

# M. Nicholas Musselwhite, PhD

Instructional Assistant Professor & Assistant Director of Online Programs | Department of Neuroscience | College of Medicine

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## EDUCATION

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2020	<b>University of Florida</b> PhD Veterinary Medical Sciences Dissertation Topic: Central and Peripheral Modulation of Reflex Tracheobronchial Cough	Gainesville, Florida
2012	<b>University of North Florida</b> BS Psychology (Minor: Sociology) <i>cum laude</i>	Jacksonville, Florida

## ACADEMIC EMPLOYMENT

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2024 – Present	<i>Assistant Director of Online Programs</i> Department of Neuroscience University of Florida	Gainesville, Florida
2023 – Present	<i>Instructional Assistant Professor</i> Department of Neuroscience University of Florida	Gainesville, Florida
2020 – 2022	<i>Postdoctoral Associate</i> Kentucky Spinal Cord Injury Research Center University of Louisville	Louisville, Kentucky
2020 – 2020	<i>Adjunct Research Associate</i> Department of Physiological Sciences University of Florida	Gainesville, Florida
2014 – 2020	<i>Graduate Student Alumni Fellow</i> Department of Physiological Sciences University of Florida	Gainesville, Florida
2015 – 2017	<i>Graduate Teaching Assistant</i> Department of Physiological Sciences University of Florida	Gainesville, Florida
2013 – 2014	<i>Biological Scientist</i> Department of Physiological Sciences University of Florida	Gainesville, Florida

## PROFESSIONAL MEMBERSHIPS

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2019 - Current	Society for Neuroscience
2014 - Current	American Physiological Society
2011 - 2015	Florida Association of Behavior Analysis
2013 - 2015	Comparative Cognition Society
2013 - 2014	Animal Behavior Society
2011 - 2013	American Psychological Association

## AWARDS & GRANTS

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2019 Phi Zeta Excellence in Doctoral Research Award  
2019 9<sup>th</sup> Annual SfN NCF Chapter Conference Graduate Student Poster Competition First Place  
2018 Phi Zeta Excellence in Basic Science Research Award  
2017 Phi Zeta Annual Research Symposium Best in Show Second Place  
2016 VGSA Travel Award  
2014 UF Alumni Graduate School Fellowship (aka Graduate School Preeminence Award)  
2011 UNF Academic Enrichment Grant  
2005 Florida Medallion Scholar

## TEACHING & MENTORING EXPERIENCE

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### University of Florida, College of Medicine

GMS 6705 Functional Human Neuroanatomy  
GMS 6007 Fundamentals of Neuroscience  
GMS 7795 Homeostasis and the Brain  
GMS 6750 Molecular Pathobiology of Neural Disease  
GMS 6910 Neuroscience Capstone  
BMS 6020 Clinical Neuroscience  
GMS 7795 Neurobiology of Learning and Memory I  
GMS 7795 Neurobiology of Learning and Memory II  
GMS 7795 Neurobiology of Pain

### University of Florida, College of Veterinary Medicine

VEM 5110 Animal Systems I  
    VEM 5010A Endocrinology Histology Lab  
    VEM 5010D Neuroscience/Neuroanatomy & Histology Lab  
VEM 5111 Animal Systems II  
    VEM 5011E Reproduction Histology Lab  
    VEM 5011F Musculoskeletal Histology Lab  
    VEM 5011G Cardiovascular Histology Lab  
    VEM 5011H Respiration Histology Lab  
VEM 5112 Animal Systems III  
    VEM 5011I Renal Histology Lab  
    VEM 5011J Gastrointestinal I Histology Lecture & Lab  
    VEM 5011J Gastrointestinal II Histology Lecture & Lab

### University of North Florida, College of Arts and Sciences

EAB 3013c Foundations of Experimental Analysis of Behavior Lab

### Students Mentored

Michael Frazure	PhD student	University of Louisville
Kellyanna Young	PhD student	University of Louisville
Justin McLeod	undergraduate	Arizona State University

## SERVICE & OUTREACH

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2023 – 2024 Online Masters & Certificate Admissions Committee Member  
2023 Summer Neuroscience Internship Program (SNIP) Admissions Committee Member  
2016 – 2019 Neuroanatomy Instructor for UF Neuroscience Club's Brain Awareness Week  
2017 Summer Health Professions Education Program (SHPEP) Volunteer

## PUBLICATIONS & PRESENTATIONS

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### Publications

1. Poliaček I, Martvon L, Rose MJ, **Musselwhite MN**, Pitts T, Bolser DC. (2025) Changes in Cough Motor Output during Repetitive Mechanical Stimulation of the Tracheobronchial Tree in Cats. *Respiratory Physiology & Neurobiology*. <https://doi.org/10.1016/j.resp.2025.104457>
2. Bolser DC, Shen TY, **Musselwhite MN**, Rose MJ, Hayes JA, Pitts T. (2024) Evidence for peripheral and central actions of codeine to dysregulate swallowing in the anesthetized cat. *Frontiers in Neurology*. <https://doi.org/10.3389/fneur.2024.1356603>
3. Bolser DC, Shen TY, Poliaček I, Rose MJ, **Musselwhite MN**, Kotmanova Z, Martvon L, Davenport PW, Hayes JA, Pitts T. (2024) Influence of Microinjection of Kynurenic acid into the Pre-Botzinger Complex on Swallowing in the Cat. *Physiology*. <https://doi.org/10.1152/physiol.2024.39.S1.1538>
4. **Musselwhite MN**, Shen TY, Rose MJ, Iceman IE, Poliaček I, Pitts T, Bolser DC. (2022) The Influence of CO<sub>2</sub> On Spatiotemporal Features of Mechanically Induced Cough in Anesthetized Cats. *Respiratory Physiology & Neurobiology*. <https://doi.org/10.1016/j.resp.2022.103964>
5. Pitts T, Iceman KE, Huff A, **Musselwhite MN**, Frazure ML, Young KC, Greene CL, and Howland DR. (2022) Laryngeal and swallow dysregulation following acute cervical spinal cord injury. *Journal of Neurophysiology*. <https://doi.org/10.1152/jn.00469.2021>
6. Shen TY, Pertzborn MC, Rose MJ, **Musselwhite MN**, Davenport PW, and Bolser DC. (2022) Influence of Intrathoracic Vagotomy on the Cough Reflex in the Anesthetized Cat. *Respiratory Physiology & Neurobiology*. <https://doi.org/10.1016/j.resp.2021.103805>
7. Shen TY, Poliaček I, Rose MJ, **Musselwhite MN**, Kotmanova Z, Martvon L, Pitts T, Davenport PW, and Bolser DC. (2021) The Role of Neuronal Excitation and Inhibition in the Pre-Böttinger Complex on the Cough Reflex in the Cat. *Journal of Neurophysiology*. <https://doi.org/10.1152/jn.00108.2021>
8. **Musselwhite MN**, Shen TY, Rose MJ, Iceman KE, Poliaček I, Pitts T, and Bolser DC. (2021) Differential Effects of Acute Cerebellectomy on Cough in Spontaneously Breathing Cats. *PLOS ONE*. <https://doi.org/10.1371/journal.pone.0253060>.
9. King SN, Shen TY, **Musselwhite MN**, Huff A, Reed MD, Poliaček I, Howland DR, Dixon W, Morris KF, Bolser DC, Iceman KE, Pitts T. (2020) Swallow Motor Pattern Is Modulated by Fixed or Stochastic Alterations in Afferent Feedback. *Frontiers in Human Neuroscience*. <https://doi.org/10.3389/fnhum.2020.00112>.
10. Reed MD, English M, English C, Huff A, Poliaček I, **Musselwhite MN**, Howland DR, Bolser DC, Pitts T. (2019) The Role of the Cerebellum in Control of Swallow: Evidence of Inspiratory Activity During Swallow. *Lung*. <https://doi.org/10.1007/s00408-018-00192-2>
11. Kotmanova Z, Simera M, Veternik M, Martvon L, Misek J, Jakus J, Shen TY, **Musselwhite MN**, Pitts T, Bolser DC, Poliaček I. (2018) GABA-ergic Neurotransmission in the Nucleus of the Solitary Tract Modulates Cough in the Cat. *Respiratory Physiology & Neurobiology*. <https://doi.org/10.1016/j.resp.2018.02.009>
12. Pitts T, Gayagoy AG, Rose MJ, Poliaček I, Condrey JA, **Musselwhite MN**, Morris KF, Davenport PW, Bolser DC. (2015) Suppression of Abdominal Motor Activity during Swallowing in Cats and Humans. *Plos One*. <https://doi.org/10.1371/journal.pone.0128245>

### Invited Talks

1. **Musselwhite MN**. (2022) From Brain To Breath: The Neural Control of Respiration and Airway Protection. *Biology Department Seminar*. Rocky Mountain College, Billings, Montana

2. **Musselwhite MN.** (2022) Neural Control of Breathing and Airway Protective Behaviors. *Biology department seminar*. Roanoke College, Salem, Virginia
3. **Musselwhite MN.** (2021) Basic Science and Speech Language Pathology. *Research Methods*. University of Louisville, Louisville, Kentucky
4. **Musselwhite MN.** (2018) Of Cats and Men: A Translational Tale. *Center for Respiratory Research and Rehabilitation Respiratory Social & Science*. University of Florida, Gainesville, Florida

## Conference Presentations

1. **Musselwhite MN** (2018) The Influence of CO<sub>2</sub> on Spatiotemporal Features of Mechanically-Induced Coughing in Anesthetized Cats. *Experimental Biology Respiration Section Trainee Breakfast*. San Diego, California
2. **Musselwhite MN.** (2017) Adaptive Mechanisms Governing Tracheobronchial Cough: In Vivo Experiments and Model Simulations. *Center for Respiratory Research and Rehabilitation Annual Retreat*. Gainesville, Florida
3. **Musselwhite MN.** (2016) Adaptive Mechanisms Governing Tracheobronchial Cough: In Vivo Experiments and Model Simulations. *Phi Zeta Annual Research Symposium*. Gainesville, Florida
4. **Musselwhite MN.** (2013) Comparison of Forward and Backward Chaining Procedures, *Third Annual Florida Undergraduate Research Conference*. Gainesville, Florida
5. **Musselwhite MN.** (2012) Comparison Of Training Procedures for Heterogeneous and Homogenous Behavior Chains, *Florida Association of Behavior Analysis Annual Conference*. Jacksonville, Florida

## Posters

1. Bolser DC, Shen TY, Poliacek I, Rose MJ, **Musselwhite MN**, Kotmanova Z, Martvon L, Davenport PW, Hayes JA, Pitts TG. (2024) Influence of Microinjection of Kynurenic acid into the Pre-Botzinger Complex on Swallowing in the Cat. *American Physiology Summit*, Long Beach, CA
2. **Musselwhite MN**, Young K, Frazure M, Greene C, Iceman KE, Pitts T. (2022) The 5-HT<sub>1A</sub> Agonist 8-OH-DPAT Enhances Submental Laryngeal Elevator EMG Amplitude During Swallow. *Experimental Biology*, Philadelphia, PA
3. Frazure M, Young K, **Musselwhite MN**, Greene C, Iceman KE, Pitts T. (2022) Global Dysphagia Scale Detects Swallowing Disorder Following a Clinical Dose of Buprenorphine *Experimental Biology*, Philadelphia, PA
4. **Musselwhite MN**, Frazure M, Young K, Greene C, Iceman KE, Howland DR, Pitts T. (2021) Swallow Synchrony is Restored with a 5HT<sub>1a</sub> Agonist After Cervical Spinal Cord Injury. *Neuroscience*, Chicago, Illinois (Virtual)
  - a. Also presented at *Research!Louisville*, Louisville, KY
5. Frazure M, Young K, **Musselwhite MN**, Greene C, Iceman KE, Pitts T. (2021) Swallowing Disorder Following a Clinical Dose of Buprenorphine in Adult Cats. *Neuroscience*, Chicago, Illinois (Virtual)
6. **Musselwhite MN**, Shen TY, Rose MJ, Poliacek I, Iceman KE, Bolser DC, Pitts T. (2021) Mapping of the Substrate for Production of Swallow and Cough Within the Rostral Nucleus of the Tractus Solitarius (NTS)/Paramedian Reticular Nucleus by Electrical Stimulation. *Experimental Biology*, Virtual
  - a. Also presented at *26th Annual KSCHIRT Symposium*, Virtual
7. Shen TY, Rose MJ, **Musselwhite MN**, Wang W, Bolser DC. (2021) Stimulation of Upper Airway Afferents with Capsaicin and Section of the Superior Laryngeal Nerve Modulate Mechanically Induced Coughing from the Tracheobronchial Airways in Male But Not Female Cats. *Experimental Biology*, Virtual
8. Mellen N, Gourévitch B, Cai J, **Musselwhite MN**, Iceman KE, Pitts T. (2021) Large-scale Optical Recording of Respiration-modulated Neurons in Ventrolateral Medulla Reveals Cycle-to-cycle Variability Compatible with Multifunctionality. *Experimental Biology*, Virtual
9. **Musselwhite MN**, Shen TY, Rose MJ, Reed MD, Poliacek I, and Bolser DC. (2019) The Role of the Cerebellum on the Control of Tracheobronchial Cough in Spontaneously Breathing Cats. *Experimental Biology*, Orlando, Florida

10. Bolser DC, Shen **TY**, **Musselwhite MN**, Rose MJ, Davenport PW, Morris KM, and Pitts T. (2019) Influence of Codeine on Swallow in the Anesthetized Cat: Evidence for Peripheral and Central Actions of Opioids to Induce Dysregulation of Deglutition. *Experimental Biology*, Orlando, Florida
11. Shen TY, Poliacek I, Martvon L, **Musselwhite MN**, Rose MJ, Morris KM, and Bolser DC. (2019) Microinjection of Gabazine and Kynurenic Acid into the PreBötzinger Complex Alter Cough Phase Durations in the Cat. *Experimental Biology*, Orlando, Florida
12. Rose **MJ**, Shen TY, **Musselwhite MN**, Davenport PW, and Bolser DC. (2019) Role of Vagal Pathways in the Respiratory Depressant Effect of Codeine on Breathing in the Anesthetized Cat. *Experimental Biology*, Orlando, Florida
13. **Musselwhite MN**, Shen TY, Rose MJ, Watts J, and Bolser DC. (2018) The Influence of CO<sub>2</sub> on Spatiotemporal Features of Mechanically-induced Coughing in Anesthetized Cats. *Experimental Biology*, San Diego, California
14. Shen TY, Poliacek I, Kotmanova Z, **Musselwhite MN**, Rose MJ, and Bolser DC. (2018) Evidence that the preBotzinger Complex Does Not Participate in Cough Rhythmogenesis in the Anesthetized Cat. *Experimental Biology*, San Diego, California
15. Fullerton AL, Shen TY, **Musselwhite MN**, Rose MJ, Davenport PW, Morris KF, and Bolser DC. (2018) Multiple Abdominal Burst Patterns Observed During Tracheobronchial Coughing in Anesthetized Cats. *Experimental Biology*, San Diego, California
16. Bolser DC, Shen TY, Rose MJ, **Musselwhite MN**, and Davenport PW. (2017) Influence of Intrathoracic Vagotomy on the Cough Reflex in the Anesthetized Cat. *Experimental Biology*, Chicago, Illinois
17. Shen TY, Morris KF, Baekey DM, **Musselwhite MN**, Segers LG, Nuding S, Rose MJ, Lindsey BG, and Bolser DC. (2017) Distributed Networks of Medullary Tonic Expiratory Neurons Regulate Cough Motor Drive. *Experimental Biology*, Chicago, Illinois
18. Rose MJ, Shen TY, **Musselwhite MN**, Pitts TG, and Bolser DC. (2017) Sex Differences in Cough Responses of Cats. *Experimental Biology*, Chicago, Illinois
19. **Musselwhite MN**, Pitts TE, Morris KF, Shen TY, Davenport PW, and Bolser DC. (2016) Adaptive Mechanisms Governing Tracheobronchial Cough: In Vivo Experiments and Model Simulations. *Experimental Biology*, San Diego, California
  - a. Also presented at *Science by the Shore* St. Augustine, Florida 2017
  - b. Also presented at *9<sup>th</sup> Annual SfN NCF Chapter Conference* Gainesville, Florida 2019
20. Shen TY, Gestreau C, **Musselwhite MN**, Rose MJ, Pitts TE, Morris KF, Lindsey BG, Davenport PW, and Bolser DC. (2016) Frequency Dependent Inhibitory Mechanisms Controlling the Laryngeal Adductor Response (LAR). *Experimental Biology*, San Diego, California
21. King S, Bolser DC, Rose MJ, Poliacek I, Shen TY, **Musselwhite MN**, and Pitts T. (2016) Influence of Electrical and Natural Stimulation of Pharyngeal/Laryngeal Sensory Afferents on the Swallow Motor Pattern. *Experimental Biology*, San Diego, California
22. **M Musselwhite** Pitts T, Shen TY, Rose MJ, Poliacek I, Morris KF, Davenport PW, and Bolser DC. (2015) Cough-Induced Hyperventilation Does Not Elicit Prolonged Apnea During The Cough-to-Eupnea Transition Period. *Experimental Biology*, Boston, Massachusetts
23. Shen TY, **Musselwhite MN**, Rose MJ, Bolser DC, and Pitts T. (2015) Effects of Tracheal Distension on Upper Airway Reflex Responsiveness in Cat. *Experimental Biology* Boston, Massachusetts
24. **Musselwhite MN** and Iverson I. (2013) Comparison of Forward and Backward Chaining Procedures, *Florida Undergraduate Research Conference*, Gainesville, Florida

## PORTFOLIOS AND SOCIAL MEDIA HYPERLINKS

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