



Kurt C. Marsden, Ph.D.

Assistant Professor

Department of Biological Sciences
W.M. Keck Center for Behavioral Biology
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EDUCATION

- **Albert Einstein College of Medicine; Bronx, NY**
Ph.D., Neuroscience, 2010; *“Heterosynaptic potentiation of inhibitory synapses in the hippocampus”*
- **Sarah Lawrence College; Bronxville, NY**
B.A., Liberal Arts, 2002

APPOINTMENTS and EXPERIENCE

- **Assistant Professor**, North Carolina State University; Raleigh, NC 2017-present
Department of Biological Sciences
- **Postdoctoral fellow**, University of Pennsylvania School of Medicine; Philadelphia, PA 2010-2017
Mentor: Dr. Michael Granato, Department of Cell and Developmental Biology
- **Faculty**, Marine Biological Laboratory, Zebrafish Course; Woods Hole, MA 2014-2017
- **Faculty**, Citizen Science Program, Bard College; Annandale-on-Hudson, NY 2013, 2014
- **MSTP Predoctoral fellow**, Albert Einstein College of Medicine; Bronx, NY 2004-2010
Mentor: Dr. Reed Carroll, Dominick P. Purpura Department of Neuroscience
- **Undergraduate research fellow**, Albert Einstein College of Medicine; Bronx, NY Summer 2001
Mentor: Dr. Reed Carroll, Dominick P. Purpura Department of Neuroscience
- **Undergraduate research fellow**, University of California, Irvine; Irvine, CA Summer 2000
Mentor: Dr. W. Ian Lipkin, Emerging Diseases Laboratory
- **Undergraduate research assistant**, Sarah Lawrence College; Bronxville, NY 2000-2002
Mentor: Dr. Raymond Clarke, Department of Biology

AWARDS and HONORS

- **Goodnight Early Career Innovator Award**, North Carolina State University 2021
- **New Faculty Travel Award**, Genetics Society of America (GSA) 2020
- **Travel Award**, International Behavioural and Neural Genetics Society (IBANGS) 2019
- **Travel Award**, International Zebrafish Society, SCZI meeting 2019
- **Best Oral Presentation Award**, University of Pennsylvania Postdoctoral Research Symposium 2014
- **Julius Marmur Research Award**, Albert Einstein College of Medicine 2010
- **Poster Presentation Award**, Gordon Research Conference: Inhibition in the CNS 2009
- **Society for Neuroscience Student Travel Award**, Mainland New York Chapter 2008
- **Edward Cogan Prize for Mathematics and Science**, Sarah Lawrence College 2002
- **Scholar-Athlete Award**, Sarah Lawrence College 2002
- **Summer Undergraduate Research Fellowship**, Albert Einstein College of Medicine 2001
- **W. Ian Lipkin Summer Research Fellowship**, University of California, Irvine 2000

RESEARCH SUPPORT

- **National Institute of Neurological Disorders and Stroke (NINDS),** 2021-2026
R01-NS116354-01A1
“Molecular and Cellular Mechanisms of Acoustic Startle Threshold Regulation”
Total direct + indirect costs: \$1,839,424
Role: PI
Status: *Funded*
- **National Science Foundation (NSF) CAREER Award, #2046413** 2021-2026
“Molecular and Cellular Mechanisms of Acoustic Startle Threshold Regulation”
Total direct + indirect costs: \$953,772
Role: PI
Status: *Withdrawn (Recommended for funding by Activation Program review panel)*
- **National Institute of Neurological Disorders and Stroke (NINDS),** 2021-2023
R21-NS120079-01A1
“Cellular and Molecular Mechanisms of Behavioral Dysfunction in a Zebrafish Model of CHARGE Syndrome”
Total direct + indirect costs: \$407,074
Role: PI
Status: *Pending (council review 10/2021; score 13%)*
- **Center for Human Health and the Environment (CHHE), NC State University** 2019-2021
“Cellular and molecular mechanisms of cyanotoxin mixture-induced neurotoxicity”
Total direct + indirect costs: \$35,533
Role: PI
Type: Pilot Project Award under NIEHS P30 ES025128 Center Grant
- **CHARGE Syndrome Foundation** 2018-2019
“Neurobehavioral analysis of a zebrafish model of CHARGE syndrome”
Total direct + indirect costs: \$50,000
Role: PI
- **W.M. Keck Center for Behavioral Biology** 2018
“Analysis of auditory hair cell function in hypersensitive zebrafish mutants”
Total direct + indirect costs: \$1561
Role: PI
- **Ruth L. Kirschstein National Research Service Award (NRSA) for Individual Postdoctoral Fellows, NINDS F32-NS-077815** 2012-2014
“Genetic Analysis of Acoustic Startle Behavior and Circuits”
Total direct + indirect costs: \$100,588
Role: PI
- **University of Pennsylvania School of Medicine Developmental Biology Training Grant 5-T32-HD-007516-13** 2010-2011
Total direct costs: \$39,756
Role: Scholar

INVITED LECTURES

- Society for Neuroscience, Research Triangle Chapter Annual Meeting April 2020, 2021

- BASF Toxicology Group December 2020
- Center for Human Health and the Environment (CHHE) Annual Symposium; North Carolina State University; Raleigh, NC February 2020
- **Neurobiology Laboratory, National Institute of Environmental Health Sciences;** Durham, NC February 2020
- Zebrafish Neural Circuits and Behavior Meeting; Cold Spring Harbor Laboratory; Cold Spring Harbor, NY November, 2019
- Department of Molecular Biomedical Sciences, College of Veterinary Medicine North Carolina State University; Raleigh, NC October 2019
- **International Behavioural and Neural Genetics Society (IBANGS) Conference;** Edinburgh, Scotland May 2019
- Triangle Zebrafish Symposium, Duke University; Durham, NC April 2019
- **Center for Human Disease Modeling, Duke University;** Durham, NC February 2019
- East Carolina University; Greenville, NC February 2018
- Mount Holyoke College; South Hadley, MA October 2016
- **Cold Spring Harbor Laboratory Meeting on Neuronal Circuits;** Cold Spring Harbor, NY April 2016
- North Carolina State University; Raleigh, NC February 2016
- Saint Joseph's University; Philadelphia, PA February 2016
- Colgate University; Hamilton, NY December 2015
- Sense to Synapse: Biology of Sensory Transduction Conference; New York, NY April 2015
- Biomedical Postdoctoral Research Symposium, University of Pennsylvania; Philadelphia, PA November 2014
- **11th International Conference on Zebrafish Development and Genetics; Plenary Session on Physiology and Disease;** Madison, WI June 2014
- 11th International Conference on Zebrafish Development and Genetics; Workshop on Emerging Techniques in Neural Circuit Analysis; Madison, WI June 2014
- Mid-Atlantic Regional Zebrafish (MARZ) Meeting; Philadelphia, PA November 2012
- Molecular Physiology Lab, National Institute on Alcohol Abuse and Alcoholism; Bethesda, MD August 2011
- **14th Annual Julius Marmur Symposium, Albert Einstein College of Medicine;** Bronx, NY March 2010
- Gordon Research Conference: Inhibition in the CNS; Waterville, ME July 2009
- Sarah Lawrence College; Bronxville, NY February 2009
- **Brain and Spinal Injury Center, University of California San Francisco;** San Francisco, CA June 2008

PRE-PRINTS and MANUSCRIPTS IN PREPARATION (*denotes undergraduate co-author)

- Burton DF, Deslauriers JC, **Marsden KC**. Heritability of inter- and intra-strain behavioral variation in larval zebrafish. (*In preparation*)
- Hodorovich DR, Fryer-Harris T*, Burton DF, Neese K*, Chudasama V*, **Marsden KC**. Embryo medium and testing arena size modulate larval zebrafish behavior. (*In preparation*)

PUBLICATIONS (*denotes undergraduate co-author)

- Kikel-Coury N, Green L, Nichols, E, Zellmer A, Pai S*, Hedlund S*, **Marsden KC**, Smith CJ. Pioneer axons utilize a dcc signaling-mediated invasion brake to precisely complete their pathfinding odyssey. *J Neurosci*. 2021 Jun 15;JN-RM-0212-21. doi: 10.1523/JNEUROSCI.0212-21.2021.
- Lasseigne AM, Echeverry FA, Ijaz S, Michel JC, Martin EA, Marsh AJ, Trujillo E, **Marsden KC**, Pereda AE, Miller AC. Electrical synaptic transmission requires a postsynaptic scaffolding protein. *Elife*. 2021 Apr 28;10:e66898.
- Meserve JH, Nelson JC, **Marsden KC**, Hsu J*, Echeverry FA, Jain RA, Wolman MA, Pereda AE, Granato M. A forward genetic screen identifies Dolk as a regulator of startle magnitude through the potassium channel subunit Kv1.1. *PLoS Genet*. 2021 Jun 1;17(6):e1008943.
- Martin RM, Bereman MS, **Marsden KC**. BMAA and MCLR interact to modulate behavior and exacerbate molecular changes related to neurodegeneration in larval zebrafish. *Toxicol Sci*. 2021 Feb;179(2):251-261.
- Bremer JB, **Marsden KC**, Miller AC, Granato M. The ubiquitin ligase PHR promotes directional regrowth of spinal zebrafish axons. *Commun Biol*. 2019 May 22;2:195.
- Jain RA, Wolman MA, **Marsden KC**, Nelson JC, Shoenhard H, Echeverry FA, Szi C*, Bell H, Skinner J, Cobbs EN*, Sawada K*, Zamora AD*, Pereda AE, Granato M. A Forward Genetic Screen in Zebrafish Identifies the G-Protein-Coupled Receptor CaSR as a Modulator of Sensorimotor Decision Making. *Curr Biol*. 2018 May 7;28(9):1357-1369.e5.
- **Marsden KC**, Jain RA, Wolman MA, Echeverry FA, Nelson JC, Hayer KE, Miltenberg B*, Pereda AE, Granato M. A Cyfip2-Dependent Excitatory Interneuron Pathway Establishes the Innate Startle Threshold. *Cell Rep*. 2018 Apr 17;23(3):878-887.
- Miller AC, Whitebirch AC, Shah AN, **Marsden KC**, Granato M, O'Brien J, Moens CB. A genetic basis for molecular asymmetry at vertebrate electrical synapses. *Elife*. 2017 May 22;6. pii: e25364.
- **Marsden KC**, Granato M. In Vivo Ca(2+) Imaging Reveals that Decreased Dendritic Excitability Drives Startle Habituation. *Cell Rep*. 2015 Dec 1;13(9):1733-40.
- Butler MG, Iben JR, **Marsden KC**, Epstein JA, Granato M, Weinstein BM. SNPfisher: tools for probing genetic variation in laboratory-reared zebrafish. *Development*. 2015 Apr 15;142(8):1542-52.
- Wolman MA, Jain RA, **Marsden KC**, Bell H, Skinner J, Hayer KE, Hogenesch JB, Granato M. A genome-wide screen identifies PAPP-AA-mediated IGFR signaling as a novel regulator of habituation learning. *Neuron*. 2015 Mar 18;85(6):1200-11.
- Perni S, **Marsden KC**, Escobar M, Hollingworth S, Baylor SM, Franzini-Armstrong C. Structural and functional properties of ryanodine receptor type 3 in zebrafish tail muscle. *J Gen Physiol*. 2015 Mar;145(3):173-84.
- Casimiro TM, Sossa KG, Uzunova G, Beattie JB, **Marsden KC**, Carroll RC. mGluR and NMDAR activation internalize distinct populations of AMPARs. *Mol Cell Neurosci*. 2011 Oct;48(2):161-70.
- **Marsden KC**, Shemesh A, Bayer KU, Carroll RC. Selective translocation of Ca²⁺/calmodulin protein kinase IIalpha (CaMKIIalpha) to inhibitory synapses. *Proc Natl Acad Sci U S A*. 2010 Nov 23;107(47):20559-64.
- Weinger JG, Omari KM, **Marsden KC**, Raine CS, Shafit-Zagardo B. Up-regulation of soluble Axl and Mer receptor tyrosine kinases negatively correlates with Gas6 in established multiple sclerosis lesions. *Am J Pathol*. 2009 Jul;175(1):283-93.

- **Marsden KC**, Beattie JB, Friedenthal J*, Carroll RC. NMDA receptor activation potentiates inhibitory transmission through GABA receptor-associated protein-dependent exocytosis of GABA(A) receptors. *J Neurosci*. 2007 Dec 26;27(52):14326-37.
- Clarke RD, Buskey EJ, **Marsden KC***. Effects of water motion and prey behavior on zooplankton capture by two coral reef fishes. *Marine Biology*. 2004 146:1145-55.

TEACHING EXPERIENCE

- **NC State University** Raleigh, NC
 - CBS/BIO 805 – Special Topics in Neuroscience** 2020, 2021
Co-instructor
 - BIO 483 – Capstone Course in Integrative Physiology and Neurobiology** 2018-2021
Sole Instructor: The Biology of Mental Illness
 - CBS/BIO 705 – Fundamentals of Neuroscience** 2018, 2020
Lectures on motor and regulatory systems
 - GN 441/541 – Human and Biomedical Genetics** 2018-2021
Lectures on neurogenetics, genome editing
 - CBS/BIO 805 – Special Topics in Neuroscience** 2018
Lecture and workshop: using zebrafish in neuroscience research, setting up a new lab
- **Bard College** Annandale-on-Hudson, NY
 - Faculty**, *Citizen Science Program*. Designed and taught three-week intensive science literacy course for a classroom of 20 first-year undergraduates, consisting of problem-based learning, computer modeling and laboratory investigation on infectious disease. 2013, 2014
- **Marine Biological Laboratory** Woods Hole, MA
 - Faculty** for *Zebrafish Development and Genetics* course. Designed and taught workshops on zebrafish behavior and imaging of neuronal activity. 2014-2017
- **University of Pennsylvania School of Veterinary Medicine** Philadelphia, PA
 - Lecturer** for *Developmental Biology* course. Prepared and presented lectures on neural development for first-year veterinary medicine students. Fall 2015
- **The Philadelphia School's K-12 Science Outreach Program** Philadelphia, PA
 - Instructor**. Presented hands-on neuroscience demonstrations using zebrafish. 2013-2014
- **Albert Einstein College of Medicine** Bronx, NY
 - Teaching Assistant** for medical school *Clinical and Developmental Anatomy* course. 2003-2004
Led weekly seminars, lab instruction, and mock exams for small groups medical students.

MENTORING of TRAINEES

- **NC State University**
 - Derek Burton, Research Technician 2017-present
 - Vimal Chudasama, undergraduate 2018
 - Katie Neese, undergraduate 2018-2019
 - Jake Deslauriers, Ph.D student, Genetics Program 2018-present
 - Tiara Fryer Harris, undergraduate, TRIO McNair Scholar, OUR Fellow 2018-2020
 - Samuel Hedlund, undergraduate 2018-2020
 - Sanjana Pai, undergraduate 2018-2020
 - Rubia Martin, Ph.D. student, Toxicology Program 2019-present
 - Dana Hodorovich, Ph.D. Student, Comparative Biomedical Sciences Program 2019-present

Rohit Ghotkar, undergraduate	2019-present
Jordan Jarman, undergraduate, OUR Fellow	2019-present
Austen Berry, undergraduate	2019-present
Patrick Lindsley, undergraduate	2020-present
Lindsey Russ, TRIO McNair Scholar	2020-present

• **University of Pennsylvania**

Jerry Hsu, combined B.S./M.S. student, Vagelos Scholar	2012-2016
Hannah Bell, Research Technician	2011-2016
Julianne Skinner, Research Technician	2014-2017
Lauren Schmidt, Research Technician	2010-2013
Samy Belfer, MSTP student	2013-2014
Hannah Schoenhard, Ph.D. student	2015-2017
Ellebin Ortiz, Ph.D. student	2016-2017
Colleen Fehm, undergraduate	2012-2013
Christine Shen, undergraduate	2011-2012

• **Albert Einstein College of Medicine**

Tanya Casimiro, Ph.D. student	2008-2010
Adi Shemesh, MSTP student	2008-2010
Jenna Friedenthal, undergraduate	2006-2010
Thalia Segal, undergraduate	2006-2007

• **Sarah Lawrence College**

Private tutor in Biology, Chemistry, and Physics	2001-2002
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UNIVERSITY and OTHER SERVICE, PROFESSIONAL SOCIETIES

• 2020 Triangle Zebrafish Symposium (canceled due to COVID-19) Co-organizer	2019-2020
• National Organization for Rare Disorders (NORD) Faculty Advisor, NC State Chapter	2020-present
• Genetics Society of America (GSA) Member	2020-present
• International Behavioural and Neural Genetics Society (IBANGS) Member	2019-present
• Comparative Medicine Institute (CMI), NC State University Member	2019-present
• Society for Neuroscience, Research Triangle Chapter Member	2018-present
• Faculty for Undergraduate Neuroscience (FUN) Member	2018-present
• Neuroscience Faculty Search Committee, NC State University Member	2018-2019, 2021
• Department of Biological Sciences, NC State University	

Library Representative	2018-present
• Center for Human Health and the Environment (CHHE), NC State University	
Member	2018-present
• Toxicology Ph.D. Program, NC State University	
Member, Faculty Mentor	2018-present
• International Zebrafish Society	
Member	2017-present
• Comparative Biomedical Sciences Ph.D. Program, NC State University	
Member, Faculty Mentor	2017-present
• Genetics Ph.D. Program, NC State University	
Member, Faculty Mentor	2017-present
• Biology Ph.D. Program, NC State University	
Member	2017-present
• Neuroscience Program Steering Committee, NC State University	
Member	2017-present
• W.M. Keck Center for Behavioral Biology, NC State University	
Member	2017-present
• Developmental Biology Club, University of Pennsylvania	
Co-founder and organizer	2011-2016
• Mid-Atlantic Regional Zebrafish (MARZ) Meeting	
Session chair	November 2014
• Society for Neuroscience	
Student member, Postdoc member	2004-2013
• Review Editor	
<i>Frontiers in Neural Circuits</i>	
• Ad Hoc Reviewer	
<i>Journal of Neuroscience</i>	
<i>Scientific Reports</i>	
<i>Disease Models and Mechanisms</i>	