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EDUCATION & RESEARCH EXPERIENCE

Postdoctoral Research Associate October 2021 - present

Advisor: Dr. John R. Carlson

Yale University
Department of Molecular, Cellular, Developmental Biology
New Haven, CT 06511

Doctorate of Philosophy in Biology August 2015 - August 2021

Dissertation Advisor: Dr. Andrew M. Dacks

West Virginia University
Department of Biology
Morgantown, WV 26505

Bachelor's of Science in Biology August 2010 - May 2014

***Minor in Psychology**

West Virginia University
Morgantown, WV 26505

Supplementary Education & Certifications

CSHL Neurobiology of Drosophila: Genes, Brains & Behavior June 2018

Cold Spring Harbor Laboratory
Cold Spring Harbor, NY 11724

SCIENTIFIC INTERESTS & PHILOSOPHY

My general research interests are to understand: **(1)** how is the external world internalized and represented by the brain; **(2)** how does the brain generate behavior; and, **(3)** what are the general principles of neural flexibility. To pursue these interests, I combine the genetically-tractable and compact nervous system of *Drosophila*, powerful molecular approaches, as well as innovative approaches for behavioral analysis. Ultimately, I wish to establish my own research group that uses these tools to resolve: **(1)** how the brain processes and integrates distinct streams of sensory system input and activity to generate behavior; **(2)** how the actions of neuromodulators within individual modalities alters their integration with other modalities and what behavioral programs are executed; and, **(3)** what principles of operation and neuromodulation of sensory integration are shared/differ across metazoa.

PUBLICATIONS

§ Co-first authors/equal contributors.

Julius Jonaitis, Mohd F.E.B. Mazri, John W. Hageter, Oliver M. Cook, **Tyler R. Sizemore**, Marryn M. Bennett, Jacob D. Ralston, Farzaan Salman, Emma J. Fletcher, Danielle E. Matheny, Johnston Renton, Keshav L. Ramachandra, Eric J. Horstick, Andrew M. Dacks. (2025) Differential modulation of feedforward inhibition reflects topographic organization in the olfactory system. *Nature Communications* (*in press*)

§Farzaan Salman, §Julius Jonaitis, Jacob D. Ralston, Oliver M. Cook, Marryn M. Bennett, **Tyler R. Sizemore**, Keshav L. Ramachandra, Kaylynn E. Coates, Jessica L. Fox, Andrew M. Dacks. (2025) Connectivity of serotonin neurons reveals a constrained inhibitory subnetwork within the olfactory system. *bioRxiv* 2025.08.19.671125; doi: https://doi.org/10.1101/2025.08.19.671125.

Tyler R. Sizemore and John R. Carlson. (2023) Pain: The agony and the AstC. Dispatch. *Current Biology* 33(12):R695-697. doi: 10.1016/j.cub.2023.05.029.

Tyler R. Sizemore, Julius Jonaitis, and Andrew M. Dacks. (2023) Heterogeneous receptor expression underlies non-uniform peptidergic modulation of olfaction in *Drosophila*. *Nature Communications* **14**, 5280. doi: 10.1038/s41467-023-41012-3.

- Accompanying Data Repository: https://zenodo.org/records/8127341
- Accompanying Code Repository: https://github.com/tsizemo2/Sizemoreetal2023

§Julius Jonaitis, §Mohd F.E.B. Mazri, **Tyler R. Sizemore**, Jacob D. Ralston, Farzaan Salman, Emma J. Fletcher, Danielle E. Matheny, Keshav L. Ramachandra, Andrew M. Dacks. (2023) Stimulus-specific modulation is enabled by differential serotonin receptor expression. *bioRxiv* 546011 doi: 10.1101/2023.06.21.546011.

Tyler R. Sizemore. (2021) The receptor basis of serotonergic modulation in an olfactory network. *Dissertation* doi: 10.33915/etd.8318.

§Maureen M. Sampson, §Katherine M. Myers-Gschweng, Ben J. Hardcastle, Shivan L. Bonanno, **Tyler R. Sizemore**, Rebecca C. Arnold, Fuying Gao, Andrew M. Dacks, Mark A. Frye, David E. Krantz. (2020) Serotonergic modulation of visual neurons in *Drosophila melanogaster*. *PLOS Genetics* 16(8):e1009003; doi: 10.1371/journal.pgen.1009003.

Tyler R. Sizemore, Laura M. Hurley, and Andrew M. Dacks. (2020) Serotonergic modulation across sensory modalities. *Journal of Neurophysiology* 123(6), 2406-25; doi:10.1152/jn.00034.

Tyler R. Sizemore and Andrew M. Dacks. (2020) Circadian Clocks: Mosquitoes master the dark side of the room. Dispatch. *Current Biology* 30(16); doi:10.1016/j.cub.2020.06.069.

Tyler R. Sizemore and Andrew M. Dacks. (2016) Serotonergic modulation differentially targets distinct network elements within the antennal lobe of *Drosophila melanogaster*. *Scientific Reports* 6, 37119; doi:10.1038/srep37119.

Andrew M. Dacks, Ayad Auda, Kaylynn E. Coates, and **Tyler R. Sizemore**. (2016) A functional atlas of serotonin receptor expression in the antennal lobe. *Chemical Senses* 41(9): E140-E141.

Adam T. Majot, **Tyler R. Sizemore**, Mohna B. Bandyopadhyay, Lucas M. Jozwick, and Ashok P. Bidwai. 'Protein kinase CK2, a window into the post-translational regulation of the E(spl)/HES repressors from invertebrates and vertebrates.' *Protein Kinase CK2 Cellular Function in Normal and Disease States*. Ed. Khalil Ahmed, Olaf-Georg Issinger, and Ryszard Szyszka:Springer International, 2015. Print.

TEACHING EXPERIENCE

† Student evaluations of instructor (SEIs) available upon request.

***** Solely responsible for preparing all teaching materials, quizzes, and exams.

Invited Lectures

"Big Discoveries in a Tiny Brain", Neurogenetics and Behavior (WVU BIOL474) November 2019
Honor's Cellular Biology Add-On "Drosophila Module" (WVU BIOL298B) October 2018-November 2018

Graduate Teaching Assistantship (WVU Department of Biology)

Principles of Biology (BIOL115) May 2014-July 2014, August 2014-December 2014
Introductory Physiology (BIOL117) July 2014-August 2014
† Honors Introductory Biology Add-On (BIOL298A) August 2015-December 2015
† Cellular Biology (BIOL219) August 2015-December 2015
†***** Molecular Genetics (BIOL324) January 2015-May 2015, January 2016-May 2016, January 2017-May 2017

Peer-Led Team Learning Leader (WVU Department of Chemistry) August 2013-May 2014

Organic Chemistry tutor for ~10 students across multiple sections.

MENTORING EXPERIENCE

¶ 1st generation college student.

* Under-represented minority in STEM.

Graduate students

Bibhu Simkhada (*FlyCROSS* mentee)
¶* Malia Miller

Undergraduate students

¶* Savannah Lusk
Ian McCulloch
¶ Scott Arbet

CONFERENCE ATTENDANCE, PRESENTATIONS & POSTERS

Oral presentations & invited talks

2025 "Dynamic action selection during *Drosophila* feeding behaviors", Virginia Tech School of Neuroscience (Invited Talk)
2017 "CRISPR in *Drosophila*", 2017 NIH IDeA Southeast Regional Conference (Presentation)

Poster presentations

2019 "Peptidergic Modulation of Olfactory Processing" CSHL Neurobiology of Drosophila Conference (Poster)
2017 "Mapping serotonergic circuits in the optic lobe of *Drosophila melanogaster*" Cold Spring Harbor Laboratories Neurobiology of *Drosophila* (Poster)
2016 "A functional atlas of serotonin receptor expression in the Antennal Lobe" 17th International Symposium on Olfaction and Taste (Poster)
2016 "Receptor Basis of Serotonergic Modulation in an Olfactory Circuit" GSA's Allied Genetics Conference (Poster)
2016 "Serotonergic Modulation of Inhibitory Input to Lateral Horn Affects Odor-Mediated Attraction in *D. melanogaster*" Society for Neuroscience (Poster)
2015 "Spatiotemporal Expression of 5-HT1A in the Antennal Lobe of *D. melanogaster*" WVU Biology Retreat (Poster)
2015 "Serotonergic modulation of Ventral Projection Neurons in the Olfactory System of *Drosophila*" WVU Neuroscience Retreat (Poster)

Attendance/participation

2022 3rd Annual ISCE/APACE Joint Meeting: Frontiers in Chemical Ecology Symposium (Attendee)
2022 Columbia Neuronal Ensembles Conference 2022 (Attendee)
2021 Yale Kavli Workshop – Neuromodulation (Attendee)
2021 CSHL Neurobiology of Drosophila Conference (Attendee)
2021 Functional Logic of Neural Circuits: Diamonds in the Rough (Attendee)
2020 Picower Institute Fall Symposium - Internal States of the Brain (Attendee)
2020 International Symposium on Olfaction and Taste (Attendee)
2020 NIH BRAIN Initiative Investigators Meeting (Attendee)
2020 Columbia Workshop on Brain Circuits, Memory and Computation (Attendee)

HONORS & AWARDS

Eberly College of Arts & Sciences Conference Travel Award ($400USD)	August 2018
Eberly College of Arts & Sciences Doctoral Research Mini-grant ($550USD)	October 2017
WVU Biology Department: Most Productive Graduate Student ($1,000USD)	April 2017
Eberly College of Arts & Sciences Doctoral Research Mini-grant ($550USD)	March 2017
Eberly College of Arts & Sciences Conference Travel Award ($900USD)	May 2016
Eberly College of Arts & Sciences Doctoral Research Mini-grant ($550USD)	February 2016
WVU Biology Department: Most Productive Graduate Student ($1,000USD)	April 2015
Grant-In-Aid of Research from Sigma Xi, The Scientific Research Society ($1,750USD)	January 2015
West Virginia PROMISE Scholarship	August 2010

OUTREACH

Positions

CSHL Neurobiology of Drosophila Course Alumni Social Media Coordinator	June 2019-August 2022

Panels, Exhibitions, and Presentations

"Spineless", Yale Peabody Museum, Exhibit Contributor, 2025
Alumni Q&A panel, BGSA, WVU Department of Biology, 2025, 2022
"Meet a scientist", Virtual Q&A, BIOL0145 Middlebury College, 2025
"Genetic inheritance: from Genotype to Phenotype", 7th grade science, Holy Family Academy, 2025
Postdoc Recruitment Event, Virtual Q&A, Yale University, 2024
"Meet a scientist", Virtual Q&A, BIOL0145 Middlebury College, 2021
Florida Atlantic University Summer REU program, Graduate School Information Panel, 2020
Day of Biology Tour, Lab Tour Host, 2018
"Why 17 years? Looking for answers in Cicada Brains" Magicicada Day, WVU Arboretum, 2016
WVU Student Support Services/TRiO Graduate School Information Panel, 2017
"Genomic Surgery: The CRISPR-Cas System" WVU, Department of Biology, 2014

ACADEMIC SERVICE

Ad hoc Peer-Reviewer

European Journal of Neuroscience (since August 2022), eLife (since August 2025)

Peer-Review Experience with Supervisor

Current Biology	February 2023, June 2020
Journal of Neuroscience	June 2022, December 2018
Proceedings of the National Academy of Sciences (PNAS)	October 2021
Scientific Reports	September 2019
Cell Reports	June 2019

Within-Department Service

Host, Dr. Yvette Fisher, WVU Biology Colloquium series	December 2020
In vivo Calcium Imaging Clinic	May 2019
WVU Biology Intradepartmental Peer Mentor	August 2018

Extramural Service

FlyCROSS mentor, Genetics Society of America	Current
CSHL Neurobiology of Drosophila Course Alumni Social Media Coordinator	June 2019-August 2022

ORGANIZATION MEMBERSHIPS

Sigma-Xi Scientific Research Society	January 2023-Current
National Postdoctoral Association	October 2021-Current
Flywire Tracing Consortium	August 2021-Current
Full Adult Fly Brain (FAFB) Tracing Consortium	July 2020-Current
Genetics Society of America	May 2014-Current
Society for Neuroscience	October 2016-2018
Elected to Sigma-Xi Scientific Research Society	February 2015
West Virginia University Swimming & Diving Team	August 2010-May 2013

PRESS

"*WVU biologist receives $1.3 million NIH grant to examine fruit flies' olfactory systems*," Kristen Uppercue, WVU ECAS	July 2018
"*When science and art collide*," Kristen Uppercue, WVU ECAS	January 2018
"*Mood Swings*" Whole mount *Drosophila* central brain, Interstellate, Volume 2	November 2017
Student spotlight by the Blanchette Rockefeller Neurosciences Institute	August 2017

VOLUNTEER WORK EXPERIENCE

Final Exam Cram – Student Affairs WVU (Morgantown, WV)	2014
The Ronald-McDonald House (Morgantown, WV)	2012-2014
Relay for Life at WVU, Logistics officer (Morgantown, WV)	2013-2014
Habitat for Humanity (Morgantown, WV)	2011
YMCA Swim Lessons (Beckley, WV)	2008-2010