George S. Melchor

Interdisciplinary Program in Neuroscience (IPN) gm882@georgetown.edu
Biology Department, Regents Hall @thegliaguy
6411 Tondorf Rd
Washington DC, 20007

Education

Georgetown University — Washington, DC
Doctor of Philosophy, Neuroscience — 2017-Present

Austin College — Sherman, TX
Bachelor of Arts, Major/Minor: Biology/Neuroscience — 2014-17

Southwest Texas Junior College — Uvalde, TX
Associate of Arts, General Studies — 2011-13

Research Experience

Georgetown University, Ph.D. Candidate — 2017-Present
Lab of Glia Biology, Department of Biology
I investigate cellular responses using novel methods to better characterize cellular profiles in multiple sclerosis animal models. As a part of my dissertation project, I am utilizing ribosome tagging (RiboTag) to acquire cell-specific translatomes in order to investigate oligodendrocyte and inflammatory cell interactions during demyelination and remyelination. I further aim to establish functional significance for oligodendrocyte immune receptors and assess the influence of the microenvironment on oligodendrocyte-inflammatory cell interactions.
Mentor: Jeffrey K. Huang Ph.D.

Interdisciplinary Program in Neuroscience Lab Rotations — 2017-18
Huang, Pak, & Conant Labs, Georgetown University
In my Huang lab rotation, I investigated the role of amino acids during remyelination by conducting focal spinal cord lesions, and analyzing the lesioned tissue via qRT-PCR and biochemical fluorescence assays. In the Pak lab, I studied the effects of SPAR1 mutations on dendritic spine morphology, using transfection of primary neurons. In the Conant lab, I investigated the effects of monoamine treatment on synaptic integrity and APP processing, using a variety of molecular techniques in primary astrocyte cultures, treated slice preparations, and 5xFAD mouse tissue, including immunoblotting, ELISA, and fluorescence activity assays.
Mentors: Jeffrey K. Huang Ph.D., Daniel Pak Ph.D., Katherine Conant M.D.

Austin College, Independent Undergraduate Researcher — 2015-17
Barton Lab, Department of Biology
I studied the role of PA28γ, a proteasome activator that is commonly overexpressed in many cancers, on the acquisition of cancerous phenotypes. I worked on characterizing PA28γ expression and protein levels in several commercially available tumorigenic and cancerous cell lines. I also investigated the interactions between PA28γ and mutated p53 in these lines and MNNG-mutated MEFs using whole gene sequencing, immunofluorescence, immunoblotting, colorimetric proliferation assays, and qRT-PCR.
Mentor: Lance F. Barton Ph.D.

Technical Skills

Mouse and rat care and handling, Cre-lox based genetics: constitutive and inducible CreERT mouse lines, primary neuronal and astrocyte culture, mammalian cell culture, neuronal transfections, spinal cord focal lesion survival surgery, immunoprecipitation, MACS separation, immunofluorescence, gel electrophoresis, quantitative real-time PCR, confocal microscopy, MetaMorph, ImageJ, Prism, R coding language.

Funding

Patrick Healy Graduate Student Fellowship 2017-

Graduate School of Arts and Sciences, Georgetown University

This merit-based, full stipend graduate dissertation award, named in honor of Georgetown's 28th president, is intended to further Georgetown's commitment to creating a diverse community composed of the most qualified students.

Honors and Awards

Neuroscience Scholars Program Fellow 2020-2022
Society for Neuroscience

NSF Scholarship to the 25th Summer Institute in Statistical Genetics (SISG) 2020
University of Washington

Medical Center Graduate Student Organization (MCGSO) Course Grant 2019
Georgetown University

Retreat Rotation Talk Award 2017
Interdisciplinary Program in Neuroscience, Georgetown University

Paragon Award for New Advisors 2017
Phi Theta Kappa Annual Convention

Minority Affairs Committee Special Recognition Presentation Award 2016
56th Annual Meeting of the American Society for Cell Biology

Minority Affairs Committee Travel Award 2016
56th Annual Meeting of the American Society for Cell Biology

Sciences Summer Research Program 2016
Biology Department, Austin College

Stephens Family International Studies Scholarship Program 2016
Austin College

Undergraduate Transfer Scholarship 2014-17
Jack Kent Cooke Foundation

Teaching Experience

Georgetown University

Experiences in Neuroscience Summer Course (NSCI 984)

Co-Director 2019-

<u>Responsibilities</u>: developing course outline, recruiting lecturers, managing Canvas site, grading

Lecturer 2018-

<u>Lectures taught:</u> History of Neuroscience,Oligodendrocytes & Myelin, Molecular Methods

Anatomy and Physiology Teaching Assistant 2019-
Labs taught: Brainstem and Cranial Nerves, Learning and Memory, Spinal Cord

Introduction to Cognitive Neuroscience, Guest Instructor (ICOS 201) 2019
Lab taught: Neuroanatomy for Cognitive Scientists

Topics in Neuroscience: Disease, Research, and Treatment (TINs) Guest Lecturer (NSCI 425) 2019
Lecture taught: Multiple Sclerosis

Learning Design & Science Education (PBIO 699) 2018
Graduate course focused on learning design and evidence-based teaching of science

Teaching Practicum for Drugs, the Brain, and Behavior (NSCI 920) 2018
Lecture taught: Glia and Gliomas

Austin College
Developmental Biology (BIOL 324) & Comparative Vertebrate Anatomy (BIOL 322) Assistant
2015-16
Responsibilities: planning and setting up labs, assistance in dissections, holding office hours, grading

Scientific Service and Outreach

Medical Center Graduate Student Organization (MCGSO)
Co-Outreach Chair 2018-19
Responsibilities: Developed,organized, and volunteered to complete the annual food drive, Brain Awareness Week initiatives (including a day in neuroscience learning for middle school students), and a community STEM Night.
Member/Volunteer 2017-

Interdisciplinary Program in Neuroscience (IPN)
Admissions Committee - Student Representative 2018-
Responsibilities: Organize recruitment weekends, lead student evaluations
Student Advisory Committee 2018-
Responsibilities: Aid new neuroscience PhD students transition through graduate school
Social Chair 2018-2020
Events: Annual program retreat, Fall Gathering, Winter Party, Movie nights

Academic and Career Training

25th Summer Institute in Statistical Genetics (SISG) July 2020
Attended module-based, intensive training sessions that combined theoretical and hands-on instruction in large -omics data upstream processing, pathway and network analyses, and multivariate statistical analysis. The institute utilized the R coding language, and had an emphasis on rigor and reproducibility.

Bio-Trac. Single Cell RNA Seq Workshop 2019
Covered the theoretical concepts and practical application of tissue processing via MACS protocols through next generation sequencing and analyses of single-cell RNA seq data using R software

National Council for Community and Education Partnerships

Youth Leadership Summit Consultant 2018-

Responsibilities: provide on-site logistics and support student engagement

Phi Theta Kappa Honor Society

Co-Advisor for Omicron Psi Chapter at Grayson College in Texas 2015-17

Responsibilities: supported students in academic research, scholarship, and leadership opportunities

Research Mentor Experience

Maya Shah 2020-

Georgetown University Class of 2023

Publications

1. Downey, R. M., Downey, K. B., Jacobs, J., Korthas, H., **Melchor, G. S.**, Speidell, A., Waguespack, H., Mulroney, S. E., & Myers, A. K. **(2020)** Learning Design in Science Education: Perspectives from Designing a Graduate-Level Course in Evidence-Based Teaching of Science. *Adv. Phys. Educ.* ***Manuscript under review.***
2. **Melchor, G. S.**, Khan, T., Reger, J. F., & Huang, J. K. **(2019)** Remyelination Pharmacotherapy Investigations Highlight Diverse Mechanisms Underlying Multiple Sclerosis Progression. *ACS Pharmacol. Transl. Sci. 2* (6), 372-386, DOI: 10.1021/acsptsci.9b00068

Poster Presentations

1. **Melchor, G.S**.; Peterson, K.B.; Butterfield, H.E.; & Barton L.F. "PA28γ expression affects the acquisition of cancer phenotypes" American Society for Cell Biology, 56th Annual Meeting, San Francisco, CA, December 3-7, 2016, abstract P1118. *Special Recognition Received.*
2. **Melchor, G.S**.; Peterson, K.B.; Butterfield, H.E.; "PA28γ expression affects the acquisition of cancer phenotypes" Biology Department Seminar, Austin College, November 10, 2016.
3. **Melchor G** & Barton LF, "Transformation of MEF Cells: Investigating the Phenotypes of Cancer & the Role of PA28γ" Austin College Cancer Biology & Women's Health Forum, December 3, 2015.
4. M Baumgartner, Carr S, Dang B, Diaz-Martinez M, Koka T, **Melchor G**, Munyoki C, Witherspoon C, & Barton LF, "The Role of PA28γ in the Cellular Stress Response to Anisomycin" Student Scholarship Conference, Austin College, March 21, 2015, Abstract 36.

Professional Associations

AAAS, AAAS/Science Program for Excellence in Science Member 2019-
New York Academy of Science, Science Alliance Member 2018-
Society for Neuroscience 2017-
Phi Beta Kappa Honor Society 2017-
Beta Beta Beta, National Biological Honor Society 2015-
Alpha Chi, National College Honor Society 2015-
Phi Theta Kappa Honor Society 2013-