

Michael N. Young

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Education

2016-Present

Ph.D. in Neurobiology.....4.0 GPA

Graduated 2016

Duke University, Durham NC

Graduated 2014

M.S. in Biology, Concentration in Physiology.....4.0 GPA

B.S. in Biochemistry3.4 GPA

Research Experience

July 2017 – Present

Energetics of rapid cellular mechanosensation

Graduate research assistant, Lab of Dr. Jorg Grandl, Duke University

- Developed a novel assay combining atomic force microscopy and whole-cell electrophysiology to probe cellular mechanosensitivity.
- Used this assay to measure thresholds and sensitivity of mechanochannels and the effects of pharmacological manipulations.

Apr 2017 – June 2017

Characterization of voltage-dependent movements of Piezo transmembrane domains

Graduate research assistant, Lab of Dr. Jorg Grandl, Duke University

- Performed cysteine scanning mutagenesis and cell-attached voltage & pressure clamp protocols to probe the voltage-dependent movements of transmembrane helices.

Jan 2017 – Apr 2017

Characterizing electrophysiological properties of VGlut1+ Low-threshold mechanoreceptors

Graduate rotation student, Lab of Dr. Ru-rong Ji, Duke University

- Performed dissection and primary culture of dorsal root ganglion neurons followed by characterization of the response of channelrhodopsin expressing cultured neurons to optical and electrical stimulation. Also performed tissue sectioning and RNAScope in situ hybridization of spinal cord and immunohistochemistry to characterize nerve endings.

Sept 2016 – Dec 2016

Determine the effects of Ani9 on TMEM63a and TMEM63b function

Graduate rotation student, Lab of Dr. Huanghe Yang, Duke University

- Performed inside out patching of TMEM63a and TMEM63b to characterize the specificity and efficacy of a TMEM63a agonist.

Sept 2012 – May 2016

Characterization of the interaction between ASIC and BK channels in glioma-derived cell lines

Graduate research assistant/Undergraduate research assistant, Lab of Dr. Elena Petroff, Montclair State University

- Used whole-cell patch clamp electrophysiology and pharmacological dissection of currents to probe the functional interaction of two channels.

Aug 2013

Determining the role of Y318 in BK Channel sensitivity to omega-3 fatty acids

Volunteer research assistant, Lab of Dr. Toshinori Hoshi, University of Pennsylvania

- Performed mutagenesis and inside-out patch clamp electrophysiology to characterize the role of Y318 in BK Channel sensitivity to the omega-3 fatty acid DHA.

Skills

Laboratory:

In vitro electrophysiology (whole-cell, outside-out, inside-out, cell attached), pressure-clamp, whole-cell poke, atomic force microscopy, cell culture, mutagenesis, and cloning.

Analysis:

Python, Julia, R, Matlab, ImageJ

Other:

Some experience with web-development with HTML, CSS, and Javascript (some), 3D modeling/animation in Blender, Prototyping and design using Autodesk Fusion CAD software, some experience with Labview.

Publications

Chamessian A, Matsuda M, **Young M**, Wang M, Zhang ZJ, Liu D, Tobin B, Xu ZZ, Van de Ven T, Ji RR. (2019) Is Optogenetic Activation of Vglut1-positive AB Low-Threshold Mechanoreceptors Sufficient to Induce Tactile Allodynia in Mice After Nerve Injury? *Journal of Neuroscience*. 39 (31) 6202-6215; doi: 10.1523/JNEUROSCI.2064-18.2019.

Chamessian A, **Young M**, Qadri Y, Berta T, Ji RR, Van de Ven T. (2018) Transcriptional Profiling of Somatostatin Interneurons in the Spinal Dorsal Horn. *Sci Rep*, 8. doi: 10.1038/s41598-018-25110-7.

Wu J, **Young M**, Lewis AH, Martfeld AN, Kalmeta B, Grandl J. (2017) Inactivation of Mechanically Activated Piezo1 Ion Channel is Determined by the C-terminal Extracellular Domain and Inner Pore Helix. *Cell Rep*, 21(9), 2357-2366. doi: 10.1016/j.celrep.2017.10.120.

Snitsarev V, **Young MN**, Miller RM, Rotella DP. (2013) The spectral properties of (-)-epigallocatechin-3-O-gallate (EGCG) fluorescence in different solvents: dependence on solvent polarity. *PLoS One*, 8(11), e79834. doi: 10.1371/journal.pone.0079834.

Fellowships and Awards

2018 Holland-Trice Graduate Student Fellowship

2018 Duke Graduate School Conference Travel Award

2017 Duke University Department of Anesthesiology Outstanding Predoctoral Poster

2016 National Science Foundation Graduate Research Fellowship (Honorable Mention)

2016 Montclair State University Outstanding Graduate Student in Biology

2014 Pharmfest Graduate Scholarship

2013 Charles E. Hadley Memorial Fund for Independent Student Research

2013 Outstanding Student Employee Award

Presentations

Research Talks

2016 Characterization of the interaction between ASIC and BK channels in glioma derived cell lines. *Montclair State University*. Masters Thesis.

Posters

2021 The energetics of rapid cellular mechanotransduction. *Biophysical Society*.

- 2019** The energetics of rapid cellular mechanotransduction. *Annual Duke Neurobiology Retreat.*
- 2018** Mechanosensory specializations and their underlying cellular and molecular mechanisms. *Annual Duke Neurobiology Retreat.*
- 2017** Inactivation of mechanically activated Piezo1 ion channels is determined by the C-terminal extracellular domain and the inner pore helix. *Gordon Research Conference: Ion Channels.*
- 2017** Characterization of VGlut1+ low-threshold mechanoreceptors. *Duke University Department of Anesthesiology Retreat.*
- 2014** Characterization of the spectral properties of (-) Epigallocatechin 3-O-gallate (EGCG) fluorescence in solvents of different polarity. *Experimental Biology.*
- 2013** Neuroprotective effects of EGCG on H₂O₂ and MPTP-stressed PC12 cells. *Montclair State University Research Symposium.*
- 2012** Regulation of BK channel activity in rat glial cells. *Society for Neuroscience annual conference.*
- 2012** Whole-cell current changes in response to change in extracellular pH in cultured rat glia. *Montclair State University Research Symposium.*

Professional Affiliations

- 2020-Present** Biophysical Society
- 2012-2018** Society for Neuroscience
- 2015-2016** Society for General Physiologists

Teaching Experience

- 2018** *Graduate Teaching Assistant – Duke University*
I moderated discussions for the graduate student journal club course. My responsibilities included guiding discussions, promoting participation, and ensuring a deep understanding of literature spanning a broad spectrum of neuroscience.
- 2014-2016** *Graduate Teaching Assistant – Montclair State University*
Taught lab sections for Microbiology (2 years), Cellular and Molecular Biology (1 year), Biological Sciences (1 semester), and Anatomy and Physiology I&II (1 semester each). I prepared all labs, generated lesson plans, graded all exams, written, practical assignments.
- 2014** *Undergraduate Teaching Assistant – Montclair State University*
Aided in student guidance and preparation for Microbiology laboratory and assisted with exam proctoring.

Outreach and Professional Service

- 2020-2021** *Duke University Neuroscience Experience*
Helped as part of a team of graduate students that secured funding to start a local research program offering individuals from underrepresented groups in local high schools the opportunity to gain summer research experience in a Duke Neurobiology research lab.
- 2020-2021** *Females and Allies Excelling More in Math, Engineering, and Science (FEMMES+) Capstone volunteer*
Assisted running activities during a single day event aimed towards increasing exposure and excitement about STEM concepts to 4th -6th grade students through interactive activities as a volunteer.

- 2018-2020** *Duke University Department of Neurobiology representative in the Graduate and Professional Student Council*
I acted as the voice of my constituents in the Department of Neurobiology on campus-wide decisions and as a channel of communication sharing opportunities across campus and events with the department.
- 2015** *Instructor in Montclair State University Gifted & Talented Summer Program*
Taught courses for students ranging from 3rd grade to high school in Marine Biology, Neuroscience, Microbiology, Pre-med, and Illusion Science.
- 2014-2015** *Graduate Coordinator for Partners of America International Collaboration*
Helped coordinate an exchange program of 7 students from Universidad Mayor in Santiago, Chile and 6 undergraduate students from Montclair State University. The program involved travel to each respective university to learn more about the local biotech industry and research both in New Jersey and Santiago.
- 2012, 2014, 2015** *Weston Science Scholar Mentor*
Taught laboratory techniques including cell culture and staining to high school students.
- 2013** *NJ Academy of Sciences Reviewer*
Reviewed research proposals from high school students as part of the Grant in Aid program.