

# Leigha M. Lynch

## Curriculum Vitae

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Midwestern University

Glendale Campus

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### Education

- 2018 Ph.D. in Biomedical Sciences, Anatomy and Vertebrate Paleontology Track,  
Oklahoma State University Center for Health Sciences,  
Advisor: Dr. Anne Weil
- 2012 M.S. in Geosciences, East Tennessee State University,  
Advisor: Dr. Steven Wallace
- 2009 B.S. in Geology, Bowling Green State University,  
Advisors: Dr. John Farver and Dr. Peg Yacobucci

### *Training courses*

- October 2019 Inclusive Teaching in STEM; Instructor Dr. Denise Leonard
- September 2019 Introduction for Course Design; Instructor Dr. Julia Johnson
- May 2016 Genomic Data Science with Galaxy, Instructor Dr. James Taylor
- May 2016 Python for Genomic Data Sciences, Instructors Dr. Mihaela Pertea and Dr.  
Steven Salzberg
- April 2016 Introduction to Genomic Technologies, Instructors Dr. Steven Salzberg  
and Dr. Jeff Leek
- October 2015 Introduction to Geomorph in R workshop, Instructor Dr. Emma Sherratt
- December 2013 Geometric Morphometrics Workshop, Instructor Dr. Miriam Zelditch

### Positions Held

- 2020-Present Assistant Professor, Department of Anatomy, Midwestern University  
Glendale
- 2018-2020 Postdoctoral Research Associate, Washington University School of  
Medicine in St. Louis
- 2013-2017 Teaching Assistant, Oklahoma State University Center for Health  
Sciences
- 2012-2013 Adjunct Professor, East Tennessee State University

## Other Academic Positions

2014, 2015    Camp Manager and Field Assistant, Homestead Quarry, OSU-CHS  
2012-2013    Field/lab assistant, Gray Fossil Site, East Tennessee State University

## Teaching Experience

### *Midwestern University- Assistant Professor*

2020            Human Anatomy with Laboratory, ANATG 502/503/504 Course Head: Dr. Kathleen Muldoon

### *Washington University School of Medicine in St. Louis- Postdoctoral Research Assistant*

2018-2020    The Human Body: Anatomy, Embryology, Imaging Course head: Dr. Amy Bauernfeind and Dr. Kari Allen

### *Oklahoma State University Center for Health Sciences- Graduate Teaching Assistant*

2013-2016    Clinical Anatomy, BIOM 5116, Course head: Dr. Kent Smith

### *East Tennessee State University- Adjunct Professor*

2013            Life Through Time, GEOL 1050, Course head: Dr. Blaine Schubert  
2012; 2013    Weather and Climate (online), GEOG 1110, Course head: Ingrid Luffman, M.S.

### *Graduate Students Mentored*

Sarah Baumgarten	Washington University in St. Louis
Christopher Lawrence	University of Tulsa
Olivia Franklin	Idaho State University
Morgan McKenna	Idaho State University
Michelle Carpenter	Idaho State University

### *Undergraduate Students Mentored*

Khanh To	Oklahoma State University
Gage Holleman	University of Tulsa
Lauren Bateman	University of Tulsa

## Awards and Honors

### *Research Funding*

In Prep        NSF IIBR “Effects of diffusible iodine-based contrast-enhanced computed tomography (diceCT) on DNA quality in museum wet specimens”  
                  PI: **Leigha M Lynch**  
                  Co-PI’s: Ashley Morhardt, Paul Gignac  
2021            Midwestern University Core Facility Outsourcing Fund \$3,200  
2017            Sigma Xi Grants in Aid of Research \$1,000

2017	Geological Society of America Graduate Student Research Grant \$2,445
2016	Oklahoma State University Robberson Summer Graduate Research Fellowship \$4,000
2016	American Society of Mammalogists Grants-in-Aid \$1,429
2016	Larry D. Agenbroad Legacy Fund for Research (Mammoth Site, South Dakota) \$750
2016	Oklahoma State University Women's Faculty Council Research Award \$750
2012	Don Sundquist Center of Excellence in Paleontology \$200
2011	Don Sundquist Center of Excellence in Paleontology \$200
2010	NSF GK-12 Grant to G. Anderson \$60,000 stipend and \$5,000 travel
2009	Mancuso Geology Field Experience (BGSU) \$500
2009	D.L. Roder Geology Field Experience (BSGU) \$1,500
2008	BGSU Undergraduate Research (ASUR) \$250
2007	GSA Geoscience Education Division Student Travel Grant \$200

### ***Academic Honors***

2018	Oklahoma State University in Tulsa Research Day 2 <sup>nd</sup> place oral presentation
2018	David and Marvilee Wake Award Honorable Mention
2017	Biomedical Sciences Outstanding Graduate Student Award (OSU)
2016	Oklahoma State University in Tulsa Research Day 1 <sup>st</sup> place poster presentation
2015	Oklahoma State University in Tulsa Research Day 2 <sup>nd</sup> place poster presentation
2009	Conrad and Deanna Allen Fund (BGSU) \$350
2009	David V. Jacques Memorial (BSGU) \$1,500
2008	Toledo Gem and Rockhound (BSGU) \$450
2007	M.S. Lougheed Book Award (BGSU) \$250
2006-2009	Academic Investments in Math and Science (BGSU) \$15,250
2006-2009	University Professors Scholarship (BGSU) \$34,296

### **Invited Lecture Presentation**

“Evolving in Isolation: Pleistocene glaciation resulted in the speciation and morphological divergence of the North American pine marten, *Martes*.” International Congress on Vertebrate Morphology, July 2019, Prague, Czech Republic

“Carnivorans as models for understanding morphological evolution in response to environmental variation.” Midwestern University, November 10, 2019, Glendale, Arizona

“How equivalent are morphological and molecular species and subspecies? Testing a 12000-year record of fossil and recent *Martes*.” Oklahoma State University Women's Faculty Council Award Ceremony, March 30, 2016, Stillwater, Oklahoma

## Scientific Publications

### *Peer reviewed articles*

#### **In Prep:**

**Lynch, Leigha M.**, Kari L. Allen. *In Prep*. Relative brain volume of carnivorans does not reflect environmental or dietary variation. *The American Naturalist*.

#### **Submitted:**

Van Handel, Amelia C, **Leigha M Lynch**, Jimmy H Daruwalla, James Higgins, Kari C Allen, Mitchell A Pet. *In Review*. Medial femoral trochlea osteochondral free flap reconstruction versus proximal row carpectomy for advanced Keinbock's Disease: a 3-dimensional morphometric comparison. *Journal of Hand Surgery (European Volume)*.

#### **Accepted:**

#### **Published:**

**Lynch, Leigha M.**, Ryan Felice, Haley D. O'Brien. 2020. Appendicular skeletal morphology of North American *Martes* reflects a punctuated mode of evolution in conjunction with Pleistocene glacial cycles. *The Anatomical Record*.1-24. doi:10.1002/ar.24545

**Lynch, Leigha M.** 2019. Fossil calibration of mitochondrial phylogenetic relationships of North American pine martens, *Martes*, suggests an older divergence of *M. americana* and *M. caurina* than previously hypothesized. *Journal of Mammalian Evolution*. 27: 535-548. doi:10.1007/s10914-019-09476-7

O'Brien, Haley D., **Leigha M. Lynch**, Greg Erickson, Kent Vliet, John Bruggen, and Paul M. Gignac. 2019. Crocodylian head width allometry and a Bayesian framework for predicting body size in extinct suchians. *Integrative Organismal Biology* 1 (1): 1-15. doi:10.1093/iob/obz006

**Lynch, Leigha M.** 2019. Skeletal limb morphology of the North American pine marten, *Martes americana* and *Martes caurina*, varies predictably by biome. *Biological Journal of the Linnean Society* 126 (2): 240-255. doi:10.1093/biolinnean/bly175

**King, Leigha M.** and Steven C. Wallace. 2013. Phylogeny of Panthera, Including *P. atrox*, based on craniodental characters. *Historical Biology* 26 (6): 827-833. doi: 10.1080/08912963.2013.861462

**King, Leigha M.** and Steven C. Wallace. 2011. Sexual dimorphism in the Black Footed Ferret (*Mustela nigripes*) revealed by geometric morphometrics. *Current Research in the Pleistocene* 28: 168-169.

## **Abstracts**

### **Submitted:**

#### **Accepted:**

**Leigha M. Lynch**, Kari L. Allen. 2021. Carnivoran relative brain volume does not correlate with environmental and dietary variation. *Society for Integrative and Comparative Biology*, Annual Meeting Abstracts.

Van Handel, Amelia C., **Leigha M. Lynch**, Jimmy H. Daruwalla, James P. Higgins, Kari L. Allen, Mitchell A. Pet. 2021. Medial femoral trochlea osteochondral free flap reconstruction versus proximal row carpectomy for advanced Kienbock's Disease: a three-dimensional morphometric comparison. *American Association for Hand Surgery Annual Meeting*.

Van Handel, Amelia C., **Leigha M. Lynch**, Jimmy H. Daruwalla, James P. Higgins, Kari L. Allen, Mitchell A. Pet. 2020. Quantifying carpal surface variability: 3-dimensional morphometric modeling of wrist anatomy. *American Society for Surgery of the Hand 75<sup>th</sup> Annual Meeting*.

Van Handel, Amelia C., **Leigha M. Lynch**, Jimmy H. Daruwalla, James P. Higgins, Kari L. Allen, Mitchell A. Pet. 2020. Considering suitability for proximal row carpectomy: surface morphology variability of the lunate facet exceeds that of the proximal capitate. *American Society for Surgery of the Hand 75<sup>th</sup> Annual Meeting*.

#### **Published:**

**Lynch, Leigha M.**, Morgan E. McKenna, John V. Dudgeon. 2020. Living on the edge: ecology of the extinct Noble marten as determined by morphological and isotopic evidence. *Society for Integrative and Comparative Biology*, Annual Meeting Abstracts.

**Lynch, Leigha M.** 2019. Evolving in isolation: Pleistocene glaciation resulted in the speciation and morphological divergence of the North American pine marten, *Martes*. *Journal of Morphology*, 280: S169.

**Lynch, Leigha M.**, Kari L. Allen. 2019. Relative brain volume of North American carnivorans does not support the Cognitive Buffer Hypothesis. *Journal of Morphology*, 280: S66-67.

**Lynch, Leigha M.**, Gage Holleman, Warren Booth. 2019. Accurate phylogenetic relationships can be produced from fragments of DNA. *Society for Integrative and Comparative Biology*, Annual Meeting Abstracts, 252.

**Lynch, Leigha M.** 2018. Isolation by Pleistocene glaciers resulted in divergence of skeletal limb morphology of North American pine martens, *Martes americana* and *Martes caurina*. *Society for Integrative and Comparative Biology, Annual Meeting Abstracts*, 252.

**Lynch, Leigha M.** 2017. What does skeletal morphology really tell us? Variation in pine marten limbs by biome and molecular phylogeny. *Geological Society of America Abstract with Programs*, 49(6): 229-11.

**Lynch, Leigha M.** 2017. Skeletal limb morphology of *Martes americana*, a small mustelid carnivoran, varies predictably by biome but not in correlation with body size. *Journal of Vertebrate Paleontology, Programs and Abstracts*, 154.

**Lynch, Leigha M.** 2016. *Martes americana* is selective in following the rules: a test of Bergmann's and Allen's rules. *Journal of Vertebrate Paleontology, Programs and Abstracts*, 179.

**Lynch, Leigha M.,** Eric R. Lynch, Blaine W. Schubert. 2016. Predicting skull size of Brevirostres using cranial pit depth. *Program and Abstracts of the 11th International Congress of Vertebrate Morphology*, 168.

**Lynch, Leigha M.** 2015. When is enough enough? Evaluation of DNA sequence length in *Martes americana* with application to aDNA extractions. *Journal of Vertebrate Paleontology, Program and Abstracts*, 169.

Jasinski, Steven and **Leigha M. King.** 2014. The Middle Miocene Carnivora of New Mexico (Tesuque Formation): species patterns, richness, and faunal turnover. *Journal of Vertebrate Paleontology, Program and Abstracts*, 154.

**King, Leigha M.,** Eric R. Lynch, and Blaine W. Schubert. 2013. Cranial pit development in extant and fossil *Alligator*. *Journal of Vertebrate Paleontology, Program and Abstracts*, 154.

**King, Leigha M.** and Steven C. Wallace. 2012. Phylogenetic placement of *Panthera atrox* based on cranial and mandibular characters. *Journal of Vertebrate Paleontology* 32: 121A.

**King, Leigha M.** and Steven C. Wallace 2011. Effect of the genetic bottleneck on the sexual dimorphism of the black footed ferret (*Mustela nigripes*). *Journal of Vertebrate Paleontology* 33: 136A.

**King, Leigha M.,** Peg Yacobucci, and John Farver. 2010. Use of finite element analysis to determine the optimum angle of Thescelosaur (Dinosauria) metatarsals. *Journal of Vertebrate Paleontology supplemental to* 30(3):115A.

**King, Leigha** and Joe T. Elkins. 2007. Gender differences and results of the Geoscience Concept Inventory on field-based programs. *Geological Society of America Abstracts with Programs*, 39(6): 317.

## **Paleontology Field and Lab Experience**

- 2015-Present Dudgeon laboratory at Idaho State University: included ancient DNA processing techniques such as sampling, extractions, library amplification, and NextGen sequencing, and training a new master's student in DNA methods
- 2014-2018 Booth laboratory at University of Tulsa: included modern DNA processing techniques such as extraction, PCR, gel electrophoresis, and Sanger sequencing
- 2014-2017 Homestead Quarry: included camp management duties such as managing a budget, preparing meals, and restocking supplies, and field work duties such as digging, jacketing specimens, quarry mapping, teaching high school students field methods
- 2010-2013 Gray Fossil Site: included digging, jacketing specimens, picking sediments, identification of specimens, macerating, preparing, and cataloguing modern specimens for collection
- 2009 Bowling Green State University Geology Field Camp: included rock unit identification, geologic mapping of units and structures, using ArcGIS
- 2009 Cincinnati Museum Center Volunteer: preparing specimens (mainly dinosaur)
- 2008-2009 Museum of the Rockies Field Crew: included digging, jacketing bones, prospecting, logging specimen localities, minor field preparing

## **Service and Outreach**

### **Professional Service (Student Organizations)**

- 2021-Present Society for Integrative and Comparative Biology, Program Officer for Division of Phylogenetics and Comparative Biology
- 2019-2020 Society for Integrative and Comparative Biology, Program Officer Elect for Division of Phylogenetics and Comparative Biology
- 2015-2017 Society for Career Opportunities and Professional Exploration, President and Founding Officer (2015-2017)
- 2013-2017 Biomedical Sciences Graduate Student Association, Senate Representative (2016-2017)
- 2006-2009 Geology Club Bowling Green State University
- 2006-2009 Sigma Gamma Epsilon; Secretary (2008)
- 2006-2009 Base Campus; Activities Coordinator (2009)

### **Public Outreach**

Fall 2020	Paleo Talks <a href="https://www.youtube.com/watch?v=Um9oSsDwSdc&amp;list=PLJncIemz2Fxbi-ym8OV4yO2j9wcd1WNI&amp;index=23">https://www.youtube.com/watch?v=Um9oSsDwSdc&amp;list=PLJncIemz2Fxbi-ym8OV4yO2j9wcd1WNI&amp;index=23</a>
Spring 2020	Ancient DNA consultant for The Common Descent Podcast <a href="https://www.youtube.com/watch?v=BqpljFjYjMc&amp;t=1s">https://www.youtube.com/watch?v=BqpljFjYjMc&amp;t=1s</a>
Academic Year 2019	Letters to a Pre-Scientist pen pal
Summer 2018	Thumbroll anatomy dissector <a href="https://www.youtube.com/watch?v=YuJ8bFf_je8">https://www.youtube.com/watch?v=YuJ8bFf_je8</a>
Summer 2018	Mustelid anatomy consultant for the BBC
Spring 2018	Ancient DNA consultant for The Common Descent Podcast
Spring 2014, 2015, 2016	Roy Clark Elementary STEM night
Fall 2015	Curious Cowboys STEM Camp
Summer 2014, 2015	ExplorOlogy Paleo Expedition in Black Mesa field assistant

### Press

“Combining DNA and fossil evidence to understand how pine martens evolved through the Ice Age,” PHYS.ORG

<https://phys.org/news/2019-08-combining-dna-fossil-evidence-martens.html>

“One more brutal fact about the Ice Age Arctic: it also had hyenas,” The Atlantic

<https://www.theatlantic.com/science/archive/2019/06/arctic-hyenas-once-roamed-north-america/591916/>

“No, this *mystery creature* is not a dinosaur,” EarthTouch News

<https://www.earthtouchnews.com/wtf/wtf/no-this-mystery-creature-is-not-a-dinosaur/>

“The incredible science of ancient DNA,” EarthTouch News

<https://www.earthtouchnews.com/natural-world/how-it-works/the-incredible-science-of-ancient-dna/>

“Siberia’s frozen cave lion cubs: DNA, cause of death & other secrets,” EarthTouch News

<http://www.earthtouchnews.com/discoveries/discoveries/siberias-frozen-cave-lion-cubs-dna-cause-of-death-other-secrets>

### Professional Memberships

2020-Present American Association for Anatomy

2017 Sigma Xi

2017, 2007 Geological Society of America

2017-2018 American Society of Naturalists

2016-2018 Paleontological Society

2016-2018 American Society of Mammalogists  
2015-Present Society for Integrative and Comparative Biology  
2007-Present Society of Vertebrate Paleontology  
2010-2013 Don Sundquist Center of Excellence in Paleontology  
2010-2013 Southeastern Association of Vertebrate Paleontology

### **Scholarly Review**

Biological Journal of the Linnean Society

Journal of Anatomy

Journal of Biogeography

Journal of Mammalogy

Journal of Vertebrate Paleontology

Northwestern Naturalist