

Roberto A. Aponte Rivera

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Education

BROWN UNIVERSITY

Master of Science, Neuroscience

Providence, RI

2017-2021

- NIH-Brown University Graduate Partnership Program Fellow

UNIVERSITY OF PUERTO RICO – RIO PIEDRAS CAMPUS

Bachelor of Science, Cell & Molecular Biology

San Juan, PR

2012-2017

- Neuro-ID, BP-ENDURE Trainee (2015-2017)

Work Experience

UNIVERSITY OF PUERTO RICO – RIO PIEDRAS CAMPUS

Professor, Laboratory Coordinator & Instructor

San Juan, PR

2023-Current

- Teaching 2 sections of BIOL 3365 – Molecular Biotechnology Laboratory, a stand-alone lab course.
- I organize the weekly laboratory experiences along with the course didactic materials, and I oversee any issues that may arise from experimental protocols.
- I prepare the materials necessary for weekly laboratory experiences.
- In charge of evaluating the current course experimental protocols and updating it to meet current standards in STEM academia and industry.

Research

National Institute on Deafness and Other Communication Disorders

Graduate Research Fellow

Bethesda, MD

2019-2021

- Studied the effects of hair cell ablation on hair cell activity within the neuromast of zebrafish.
- Focused on the molecular mechanisms that drive hair cell presynaptic activity and silencing.
- Developed simultaneous calcium imaging and pharmacology techniques to assay presynaptic activity in wild-type and mutant zebrafish lines in vivo. Published as a methods chapter.
- Designed and programmed behavioral experiments to assay zebrafish startle response to study CIB2/3 influence on hair cell development. Publication in progress.

Mentor: Katie S. Kindt, Ph.D.

Institute of Neurobiology at the University of Puerto Rico - Medical Sciences Campus

Undergraduate Research Fellow

San Juan, PR

2015-2017

- Studied the effects of behavioral and molecular tolerance of alcohol in mice.
- Focused on large conductance, calcium-activated potassium (BK) channels.
- Designed behavioral experiments to measure ethanol drinking and blood ethanol concentration.
- Analyzed behavioral data to determine the facilitation and escalation of ethanol drinking in ethanol-tolerant mice.

Mentor: Cristina Velazquez-Marrero, Ph.D.

Icahn School of Medicine at Mount Sinai

Summer Undergraduate Research Experience Student

New York, NY

2016

- Studied the effects of beta-catenin expression within the nucleus accumbens (NAc) on alcohol consumption behaviors in mice.
- Performed stereotaxic surgeries to drive viral-mediated Cre-Lox knockdown of beta-catenin within the NAc of beta-catenin floxed mice.
- Validated NAc viral infection via immunohistochemistry and knockdown via qPCR.
- Designed a Two-Bottle Choice Intermittent Access Ethanol paradigm to measure ethanol drinking.

Mentor: Eric J. Nestler, MD, Ph.D.

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University of Puerto Rico - Río Piedras Campus
Undergraduate Research Student

San Juan, PR
2014

- Studied pigment dispersing factor expression in fruit flies to determine disruption of the circadian rhythm.
- Dissected fruit fly brains and used immunohistochemistry to image on a confocal microscope.

Mentor: José L. Agosto-Rivera, Ph.D.

Publications

Arnaud P. J. Giese, Wei-Hsiang Weng, Katie S. Kindt, Hui Ho Vanessa Chang, Jonathan S. Montgomery, Evan M. Ratzan, Alisha J. Beirl, **Roberto Aponte Rivera**, Jeffrey M. Lotthammer, Sanket Walujkar, Mark P. Foster, Omid A. Zobeiri, Jeffrey R. Holt, Saima Riazuddin, Kathleen E. Cullen, Marcos Sotomayor, & Zubair M. Ahmed. (2023). Complexes of vertebrate TMC1/2 and CIB2/3 proteins form hair-cell mechanotransduction cation channels. bioRxiv, 2023.05.26.542533. <https://doi.org/10.1101/2023.05.26.542533>

Hussain, S., **Aponte-Rivera, R.**, Barghout, R. M., Trapani, J. G., & Kindt, K. S. (2022). In Vivo Analysis of Hair Cell Sensory Organs in Zebrafish: From Morphology to Function. In A. K. Groves (Ed.), Developmental, Physiological, and Functional Neurobiology of the Inner Ear (pp. 175–220). Springer US. https://doi.org/10.1007/978-1-0716-2022-9_9

Presentations

Examining Low Dimensional Representations of Sensory & Motor Signal in Visual Cortex (07/2022) Neuromatch NMA Deep Learning Course G. Heo, N. Telerman, H. Shen, F. Fainstein, & R. Aponte-Rivera

Exploring the Response of Zebrafish Hair Cells During Damage (02/2021) 44th Annual MidWinter Meeting, The Association for Research in Otolaryngology, Virtual Conference R.A. Aponte-Rivera, & K. Kindt

Early life stress accelerates amygdala development while delaying prefrontal connectivity (11/2018) Integrative Physiology and Behavior, Neuroscience 2018, SfN San Diego Convention Center: Hall B-H, San Diego, CA
G. Manzano-Nieves, M. Bravo, A. Johnsen, H. Shin, R.A. Aponte-Rivera, & K. Bath

Role of the Nucleus Accumbens Beta-catenin Expression In Alcohol Consumption (12/2016) 25th Puerto Rico Neuroscience Conference University of Puerto Rico - Rio Piedras Campus, San Juan, Puerto Rico R.A. Aponte-Rivera, E.A. Ribeiro, E. Mouzon, E. J. Nestler & C. Velázquez-Marrero

The Role of Nucleus Accumbens Beta-catenin Expression In Alcohol Consumption (11/2016) Diversity Fellows Poster Session, Society for Neuroscience San Diego Convention Center: Hall A, San Diego, CA R.A. Aponte-Rivera, E.A. Ribeiro, E. Mouzon, E. J. Nestler & C. Velázquez-Marrero

Time-dependent Wnt/ β -catenin signaling in response to 25 mM ethanol exposure (08/2015) Society for Neuroscience 45th Annual Meeting, McCormick Place, Chicago, IL A. Burgos, R. Aponte, S.N. Treistman, C. Velazquez-Marrero

Leadership & Activities

DISCOVER 2018

Providence, RI

Visions of Collective Memory

2018

Discover (<https://www.facebook.com/discoverbrisd/>) is an interdisciplinary gallery exhibition that aims to open a conversation between art and science.

- Collaborated with artist John Shen (@jcklbyfsh) in creating an art installation titled 'Visions of Collective Memory'.
- Made use of current neuroscientific knowledge of how memory works to inform work. Art piece was meant to exhibit both the concept of collective memory and infantile amnesia.
- Combined use of audiovisual editing tools such as Adobe Premiere and After Effects with scientific data analysis from both public and personally acquired scientific data.

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Brain Week Rhode Island

Providence, RI

BRAINY Visits

2018

Brain Week Rhode Island (<https://brainweekri.org/>) celebrates international Brain Awareness Week, a campaign to increase awareness of the progress and benefits of brain research.

- Visited K-12 schools throughout the month of March alongside other students of the Brown Neuroscience Graduate program to increase awareness and educate students on the progress and benefits of brain research.

Puerto Rico Neuroscience Conference

San Juan, PR

25th Annual Puerto Rico Neuroscience Conference

2016

Puerto Rico Neuroscience Conference is held annually by the neuroscience community in Puerto Rico to showcase the latest findings and promote communications among peers.

- Promoted the conference among peers to increase participation in the poster session.
- Took attendance and assigned placards with identification to attendees.
- Coordinated presentations by troubleshooting microphones, and display of presentations.
- Led attendees to lunch premises and made sure every participant's poster was displayed on the correct board.

ASBMB UPR-RP Chapter

San Juan, PR

2nd Cellular and Molecular Biology Meeting

2015

A Cell and Molecular Biology centered institutional meeting for undergraduate research at UPRRP.

- Organized and planned the event with other members of the ASBMB chapter committee.
- Recruited the keynote speaker, Dr. Carlos Noguera-Ortiz, to give a career talk at the meeting.

Fellowships

Neuroscience NIH-Brown University Graduate Partnership (09/2017 - 08/2021)

The Graduate Partnerships Program (GPP), provides a framework for graduate studies at NIH, research fellowship is awarded upon acceptance into the program covering tuition costs and providing a competitive stipend.

Neuro-ID, BP-ENDURE Trainee (06/2015 - 05/2017)

The Neuro-ID program (<http://neuroid.uprrp.edu/>) provides research, education, outreach, and networking opportunities in neuroscience to its fellows. It is funded by the NIH 1R25MH092912-01.

Certificates

NMA Deep Learning (07/2022)

Neuromatch (2022): Took online course that taught the use of Pytorch in modern deep learning applications such as Convnets, VAEs, GANs, Time Series, NLP, & Reinforcement Learning.

Data Analysis for Life Sciences (03/2022 - 06/2022) edX - HarvardX (2022): Took online courses PH525.1x, PH525.2x, PH525.3x & PH525.4x prepared by Harvard University. Learned to use R for linear and high dimensional statistical analysis and modeling.

Skills

Technical: Graphpad Prism, R, Python, Microsoft Office Suite, LabArchives

Language: English (Native), Spanish (Native)

Laboratory: Animal Research Models (zebrafish, rodent), Stereotactic Brain Surgery, Brain Tissue Processing and Sectioning, Immunohistochemistry, Confocal Laser Scanning Microscopy, Fiber Photometry, qPCR, Calcium Imaging, In vivo Pharmacology, Bacterial Transformation, Western Blot, Agarose Gel Electrophoresis, Behavioral Experimental Design & Analysis