Biological Sciences, Australia

2020 Ad Hoc Tenure Reviewer
The Ohio State University College of Medicine

2020 Symposium Organizer for American Association for Anatomy Annual Meeting at Experimental Biology in San Diego, CA. Selected by competitive proposal application: “The covert health consequences of obesity and hormone signaling: Paradoxical effects on bone and body composition.” (Cancelled due to COVID-19)

2019 Interview and Fact Checking, NYTimes Anatomy Supplement for Kids (Dec 2019 Edition)

2019-2020 Anti-Harassment Task Force, American Association for Anatomy Board of Directors

2019 Grant Reviewer for Marsden Fund, New Zealand

2019 Session Chair, American Association for Anatomy Annual Meeting at Experimental Biology in Orlando, FL.

2017-pres Board of Reviewers for The Anatomical Record Journal

2017-2018 Basmajian Award Selection Committee, American Association of Anatomists

2015-2019 Abstract Reviewer for Orthopaedic Research Society 2016, 2017, and 2020 Annual Meetings

2016 Session Chair, American Association of Anatomists Annual Meeting at Experimental Biology in San Diego, CA.

2015 Chair and Organizer of Symposium at American Association of Anatomists Annual Meeting at Experimental Biology in Boson, MA. Selected by competitive proposal application: "Vascular and connective imaging *in situ*: returning bone to the skeleton"

2014-2015 Grant Reviewer for Leakey Foundation

2013 Focus Group to Evaluate Grant's Anatomy Dissector for Lippincott Williams and Wilkins Publisher at Experimental Biology Meeting in Boston, MA

2012 Grant Reviewer for Graduate Women in Science National Fellowship Program

2012-2015 Poster Judge for Scholander Competition, American Physiological Society at Experimental Biology Annual Meeting

2006-pres Manuscript Reviewer for American Journal of Physiology (2011-2014: Regulatory, Integrative and Comparative Physiology; Renal Physiology), American Journal of Physical Anthropology (2018), American Journal of Biological Anthropology (2022), Anatomical Record (2007, 2018, 2021, 2022), Anatomical Sciences Education (2016-17), Animal Biology (2008), Biological Reviews (2016), Biomedicine & Pharmacotherapy (2023), Bone (2019), Bone Reports (2016-2018), Building Bones (edited volume, 2015), Clinical Orthopaedics and Related Research (2018, 2020), Evolutionary Biology (2014), Frontiers in Endocrinology (2014-15), Frontiers in Endocrinology Bone Research (2023), Frontiers in Physiology (2021, 2023), Heliyon (2024), Integrative and Comparative Biology (2023), International Journal of Environmental Research and Public Health (2009-10), Journal of Anatomy (2021), Journal of Applied Physiology (2012-2015, 2020), Journal of Biomechanics (2007), Journal of Endocrinology (2022), Journal of Experimental Biology (2021), Journal of Human Evolution (2008), Journal of Mammalian Evolution (2021), Journal of Orthopaedic Research (2010, 2016), Medicine & Science in Sports & Exercise (2021, 2024), Molecular Biology of the Cell MBoC (2023); Nutrients (2014, 2017), Peer Journal (2018) Primate Craniofacial Function and Biology (2006; edited volume), PLoS ONE (2012), Proceedings of the National Academy of Sciences (2011), Scientific Reports (2020), South African Journal of Science (2015), Toxicology (2019-2020), Yearbook of Physical Anthropology (2010)

Regional

2022 Grant Reviewer for Ohio University OURC Baker Fund Program

2019 Grant Reviewer for WVCTSI LAUNCH Pilot Grant Program
West Virginia University, West Virginia Clinical and Translational Science Institute

2013 Poster Judge at Appalachian Regional Cell Conference, 26 October

University and College

2023-2025 Faculty Search Committee External Department Member
Marshall University, Biological Sciences Anatomy Search

2023-2024 Biomedical Sciences MD/PhD Admissions Interview Committee
Marshall University, Joan C. Edwards School of Medicine

2021 Poster Judge, Health Sciences Research Day
Marshall University, Joan C. Edwards School of Medicine

2020-pres Pre-Clerkship Committee
Marshall University, Joan C. Edwards School of Medicine

2020-pres Course Director, GI and Nutrition
Marshall University, Joan C. Edwards School of Medicine

2019-2020 SRIMS (Summer Research Internship for Minority Students) Selection Committee
Marshall University, Joan C. Edwards School of Medicine

2018-2019 Grant Reviewer for COBRE ACCORD Pilot Grants
Marshall University, Joan C. Edwards School of Medicine

2017-2018 Salary Committee for Restructuring Basic Science Research Compensation
Marshall University, Joan C. Edwards School of Medicine

2017-pres Faculty Advisor, Phi Delta Epsilon Medical Fraternity
Marshall University, Joan C. Edwards School of Medicine

2017 Excellence in Leadership Award Selection Committee
Marshall University, Faculty Advancement, Joan C. Edwards School of Medicine

2016-2020 Biomedical Sciences PhD Admissions Committee
Marshall University, Joan C. Edwards School of Medicine

2016-2020 Biomedical Sciences Graduate Student Award Committee
Marshall University, Joan C. Edwards School of Medicine

2014-pres Curriculum Committee, Biomedical Sciences Representative (re-elected 2020, 2023)
Marshall University, Joan C. Edwards School of Medicine

2011-2021 Academic Standards Committee, Marshall University School of Medicine
Responsible for reviewing medical student performance and helping make decisions and recommendations related to academic and/or professional deficiencies. Rotated off committee in 2021 to assume responsibilities of GI and Nutrition Course Director

2015-2016 Biomedical Sciences Workgroup to Redevelop Research Clusters
Marshall University, Joan C. Edwards School of Medicine

2015 Ad Hoc Tenure Committee Member
Marshall University, School of Pharmacy

2015 Work-Effort Evaluation Form Group Member
Marshall University, Joan C. Edwards School of Medicine

2015-2016 Biomedical Sciences PhD Interview Committee
Marshall University, Joan C. Edwards School of Medicine

2014 Search Committee, Chair of the Department of Family Medicine and Community Health
Marshall University, Joan C. Edwards School of Medicine

2013 Panelist on Research Skill and Publishing Strategies, 1 May 2013, Marshall University Joan C. Edwards School of Medicine.

2012 Grant Reviewer for Marshall Health Translational Pilot Grant Program, Marshall University Joan C. Edwards School of Medicine

2012-2016 Curriculum Block Integration Team Member
Participated in organization and coordination of Structure and Function Blocks II and V at Marshall University School of Medicine to help create a curriculum that is integrated and promotes life long learning. Reviewed block content with other team members to identify redundancies, gaps, and sequence of material, including identification of appropriate methods of pedagogy and assessment. Worked with other faculty on effectively delivering content.

2011-2013 LCME Citation Action Team
Responsible for creating and following progress on action plans to address citations ED5a and ED33, Life Long Learning and Horizontal and vertical integration of curriculum. Contributed to summaries, tables, and examples for LCME briefing book. Duties include attendance at some curriculum committee meetings to monitor action plan progress, meetings with action team members and other faculty, meetings with Dean, and formal meetings with LCME site visitors.

2011-2012 Evaluation Committee, Marshall University School of Medicine
Responsible for reviewing and identifying deficiencies in course and faculty evaluations

2011-2012 Poster Judge, Marshall University School of Medicine Annual Research Day

2011-2012 MU-ADVANCE, an NSF-funded program at Marshall University
Wrote summary reports and met with external evaluator at end of granting period.
Supplied evidence for positive outcomes of ADVANCE program.
Participated Focus Group to gauge impact of networking/mentoring model.

2011 Hosted Visiting Researcher Seminar on Multiphoton Microscopy (7 Feb)
Arranged University-wide seminar and luncheon for interested faculty with Dr. Rebecca Williams from Cornell University to advertise new technology available at Marshall.

2011 Grant Reviewer for Cell Differentiation and Development Center, Marshall University

2010-2012 Faculty Senate, Marshall University School of Medicine representative

2009-2011 LCME Medical Students Subcommittee, Marshall University School of Medicine
Self-study task force to prepare final report for LCME site visit 13-16 March, 2011
Met with LCME site visit team as junior faculty representative from Anatomy.

2009-pres Multiphoton Microscope Oversight Committee
Marshall University Molecular and Biological Imaging Core
Integral member of advisory committee for the purchase and management of NSF-funded confocal/multiphoton microscope. Help ensure that equipment is properly maintained and serviced. Helped secure loaner multiphoton laser after major equipment failure in October 2011, which was crucial for allowing investigators to continue research for over six months until a replacement was installed in May 2012. Continue to address all ongoing equipment and service contract concerns as needed.

2009-2016 Biomedical Sciences Graduate Program, Marshall University
Participated in recruiting interested students to PhD program, interview candidates, meet interviewees and accepted students.

<u>Department</u>

2023-2024 NAGPRA Survey and Site Visit Department Coordinator
Completed survey questionnaire and compiled information regarding human skeletal material housed in Anatomy/Biomedical Sciences. Provided all known documentation and facilitated access to material during site visit July 2024.

2019-pres Chair, Anatomy Oversight Committee
Oversee cadaver usage and allocate bodies to appropriate programs for medical and health-sciences education and research. Review and approve requests for cadavers.
Department of Biomedical Sciences, Marshall University School of Medicine

2018-pres Research Coordinator, Gross Anatomy
Responsible for reviewing and approving requests for access to cadaver specimens for research. Inspect off-site facilities and ensure that material is used and returned in accordance with rules and regulations of the Human Gift Registry of West Virginia.
Department of Biomedical Sciences, Marshall University School of Medicine

2018-pres Laboratory Access Coordinator
Responsible for granting/denying faculty and student access to gross anatomy and histology laboratories. Coordinate access for first year medical, physician assistant, and physical therapy courses, graduate and medical electives, residents and faculty.
Department of Biomedical Sciences, Marshall University School of Medicine

2019-2020 Faculty Search Committee, COBRE Investigator
Selection committee to hire a junior investigator for COBRE grant
Dept of Clinical and Translational Sciences, Marshall University School of Medicine

2018-2019 Faculty Search Committee, Histology
Selection committee to hire a histologist
Department of Biomedical Sciences, Marshall University School of Medicine

2018 Director of Human Gift Registry Search Committee
Department of Biomedical Sciences, Marshall University School of Medicine

2016-pres Histology Core Facility Oversight and Maintenance
Perform maintenance and user training, facilitate scheduling and reagent purchasing for all faculty, staff, and student users in department. Obtain quotes and arrange repairs for maintenance contracts.
Department of Biomedical Sciences, Marshall University School of Medicine

2016-2017 Faculty Search Committee, Neuroanatomy
Selection committee to hire a neuroanatomist
Department of Biomedical Sciences, Marshall University School of Medicine

2012-2018 Anatomical Specimen Research Usage Liaison, Human Gift Registry
Researched cadaver protocols at other institutions and created standardized protocol for cadaver usage requests at Marshall. Serve as liaison between Departments of Anatomy and Orthopaedics to facilitate medical student cadaver research projects.

2012-pres Anatomy Model Inventory and Instrument Acquisition
Created exhaustive inventory of teaching model collection for gross anatomy; maintain inventory with new models; researched and helped acquire models and instruments to aid faculty in performing specialized dissections in the gross anatomy laboratory.
Department of Biomedical Sciences, Marshall University School of Medicine

2009-2016 Histology Equipment Oversight and Maintenance
Secured equipment for department, performed maintenance and user training.
Department of Anatomy and Pathology, Marshall University School of Medicine

2012-2015 Faculty Search Committee, Neuroanatomy
Selection committee to hire a senior level neuroanatomist
Department of Anatomy and Pathology, Marshall University School of Medicine

2011-2012 Faculty Search Committee, Gross Anatomy
Selection committee to hire a junior level gross anatomist
Department of Anatomy and Pathology, Marshall University School of Medicine

2010-2012 Outreach Committee
Creation and implementation of formal policy for anatomy outreach events; established protocol that now enables local high school students to visit gross anatomy laboratory.
Department of Anatomy and Pathology, Marshall University School of Medicine

2009-2012 Human Gift Registry Memorial Service Planning Committee
Invitations, program, and photo memorial board to recognize body donors. Worked with medical student liaison committee to encourage student participation and attendance.
Department of Anatomy and Pathology, Marshall University School of Medicine

2000-2002 Graduate Student Senator
Attended meetings, voted on behalf of Department, disseminated information
Department of Anthropology, Kent State University

Professional Development Activities (selection of >83 notable activities and workshops since 2006)

2024 American Association for Anatomy Annual Meeting Symposium on Legacy Anatomical Collections (attended in anticipation of NAGPRA site visit, 23 March).

2024 Marshall University Search Committee Training (4 January).

2023 Ethics Committee Training for Managing Sensitive Cases, American Association for Anatomy Zoom and OpenSesame online training video (26-28 September).

2023 Building Supportive Communities: Clery Act and Title IX Training. (5 June)

2023 WVCTSI R01 Grant Writing hosted by West Virginia CTSI program. This continued intensive grant writing program helped prepare a November 2023 R01 re-submission.

2022 WVCTSI R01 Grant Writing Group hosted by West Virginia CTSI program. This 3-month intensive grant writing group helped prepare a February 2023 R01 submission.

2022 WVU Research Tech Bytes: NIH Data Management and Sharing Policy Change. Seminar on new NIH policy change hosted by West Virginia University. (15 Dec)

2022 Mentoring Across the Continuum. Virtual workshop hosted by Marshall University School of Medicine to incorporate inclusive practices and foster academic success. (13 May)

2022 Panel discussions with AAMC (Eric Weissman) and NIH representatives (Joshua Gordon, Marie Bernard) in the two-day Anatomy Chairs meeting. Breakout session following presentation by Sunny Nakae from California University of Science and Medicine on being an advocate. (24-25 February)

2022 The Advice We Get and Give. West Virginia University HSC Office of Research and Graduate Education. Virtual professional development session (15 February)

2021 Responsible Conduct of Research. CITI Program Training Course (13 December)

2021 Title IX Wellness and Safety Training, online training module to help Marshall University remain a safe, welcoming environment for all. Everfi. (26 July)

2020 Managing Bias, online diversity training module to increase understanding of intercultural differences and to challenge bias, stereotyping and other forms of discrimination in universities. Everfi for Marshall University. (17 October)

2020 Phi Delta Epsilon Advisor Training Program, Plaid Learning Management System. Online training modules on mentoring college students, including providing feedback, preventing harassment and approaching conflict in a team setting. (12 October)

2020 Challenges and Solutions for Socially Distanced Anatomy Labs (30 July) and Virtual Anatomy (29 April) Discussions for Gross Anatomy Teaching during Pandemic. Series of interactive Zoom webinars hosted by American Association for Anatomy

2020 Common Difficulties of Orthopaedics that No One Talks About. Diversity Roundtable Discussion at Orthopaedic Research Society 2020 Annual Meeting (9 Feb)

2019 Leadership Corner Article, American Association for Anatomy September Newsletter

2018 Grant Review Training Session, presented by Uma Sundaram at Marshall University (7 December)

2018 Imaris Image Visualization and Analysis Workshop, presented by James Shaw at Marshall University (30 November)

2018 Top Hat Training, presented by Nitin Puri at Marshall University (20 September)

2018 Optimizing the Practice of Mentoring: An Online Curriculum for the Professional Development of Research Mentors, CTSI institute at the University of Minnesota (8 September)

2018 Write Winning Grant Proposals Workshop, presented by John D. Robertson of Grants Central at Marshall University (21-22 March)

2018 LCME Site Visit Preparation Seminar, presented by Veronica Cantanese at Marshall University Joan C. Edwards School of Medicine (17 January)

2017 Career Advancement Seminars for Junior Faculty, hosted by American Association of Anatomists at Experimental Biology 2017 (22-26 April)

2015 Write Winning Grant Proposals Workshop, presented by John D. Robertson of Grants Central at Marshall University (2-3 April)

2014 Career Advancement Seminars for Junior Faculty, hosted by American Association of Anatomists at Experimental Biology 2014 (26 April)

2014 International Association of Medical Science Educators (IAMSE) Spring Webinar Series. Attended two webinars for teaching enhancement (9 Jan, 16 Jan)

2013 Team Based Learning Workshop at Marshall University School of Medicine
Training session by Dr. Brian Dzwonek, Associate Dean for Medical Student Education (13 December)

2013 Orthopaedic Research Society Professional Development Webinar: Women Should Ask. Seminar focused on enhancing success of female faculty. (20 November)

2013 International Association of Medical Science Educators (IAMSE) Fall Webinar Series. Attended three webinars for teaching enhancement (9 Sept, 3 Oct, 10 Oct)

2012	United States Bone and Joint Initiative Young Investigator Initiative (2-4 November) Attended second of two workshops in formal grant mentoring program.
2012	International Association of Medical Science Educators (IAMSE) Fall Webinar Series. Attended three webinars for teaching enhancement (6 Sept, 20 Sept, 10 Sept)
2012	Building Small Group Facilitation, seminar at Marshall University School of Medicine Training session by Dr. Elza Mylona for enhancing small group teaching (27 July)
2011-2012	Anatomy Education Formal Mentoring by Faculty at University of Virginia, McMaster, and Cornell University to aid in creation of active learning modules at Marshall.
2011	Budgeting Basics Workshop, Marshall University Research Corporation (13 October) Grant Development workshop focused on creating budgets for extramural applications
2011	Association of American Medical Colleges Early Career Women Faculty Professional Development Seminar (9-12 July)
2011	Approaches to Interactive Engagement, seminar at Marshall Univ. School of Medicine Training session by Dr. David Maloney to help faculty make lectures interactive (8 July)
2010	United States Bone and Joint Decade Young Investigator Initiative (29-31 October) Grant mentoring program to help junior faculty successfully obtain external funding
2010-2012	Professional Institutional Enhancement Seminars, Marshall Univ. School of Medicine Regular seminars geared at helping faculty improve research and teaching skills
2010	Writing Workshop: Publish and Flourish, Marshall University (28 June) Strategies to become a more prolific writer and scholar
2010	Teaching Workshops, Marshall University (13 May and 3 June) For the development of effective teaching strategies in medical education
2010	Grant Development, Marshall University (16 April) Policies and procedures for grant submission and tips for successful applications
2010	NSF Regional Grants Workshop, Cleveland OH (22-23 March) Information on current NSF policies, procedures and funding opportunities
2010	Copyright Compliance Workshop, Marshall University (31 March) Current copyright laws as they pertain to higher education
2010-2011	Scientific Integrity Seminar, Marshall University (8 March 2010 and 28 March 2011) Training in the responsible conduct of research
2009	Department Retreat, Anatomy and Pathology, Marshall University (6 November) Faculty development workshop for medical educators, issues of professionalism
2009	Teaching Workshop, Cornell University (27 May) Navigating path to successful teaching faculty position

2008-2009 Grant Writing Workshops, Cornell University
Four-part in-depth series covering all aspects of grant writing and review processes

2008 CV Development, Cornell University (29 September)
For the development and enhancement of a professional curriculum vitae

2008 Mentoring Workshop: On mentoring and being mentored, Cornell University (17 Jan)
Philosophy of mentoring and developing effective mentor-mentee relationships

2008 Scientific Methods Workshop, T Sun, New York University (21 April)
Survival skills for young biomedical researchers, held at Cornell University

Outreach Activities

2023-2024 Anato-Bee USA Chapter Host and Coordinator for Local Competition

2024 Mentor Interview with Brooklyn Johnson, BS/MD student, to discuss advice and career options in preparation for transition to medical school, 15 March 2024.

2023 Anatomy interview with Jessica Byram on Anatomy Laboratory Outreach and Ethics. 3 January 2023

2022 Coordinated post-COVID Anatomy Outreach Program to resume high-school visits to Marshall University School of Medicine. Fall 2022.

2022 American Association for Anatomy (AAA) interview with McKinley Advisors, an association consulting firm, to evaluate opportunities to enhance the impact of the AAA and grow the financial resources available for pursuit of its mission. 10 February 2022.

2020 “Pathway to a Bone Physiology Lab: Steps and Missteps” Presented research and academic advice to students in STEM Immersion Program, hosted by West Virginia State University (Zoom). The goal was to help first generation college students understand what it takes to be successful in academics and what type of jobs they could pursue with a degree in the STEM fields. 20 July 2020.

2019 Interview with NYTimes reporter Kim Tingley on our evolving understanding of how the body works for a NYTimes supplement for children. 22 November 2019.

2018 Discussed research with Phi Delta Epsilon medical fraternity members and gave presentation at monthly meeting. Marshall University School of Medicine, 3 May 2018.

2015 Sponsored student research at Undergraduate Research Day at the WV Capitol.
Highlighted in Herald Dispatch: http://www.herald-dispatch.com/news/undergraduate-research-day/article_6fe74363-0e97-5202-882b-2ec572296d95.html (4 Mar)

2014 Sponsored student research at Undergraduate Research Day at the WV Capitol,
Highlighted in Herald Dispatch: http://www.herald-dispatch.com/news/x1781485324/MU-students-to-present-work-at-Undergraduate-Research-Day (30 Jan)

2013 "Perspectives in Biomedical Sciences Research: Anatomy of a Bone Physiology Lab" Research presentation on career advice and bone imaging at "Science Cafe," an outreach project hosted by Marshall University Graduate Student Organization in collaboration with American Society of Biochemistry and Molecular Biology and Cabell Midland High School. The goal was to facilitate science literacy and advocacy to the local community, specifically senior level high school students. 6 March 2013. **Highlighted on ASBMB Public Outreach Site** http://www.asbmb.org/PublicOutreach/Templates/PubOutreachDefault.aspx?id=40020

2012 Interview with local high school student about bone imaging research; interview with Marshall University Student Newspaper about microscopy facility. **Highlighted in the Parthenon:** http://www.marshallparthenon.com/sports/grant-allows-mu-professor-to-study-how-temperature-effects-bone-growth-1.2793649#.UQ6u_o7HMfM

2011 Anatomy department outreach program for high school students
Coordinated field trip for Anatomy class from Fairview High School (Ashland, KY) to Marshall University School of Medicine, 16 May 2011.

2011 Sponsored student research at Undergraduate Research Day at the WV Capitol, **Highlighted in the Parthenon:**http://www.marshallparthenon.com/2.6881/marshall-students-prepare-for-annual-undergraduate-research-day-1.2446022#.UQ6vcY7HMfM

2010 "Regulation of Bone Elongation" Presentation for local high school students in Huntington, WV. 13 May 2010, held at Marshall University.

2010 "Skeletons in the Closet," Expanding Your Horizons science program for middle school girls, sponsored by Association for Women in Science, 10 April 2010.
Highlighted in The Herald Dispatch: http://www.herald-dispatch.com/news/x874709075/Middle-school-girls-attend-math-science-conference

2009 "Anatomy in the Life Sciences" Presentation for Pre-Nursing / Allied Health Students, Boyd County High School, KY. 19 October 2009 held at Marshall University.

2008 Veterinary anatomy prosection, musculoskeletal system.
Performed dissections to assist a graduate student learning anatomy.
The Animal Body Course, Cornell University College of Veterinary Medicine

2008 Nomination: Dr. C. Owen Lovejoy, Recipient of Outstanding Mentorship Award
Kent State University Graduate Student Senate (honored 5 March)

2005-2009 Educational lectures on the environment and institutional animal husbandry practices
Kent State University and Cornell University

2006-pres Student mentoring: advise students and post-docs from various institutions on dissertation preparation, research methods, funding, and job search strategies. Edit papers and grants. Consult on animal husbandry, breeding, and experimental design.

2000-pres Peer mentoring in research-teaching: advise on teaching strategies and research methods; edit papers, share course materials, lecture handouts and slides; consult for *in vivo* imaging methods and troubleshooting, animal breeding/husbandry, IACUC protocols, lab setup, safety, and management.