Department of Psychology Colorado College 14 E Cache la Poudre St Colorado Springs, CO 80903 United States <u>rtmaloney@coloradocollege.edu</u>

#### **Research and Education**

- 2024- Assistant Professor of Psychology Department of Psychology, Colorado College My research involves understanding how the stability of individual preferences evolves over time. I teach a range of topics covering Neuroscience, Computational and Statistical Methods, and Animal Behavior.
- 2020-2024 **Postdoctoral Research Fellow** de Bivort Lab, Harvard University I studied individuality in fruit flies, how it shifts over time, the potential ecological role of shifts in individual behavior, and the molecular underpinnings of individuality.
- 2018-2020 **Postdoctoral Research Fellow** Pecot Lab, Harvard Medical School I studied the behavioral and physiological role of the DIP class of cell-surface proteins on the development and function of the *Drosophila* visual system using automated behavioral assays and physiological recordings.
- 2011-2018 **Graduate Student, PhD in Neuroscience** Berson Lab, Brown University I characterized the connection between intrinsically photosensitive retinal ganglion cells and thalamocortical cells in the dorsal lateral geniculate nucleus (dLGN) in order to better understand the processing of absolute luminance in the thalamocortical visual system and elucidate how different retinal ganglion cell types contribute to activity in the dLGN.

2009-2011 **Undergraduate Researcher** Marder Lab, Brandeis University I investigated the distribution and physiological effect of the neuropeptide AST-B on the crustacean stomatogastric nervous system in crab (*C. borealis*) and lobster (*H. americanus*). using a variety of techniques, including extracellular and sharp electrode intracellular recording, immunohistochemistry, and confocal microscopy.

#### 2007-2011 BS/MS in Neuroscience

Publications

**Maloney, R.**, Quattrochi, L., Yoon, J., Souza, R. & Berson, D. Efficacy and specificity of melanopsin reporters for retinal ganglion cells. *J. Comp. Neurol.* 532, (2024).

Bivort, B. de, Buchanan, S., Skutt-Kakaria, K., Gajda, E., Ayroles, J., O'Leary, C., Reimers, P., Akhund-Zade, J., Senft, R., **Maloney, R.,** et al. (2022). Precise Quantification of Behavioral Individuality From 80 Million Decisions Across 183,000 Flies. Front. Behav. Neurosci. *16*, 836626. 10.3389/fnbeh.2022.836626.

**Maloney**, **R.T.** (2021). Neuromodulation and Individuality. Front Behav Neurosci *15*, 777873. https://doi.org/10.3389/fnbeh.2021.777873.

Xu, C., Theisen, E., **Maloney, R.,** Peng, J., Santiago, I., Yapp, C., Werkhoven, Z., Rumbaut, E., Shum, B., Tarnogorska, D., et al. (2019). Control of Synaptic Specificity by Establishing a Relative Preference for Synaptic Partners. Neuron *103*, 865-877.e7. <u>https://doi.org/10.1016/j.neuron.2019.06.006</u>.

**Brandeis University** 

Szabo, T.M., Chen, R., Goeritz, M.L., **Maloney, R.T.,** Tang, L.S., Li, L., Marder, E. (2011). Distribution and Physiological Effects of the B-Type Allatostatins (Myoinhibitory Peptides, MIPs) in the stomatogastric nervous system of the crab, *Cancer borealis. Journal of Comparative Neurology*, 519 (13), 2658-2676.

#### Presentations

**Maloney, R.T.** Ye, A., Alisch, T., Saint-Pre, S., de Bivort, B. (10-5-2023). Phenotypic Drift in Individual Preference as a Strategy for Unpredictable Worlds. Poster, Cold Spring Harbor Laboratory Neurobiology of Drosophila Conference

**Maloney, R.T.** (6-14-2023). Phenotypic Drift in Individual Preference as a Strategy for Unpredictable Worlds. Talk, Boston Area Drosophila Conference

**Maloney**, **R.T.** (12-9-2022). Phenotypic Drift in Individual Preference as a Strategy for Unpredictable Worlds. Invited Talk, University of Iceland

**Maloney, R.T.**, Ye, A., Bivort B. de. (2021). Drift in Individual Preference as a Population-level Strategy for Environmental Adaptation. Poster Session: Drosophila Research Conference (Online)

**Maloney, R.T.,** Cruickshank, S., Berson, D.M. (2017). Properties of Retinogeniculate Synapses of Intrinsically Photosensitive Retinal Ganglion Cells. Paper Presentation: ARVO Annual Meeting. Baltimore, MD.

**Maloney, R.T.,** Yoon, J.S., Berson, D.M. (2015). A Viral Method for Optogenetic Control of Intrinsically Photosensitive Retinal Ganglion Cells. Poster Session: ARVO Annual Meeting. Denver, CO.

**Maloney, R.T.,** Goeritz, M., Szabo, T., Marder, E. (2010). Localization and Effects of B-Type Allostatin Peptides in the Stomatogastric Nervous System. Poster Session: Society for Neuroscience Meeting, San Diego, CA.

Awards	
2022 HBI Postdoctoral Pioneers Award	Harvard Brain Institute
One of eight postdocs selected for competitive funding for new projects.	
2015 ARVO MIT Outstanding Poster Finalist	ARVO 2015 Annual Meeting
One of five visual neuroscience finalist posters selected among students and	postdocs.
2015 Retina Foundation Travel Award	ARVO 2015 Annual Meeting
Selective for a competitive travel award to the ARVO 2015 Annual Meeting.	

#### **Training in Teaching**

2011-2017Brown University Sheridan Center for Teaching and Learning: Teaching Certificate Program<br/>Certificate I: Sheridan Teaching Seminar - Reflective Teaching1 year program<br/>1 year program

2019 Alan Alda Seminar Science Communication Workshop

## **Teaching Experience**

#### 2024 Teaching Fellow: LS 50, Integrative Biology

Molecular and Cell Biology Department, Harvard University

I served as teaching fellow for LS 50, an integrative science class blending Biology, Chemistry, Math, and Programming. Responsibilities included 2x weekly section, developing and grading problem sets, and weekly office hours.

# 2019-2022 Instructor: Introduction to Neurobiology and Invertebrate Physiology (Blood and Brains: Comparative Physiology of the Neurovascular Unit)

## Summer@Brown, Brown University

I gave 4 remote 30-60 minute guest lectures covering basic neurobiology, comparative cardiovascular physiology in invertebrates, and the use of *Drosophila melanogaster* as a model organism for genetics to a class of 12-22 high school students.

## 2018 **Guest Lecture: Cortex** (NEUR 1650 Structure of the Nervous System)

Department of Neuroscience, Brown University

I taught the lecture on cortical anatomy and function in this neuroanatomy course designed for undergraduate and graduate students. I covered the roles of different parts of the cortex, the different cells of the cortex, the inputs and outputs to the cortex, and the intra-areal structure of different cortical regions.

# 2014-2016 Course Design and Instructor: Computer Modeling of the Brown

Summer@Brown, Brown University

I designed and taught a 3 week course meeting every day for 3 hours for high school students (12 students in 2014, 21 students in 2015 and 2016) as part of the Summer@Brown program. In this course, students learned to create simple models of neurons in MATLAB in the context of a variety of topics in neuroscience.

# 2014-2016 Guest Lecture: Learning and Memory (Neuroscience in Health and Disease)

Summer@Brown, Brown University

In 2014, 2015, and 2016 I gave guest lectures on the neuroscience of learning and memory for this class with ~30 high school students.

# 2015 **Guest Lecture: Cellular Anatomy** (NEUR 1650 Structure of the Nervous System)

Department of Neuroscience, Brown University

I taught the cellular anatomy lecture for this neuroanatomy course designed for undergraduate and graduate students. I covered different parts of the neurons and glia and their functional roles, as well as different techniques to stain and image the different parts of neurons.

#### 2012-2018 Neuroscience Outreach

#### Department of Neuroscience, Brown University

I gave lectures and interactive presentations on gross anatomy (x3), the visual system (x1), and optical illusions (x2) as part of Brown University's outreach to local high schools, the Rhode Island Brain Bee, and the Providence Waterfire "Big Bang Science Fair.)

# 2013 Guest Lecture: Brain Stem (NEUR 1650 Structure of the Nervous System)

Department of Neuroscience, Brown University

I taught the brain stem lecture in this neuroanatomy course designed for undergraduate and graduate students. I covered major structures and landmarks in the brainstem, as well as discussed the functions of many brain areas and their clinical relevance.

# 2013 **Teaching Assistant** (NEUR 1540 Neurobiology of Learning and Memory)

Department of Neuroscience, Brown University

I served as TA for this undergraduate course covering the primary research into the processes of learning. In addition to office hours, I also guest lectured on three classes on emotional memory and fear learning, and one class on computer models of memory.

## Mentoring Experience

# 2021- Undergraduate Mentor de Bivort Lab, Harvard University I have mentored 2 undergraduates, Athena Ye and Sam-Keny Saint Pre, teaching them fly genetics, molecular biology, microscopy, and behavior. As part of mentoring, I also covered primary scientific literature and gave workshops on MATLAB, Python, and data analysis.

#### 2018-2020 Undergraduate Mentor

I have mentored 2 undergraduates, Ananth Das and Elizabeth LeBlanc, teaching them fly genetics, electrophysiology, microscopy, and behavior. As part of mentoring, I also covered primary scientific literature and gave workshops on MATLAB and data analysis.

2014-2018 Undergraduate Mentor Berson Lab, Brown University I have mentored 2 undergraduates, James Yoon and Maikerly Reyes, teaching them ocular injections, eye dissections, immunohistochemistry, and chronic drive and headpost surgeries. As part of mentoring, I taught them about the visual system and engaged in regular discussions and review of the primary literature.

2010 Mentoring Summer Student Marder Lab, Brandeis University I supervised a visiting summer student from Puerto Rico and taught her basic electrophysiology and histology with respect to our research on the lobster stomatogastric ganglion.

#### **Professional Development**

- 2015 Co-Facilitator, Sheridan Center Certificate IV Program Brown University I co-led the Certificate IV program, teaching graduate students to observe and provide constructive feedback to their peers.
- 2014-2017 Sheridan Center Head Teaching Consultant for the Sciences Brown University As Head Teaching Consultant (TC) for the Sciences, I helped organize and facilitate the Certificate IV program for peer observation.
- 2015-2016 Co-Facilitator, Sheridan Center Certificate I Program Brown University I co-led the Certificate I program in the Spring of 2015 and 2016, organizing lectures and workshops on the topics of grading and evaluating student learning, and teaching as persuasive communication.

2013-2017 Sheridan Center Certificate I Discussion Leader Brown University I facilitated discussions with graduate students in the Certificate I program, where I provided more in depth knowledge and discussion of the material covered in the lectures and readings for the program and facilitated a dialogue among students in different fields, with the aim of them developing as teachers through reflective practice and learning from other disciplines.

# **Research Skills**

- Programming languages: MATLAB, Python, R, STAN, C++, Arduino
- Intracellular recordings
- In vivo and in vitro extracellular recordings
- In vivo and in vitro optogenetics
- Immunohistochemical staining

- Fly husbandry and genetics
- Confocal Microscopy
- Expansion Microscopy
- Ocular viral and dye injections (mouse)
- Mouse chronic implants and headposting

Pecot Lab, Harvard Medical School

#### Service

- **Reader, Harvard College Research Program:** Reviewed Undergraduate Applications for summer and semester research funding
- Reviewer for eLife, Journal of Vision
- Organismal and Evolutionary Biology Diversity, Inclusion, and Belonging Committee: Serving on the community education subcommittee, we instituted "Evolution Day", a day for highschool students to see research and talk to graduate students, postdoc, and faculty, the "OEB and Society Seminar" where we bring in social scientists and humanists to talk about topics related to biology research (and in particular the ethical considerations of research), and "Emerging Scientists", a program we got funding for in order to bring underrepresented high school students in to get research experience as well as structured mentoring and interactions with graduate students, postdocs, and faculty (with the goal of demystifying a career in research).

- Neuroscience Graduate Student Liaison for the Sheridan Center for Teaching and Learning: Communicated the opportunities of the Sheridan Center to the Neuroscience Graduate Students and conveyed graduate student needs to the Sheridan Center.
- Student Organizer, Brown Neuroscience Graduate Program Retreat: Organized the departmental retreat.

Student Organizer, Brown Neuroscience Systems Neuroscience Journal Club: Ran the systems neuroscience journal club for two years.