

Benjamin A. Schwartz
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Education

University of Arizona, Ph.D: Neuroscience
2016- Expected Spring 2021

University of Arizona: Graduate Certificate in College Teaching
2017- Expected Spring 2021

University of California, Los Angeles, B.S: Neuroscience
2012-2016

Research Experience

-Graduate Student in Neuroscience at the University of Arizona, Laboratory of Prof. Shaowen Bao, PhD: Spring 2017-Present

- First project: The goal is to study the role of DNA methylation as a molecular mechanism for closure of the critical period. The project entailed epigenetically modifying adult mice and accessing the effect on auditory cortical map plasticity, cellular physiology and cortical gene expression.
- Second project: The goal is to understand mechanisms by which traumatic brain injury can lead to increased plasticity within the central nervous system. The work entails inducing hearing lesions in mice and accessing the effect on auditory cortical map plasticity in wild-type and TNF-alpha knockout mice.
 - Techniques utilized include: Pharmacological intra-peritoneal injections, Electrophysiological recordings and analysis, immunohistochemistry, microscopy, RT-PCR, methylated DNA dot blot, noise-induced hearing lesions, Auditory brainstem response measurements, behavioral manipulations and analysis, and animal colony husbandry.

-Graduate Student in Neuroscience at the University of Arizona, Laboratory of Prof. Carol Barnes, PhD: Fall 2016

- The goal of the project was to investigate the learning capabilities of aged rats on a spatial alternation learning task. The work entailed behaviorally yoking pairs of aged and young rats, then establishing an automated version of the W-maze for the animals to learn.
 - Techniques utilized include: Animal husbandry, Morris Water Maze, cheeseboard maze, novel-object recognition, W-maze, coding in python and R, animal dissections.

-Research Assistant in Integrative Biology and Physiology at the University of California, Los Angeles, Laboratory of Prof. Stephanie White, PhD: Fall 2012-Summer 2016

- The goal of the project was to understand whether behavioral regulation of reelin signaling within the basal ganglia, is specific to vocal learners. The work entailed characterizing the expression of the neuronal migration protein, reelin, within the basal ganglia of zebra finch.
 - Techniques utilized include: Cryo-sectioning, micro-dissection, protein assay, SDS-PAGE, immunohistochemistry, microscopy, behavioral analysis and animal colony husbandry.

-Research Assistant in Cellular and Molecular Medicine at the University of Arizona, Tucson AZ, Laboratory of Prof. Jil Tardiff, MD, PhD: Summer 2012

- The goal of the project was to characterize the mutation-induced conformational changes in cardiac Troponin T protein that have been linked to Hypertrophic Cardiomyopathy. The work entailed purification of sarcomere protein, Troponin T, for FRET analysis.
 - Techniques utilized include: Bacterial Expression of Troponin T, Protein precipitation using ammonium sulfate, anion exchange chromatography, SDS-PAGE, and TR-FRET analysis

Teaching Experience and Training

-Co-Teaching NROS 310 (Cell and Molecular Biology of Neurons): Spring 2021

-Graduate Certificate in College Teaching: Fall 2018-Spring 2021

- Multi-semester program that trains graduate students on the fundamentals of learner centered teaching, and modern teaching philosophies grounded in evidence based learning. Courses taken include:
 - a) IA 697a- Learner Centered Teaching
 - b) IA 697b- Using Technology in Teaching
 - c) IA 697p- College Teaching Practice

-Diversity in the Classroom Certificate: Spring 2019

- Workshop series dedicated to training educators on how to create more inclusive classrooms. Workshops attended include:
 - a) Serving Our International Students: Perspectives on Different Classroom Expectations
 - b) Designing Effective Courses for Diverse Learners
 - c) Microaffirmations for Student Success
 - d) Reducing Unconscious Bias & Micro-Aggressions in the Classroom

- Teaching Assistant NROS 308 (Cellular Neurophysiology): Fall 2019-Fall 2020
 - Lab class that utilizes a computer program to teach the basics of electrophysiology. Responsibilities included in person instruction and guiding lab groups through assignments.
- Teaching Assistant NROS 430 (Neurogenetics): Spring 2018-Spring 2020
 - An upper division course that teaches the fundamentals of genetics, and then applies those principles to techniques in neuroscience and understanding the genetic component of neurological diseases. Responsibilities included leading discussion sections, writing weekly quizzes, grading and occasionally leading lectures.

Publications

- 1) **Schwartz, B. A.**, Wang, W., & Bao, S. (2020). Pharmacological DNA Demethylation Weakens Inhibitory Synapses in the Auditory Cortex and Re-opens the Critical Period for Frequency Map Plasticity. *Neuroscience*, 440, 239–248. <https://doi.org/10.1016/j.neuroscience.2020.05.056>
- 2) Kapellusch A.J., Lester, A.W., **Schwartz, B.A.**, Smith, A.C., Barnes, C.A. (2018). Analysis of learning deficits in aged rats on the W-track continuous spatial alternation task. *Behavioral Neuroscience*. 132(6): 512-519. DOI: 10.1037/bne0000269
- 3) Fraley, E. R., Burkett, Z. D., Day, N. F., **Schwartz, B. A.**, Phelps, P. E., & White, S. A. (2016). Mice with Dab1 or Vldlr insufficiency exhibit abnormal neonatal vocalization patterns. *Scientific Reports*, 1–12. DOI: 10.1038/srep25807
- 4) McConnell, M., Grinspan, L. T., Williams, M. R., Lynn, M. L., **Schwartz, B. A.**, Fass, O. Z., Schwartz, S.D., Tardiff, J. C. (2017). Clinically Divergent Mutation Effects on the Structure and Function of the Human Cardiac Tropomyosin Overlap. *Biochemistry*, 56, 3403–3413. DOI: 10.1021/acs.biochem.7b00266

Poster Presentations

- 1) **Schwartz, B.A.**, Wang, W., Bao, S. (2019). Epigenetic Modulation of Auditory System Critical Period Plasticity
 - Presented at 49th annual Society for Neuroscience meeting

- 2) Kapellusch, A. J., Lester, A.W., **Schwartz, B.A.**, Brewster J. R., Barnes, C. A. (2017). Deficits in aged rats on the W-track continuous spatial alternation task suggest impaired hippocampal-prefrontal interactions
 - Presented at 47th annual Society for Neuroscience meeting
- 3) **Schwartz, B. A.**, Fraley, E. R., White, S. A. (2015). Specificity of behaviorally regulated Reelin-signaling in vocal learners and non-learners
 - Presented at 16th annual UCLA Neuroscience Undergraduate Poster Day

Awards and Honors

- Active Motif Best Poster Award at 49th Society for Neuroscience: 2019
- Carter Travel Grant recipient: 2019
- Winner of Deans Prize for outstanding poster presentation at UCLA Neuroscience Undergraduate Poster day: 2015
- Undergraduate Research Fellowship Program (URFP): 2014-2015