

# Curriculum Vitae

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[PUBMED Bibliography](#)

## Education

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2013-Current Ph.D., University of Tennessee Health Science Center  
Department of Anatomy and Neurobiology, intended graduation: August 2019  
Advisor: Max L. Fletcher  
Dissertation: Aversive learning-induced odor transformations in the olfactory bulb: Investigating the link between behavioral generalization and sensory plasticity  
*Classical fear learning often results in learned fear to the conditioned stimulus as well as fear generalization, expansion of fear responses to neutral, unconditioned stimuli. Generalization might indicate fear learning-induced increases in perceptual similarity, specifically in sensory processing regions. My current research employs wide-field and 2-photon calcium imaging of the main olfactory bulb of awake mice to investigate how olfactory stimuli are encoded by different cell types before and after single-day fear learning and ultimately how this relates to behavior. Other approaches include in vivo pharmacology/optogenetics and molecular biology to understand circuits involved in learning-induced sensory plasticity.*

2009-2013 B.S., University of North Georgia, Dahlonega, GA  
Major: Psychological Science  
Minor: Biology

## Research

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### Current Research Funding

2017 Fear learning-induced transformations of olfactory bulb odor representations and behavioral generalization (F31DC016485)

Funding Agency: National Institute on Deafness and Other Communication Disorders (NIDCD)  
Project Dates: 07/01/2017 to 06/30/2019

### Publications:

1. Shanks, R.A., **Ross, J.M.**, Doyle, H.H., Helton, A.K., Picou, B.D., Schulz, J., Tavares, C., Bryant, S., Dawson, B.L., & Lloyd, S.A. Adolescent exposure to cocaine, amphetamine, and methylphenidate cross-sensitizes adults to methamphetamine with drug- and sex-specific effects. *Behavioural Brain Research* (281):116-24. doi: 10.1016/j.bbr.2014.12.002
2. Rao, S.K., **Ross, J.M.**, Harrison, F.E., Bernardo, A., Reiserer, R.S., Reiserer, R.S., Modley, J.A., & McDonald, M.P. Differential proteomic and behavioral effects of long-term voluntary exercise in wild-type and APP-overexpressing transgenics. *Neurobiology of Disease* (78):45-55. doi: 10.1016/j.nbd.2015.03.018
3. McAfee, S.S., Ogg, M.C., **Ross, J.M.**, Liu, Y., Fletcher, M.L., & Heck, D.H. Minimally invasive highly precise monitoring of respiratory rhythm in the mouse using an epithelial temperature probe. *Journal of Neuroscience Methods*. 263:89-94. doi: 10.1016/j.jneumeth.2016.02.007
4. **Ross, J. M.**, & Fletcher, M. L. (2018). Learning-Dependent and -Independent Enhancement of Mitral/Tufted Cell Glomerular Odor Responses Following Olfactory Fear Conditioning in Awake Mice. *The Journal of Neuroscience*, 38(20), 4623-4640. doi: 10.1523/jneurosci.3559-17.2018
5. Ogg, M. C., **Ross, J. M.**, Bendahmane, M., & Fletcher, M. L. Olfactory bulb acetylcholine release dishabituates odor responses and reinstates odor investigation. *Nature Communications*, 9(1). doi: 10.1038/s41467-018-04371-w
6. **Ross, J. M.**, & Fletcher, M. L. (2018). Aversive learning-induced plasticity throughout the adult mammalian olfactory system: Insights across development. *Journal of Bioenergetics and Biomembranes*, doi: 10.1007/s10863-018-9770-z
7. **Ross, J. M.**, & Fletcher, M. L. (2018). Assessing Classical Olfactory Fear Conditioning by Behavioral Freezing in Mice. *Bio-protocol*, 8(18): e3013. doi: 10.21769/BioProtoc.3013.

### Research Honors and Awards:

1. Faculty – Undergraduate Summer Engagement Grant for Undergraduate Research, *Center for Undergraduate Research and Creative Arts*. 2012
2. First Place – Psychology, Sociology, Biology, and Business Panel, *North Georgia 18<sup>th</sup> Annual Research Conference*. 2013
3. Steve Noble Undergraduate Research Award, *Department of Psychological Scienc*2. 2013
4. Neuroscience Institute Travel Award. 2016
5. Neuroscience Institute Travel Award. 2017
6. Neuroscience Institute Travel Award. 2018
7. College of Graduate Health Sciences Travel Award. 2018

### Poster Presentations:

1. Smudde, R., **Ross, J.M.**, Dawson, B.L., Racial bias in mock juror decisions involving sexual harassment of African Americans and Latinas: An analysis of perceptions of the defendant. Georgia Sociological Association Conference. Dahlonega, GA.
2. Tavares, C., Schulz, J., **Ross, J.M.**, Helton, A.K., Lloyd, S.A., & Shanks, R.A. Does Adolescent Exposure to Methylphenidate Elicits Changes in  $\Delta$ FosB expression? A Possible Underlying Mechanism of Cross-Sensitization. North Georgia Annual Research Conference, Dahlonega, GA.
3. Helton, A.K., **Ross, J.M.**, Schulz, J., Lloyd, S.A., & Shanks, R.A. (2013) Quantitative PCR analysis of the effects of methamphetamine abuse on the expression of the PRX family of proteins in dopaminergic regions of the brain. North Georgia Annual Research Conference. Dahlonega, GA.
4. Schulz, J., Tavares, C., **Ross, J.M.**, Helton, A.K., Lloyd, S.A., & Shanks, R.A. BDNF expression in adolescent mice after chronic methylphenidate exposure. Association of Southeastern Biologists. Charleston, WV.
5. Tavares, C., Schulz, J., **Ross, J.M.**, Helton, A.K., Lloyd, S.A., & Shanks, R.A. Does Adolescent Exposure to Methylphenidate Elicits Changes in  $\Delta$ FosB expression? A Possible Underlying Mechanism of Cross-Sensitization. Association of Southeastern Biologists. Charleston, WV.
6. **Ross, J.M.**, Dawson, B.L., & Tran, N.M. If “we do” then “I can’t”: Discrimination and career mobility of same-race and interracial applicants. North Georgia Annual Research Conference. Dahlonega, GA.
7. **Ross, J.M.** & Fletcher, M.L. Non-selective enhancement of olfactory bulb glomerular responses following olfactory fear conditioning in awake behaving mice. Association for Chemoreception Sciences. Bonita Springs, FL.
8. **Ross, J.M.** & Fletcher, M.L. Classical olfactory fear conditioning non-selectively enhances olfactory bulb glomerular responses in awake behaving mice. Society for Neuroscience. San Diego, CA.
9. **Ross, J.M.** & Fletcher, M.L. Distinct circuits mediate glomerular enhancements for trained and untrained stimuli following aversive conditioning. Association for Chemoreception Sciences. Bonita Springs, FL.
10. **Ross, J.M.** & Fletcher, M.L. Visualizing cholinergic signaling in the olfactory bulb. Association for Chemoreception Sciences. Bonita Springs, FL.
11. **Ross, J.M.** & Fletcher, M.L. Learning-dependent and –independent enhancement of olfactory bulb odor responses following olfactory fear conditioning in awake mice. Society for Neuroscience. San Diego, CA.

#### Oral Presentations:

1. **Ross, J.M.**, Helton, A.K., Lloyd, S.A. & Shanks, R.A. FUSEing behaviours and mechanisms. North Georgia Faculty-Undergraduate Summer Engagement Presentation. Dahlonega, GA.
2. Helton, A.K., **Ross, J.M.**, Schulz, J., Lloyd, S.A., & Shanks, R.A. (2013) Quantitative CR analysis of the effects of methamphetamine abuse on the expression of the PRX family of proteins in dopaminergic regions of the brain. Association of Southeastern Biologists. Charleston, WV.
3. **Ross, J.M.**, Doyle, H.H., Picou, B.D., Schulz, J., Tavares, C., Bryant, S., Helton, A.K., Lloyd, S.A., Shanks, R.A., & Dawson, B. L. The effects of adolescent exposure to psychostimulants on cross-sensitization to methamphetamine in adulthood are drug and sex specific. North Georgia Annual Research Conference. Dahlonega, GA.

4. **Ross, J.M.**, Doyle, H.H., Picou, B.D., Schulz, J., Tavares, C., Bryant, S., Helton, A.K., Lloyd, S.A., Shanks, R.A., & Dawson, B. L. The effects of adolescent exposure to psychostimulants on cross-sensitization to methamphetamine in adulthood are drug and sex specific. Association of Southeastern Biologists. Charleston, WV.

### Society Memberships:

American Association for the Advancement of Science  
 Society for Neuroscience  
 Association for Chemoreception Sciences  
 Psi Chi  
 Omicron Delta Kappa

## Teaching

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### Formal Teaching:

#### *Undergraduate Teaching:*

PSYC/BIOL 4230L	Neuroscience Lab Assistant for Undergraduates	Spring 2013
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#### *Graduate Teaching:*

ANAT 841	Behavioral Neuroscience, Topic: Aversive learning	Fall 2018
DANA 103	Neuroanatomy Lab Assistant for D1 Dental Students	2017-2018
ANAT 442	Neuroanatomy Lab Assistant for Occ. Therapy Students	2015-2018
NEUR 212	Neuroanatomy Lab Assistant for M2 Medical Students	2015-2019

### Seminars and Lectures:

1. Brain Awareness Week Special Topic: *Flavor through Integration of Taste and Smell*, 7<sup>th</sup> and 8<sup>th</sup> grade, Bellevue Middle School, Memphis, TN. 2015
2. Brain Awareness Week Special Topic: *Evolution of Neuroanatomy for Sensory Systems*, 7<sup>th</sup> and 8<sup>th</sup> grade, Bellevue Middle School, Memphis, TN. 2015
3. AChemS Community Outreach Special Topic: *We eat with our eyes: The effect of visual cues on flavor perception*, 3<sup>rd</sup> grade, Franklin Park Elementary School, Fort Myers, FL. 2016
4. UTHSC Brain Awareness Day: Drugs change the brain, but not in a good way. Community outreach event open to high schoolers. Memphis, TN. 2016
5. Special Topic: *What does the brain know and how do we know?: Historical and anatomical perspectives*. Honors Anatomy and Physiology (11<sup>th</sup> and 12<sup>th</sup> grades) classes, St. Benedict at Auburndale, Cordova, TN. 2017
6. AChemS Community Outreach Special Topic: *What does your nose know about taste?*, 3<sup>rd</sup> grade, Imaginarium Hands on Museum and Aquarium, Fort Myers, FL. 2017
7. Special Topic: *What does the brain know and how do we know?: Understanding and applying the scientific method*. Biology Plus (10<sup>th</sup> grade) & Honors Anatomy and Physiology (11<sup>th</sup> and 12<sup>th</sup> grades) classes, St. Benedict at Auburndale, Cordova, TN. 2018

8. AChemS Community Outreach Special Topic: *What does your nose know about taste?*, 3<sup>rd</sup> grade, Imaginarium Hands on Museum and Aquarium, Fort Myers, FL. 2018

**Supervisory Training:**

*High school students:*

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| 2018 | Madeline Matheson, from St. Benedict at Auburndale, currently pursuing B.S. Chemical Engineering at Auburn University |
| 2017 | Meghan Tuttle, from St. Benedict at Auburndale, currently pursuing B.S. in Biology at University of Mississippi       |