

## Martha Ruth Chase Bhattacharya, Ph.D.

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### CURRENT POSITION

Assistant Professor (tenure track), Neuroscience, University of Arizona, Tucson, AZ (Jan 2017-present)

### EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	DATES	FIELD OF STUDY
Harvard University, Cambridge, MA	AB	09/1996-06/2000	Biochemical Sciences
University of California, San Francisco	PHD	09/2001-12/2007	Cell Biology
Washington University in St. Louis	Postdoctoral Fellow	09/2008-07/2014	Neuroscience, Genetics

### CAREER SUMMARY

**Training:** My research objectives can be broadly unified by a desire to understand how specific cell types in the brain perform their unique functions. While my first research projects at Harvard University focused on pancreatic beta cell differentiation factors in chick embryos (lab of *Dr. Douglas Melton*), I quickly gravitated to molecular and cellular neuroscience as a graduate student. In my graduate work at UCSF, I studied the molecular basis of the sense of touch using primary mouse somatosensory neuron cultures (lab of *Dr. David Julius*). As a postdoctoral fellow at Washington University in St. Louis (lab of *Dr. Aaron DiAntonio*), I continued to do primary sensory neuron cultures, but combined this with genetic approaches in *Drosophila* to identifying new pathways that regulate nervous system integrity. This dual organism approach has been extremely successful, enabling my laboratory to perform genetic screens and other discovery work *in vivo* in *Drosophila* while validating evolutionary conservation in mouse or human cells. The projects currently ongoing in my lab reflect my training in both the diversity of approaches and also continue my focus on basic neuronal cell biological mechanisms.

**First Faculty Position:** Following my postdoctoral work, my trajectory has been a bit atypical. My first tenure-track position (2014-2016) was at a small pharmacy-focused college in St. Louis where research was de-emphasized and I had a heavy teaching load (two-semester introductory biology lectures and labs), as well as two very young children. Nevertheless, in this 2.5 year period, I continued to generate data in my postdoctoral laboratory and was able to submit and publish the first study of a new axon degeneration gene, identified in flies and tested in mice, in the *Journal of Neuroscience*. I completed this work with support from a 3-year Development Grant (transition award) from the Muscular Dystrophy Association.

**Current Position:** Seeking an opportunity for a more ambitious research program, I relocated to the University of Arizona Department of Neuroscience in 2017, where I am currently an Assistant Professor. I have funding from NINDS (R01 NS105680, PI) to support mouse and *Drosophila* work in my lab. While the pandemic significantly affected my own productivity (kids at home) as well as that of my lab personnel (multiple mental health crises, with two requiring hospitalization), we have recovered our momentum in 2021. As of the Sloan Fellowship submission date, we have a paper in press at *PAIN* (August 2021) and a second paper under review (currently on BioRxiv).

### PUBLICATIONS

1. Cho\* TS, Beigate\* E, Klein\* NE, Sweeney ST, **Bhattacharya MRC**. The *Drosophila* TMEM184b ortholog Tmep ensures proper locomotion by restraining ectopic firing at the neuromuscular junction. *BioRxiv*. 2021. DOI: 10.1101/2021.09.11.459917.
2. Larsen EG, Cho TS, McBride ML, Feng J, Manivannan B, Madura C, Klein NE, Wright EB, Wickstead ES, Garcia-Verdugo HD, Jarvis C, Khanna R, Hu H, Largent-Milnes TM, **Bhattacharya MRC**. TMEM184B is necessary for IL-31-induced itch. *PAIN* (*in press*). DOI: 10.1097/j.pain.0000000000002452.

3. **Bhattacharya MRC**. A chemotherapy-induced peripheral neuropathy model in *Drosophila melanogaster*. *Methods in Molecular Biology*. 2020;2143:301–310.
4. **Bhattacharya MRC**, Geisler S, Pittman SK, Doan RA, Weihl CC, Milbrandt J, DiAntonio A. TMEM184b promotes axon degeneration and neuromuscular junction maintenance. *Journal of Neuroscience*. 2016;36(17):4681–4689.
5. **Bhattacharya MRC**, Gerdtts J, Naylor SA, Royse EX, Ebstein SY, Sasaki Y, Milbrandt J, Diantonio A. A model of toxic neuropathy in *Drosophila* reveals a role for MORN4 in promoting axonal degeneration. *Journal of Neuroscience*. 2012;32(15).
6. **Bhattacharya MRC**, Bautista DM, Wu K, Haeberle H, Lumpkin EA, Julius D. Radial stretch reveals distinct populations of mechanosensitive mammalian somatosensory neurons. *Proceedings of the National Academy of Sciences*. 2008;105(50):20015–20020.
7. Li R, **Chase M**, Jung SK, Smith PJS, Loeken MR. Hypoxic stress in diabetic pregnancy contributes to impaired embryo gene expression and defective development by inducing oxidative stress. *American Journal of Physiology - Endocrinology and Metabolism*. 2005;289(4 52-4).

## **PREVIOUS POSITIONS AND SCIENTIFIC APPOINTMENTS**

2014 - 2016	Assistant Professor (tenure track), Biological Sciences, St. Louis College of Pharmacy, St. Louis, MO
2008 - 2014	Postdoctoral Research Scholar, Washington University in St. Louis, St. Louis, MO
2008 - 2008	Adjunct Physiology Instructor, University of San Francisco, San Francisco, CA
2006 - 2008	Adjunct Neuroscience and Developmental Biology Instructor, San Francisco State University, San Francisco, CA
2001	Research Assistant, Joslin Diabetes Center, Harvard Medical School, Boston MA.
2000 - 2001	Teaching Fellow (full time, high school teacher), Chemistry, Phillips Academy, Andover, MA.
2000	Teaching Assistant, Molecular Biology, Advanced Studies Program, St. Paul's School, Concord, NH
1998 - 1998	Summer Research Fellow, Baylor College of Medicine, Houston, TX
1997 - 1997	Summer Research Fellow, National Institute of Child Health and Human Development, Bethesda, MD

## **HONORS AND SPEAKING ENGAGEMENTS**

2021	Distinguished Early-Career Teaching Award, College of Science, University of Arizona
2020	Selected Speaker, Cold Spring Harbor Conference on Neuronal Connectivity (virtual)
2019	Invited Speaker, Arizona ALS Symposium
2019	Invited Speaker, Vollum Institute, Oregon Health Sciences University
2018	Invited Speaker (Keynote), Neuroscience, Arizona Wellbeing Commons Meeting, Phoenix AZ
2018	Invited Speaker, LiveLikeLou ALS Symposium
2018	Selected Speaker, Society for Neuroscience Annual Meeting
2017	Selected Speaker, Muscular Dystrophy Association Scientific Conference
2016	Featured Faculty Member in Script Magazine, St. Louis College of Pharmacy Alumni Organization
2016	Bright Spot Award Winner, St. Louis College of Pharmacy
2015	Selected Speaker, Muscular Dystrophy Association Scientific Conference
2013	Selected Speaker, Washington University Postdoctoral Symposium

## **GRANTS AND FELLOWSHIPS**

- 2020 - 2021 Dean's Education and Innovation Grant, College of Science, University of Arizona (Topic: Funding a new Course-based Research Experience for undergraduates on Neuron-Glial communication in *Drosophila*.)
- 2019 - 2020 BIO5 Team Scholars Grant (Co-I, Dr. Fei Yin). Topic: Neuron-Glial Crosstalk in the Nervous System
- 2018 - 2023 NIH R01 (Topic: Defining the mechanisms of TMEM184B in axon degeneration and nervous system maintenance)
- 2013 - 2016 Development Grant Recipient, Muscular Dystrophy Association
- 2009 - 2011 F32 Ruth L. Kirschstein National Research Service Award, NINDS, NIH
- 2003 - 2006 Graduate Research Fellowship, National Science Foundation

## **SERVICE (selected)**

- 2021 (Nov) - Member, Public Education and Communication Committee (PECC), Society for Neuroscience
- 2014 - 2018 Review Panelist, Graduate Fellowship Program, National Science Foundation
- 2010-present Founder and Instructor, Workshop for Graduate Fellowship Writing (Washington University in St. Louis and University of Arizona)

## **TEACHING**

Preface: I am extremely passionate about education of the next generation. I have sought out training as an educator at many points during my career (see "previous positions"). I designed two new courses in my first 4 years at the University of Arizona, one of which is the first course-based research experience (CURE) offered in my department. This year, I won the Distinguished Early-Career Teaching Award for the College of Science at the University of Arizona for my classroom efforts and accomplishments (see "honors" above).

1. NSCS 440, "How to Build a Brain: Mechanisms of Neural Development". Jr/Sr, enrollment 40.
  - a. Designed this course from scratch, launched Spring 2019
  - b. Taught in Spring semesters
2. NSCS 392, "VIP-CURE in Brain Communication Networks." All levels. Enrollment 12.
  - a. Multi-semester (continuing) course-based research experience
  - b. Designed this course from scratch, launched Spring 2021
  - c. Designed to teach computational skills (R, informatics) and then test *in silico* hypotheses using RNAi knockdown in *Drosophila* and behavior evaluation
3. Brief list of undergraduate teaching at previous institutions:
  - a. Introductory Biology (lecture to 90 students) I (fall) and II (spring), including labs, St. Louis College of Pharmacy. Full course responsibility. 2014-2016
  - b. Developmental Biology (lecture to 40 students), San Francisco State University. Full course responsibility. Spring 2008.
  - c. Physiology laboratory sections. At University of San Francisco (2008), St. Louis College of Pharmacy (2013).
  - d. Cell and Molecular Neuroscience. San Francisco State University (2006). Team-taught with 3 others. 35 students.