

## Lorin A. Neuman-Lee, Ph.D.

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### **Institutional Address**

320 Lab Science East  
Arkansas State University  
Jonesboro, AR 72467

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### **Education**

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Doctor of Philosophy in Biology Spring 2016

Utah State University

Advisor: Susannah French

Dissertation: *Anthropogenic and natural stressors and their effect on immunity, reproduction, and the stress response*

Master's of Science in Biology Fall 2010

Eastern Illinois University

Advisors: Stephen Mullin and Karen Gaines

Thesis: *Multiple endpoints of endocrine disruption in gravid watersnakes (Colubridae: Nerodia) as a function of ingestion of a common herbicide*

Bachelor's of Science in English Spring 2008

Iowa State University

Emphasis in Rhetorical Analysis

Bachelor's of Science in Biology Fall 2007

Iowa State University

Advisor: Fredric Janzen

### **Professional Experience**

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Assistant Professor of Physiology 2017-present

Department of Biological Sciences

Arkansas State University

Post-doctoral lecturer 2016-2017

Biology Department

Utah State University

### **Publications**

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\*Denotes undergraduate

### **Refereed Journal Articles**

- Field E, Hartzheim A, Terry J, Haydt N, Dawson G, **Neuman-Lee L**. Reptilian innate immunology and ecoimmunology: What do we know and where are we going? In press. *Integrative and Comparative Biology*.
- Van der Walt M, **Neuman-Lee LA**, Terletzky PA, Atwood TC, Gese EM, and French SS. 2021. Measuring stress and reproduction in polar bears (*Ursus maritimus*) using hair hormone concentrations. *General and Comparative Endocrinology*. 310
- Kordosky J, Gese EM, Thompson C, Terletzky P, **Neuman-Lee L**, Schneiderman J, Purcell K, and French SS. 2021. Landscape of stress: Tree mortality influences physiological stress and survival in a native mesocarnivore. *PLoS One*. 16(7): e0253604.
- Durso AM, **Neuman-Lee LA**, Hopkins GR, Brodie Jr, ED. 2021. Stable isotope analysis suggests that tetrodotoxin-resistant Common Gartersnakes (*Thamnophis sirtalis*) rarely feed on newts in the wild. *Canadian Journal of Zoology*. 99(5):331-338.
- Spence A, French SS, Hopkins GR, Durso AM, Hudson SB, Smith GD, **Neuman-Lee LA**. 2020. Long-term monitoring of two snake species reveals immune-endocrine interactions and the importance of ecological context. *Journal of Experimental Zoology Part A: Ecological and Integrative Physiology*. 333(10):744-755.
- Franzen-Klein D, Jankowski M, Roy CL, Nguyen-Phuc H, Chen D, **Neuman-Lee LA**, Redig P, and Ponder J. 2020. Evaluation of neurobehavioral abnormalities and immunotoxicity in response to oral imidacloprid exposure in domestic chickens (*Gallus gallus domesticus*). *Journal of Toxicology and Environmental Health, Part A*. 83(2): 45-65.
- Stevenson ET, Gese EM, **Neuman-Lee LA**, and French SS. 2020. Instability of glucocorticoid metabolites in coyote scats: Implications for field studies. *Human-Wildlife Interactions* 14(2): 8.
- Mohammadi S, Kiriazis NM, and **Neuman-Lee LA**. 2020. The natural selection game: Incorporating active learning in evolution curricula for general biology. *American Biology Teacher*. 82(2): 104-112.
- Neuman-Lee LA**, Hudson SB, Webb AC, and French SS. Investigating the relationship between corticosterone and glucose in a reptile. 2020. *Journal of Experimental Biology* 223(2)
- Neuman-Lee LA**, Van Wettere AJ, French SS. 2019. Interrelations among multiple metrics of immune and physiological function in a squamate, the Common Gartersnake (*Thamnophis sirtalis*). *Physiological and Biochemical Zoology* 92(1): 12-23.
- Ryan M\*, **Neuman-Lee LA**, Durham S, Smith GD, and French SS. 2018. A sex-dependent change in behavioral temperature regulation in African house snakes (*Lamprophis fuliginosus*) challenged with different pathogens. *Journal of Thermal Biology*. 73: 8-13.

- Stevenson ET, Gese EM, **Neuman-Lee LA**, and French SS. 2018. Levels of plasma and fecal glucocorticoid metabolites following an ACTH challenge in male and female coyotes (*Canis latrans*). *Journal of Comparative Physiology B*. 188(2): 345-358.
- Neuman-Lee LA**, Terletzky PA, Atwood TC, Gese EM, Smith GD, Greenfield S\*, Pettit J\*, and French SS. 2017. Demographic and temporal variations in immunity and condition of polar bears (*Ursus maritimus*) from the southern Beaufort Sea. *Journal of Experimental Zoology, Part A*. 327(5) 333-346.
- Smith GD, **Neuman-Lee LA**, Webb AC, Angilletta, Jr., MJ, DeNardo DF, and French SS. 2017. Metabolic responses to immune challenges and varying resource availability in the side-blotched lizard (*Uta stansburiana*). *Journal of Comparative Physiology B*. 1-10.
- Neuman-Lee LA** and French SS. 2017. Endocrine-reproductive-immune interactions in female and male Galapagos marine iguanas. *Hormones and Behavior*. 88: 60-69.
- French SS, **Neuman-Lee LA**, Terletzky P, Kiriazis NM, Taylor E, and DeNardo DF. 2017. Too much of a good thing? Ecotourism has a “dose-dependent” impact on innate immunity in marine iguanas, *Amblyrhynchus cristatus*. *Biological Conservation*. 210: 37-47.
- Neuman-Lee LA**, Brodie, Jr. ED, Hansen T\*, Brodie III ED, and French SS. 2017. To stress or not to stress: Physiological responses to tetrodotoxin in resistant gartersnakes vary by sex. *Comparative Biochemistry and Physiology: Part A*. 209: 34-40.
- Ranglack D<sup>†</sup>, **Neuman-Lee LA**<sup>†</sup>, French SS, and du Toit J. Using fecal glucocorticoids to explain unusual habitat selection patterns in free-ranging bison with high conservation value. 2017. *Southwestern Naturalist*. 62(1): 62-68.
- <sup>†</sup>Authors contributed equally to this study
- Mohammadi S, French SS, **Neuman-Lee LA**, Durham SL, Kojima Y, Mori A, Brodie, Jr. ED, Savitzky AH. 2017. Corticosteroid responses of snakes to toxins from today (bufadienolides) and plants (cardenolides) reflect differences in dietary specializations. *General and Comparative Endocrinology* 247: 16-25.
- Neuman-Lee LA**, Grieves T, Hopkins GR, and French SS. 2017. The role of the kisspeptin system on regulation of the reproductive endocrine axis and territorial behavior in the male side-blotched lizard (*Uta stansburiana*). *Hormones and Behavior*. 89: 48-54.
- Skinner HM, Durso AM, **Neuman-Lee LA**, Mueller SD\*, and French SS. 2016. Effect of energy manipulation and diet complexity on life history strategies in Side-blotched lizards (*Uta stansburiana*). *Journal of Experimental Zoology, Part A*. 325(9): 626-637.
- Spence AR\*, Hopkins GR, **Neuman-Lee LA**, Smith GD, Brodie, Jr. ED, and French SS. 2016. Detrimental effects of zinc oxide nanoparticles on amphibian life stages. *Journal of Experimental Zoology: Part A*. 325(7): 415-424.

- Hopkins GR, Brodie, Jr. ED, **Neuman-Lee LA**, Mohammadi S, Brusch IV GA, Hopkins ZM\*, and French SS. 2016. Tidal newts: Physiological responses to salinity vary with proximity to the ocean in a coastal amphibian. *Physiological and Biochemical Zoology* 89(4): 322-330.
- Neuman-Lee LA**, Brodie, Jr. ED, Hansen T\*, Brodie III ED, and French SS. 2016. Comparing the natural and anthropogenic sodium channel blockers tetrodotoxin and indoxacarb in gartersnakes. *Journal of Experimental Zoology: Part A* 325(4): 255-264.
- Mohammadi S, Brodie, Jr. ED, **Neuman-Lee LA**, Savitzky AH. 2016. Mutations to the cardiotonic steroid binding site of Na<sup>+</sup>/K<sup>+</sup>-ATPase confer high level of resistance to gababufotalin in a natracine snake. *Toxicon*. 114: 13-15.
- Neuman-Lee LA**, Fokidis B, Spence A\*, Van der Walt M\*, Smith GD, Durham S, French SS. 2015. Interactions between food restriction and chronic stress influence investment in immune function in gartersnakes. *Functional Ecology*. 29: 1453-1462.
- Neuman-Lee LA**, Carr J, Vaughn K\*, French SS. 2015. Physiological effects of polybrominated diphenyl ether (PBDE-47) on pregnant gartersnakes and resulting offspring. *General and Comparative Endocrinology*. 219: 143-151.
- Neuman-Lee LA**, Stokes AN, Greenfield S\*, Hopkins G, Brodie ED, Jr., French SS. 2015. Effects of antipredator behavior and tetrodotoxin concentrations on stress response in Rough-skinned newts. *General and Comparative Biology*. 213:59-64.
- Boone MD, Bishop CA, Boswell LA, Brodman RD, Burger J, Davidson C, Gochfeld M, Hoverman JT, **Neuman-Lee LA**, Relyea RA, Rohr JR, Salice C, Semlitsch RD, Sparling D, and Weir S. 2014. Pesticide regulation amid the influence of industry. *Bioscience*. doi: 10.1093/biosci/biu138
- Neuman-Lee LA** and French SS. 2014. Wound healing reduces stress-induced immune changes: Evidence for immune trade-offs in the side-blotched lizard. *Journal of Comparative Physiology B*, 1-7
- Neuman-Lee LA**, Gaines KF, Baumgartner KA\*, Voorhees JM\*, Mullin SJ. 2014. Assessing holistic effects of atrazine ingestion on gravid Northern Watersnakes (*Nerodia sipedon*) and their offspring. *Environmental Toxicology*. 29(9): 1072-1082 doi: 10.1002/tox.21837.
- Warner DA, Jergenson A\*, **Neuman-Lee LA**, Janzen FJ. 2014. Swimming against the tide: resilience of a riverine turtle to extreme environmental events. *Biology Letters* 10(3) doi: 10.1098/rsbl.2013.0782
- Stokes AN, Ducey PK, **Neuman-Lee LA**, Hannifin CT, French SS, Pfreder ME, Brodie ED III, Brodie ED, Jr. 2014. Confirmation and distribution of tetrodotoxin for the first time in terrestrial invertebrates: Two terrestrial flatworm species (*Bipalium adventitium* and *Bipalium kewense*). *PLoS ONE*. 9(6) doi: 10.1371/journal.pone.0100718.

- Neuman-Lee LA**, Hopkins GR, Brodie ED, Jr., French SS. 2013. Sublethal contaminant exposure alters behavior in a common insect: Important implications for tropic transfer. *Journal of Environmental Science and Health, Part B*. 48(6): 442-448.
- Neuman-Lee LA**, Durso AM, Kiriazis NM\*, and Mullin SJ. 2013. Differential habitat use by Common Watersnakes (*Nerodia sipedon*). *IRCF Reptiles & Amphibians* 20(4): 166-171.
- French SS and **Neuman-Lee LA**. 2012. Novel ex vivo method for microbiocidal activity across vertebrate species. *Biology Open* 1: 482-487.
- Neuman-Lee LA** and Janzen FJ. 2011. Atrazine exposure impacts behavior and survivorship of neonatal turtles. *Herpetologica* 67(1): 23-31.
- Neuman-Lee LA**, McGaugh SE, Pfrender M, and Janzen FJ. 2011. Using mitochondrial DNA to determine the identity and origin of a gartersnake found in Alaska. *Journal of Herpetology* 45(1):63-65.

#### **Geographic Distribution Notes**

- Neuman-Lee LA** and Durso AM. 2011. *Graptemys pseudogeographica* (False Map Turtle) Carroll & Whiteside Counties, Illinois. Geographic Distribution. *Herpetological Review*. 42(1):110.
- Neuman-Lee LA** and Durso AM. 2011. *Graptemys geographica* (Northern Map Turtle) Whiteside County, Illinois. Geographic Distribution. *Herpetological Review*. 42(1):110.
- Durso AM and **Neuman-Lee LA**. 2011. *Chelydra serpentina* (Snapping Turtle) Whiteside County, Illinois. Geographic Distribution. *Herpetological Review*. 42(1):110.

#### **Other Publications**

- Neuman-Lee L. 2008. A Day at Turtle Camp. *The Big Muddy: A Journal of the Mississippi River Valley* 8(1):40-47.

#### **Awards and Honors**

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| 2021 | College of Sciences and Mathematics Emerging Faculty Scholar Award, Arkansas State University |
| 2016 | College of Science Researcher of the Year, Utah State University                              |
| 2016 | Biology Graduate Researcher of the Year, Utah State University                                |
| 2013 | Biology Graduate Teacher of the Year, Utah State University                                   |
| 2012 | James A. and Patty MacMahon Ecology Graduate Student Research Award, Utah State University    |
| 2010 | Distinguished Graduate Student Award, Eastern Illinois University                             |
| 2010 | Graduate Showcase Recipient, Eastern Illinois University                                      |

- 2009 Graduate Research Award, 2<sup>nd</sup> Runner-up, Herpetologists' League  
 2009 Stephen Jay Gould Award (*Darwin's Rhetorical Model: Its effectiveness and continued use*), Eastern Illinois University  
 2008 Cardinal Key Honor Society (<1% of ISU Senior Class), Iowa State University

### **Grants and Fellowships**

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- 2021 Memphis Zoo Conservation Action Network Grant, Memphis TN—*Health and demographics of freshwater turtles within the Memphis Zoo*  
 2021 INBRE Collaborative Research Grant—*Characterization of snake immunity for a novel animal model*  
 2021 Arkansas BioSciences Institute—*Correlating environmental microbial diversity to prevalence and severity of an emerging vertebrate disease*  
 2020 Memphis Zoo Conservation Action Network Grant, Memphis, TN—*Influence of microhabitat on tortoise physiology*  
 2020 College of Science and Mathematics, Arkansas State University—*Investigating innate immune characteristics in two wild reptilian populations affected by fungal pathogens*  
 2019 Arkansas State Wildlife Grant-- *Monitoring Illinois Chorus Frog (Pseudacris illinoensis) in Northeast Arkansas*  
 2019 Arkansas BioSciences Institute-- *Establishing long-term research of the immune and endocrine system interactions in reptilian species of the Mississippi Delta Region*  
 2018 INBRE Mini-Sabbatical-- *Detecting phagocytic B cells in reptiles*  
 2018 A-State Faculty Research Awards Council-- *Energetic trade-offs in Collared Lizards (Crotaphytus collaris) in a broader context*  
 2018 Arkansas BioSciences Institute-- *Confirming the presence and activity of phagocytic B cells in squamates to further our understanding of innate immune system functioning*  
 2013 Doctoral Dissertation Improvement Grant, Utah State University  
 2010-2011 Vice President Research Fellowship, Utah State University  
 2010 Graduate Student Investigator Award, Eastern Illinois University  
 2010 Williams Travel Award, Eastern Illinois University  
 2009 Graduate Student Research Award, The Wildlife Society's Toxicology Working Group  
 2009 Presidential Graduate Assistantship, Eastern Illinois University  
 2009 Williams Travel Award, Eastern Illinois University  
 2005 Renewing Earth and Its People (REAP)

### **Invited Talks**

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- 2021 "Discussion of Spence et al., 2020 paper." Ohio Wesleyan University (Remote), April 20, 2021  
 2021 "Endocrine and immune interactions in reptiles." Southern Arkansas University (Remote), April 1, 2021

- 2020 “Comparative physiology: Reproduction in reptiles.” University of St. Thomas (Remote), April 3, 2020
- 2019 “Endocrine and immune interactions in reptiles.” University of Central Arkansas, Seminar Series; March 1, 2019
- 2018 “Setting yourself up for success during grad school.” Arkansas State University Graduate Council, Keynote Address; Jonesboro, AR
- 2012 “Ecological and physiological effects of the herbicide atrazine.” Franklin and Marshall College; Lancaster, PA
- 2011 “Holistic effects of atrazine on pregnant watersnakes and their offspring.” Biology Department Seminar; University of Utah; Salt Lake City, UT
- 2008 “Planting a TREE Program: A Practical Model.” Ecological Society of America Annual Meeting; Milwaukee, WI (with J Strickland, J Maciel, S Thol, and F Janzen)

### **Conference Activity/Participation**

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\*Denotes undergraduate

### **Oral Presentations**

- 2022 Terry J, Field E, and Neuman-Lee LA. Glucocorticoids, sex steroids, and innate immunity, oh my!: Examining reproductive investment and physiological tradeoffs in a freshwater turtle. Joint Meeting of Ichthyology and Herpetology. Spokane, WA
- 2022 Neuman-Lee LA. “Finding the great balance: Family and science.” Part of Diversity, Equity & Inclusion in Ichthyology and Herpetology Symposium. Joint Meeting of Ichthyology and Herpetology. Spokane, WA
- 2022 Janzen FJ, Flores D, Strickland J, **Neuman-Lee LA**, Bodensteiner B, and Thol S. “Turtle Camp Research and Education in Ecology Program.” Part of Diversity, Equity & Inclusion in Ichthyology and Herpetology Symposium. Joint Meeting of Ichthyology and Herpetology. Spokane, WA
- 2022 Field E, Terry J, Hartzheim A, Dawson G, and **Neuman-Lee LA** (presenter). “Reptilian innate immunology: What do we know and where are we going?” Part of Ecoimmunology: What unconventional organisms tell us after two decades symposium. Society for Comparative and Integrative Biology. Virtual.
- 2022 Terry J, Fiedor T, Veach MV, and **Neuman-Lee LA**. “Physiological tradeoffs in wild red-eared sliders (*Trachemys scripta*) throughout the active season.” Society for Comparative and Integrative Biology. Virtual.
- 2021 Terry J, Fiedor T, Veach MV, Vickrey, and **Neuman-Lee LA**. “Ecophysiological tradeoffs in female red-eared sliders (*Trachemys scripta*).” Society of Integrative and Comparative Biology. Virtual

- 2018 **Neuman-Lee LA**, Brodie, Jr. ED, and French SS. “Examining the stress response in the gartersnake-newt-TTX system.” Joint Meeting of Ichthyologists and Herpetologists. Rochester, NY. \*Invited symposium talk
- 2016 Smith GD, **Neuman-Lee LA**, Webb AC, Denardo DF, Angilletta MJ, and French SS. “Lizards downregulate their metabolism in response to an immune challenge: implications for energy status.” Society of Integrative and Comparative Biology. Portland, OR.
- 2015 **Neuman-Lee LA**, Brodie, Jr. ED, and French SS. “Physiological consequences of evolution: Quantifying the costs of adaptive resistance to tetrodotoxin in gartersnakes. Society of Integrative and Comparative Biology. West Palm Beach, FL.
- 2015 Smith GD, Durso AM, **Neuman-Lee LA**, and French SS. “The town lizard and the country lizard: the physiological ecology of urbanization in *Uta stansburiana*.” Society of Integrative and Comparative Biology. West Palm Beach, FL.
- 2015 Spence AR\*, Hopkins GR, **Neuman-Lee LA**, Brodie, Jr. ED, French SS. “Effects of chronic and acute exposure to ZnO nanoparticles across life-history stages in a caudate amphibian (*Taricha granulosa*). Society for Integrative and Comparative Biology; West Palm Beach, FL.
- 2014 Mohammadi S, Savitzky AH, **Neuman-Lee L**, Petschenka G. “Molecular and Physiological Mechanisms of Bufadienolide-resistance in Toad-Eating Snakes.” Joint Meeting of Ichthyologists and Herpetologists. Chattanooga, TN.
- 2014 **Neuman-Lee LA**, Smith GD, and French SS. “Interactive effects of food restriction and restraint stress on stress reactivity, immune function, and energy metabolite use and storage in snakes.” Society of Integrative and Comparative Biology. Austin, TX.
- 2014 Durso AM, Smith GD, **Neuman-Lee LA**, and French SS. “Using labeled nutrient tracers to reveal resource allocation in lizards with competing needs.” Society for Integrative and Comparative Biology. Austin, TX.
- 2014 Smith GD, **Neuman-Lee LA**, Durso AM, and French SS. 2014. “Investment between reproductive and immune systems varies with latitude and time in *Uta stansburiana*.” Society for Integrative and Comparative Biology. Austin, TX.
- 2011 **Neuman-Lee LA**, Gaines KF, Baumgartner KA\*, Voorhees J\*, and Mullin SJ. “Using multiple endpoints to determine the effects of atrazine ingestion on gravid female watersnakes and their offspring.” Society for Integrative and Comparative Biology; Salt Lake City, UT.



- 2010 **Neuman-Lee LA**, Gaines KF, and Mullin SJ. “Estradiol levels in watersnakes (Colubridae: Nerodia) during gestation as a function of exposure to ingested atrazine.” Joint Meeting of Ichthyologists and Herpetologists; Providence, RI.
- 2010 **Neuman-Lee LA**, Mullin SJ and Gaines KF. “Atrazine during pregnancy: Its impacts on viviparous reptile mothers and young.” Midwest Ecology and Evolution Meetings; Ames, IA.
- 2009 **Neuman-Lee LA** and Janzen F. “Examining the effects of atrazine on embryos of turtles from two deeply divergent Cryptodiran families (Emydidae and Trionychidae).” Joint Meeting of Ichthyologists and Herpetologists; Portland, OR.
- 2008 **Neuman-Lee L**. “Short term exposure to herbicide yields long term effects in Map Turtles (*Graptemys*).” Ecological Society of America Annual Meeting; Milwaukee, WI.
- 2008 **Neuman-Lee LA**. “Short term exposure to herbicide yields long term effects in Map Turtles (*Graptemys*).” Undergraduate Research Symposium; Iowa State University.

#### **Poster Presentations**

- 2022 Haydt N, Bellis N, and **Neuman-Lee LA**. “Predicting the distribution of soil microbes associated with snake fungal disease in Arkansas.” Joint Meeting of Ichthyology and Herpetology. Spokane, WA
- 2022 Field E, Terry J, and **Neuman-Lee LA**. “Unraveling the relationships between immunity, reproduction, and stress in four species of watersnake.” Joint Meeting of Ichthyology and Herpetology. Spokane, WA
- 2022 Hartzheim AM, Terry J, Poo S, and **Neuman-Lee LA**. “Diversity in innate immune response of two threatened species of tortoise.” Society for Comparative and Integrative Biology. Virtual.
- 2022 Krajcir KJ, Donahue ER, Terry JL, **Neuman-Lee LA**, and Boves TJ. Comparative physiology of two breeding cardinalid species in northeast Arkansas. Society for Comparative and Integrative Biology. Virtual.
- 2022 Field EF, Terry J, and **Neuman-Lee LA**. “Endocrine and immune tradeoffs in Northeast Arkansas snakes.” Society for Comparative and Integrative Biology. Virtual.
- 2019 Terry J, Bulice T\*, and **Neuman-Lee LA**. *Monitoring Illinois Chorus Frog (Pseudocris illinoensis) in Northeast Arkansas*. Joint Meeting of Ichthyologists and Herpetologists. Park City, UT
- 2019 Martin LA, Bulice T\*, Gifford M, and **Neuman-Lee LA**. *Physiological tradeoffs in reproductive collared lizards*. Joint Meeting of Ichthyologists and Herpetologists. July 2019, Park City, UT
- 2019 Dawson G\*, Martin LA, and **Neuman-Lee LA**. *Helping the Herps: Restoring the Past for Arkansas State’s Future*. Society for the Preservation of Natural History Collection. May, 2019, Chicago, IL

- 2016 **Neuman-Lee LA** and French SS. *Ecoimmunology tools in gartersnakes*. Society of Integrative and Comparative Biology. Portland, OR.
- 2015 Van der Walt M\*, Smith GD, **Neuman-Lee LA**, and French SS. *Group housing and stress in Side-Blotched Lizards*. Society for Integrative and Comparative Biology; West Palm Beach, FL.
- 2015 French SS, **Neuman-Lee LA**, Greenfield SM\*. Effects of corticosterone and ACTH on the unken reflex in Rough-skinned newts, *Taricha granulosa*. Society for Integrative and Comparative Biology; West Palm Beach, FL.
- 2015 Van der Walt M\*, Smith GD, **Neuman-Lee LA**, and French SS. Lonely lizards: individual housing causes physiological change in side-blotch lizards (*Uta stansburiana*). Association of Zoos and Aquariums; Salt Lake City, UT.
- 2014 Durso AM, Smith GD, **Neuman-Lee LA**, and French SS. *Using labeled nutrient tracers to reveal resource allocation in lizards with competing needs*. Joint Meeting of Ichthyologists & Herpetologists. Chattanooga, TN.
- 2014 Hopkins GR., Brodie, Jr. ED, **Neuman-Lee LA**, Stopher ZM\*, and French SS. *Tidal newts: Evolution in a stressful environment*. Genomes to Biomes—1st Joint Conference of the Canadian Society for Ecology and Evolution, Canadian Society of Zoologists, and the Society of Canadian Limnologists, Montreal, Quebec, Canada.
- 2013 Hopkins GR., Brodie, Jr. ED, **Neuman-Lee LA**, Stopher ZM\*, and French SS. *Tidal newts: Evidence for local adaptation to an osmotically stressful environment*. Annual Meetings of the Society for the Study of Evolution & American Society of Naturalists, Snowbird, Utah.
- 2012 **Neuman-Lee LA** and French SS. *Effects of prenatal exposure to a flame retardant on survival and growth in juvenile Western Terrestrial Gartersnakes* (*Thamnophis elegans*). World Congress of Herpetology, Vancouver, British Columbia, Canada.
- 2011 **Neuman-Lee LA** and French SS. 2011. *Endocrine, immune, and behavioral responses to flame retardant exposure in gartersnakes*. 7<sup>th</sup> International Symposium on Amphibian and Reptilian Endocrinology and Neurobiology. Ann Arbor, MI.
- 2011 Gross IP\*, **Neuman-Lee LA**, Durso AM, and Mullin SJ. *Assessing the relationship between parasite loads & limb deformities in Small-mouthed Salamanders* (*Caudata: Ambystomatidae*). Joint Meeting of Ichthyologists & Herpetologists. Minneapolis, MN.
- 2010 Voorhees JR\*, **Neuman-Lee LA**, Mullin SJ, and Gaines KF. 2010. *Lipid concentrations in neonate watersnakes (Colubridae: Nerodia) as a function of in utero exposure to atrazine*. Joint Meeting of Ichthyologists and Herpetologists, Providence, RI.
- 2010 Baumgartner KA\*, Mullin SJ and **Neuman-Lee LA**. *The Effect of atrazine on scale-row symmetry during the development of neonate watersnakes (Colubridae: Nerodia)*. Midwest Ecology and Evolution Meetings, Ames, IA.
- 2009 Neuman-Lee LA, Strickland J, Thol S, Janzen F. *Planting a TREE: Exposing high school students to ecological research with reptiles*. Joint Meeting of Ichthyologists and Herpetologists. Portland, OR.

- 2009 Kiriazis NM\*, **Neuman-Lee LA** and Mullin SJ. *Population structure and morphometrics of Northern Watersnakes (Nerodia sipedon) in an anthropogenic habitat*. Joint Meeting of Ichthyologists and Herpetologists. Portland, OR
- 2009 **Neuman-Lee LA** and Janzen F. *Using DNA sequencing to determine the identity and geographic origin of an unknown snake in Alaska*. Snake Ecology Group Meeting. Donnelly, ID.
- 2008 **Neuman-Lee LA**, Thol S, Strickland J, Janzen F. *The TREE Program: Bringing Ecological Research to Local Students*. Partners in Amphibian and Reptile Conservation (PARC). Bluegrass, IA.
- 2008 **Neuman-Lee LA** and Janzen F. *Feeding behavior altered by short-term atrazine exposure during incubation in map turtles (Graptemys)*. Research at the Capitol. Des Moines, IA.
- 2007 **Neuman-Lee LA** and Janzen F. *Survivability and Recruitment in Illinois Population of Male Painted Turtles (C. picta)*. Science with Practice. Ames, IA.
- 2007 **Neuman-Lee LA**, Thol S, Strickland J, Janzen F. *The TREE Program: Bringing Ecological Research to Local Students*. Research Experience for Undergraduates (REU). Ames, IA.
- 2006 **Neuman-Lee LA** and Janzen F. *Effects of Atrazine on Map Turtle (Graptemys) Development and Behavior*. Society of Integrative and Comparative Biology. Orlando, FL.
- 2004 **Neuman-Lee LA** and Janzen F. *The Effects of Atrazine on the Performance, Survival, and Behavior of Embryonic Map Turtles (Graptemys)*. Society of Integrative and Comparative Biology, New Orleans, LA.

## **Teaching Experience**

G = Graduate; UG = Undergraduate; H = Honors

### Arkansas State University

- 2022 (Spring) Comparative Animal Physiology Lecture and Lab (UG, H, G)
- 2022 (Spring) Vertebrate Endocrinology (UG, H, G)
- 2021 (Fall) Topical Seminar: Zoonotic diseases
- 2021 (Fall) Histology (UG, H)
- 2021 (Fall) Immunology (UG, G, H)
- 2021 (Spring) Anatomy of a Grant (G)
- 2021 (Spring) Ecophysiology (G)
- 2020 (Spring) Endocrinology (G and UG)
- 2020 (Spring) Herpetology and Lab (UG and H)
- 2019 (Fall) Comparative Animal Physiology (G and UG)
- 2019 (Fall) Immunology (G, H, and UG)
- 2019 (Fall) Topical Seminar: The Biology of Stress (G)
- 2019 (Spring) Ecophysiology (G)
- 2019 (Spring) Topical Seminar: The Microbiome (G)
- 2019 (Spring) Histology and Lab (G and UG)
- 2018 (Fall) Endocrinology (G and UG)
- 2018 (Fall) Immunology (G and UG)
- 2018 (Spring) Herpetology and Lab (G and UG)

2017 (Fall) Immunology (G and UG)

Utah State University

2017 (Spring) Biology and the Citizen Lecture (Intro Bio Non-Majors), Instructor (UG)  
2016 (Fall) Comparative Physiology Lecture, Instructor (G and UG)  
2016 (Spring) Human Physiology, Guest lecture on endocrinology (UG)  
2015 (Fall) Comparative Physiology Lecture, Instructor (G and UG)  
2015 (Spring) Principles of Genetics, Guest lecturer on Mendelian genetics, sex determination and sex-linked characteristics (3 lectures) (UG)  
2014 (Spring) Human Physiology Lab (4 sections), TA (UG)  
2013 (Fall) Comparative Animal Physiology Lab (2 sections), Instructor—designed and developed 3 new labs on crayfish metabolism, snake stress and immune physiology, and osmoregulation in newts and invertebrates (G and UG)  
2013 (Spring) Introductory Lab for Biology Majors II (3 sections), TA (UG)  
2012 (Fall) Comparative Animal Physiology Lab (2 sections), Instructor (G and UG)  
2012 (Spring) Principles of Genetics, Guest lecturer on developmental, evolutionary, immuno-, and population genetics (4 lectures) (UG)  
2011 (Fall) Introductory Lab for Biology Majors I (3 sections), TA (UG)

Eastern Illinois University

2010 (Spring) Biology for Non-Majors Lab (2 sections), Instructor (UG)  
2009 (Fall) Biology for Non-Majors Lab (2 sections), Instructor (UG)  
2009 (Spring) Herpetology Lab (1 section), TA (G and UG)  
2009 (Spring) Biology for Majors Lab (1 section), TA (UG)  
2008 (Fall) Ecology Lab (2 sections), TA (G and UG)

**Mentoring Experience**

2007-2011 Coordinator and designer of Turtle Camp Research and Education in Ecology (TREE) Program, Iowa State University—mentored 20 high school students and 6 undergraduate students through this project

Mentored Students

(Arkansas State University)

*PhD*

Emily Donahue (co-advised with Dr. Than Boves; 2021-present)—TBD  
Natalie Haydt (co-advised with Dr. Emily Bellis; 2021-present)—TBD  
Jennifer Terry (co-advised with Dr. Virginie Rolland; 2021-present)—TBD

*M.S.*

Jennifer Terry (2018-2021)—Tradeoffs among physiological systems in aquatic turtles  
Alyssa Hartzheim (2019-present)—Turtles under acute stress: Immune system tradeoffs in North American freshwater turtles

Emily Field (2019-present)—Immune system tradeoffs in Northeast Arkansas snakes in relation to Snake Fungal Disease

Tristan Bulice (co-advised; 2020-present)—Biotic and abiotic stress factors influencing antler fluctuating asymmetry in white-tailed deer (*Odocoileus virginianus*) of Arkansas

*B.S.*

Sara Brown (2017-2018)—Optimization of estradiol extraction procedures

Colton Rudder (2017-2018)—Volunteered with herpetology collection

Tristan Bulice (2018-2019)—Testosterone and bite force in collared lizards

Johanna Cannon (BRIDGE intern—2018-2020)—Measuring bactericidal ability in malathion-treated chickens

Timothy Tyler (2018-2019)—Identification of antibodies for snake B Cells

Jared Hastings (2018-2019)—Measurement of estradiol levels in gartersnake females

Grant Dawson (2018-present)—Flow cell cytometry of snake blood

Christian Vickrey (2019-2020)—Field examination of turtle populations

Taylor Fiedor (2019-2021)—Snake ecophysiology

Mary (Ambrette) Veach (ABI Intern; 2019-2021)—Immunological characteristics of turtles

Shawn King (ABI Intern; 2019-present)—Immune cell characterization of turtle blood

Meghan Hughes (SUPERB scholar; 2019-present)—Leeches in turtles

Inez Cribbs (2020-present)—Cortisol in deer hair

Ethan Saffle (2020-present)—Herpetology Natural History Collection

Alexandra Gibson (2021-present)—Herpetology Natural History Collection

Katherine Willis (ABI Intern; 2021-present)—Bactericidal ability of water dragon plasma

Isaac Silos (2021-present)—TBD

*Committee Member*

Brittany McCall (PhD; 2017-present)

Amber Spence (MS; 2017-2020)

Cristofer Calvo-Sanchez (MS; 2017-2019)

Emma Martin (MS; 2017-2020)

Jacob Wessels (MS; 2017-2020)

Emily Donahue (MS; 2017-2021)

Benjamin Spitz (MS; 2017-2020)

Kevin Krajcir (MS; 2018-present)

Bradley Krick (MA; 2020-present)

Sankalpa Chakraborty (PhD; 2020-present)

*2010- 2017 (Utah State University)*

Holden Brown—Organ weights in chemically-treated snakes

Landon Felhberg (Teaching scholar)—Glucose levels in recently emerged snakes

Sydney Greenfield—Temperature effects of wound healing in newts

Tyler Hansen—TTX and snake resistance

Zachary Hopkins (Teaching scholar)—Glucose tolerance in snakes  
Heather Skinner (veterinarian student)—Maternal investment and immunity in lizards  
Georgia Kosmala (Brazilian visiting scholar)—Corticosterone levels in larval newts  
Michael Ryan—Effects of temperature on immune function in house snakes  
Eric Sims—Organ weights in chemically-treated snakes  
Austin Spence—Exploring the effect of construction on snake populations  
Marilize Van der Walt—Determining how noise and conspecifics affect lizard stress  
Eleanor Watson—Conspecific choice of scent in male and female snakes

*2008-2010 (Eastern Illinois University)*

Kyle Baumgartner—Fluctuating asymmetry in watersnake neonates  
Iwo Gross—Animal care and laboratory procedures  
Nicholas Kiriazis—Differential habitat selection in watersnakes  
Mary Jo Kocher—Animal care and laboratory procedures  
Jamie Voorhees—Lipid content in livers of atrazine-treated watersnakes

*2008 (Iowa State University)*

Kyndra Lundquist—Hatching synchrony in two species of freshwater turtle

**Research Experience**

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- 2010-2017      *Dissertation Research* Understanding the stress response in reptiles and its effect on endocrine and immune function using hormone and innate immune assays (w/ Susannah French, Utah State University).
- 2008-2010      *Master's Research* Examining link between pregnant female Northern Watersnakes (*Nerodia sipedon*) treated with an endocrine disruptor (atrazine), estradiol fluctuations, and neonate development (w/ Stephen Mullin and Karen Gaines, Eastern Illinois University).
- 2002-2008      *Undergraduate Research Assistant* Studied the impact of the common herbicide, atrazine, on the growth, behavior, and development of the turtles. Worked at "Turtle Camp" in the summers of 2003, 2004, 2006, 2007 and 2008 processing, measuring, marking, trapping, and collecting blood samples from the turtles *Chrysemys picta*, *Emys blandingii*, *Terrapene ornata*, *Chelydra serpentina*, and *Apalone mutica*. Monitored the nesting habits of *C. picta* and processed the laid nests and subsequent eggs. Extracted mDNA and sequenced two different sites (cytb and ND2) of a species of snake (*Thamnophis*) to determine its origin and phylogeographic relationship (w/ Fredric Janzen, Iowa State University).
- 2007      *Science with Practice Research Assistant* Examined population dynamics of painted turtle males using Program MARK (w/ Fredric Janzen, Iowa State University)

- 2007 *NSF Research Experience for Undergraduates Research Assistant* Trapped and marked turtle and snake individuals for long-term capture-mark-recapture projects (w/ Fredric Janzen, Iowa State University)
- 2005 *Fundación SELVA and New Community Project Intern* Catalogued medicinal plants with the aid of two indigenous shamans in Ecuadorian rainforest
- 2004 *Program for Women in Science and Engineering Research Assistant* Performed feeding trials on atrazine-treated turtles *Graptemys ouachitensis* and *Graptemys pseudogeographica* (w/ Fredric Janzen, Iowa State University)
- 2002-2004 *Undergraduate Mentoring in Environmental Biology Research Assistant*

### **Service to Profession**

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- 2021-present Committee Member, Herpetologists' League Distinguished Service to Herpetology Award
- 2022 Judge; American Society of Ichthyologists and Herpetologists Stoye Awards
- 2018-2021 Chair of Diversity and Inclusion Committee; Herpetologists' League
- 2018-2020 Acting Councilor for Herpetologists' League
- 2019 Lead Judge for E.E. Williams Award for Herpetologist's League (Conservation Division)
- 2018 Lead Judge for E.E. Williams Award for Herpetologist's League (Physiology Division)
- 2017 Lead Judge for E.E. Williams Award for Herpetologist's League (Physiology Division)
- 2009-2015 Chair, Herpetologists' League Graduate Committee
- 2011 Committee Member, Meritorious Teaching Award in Herpetology, given by 3 national herpetology societies
- 2010 Committee Member, Meritorious Teaching Award in Herpetology, given by 3 national herpetology societies
- 2006-2008 Student Representative and founder, Iowa State University Chapter of Strategies for Ecology Education, Development and Sustainability (SEEDS) Program (Ecological Society of America)
- 2005-2007 Chair and co-founder, Environmental Committee, Iowa State University
- 2003-2006 Mentor, Biology Education Success Team, Iowa State University

### **Reviewer**

African Journal of Biotechnology; Behavioral Ecology and Sociobiology; Biology Open; Bulletin of Environmental Contamination and Toxicology; Canadian Journal of Zoology; Chemosphere; Ecotoxicology; Ecotoxicology and Environmental Safety; Ethology, Ecology, and Evolution; Ecology and Environmental Safety; Environmental Contamination & Toxicology; Environmental Toxicology and Chemistry; Environmental Pollution; Functional Ecology;

General and Comparative Endocrinology; Herpetologica; Journal of Comparative Physiology B; Journal of Experimental Biology; Journal of Experimental Zoology, Journal of Herpetology; Herpetologica; Mammalian Biology; PLoS ONE; Physiological and Biochemical Zoology

### **Service to University**

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2020-present	Field Station Committee; Department of Biological Sciences
2018-present	Faculty advisor; Science Graduate Student Organization
2018-present	Biology Department Diversity Chair
2018-2020	Breakfast of Champions Committee on Retention
2019	Search Committee Member for Dean of College of Math and Sciences
2014	Biology Graduate Student Association Outreach and Social Committee, Utah State University
2012	Faculty Search Committee, Utah State University
2006	Senator (elected), Government of the Student Body, Iowa State University
2006-2008	Vice-President (elected), Sigma Tau Delta English Honor Society, Iowa State University

### **Community Outreach and Education**

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2021	Society for Integrative and Comparative Biology Meeting Mentor
2020	INBRE Conference Student Judge
2019	HerpetALLolgy Twitter Takeover
2019	Girls in STEM Outreach
2019	Outreach at A-State Childhood Services
2019	Interview for documentary
2018	Valley View Schools Outreach Event at A-State
2018	A-State BioBlitz participant
2018	Women in Science Panel at <i>Silent Sky</i> Production (invited panel discussion)
2018	Girls in Science Outreach
2018	Hispanic Center Outreach
2017	Stokes Nature Center (outreach program)
2017	Venture Academy K-2 (outreach program)
2016	Stokes Nature Center (outreach program)
2016	USU Zoo, Exotics, and Wildlife Veterinarian Club Lecture and Demonstration
2016	Science Unwrapped (outreach program)
2016	Bridgerland Science and Engineering Fair (Intel ISEF Judge)
2015	Venture High School (research adviser)
2015	Thomas Edison Science Fair Judge
2015	Stokes Nature Center (outreach program)
2014	Box Elder High School (guest speaker)
2014	Stokes Nature Center (outreach program)
2014	Science Unwrapped (outreach program)
2014	Cache Youth Resource Center (outreach program)
2014	Thomas Edison Science Fair Judge



2014	Native American Pow Wow at USU (outreach program)
2013	Science Unwrapped (outreach program)
2013	No Child Left Indoors (outreach program)
2013	Bear River Migratory Refuge (outreach program)
2012	No Child Left Indoors (outreach program)
2012	Bear River Migratory Refuge (outreach program)
2011	Edith Bowen Elementary School (outreach program)
2010	Celebration! at Eastern Illinois University (outreach program)
2009	Celebration! at Eastern Illinois University (outreach program)
2009	Thomson Public Library (outreach program)
2008	Thomson Public Library (outreach program)
2007	Boy Scouts of America (outreach program)
2007	Thomson Public Library (outreach program)
2006	Wildlife Care Clinic (volunteer—1 year)
2006	Boy Scouts of America (outreach program)
2006	Thomson Public Library (outreach program)

### **Research in the Media**

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- 2014 USU scientist discusses concerns with EPA's regulation of pesticides. The Herald Journal. September 11, 2014 [http://news.hjnews.com/allaccess/usu-scientist-discusses-concerns-with-epa-s-regulation-of-pesticides/article\\_38d5de4e-3941-11e4-85a7-cbe3b9a9d55d.html](http://news.hjnews.com/allaccess/usu-scientist-discusses-concerns-with-epa-s-regulation-of-pesticides/article_38d5de4e-3941-11e4-85a7-cbe3b9a9d55d.html)
- 2014 Utah Public Radio. September 5, 2014 (Interviewer Evan Hall)
- 2014 Does the EPA favor industry when assessing chemical dangers? Newsweek. September 3, 2014. By Zoe Schlanger. <http://www.newsweek.com/does-epa-favor-industry-when-assessing-chemical-dangers-268168>
- 2010 In field or backyard, frogs face threats. ScienceNews 178(6): 28 by S. Milius. online at [http://www.sciencenews.org/view/feature/id/62649/title/In\\_field\\_or\\_backyard\\_frogs\\_face\\_threats](http://www.sciencenews.org/view/feature/id/62649/title/In_field_or_backyard_frogs_face_threats)

### **Honor Society Memberships**

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Sigma Xi Scientific Research Society  
Phi Sigma Biological Sciences Honor Society  
Sigma Tau Delta English Honor Society

### **Society Memberships**

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The Society for Integrative and Comparative Biology, Society of Environmental Toxicology and Chemistry, Herpetologists' League, American Institute of Biological Sciences, Sigma Xi

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