Roberto A Aponte Rivera

Neuroscientist

Curious and adaptable neuroscientist with an interest in using science to enhance aspects of everyday life.

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San Juan, PR

INTERESTS

Open Science | Neuroscience | Civic Science | Biohacking | Community Science | Science Communication | Art Science | Science Outreach | Molecular Biology | Cell Biology

SKILLS

R (Programming Language) | Rodent Research Models | Zebrafish Research Models | Fruit Fly Research Models | Stereotaxic Surgery | Python (Programming Language) | Tissue Sectioning | Confocal Microscopy | Immunohistochemistry | Fiber Photometry | Optogenetics | qPCR | Graphpad Prism | Jupyter Notebook | In vivo Pharmacology | Bacterial Transformation | Western Blot | Agarose Gel Electrophoresis

LANGUAGES

English
Native or Bilingual Proficiency

Spanish
Native or Bilingual Proficiency

EDUCATION

M. S. Neuroscience
Brown University
09/2017 - 10/2021
Providence, RI

B. S. Cell & Molecular Biology
University of Puerto Rico - Río Piedras Campus
08/2012 - 08/2017
San Juan, PR

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.

PUBLICATIONS

Book Chapter

In Vivo Analysis of Hair Cell Sensory Organs in Zebrafish: From Morphology to Function

Author(s)

Hussain, Saman & Aponte-Rivera, Roberto & Barghout, Rana & Trapani, Josef & Kindt, Katie.

January 2022

In book: Developmental, Physiological, and Functional Neurobiology of the Inner Ear (pp.175-220)

DOI: 10.1007/978-1-0716-2022-9_9

RESEARCH EXPERIENCE

Graduate Student Researcher

National Institute on Deafness and Other Communication Disorders

08/2019 - 08/2021 *Bethesda, MD*

Research Summary

- Studied the effects of hair cell ablation on hair cell activity within the neuromast of zebrafish.
- Special focus on the molecular mechanisms that drive hair cell presynaptic silencing and unsilencing.
- Used calcium imaging in tandem with pharmacology to assay presynaptic activity in wild-type and mutant zebrafish lines in vivo.
- Worked on developing transgenic zebrafish to image and manipulate hair cells and supporting cells.

Mentor : Katie S. Kindt, Ph.D.

Undergraduate Researcher

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

01/2015 - 05/2017 *San Juan, PR*

Research Summary

- Studied the effects of behavioral and molecular tolerance of alcohol in mice. Focused on large conductance, calcium activated potassium (BK) channels.
- Measured ethanol drinking and blood ethanol concentration using a Drinking in the Dark (DID) behavioral paradigm to determine facilitation and escalation of ethanol drinking after inducing persistent molecular tolerance in mice.
- Modeled the effects of rapid ethanol exposure in cell cultures.

Mentor : Cristina Velazquez-Marrero, Ph.D.

Summer Undergraduate Research Experience Student

Icahn School of Medicine at Mount Sinai

06/2016 - 08/2016 *New York, NY*

Research Summary

- Studied the effects of beta-catenin expression within the nucleus accumbens (NAc) on alcohol alcohol consumption behaviors in mice.
- Performed stereotactic surgeries to drive viral-mediated Cre-Lox knockdown of beta-catenin witihin the NAc of beta-catenin floxed mice.
- Validated NAc viral infection via immunohistochemistry and knockdown via qPCR.
- Measured ethanol drinking using a Two-Bottle Choice Intermittent Access Ethanol paradigm.
- Worked on the effects of cocaine exposure on the transcription profile of somatostatin interneurons within the NAc.

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

Undergraduate Researcher

University of Puerto Rico - Río Piedras Campus

06/2014 - 12/2014 *San Juan, PR*

Research Summary

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

Mentor : José L. Agosto-Rivera, Ph.D.

SCIENTIFIC COMMUNICATION EXPERIENCE

Visions of Collective Memory
Discover 2018

05/2018 *Providence, RI*

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

Tasks/Achievements

- Collaborated with artist John Shen in creating an art installation.
- Made use 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.

BRAINY Visits
Brain Week Rhode Island

03/2018 *Providence, RI*

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.

Tasks/Achievements

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

25th Annual Puerto Rico Neuroscience Conference
Neuro-ID

12/2016 *San Juan, PR*

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

Tasks/Achievements

- Promoted the conference among peers to increase participation in the poster session.
- Took attendance and assigned placards with identification to attendees.
- Helped with coordination of presentations by troubleshooting microphones, and display of presentations.
- Led attendees to lunch premises and made sure every participants posters were displayed in the correct board.

2nd Cellular and Molecular Biology Meeting
ASBMB UPR-RP Chapter

11/2015 *San Juan, PR*

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

Tasks/Achievements

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

RESEARCH 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

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

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

Exploring the role for nucleus accumbens beta-catenin expression in alcohol consumption (05/2017)
Puerto Rico INBRE and COBRE Symposium Caribe Hilton Hotel, San Juan, PR

- R.A. Aponte-Rivera, R. De Jesús-Ayala, E.A. Ribeiro, E. Mouzon, E. J. Nestler & C. Velázquez-Marrero

RESEARCH PRESENTATIONS

Exploring the Effects of Molecular Alcohol Tolerance and β-catenin Expression on Alcohol Consumption in Mice (04/2017)

Center for Neuroplasticity at the University of Puerto Rico 4th COBRE Annual Retreat, Hotel El Convento, San Juan, PR

- R.A. Aponte-Rivera, R. De Jesús-Ayala, 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

Effects of Alcohol Molecular Tolerance on Voluntary Alcohol Consumption in Mice (04/2016)

Center for Neuroplasticity at the University of Puerto Rico 3rd COBRE Annual Retreat, Hotel El Convento, San Juan, PR

- R. Aponte, R. Meléndez, & 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

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

Exploring The Role Of Nucleus Accumbens Beta-catenin Expression In Alcohol Consumption (08/2016)

Summer Undergraduate Research Program Icahn School of Medicine at Mt. Sinai, New York, NY

- R.A. Aponte-Rivera, E.A. Ribeiro, E. Mouzon, C. Velazquez-Marrero & E.J. Nestler

Rapid Ethanol Exposure Increases Ethanol Consumption (04/2016)

4to Encuentro Subgraduado de Investigación y Creación, Hotel Condado Plaza Hilton, San Juan, PR

- R. Aponte & C. Velázquez-Marrero