

Michael Roberts
Associate Professor
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Education and Training

Education

09-1997 - 05-2000 BA, The University of Chicago, Chicago, Illinois
08-2000 - 12-2005 PhD, The University of Texas at Austin, Austin, Texas, Mentor: S. John Mihic, PhD

Postdoctoral Training

01-2006 - 05-2006 Postdoctoral Fellow, Neuroscience, University of Texas at Austin, Institute for Cell and Molecular Biology, Austin, TX, S. John Mihic, PhD
06-2006 - 06-2009 Postdoctoral Fellow, Neuroscience, Oregon Health and Science University, Vollum Institute, Portland, OR, Laurence O. Trussell, PhD
07-2009 - 06-2012 Postdoctoral Fellow, Neuroscience, University of Texas at Austin, Neuroscience, Austin, TX, Nace L. Golding, PhD

Work Experience

Academic Appointment

08-2011 - 05-2012 Lecturer, The University of Texas at Austin, Austin
10-2015 - 08-2024 Assistant Professor in Otolaryngology-Head and Neck Surgery, University of Michigan - Ann Arbor, Ann Arbor, MI
12-2021 - 08-2024 Assistant Professor in Molecular and Integrative Physiology, University of Michigan - Ann Arbor, Ann Arbor, MI
09-2024 - Present Associate Professor with tenure in Otolaryngology-Head and Neck Surgery, University of Michigan - Ann Arbor, Ann Arbor, MI
09-2024 - Present Associate Professor in Molecular and Integrative Physiology, University of Michigan - Ann Arbor, Ann Arbor, MI

Administrative Appointment

10-2021 - 09-2022 Associate Co-Director for Admissions and Recruitment, Neuroscience Graduate Program, Neuroscience Graduate Program, University of Michigan, Ann Arbor, MI

Research Positions

07-2012 - 09-2015 Research Scholar, Neuroscience, University of Texas at Austin, Austin, TX

Research Interests

- How neural circuits in the auditory midbrain use cellular and synaptic mechanisms to detect important features of speech and other vocalizations.
- Molecular and optogenetic approaches for identifying and manipulating neurons, microcircuits, and long-range neuronal projections in the auditory system.
- Neural plasticity mechanisms associated with hearing loss and how plasticity can be redirected to enhance hearing restoration.

Grants

Current Grants

R01DC021416: *Mechanisms of Cholinergic Signaling in the Inferior Colliculus*

PI

National Institutes of Health

08/2024 - 04/2029

\$2,970,564

R01DC018284: *Circuit Mechanisms for Auditory Processing in the Inferior Colliculus*

PI

National Institutes of Health

06/2020 - 05/2026 (No cost-extension)

\$2,272,277

RF1 MH141903: *Midbrain Signals for Differential Reinforcement Learning*

Co-I (PI: Apostolides)

National Institutes of Health

09/22/25 – 09/21/29

\$2,908,921

T32DC000011: *Sensory Mechanisms and Disorders*

PI (since 03/2023)

National Institutes of Health

07/2025 - 06/2030

\$2,284,322

F31DC021618: *Influence of T-Stellate Cell Input on Sound Processing in the Inferior Colliculus*

Faculty mentor (Trainee: Yoani Herrera)

National Institutes of Health

09/2023 - 08/2027

\$139,932

F31DC023101: *Identifying Molecular Markers and Local Axonal Projections of Novel Neuron Types in the Auditory Midbrain*

Faculty mentor (Trainee: Elie Huez)

National Institutes of Health

05/2025 - 04/2029

\$170,180

Submitted - Open

R01DC018284: *Circuit Mechanisms for Auditory Processing in the Inferior Colliculus*

PI

National Institutes of Health

04/2026 - 03/2031

R01DC004391: *Modulatory Circuits in the Auditory System*

Co-I (PI: Brett Schofield)

National Institutes of Health

03/2026 - 02/2031

R01: *Spatiotemporally Precise, Brain-Wide Recording of Cell-Type Resolved Gene Regulation Dynamics*

Co-I (PI: Changyang Linghu)

National Institutes of Health

07/2026 - 06/2029

Past Grants

F31DC021344: *Mechanisms Shaping Temporal Integration in the Inferior Colliculus*

Faculty mentor (Trainee: Audrey Drotos)

National Institutes of Health

09/2023 - 12/2025

\$82,918

K99DC019415: *GABA and NPY Signaling Interact to Shape Inhibition in the Auditory Tectothalamic Pathway*

Faculty mentor (Trainee: Marina Augusto Silveira)

National Institutes of Health

12/2021 - 11/2023

\$278,334

F31DC019292: *Cholinergic Modulation of VIP Neurons in the Auditory Midbrain and its Impact on the Excitability of Thalamic Neurons*

Faculty mentor (Trainee: Luis Rivera-Perez)

National Institutes of Health

09/2020 - 08/2023

\$116,792

R13DC020381: *Midwest Auditory Research Conference*

PI

National Institutes of Health

04/2022 - 09/2022

\$31,850

Neuropeptide Y as a Neuromodulator of Noise-Induced Hyperexcitability in the Inferior Colliculus

Faculty mentor (PI: Marina Augusto Silveira)

American Hearing Research Foundation

01/2019 - 12/2019

\$20,000

R56DC016880: *Auditory Processing by Neural Circuits in the Inferior Colliculus*

PI

National Institutes of Health

09/2018 - 11/2019

\$312,000

401540516: *Multi-Color Channelrhodopsin-Assisted Circuit Mapping of Auditory Inputs to a Novel Class of Stellate Cells in the Mouse Inferior Colliculus*

Faculty mentor (Trainee: David Goyer)

Deutsche Forschungsgemeinschaft

01/2018 - 12/2020

\$0 (funds awarded directly to David Goyer, covered full postdoctoral stipend for two years)

Cellular and Synaptic Basis of Binaural Gain Control Through the Commissure of the Inferior Colliculus

PI

Hearing Health Foundation

07/2017 - 06/2018

\$30,000

F31AA014454: *Mechanisms of glycine receptor modulation by ethanol*

Graduate student PI (Faculty mentor: S. John Mihic)

National Institute on Alcohol Abuse and Alcoholism

12/2003 - 11/2005
\$55,316

Honors and Awards

National

2026 Chair, Auditory System Gordon Research Conference (elected by peers)
2024 Vice-Chair, Auditory System Gordon Research Conference (elected by peers)

Institutional

2000 - 2001 Preemptive Fellowship, The University of Texas at Austin
2001 - 2002 Homer L. Bruce Endowed Graduate Fellowship, The University of Texas at Austin
2002 Fred M. Jones Endowed Graduate Fellowship, The University of Texas at Austin
2008 Fellowship for Postdoctoral Research, Tartar Trust, Oregon Health and Science University

Study Sections, Editorial Boards, Journal & Abstract Review

Study Sections

International

2010 Netherlands Organization for Scientific Research (NWO), Netherlands, (Ad Hoc)
2016 Israel Science Foundation, Israel, (Ad Hoc)
2024 German Research Foundation (DFG), Germany, (Ad Hoc)
2025 German Research Foundation (DFG), Germany, (Ad Hoc)

National

2017 National Science Foundation, United States, (Ad Hoc)
2023 ZRG1 ICN-A (02), National Institutes of Health, United States, (Ad Hoc)
2024 AUD, National Institutes of Health, United States, (Ad Hoc)

Editorial Boards / Journal & Abstract Reviews

Editorial Boards

2021 - Present Review Editor, Frontiers in Cellular Neuroscience

Journal Review

2006 - Present Journal of Neuroscience (Ad Hoc)
2009 - Present Journal of Neurophysiology (Ad Hoc)
2014 - Present Frontiers in Neural Circuits (Ad Hoc)
2015 - Present eLife (Ad Hoc)
2016 Neuroscience (Ad Hoc)
2017 Scientific Reports (Ad Hoc)
2018 - Present The Journal of Physiology (Ad Hoc)
2018 Journal of the Association for Research in Otolaryngology (Ad Hoc)
2019 - Present Journal of Comparative Neurology (Ad Hoc)
2020 Brain Structure & Function (Ad Hoc)
2020 Journal of Visualized Experiments (Ad Hoc)
2023 - Present Hearing Research (Ad Hoc)

2025 - Present

PLOS Biology (Ad Hoc)

Teaching

Mentorship

Postdoctoral Fellow

10-2016 - 04-2020

David A. Goyer, University of Michigan

- Resulted in two first-author papers.
- Awarded Postdoctoral Research Grant from the German Research Foundation (DFG).
- Currently Executive Assistant at Forschungszentrum Jülich in Germany.

07-2017 - 12-2024

Marina A. Silveira, University of Michigan

- Resulted in two first-author papers and three second-author papers (additional papers in preparation).
- Awarded K99 Pathway to Independence grant from NIDCD.
- Awarded research grant from the American Hearing Research Foundation.
- Invited talks at 2019 and 2021 Association for Research in Otolaryngology Midwinter Meetings.
- Started tenure-track faculty position at the University of Texas at San Antonio in January 2024.

10-2025 - present

Johanna Fritzinger, University of Michigan

Graduate Student

09-2017 - 12-2017

Luis Rivera-Perez, University of Michigan, Neuroscience Graduate Program, Lab rotation

04-2018 - 08-2023

Luis Rivera-Perez, University of Michigan, Neuroscience Graduate Program

- Resulted in one first-author paper and one second-author paper (additional papers in preparation).
- Honorable mention on NSF Graduate Research Fellowship.
- Awarded NIH F31 NRSA grant.
- Invited talk at 2022 Auditory System Gordon Research Conference.
- Successfully defended dissertation in May 2023. Graduated with PhD in August 2023.

09-2019 - 12-2019

Audrey Drotos, University of Michigan, Neuroscience Graduate Program, Lab rotation

09-2019 - 05-2020

Will Lynn, University of Michigan, Master of Public Health program, Research mentorship

01-2020 - 05-2020

Hannah Oberle, University of Michigan, Neuroscience Graduate Program, Lab rotation

05-2020 - 12-2024

Audrey Drotos, University of Michigan, Neuroscience Graduate Program

- First author paper in Journal of Physiology and second author on Journal of Neuroscience paper (additional studies underway).
- First author on review article in Hearing Research.
- Awarded NSF Graduate Research Fellowship.
- Awarded F31 NRSA grant.
- Invited talk at 2023 Association for Research in Otolaryngology Midwinter Meeting.
- Awarded one of two Neuroscience Innovators Award for 2024 from the Neuroscience Graduate Program, University of Michigan
- Successfully defended dissertation in October 2024. Graduated with PhD in December 2024.
- Received Honorable Mention in 2024 ProQuest Distinguished Dissertation Awards competition.

05-2021 - Present	Yoani Herrera, University of Michigan, Neuroscience Graduate Program - Published second-author paper (additional studies underway). - Awarded T32 Fellowship on Sensory Mechanisms and Disorders grant. - Best poster award at 2023 Michigan Neuroscience Conference. - Awarded F31 NRSA grant.
08-2022 - 10-2022	Jacob Reeves, University of Michigan, Neuroscience Graduate Program, Lab rotation
10-2022 - 03-2023	Elie Huez, University of Michigan, Neuroscience Graduate Program, Lab rotation
05-2023 - Present	Elie Huez, University of Michigan, Neuroscience Graduate Program
01-2024 - 03-2024	Courtney Myers, University of Michigan, Neuroscience Graduate Program, Lab rotation
05-2024 - Present	Courtney Myers, University of Michigan, Neuroscience Graduate Program
09-2024 - 10-2024	Jackie Seddon, University of Michigan, Neuroscience Graduate Program, Lab rotation
10-2025 - 12-2025	Penelope Corbett, University of Michigan, Neuroscience Graduate Program, Lab rotation

Undergraduate Student

07-2016 - 05-2019	Alexander P. George, University of Michigan - Resulted in second-author publication. - Awarded highest honors for senior thesis. - Currently completing medical school at Oakland University.
06-2017 - 08-2017	Hiywot Tulu, Neuroscience Undergraduate Research Opportunities (NURO) Program, University of Michigan/Macalester College
09-2017 - 09-2021	Justin D. Anair, University of Michigan - Resulted in first- and second-author publications. - Awarded highest honors for senior thesis. - Currently in Neuroscience PhD program at Northwestern University.
09-2018 - 06-2022	Julia T. Kwapiszewski, University of Michigan - Resulted in first- and second-author publications. - Awarded blue ribbon at UROP undergraduate research symposium. - Currently in medical school at Central Michigan University.
05-2019 - 04-2020	Lindsay E. Miles, University of Michigan
06-2019 - 08-2019	Kevin O. Cruz-Colon, Summer Intensive Research Experience in Neuroscience (SIREN), University of Michigan/University of Puerto Rico – Ponce Currently in Neuroscience Graduate Program at the University of Michigan.
06-2021 - 08-2021	Benjamin Filio, Summer Intensive Research Experience in Neuroscience (SIREN), University of Michigan/Weslyan University Currently in Brown / National Institutes of Health Graduate Partnership Program in Neuroscience.
09-2021 - 04-2022	Alexandra Digennaro, University of Michigan Awarded blue ribbon at UROP undergraduate research symposium.
09-2021 - 08-2022	Trevor Versalle, University of Michigan
09-2021 - 08-2022	Jina Patel, University of Michigan Awarded blue ribbon at UROP undergraduate research symposium.
06-2022 - 08-2022	Trinity Pirrone, Summer Intensive Research Experience in Neuroscience (SIREN), University of Michigan/Macalester College Resulted in third authorship on Journal of Neuroscience paper.
09-2022 - 05-2023	Rachel Zarb, University of Michigan, Undergraduate research assistant

09-2022 - 02-2024	Ananda Lewis, University of Michigan, UROP student
09-2022 - Present	Sarah Wajdi, University of Michigan, UROP student Received Magnificent Michigan Fellowship to support summer research in the lab.
06-2023 - 08-2023	Kennetra Smith, Summer Intensive Research Experience in Neuroscience (SIREN), University of Michigan/Virginia Tech
06-2024 - 08-2024	Britney Aguirre, Neuroscience Undergraduate Research Opportunities (NURO) Program, University of Michigan/California State University – San Bernadino
09-2024 - Present	Amal Kachour, University of Michigan, UROP student
09-2024 - Present	Lila Urogdy, University of Michigan, UROP student Awarded blue ribbon at UROP summer research symposium.
02-2025 - Present	Mariam Safirta, University of Michigan
09-2025 - Present	Sharon Lu, University of Michigan

High School Student

06-2024 - Present	Nurayda Albeez, International Academy East, Troy, Michigan Matriculated to Harvard in August 2025
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Teaching Activity

International

06-2022 - 06-2022	Neurobiology of Hearing, University of Salamanca, Spain, Instructor
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National

06-2011 - 06-2011	Ion Channel Physiology, Cold Spring Harbor Laboratory, Teaching Assistant
08-2019 - 08-2019	Biology of the Inner Ear 2019, Marine Biological Laboratory, Woods Hole, MA, Scientific Course Consultant
08-2022 - 08-2022	Biology of the Inner Ear 2022, Marine Biological Laboratory, Woods Hole, MA, Scientific Course Consultant
08-2024 - 08-2024	Biology of the Inner Ear 2024, Marine Biological Laboratory, Woods Hole, MA, Scientific Course Consultant

Institutional

09-2011 - 05-2012	Neurobiology Laboratory (BIO 365L), The University of Texas at Austin, Neuroscience, Course Director and Lecturer
08-2013 - 08-2013	Institute for Neuroscience Boot Camp, The University of Texas at Austin, Instructor
11-2016 - 11-2017	Oto ARTOP/HBCS Research Responsibility and Ethics, University of Michigan, Otolaryngology-Head and Neck Surgery, Instructor
01-2017 - Present	Preliminary Exam, University of Michigan, Neuroscience Graduate Program, Question writer and grader
03-2017 - 03-2017	Otolaryngology Sequence, M1 Course, University of Michigan Medical School, Instructor
08-2017 - 08-2023	Cellular and Molecular Neuroscience Lab – “Neuroscience Boot Camp” (Neurosci 623), University of Michigan, Neuroscience Graduate Program, Instructor; Course co-director in 2022
02-2018 - Present	Integrative Neuroscience (Physiol 592), University of Michigan, Molecular and Integrative Physiology, Instructor
02-2020 - 02-2024	Principles of Neuroscience: Sensory Systems (Neurosci 614), University of Michigan, Neuroscience Graduate Program, Instructor
10-2024 - 10-2024	Neurophysiology, Circuits, and Computational Neuroscience (Neurosci 613), University of Michigan, Neuroscience Graduate Program, Course Director

09-2025 - 10-2025 Neurophysiology, Circuits, and Computational Neuroscience (Neurosci 601),
University of Michigan, Neuroscience Graduate Program, Instructor

Dissertation Committees

01-2016 - 01-2016	David Martel, Qualifying Exam: Role of the ventral cochlear nucleus in tinnitus generation, University of Michigan, Biomedical Engineering, Committee Member
01-2016 - 01-2020	David Martel, Role of the Cochlear Nucleus Circuitry in Tinnitus and Hyperacusis, University of Michigan, Biomedical Engineering, Committee Member
01-2018 - 01-2021	Sharena Rice, Oscillations of the Granular Retrosplenial Cortex, University of Michigan, Neuroscience Graduate Program, Committee Member
01-2018 - 01-2021	Ellen Brennan, Functional Microcircuitry of the Granular Retrosplenial Cortex, University of Michigan, Neuroscience Graduate Program, Committee Member
04-2018 - 08-2023	Luis Rivera-Perez, Cholinergic signaling in the inferior colliculus, University of Michigan, Neuroscience Graduate Program, Chair
01-2020 - 08-2025	Emma Thorton-Kolbe, Olfactory coding in Drosophila, University of Michigan, Neuroscience Graduate Program, Committee Member
01-2020 - Present	Marie Walicki, Delta opioid receptor signaling in anterior cingulate cortex, University of Michigan, Neuroscience Graduate Program, Committee Member
01-2020 - 05-2024	Elizabeth Jaeckel, Effects of Chronic Morphine Treatment on Pre- and Postsynaptic Thalamo-Cortico-Striatal Mu-Opioid Receptor Signaling, University of Michigan, Pharmacology, Committee Member
01-2020 - 04-2024	Jennifer Jaime, GnRH neurons in the hypothalamus, University of Michigan, Neuroscience Graduate Program, Committee Member
01-2020 - 04-2025	Hannah Oberle, In vivo whole cell recording in the dorsal cortex of the inferior colliculus, University of Michigan, Neuroscience Graduate Program, Co-Chair
01-2020 - 01-2021	Fatimah Alkaabi, Hyperacusis, University of Michigan, Biomedical Engineering Master's Program, Committee Member
05-2020 - 12-2024	Audrey Drotos, Selectivity of inferior colliculus neurons for fundamental features of vocalization sounds, University of Michigan, Neuroscience Graduate Program, Chair
05-2021 - Present	Yoani Herrera, Sources and physiology of ascending synaptic inputs to VIP and NPY neurons in the inferior colliculus, University of Michigan, Neuroscience Graduate Program, Chair
01-2022 - 12-2023	Harini Suri, Sound processing in the auditory cortex, University of Michigan, Biopsychology, Committee Member
11-2022 - Present	Chloe Rybicki-Kler, Retrosplenial cortex circuits, University of Michigan, Neuroscience Graduate Program, Committee Member
11-2022 - 08-2025	Laila Almassri, NPY expression in synapses in the aging inferior colliculus and hippocampus, Northeast Ohio Medical University, Anatomy and Neurobiology, Committee Member
11-2022 - Present	Chandni Rana, Modulation of high frequency retrosplenial cortex oscillations across brain states like sleep and active wakefulness, University of Michigan, Neuroscience Graduate Program, Committee Member
09-2023 - Present	Elie Huez, Roles of midbrain SST neurons in auditory processing, University of Michigan, Neuroscience Graduate Program, Chair
09-2023 - Present	Jacob Reeves, Role of opioid receptors in circuit function in the anterior cingulate cortex, University of Michigan, Neuroscience Graduate Program, Co-Chair
10-2023 - 06-2025	Taylor Craig, Effects of NMDA block model of schizophrenia on neuronal properties in prefrontal cortex, Committee Member
7-2024 - Present	Viktoria Kirschnerova, Development of neocortex, Co-Chair

7-2024 - Present	Alexander Ford, Neural circuits in the superior colliculus, Committee Member
9-2024 - Present	Krystal M. Santiago-Colón, Effects of the Scn1a+/- mouse model of Dravet Syndrome on cholinergic neurons in the pedunculo-pontine tegmentum, Committee Member
09-2024 - Present	Hira Mirza, The role of hippocampal VIP neurons in sleep, Committee Member
08-2025	Christine Junhui Liu (Harvard), Neuropeptide signaling in the auditory cortex, External Committee Member

Memberships in Professional Societies

2002 - Present	Member, Society for Neuroscience
2006 - Present	Member, Association for Research in Otolaryngology

Committee/Service

National

2015	Young Investigator Symposium, "Mechanisms in binaural hearing: from synapses to psychophysics", Association for Research in Otolaryngology Annual Meeting. Baltimore, Maryland, Other, Organizer and Co-Chair
2016 - 2019	External Relations Committee, Association for Research in Otolaryngology, Member
2019 - 2020	Finance and Investment Committee, Association for Research in Otolaryngology, Member
2020 - 2022	Organizing Committee, Midwest Auditory Research Conference, Other, Member and PI of R13
2020 - 2023	Finance and Investment Committee, Association for Research in Otolaryngology, Chair
2022 - 2024	Vice Chair, Auditory System Gordon Research Conference, Vice Chair
2023 -	Faculty Sponsor, spARO – the student, postdoc, resident and fellow chapter of the Association for Research in Otolaryngology
2024 - 2026	Chair, Auditory System Gordon Research Conference, Chair

Institutional

2016 - 2021	Admissions Committee, Neuroscience Graduate Program, Member
2018 - 2023	Sensory Science Initiative Executive Board, Cross-departmental, Member
2021 - 2022	Admissions Committee, Neuroscience Graduate Program, Co-Chair
2021 - 2022	DEI Task Force: Admissions and Recruitment, Neuroscience Graduate Program, Co-Chair
2022 - 2023	Preliminary Exam Committee, Neuroscience Graduate Program, Member
2025 - Present	Space and Research Programming Team (SRPT), Medical School, Member

Departmental

2015 - 2023	HBCS Seminar Organizing Committee, Kresge Hearing Research Institute, Chair
2017 - 2022	HBCS Training Grant (T32DC000011) Admissions Committee, Otolaryngology-Head and Neck Surgery, Chair
2017 - 2022	Faculty Search Committee, Kresge Hearing Research Institute, Member
2019 - 2021	Hearing and Balance Day 2020 Organizing Committee, Otolaryngology-Head and Neck Surgery, Member
2021 - 2024	Values and Culture Committee, Otolaryngology-Head and Neck Surgery, Member
2022 - Present	Faculty Search Committee, Kresge Hearing Research Institute, Chair

2022	Neurotology Fellow Interview Board, Otolaryngology-Head and Neck Surgery, Member
2023 - Present	Director and PI of the NIH T32-funded Hearing, Balance, and Chemical Senses training program

Scholarly Activities

Presentations

Extramural Invited Presentation

Speaker

1. Fidelity of transmission of complex spikes in synaptically coupled cartwheel cells in the dorsal cochlear nucleus, Northwest Auditory and Vestibular Meeting, 10/2007, Portland, Oregon
2. Adaptations for temporal processing in neurons in the low frequency region of the gerbil inferior colliculus, Gordon Research Seminar: Auditory System, 07/2014, Bates College, Lewiston, Maine
3. Fast neurons in the inferior colliculus: substrates for temporal coding?, Association for Research in Otolaryngology Annual Meeting, 02/2015, Baltimore, Maryland
4. Mechanisms that control timing in MSO principal neurons, Eleventh International Workshop on Auditory Processing, 08/2015, Cody, Wyoming
5. Identification of novel neuron classes in the inferior colliculus, Auditory System Gordon Research Conference, 07/2018, Smithfield, Rhode Island
6. Regulation of Recurrent Excitation in the Auditory Midbrain, Association for Research in Otolaryngology Annual Meeting, 02/2024, Anaheim, California

Moderator

1. Auditory Experience and Development: Hair Cells, Babies and Brains, Auditory System Gordon Research Conference, 07/2022, Smithfield, RI
2. Podium Session: Brainstem: Structure & Function, Association for Research in Otolaryngology Annual Meeting, 02/2024, Anaheim, California

Seminar

1. How synaptic and biophysical mechanisms shape sound localization, The University of Texas Health Science Center San Antonio, 04/2014, San Antonio, Texas
2. Mechanisms that control timing in a neural circuit that localizes sounds, University of Michigan, 11/2014, Ann Arbor, Michigan
3. Mechanisms that control timing in a neural circuit that localizes sounds, Northeast Ohio Medical University, 12/2014, Rootstown, Ohio
4. Mechanisms that control timing in a neural circuit that localizes sounds, National Institute on Deafness and Other Communication Disorders (NIDCD), 01/2015, Bethesda, Maryland
5. Neural circuits underlying auditory processing in the brainstem and midbrain, Ohio University, 03/2017, Athens, Ohio
6. VIP neurons in the inferior colliculus: Identification of a novel class of principal neurons that project to auditory and non-auditory brain regions, Northeast Ohio Medical University, 10/2018, Rootstown, Ohio
7. VIP neurons in the inferior colliculus: Identification of a novel class of principal neurons that project to auditory and non-auditory brain regions, University of Pittsburgh, 10/2018, Pittsburgh, Pennsylvania
8. VIP and NPY neurons: Identification of two novel classes of principal neurons in the auditory midbrain, University of Illinois Urbana-Champaign, 09/2019, Urbana, Illinois
9. Neuropeptide neurons and neuropeptide signaling in the auditory midbrain, University of California - San Francisco, 01/2020, San Francisco, California
10. Neuropeptide neurons and neuromodulation in the auditory midbrain, University of Iowa, 10/2020, virtual due to COVID

11. Neuropeptide neurons and neuromodulation in the auditory midbrain, Tulane University, 02/2021, virtual due to COVID
12. Neuropeptide neurons and neuromodulation in the auditory midbrain, Harvard Medical School, 03/2022, virtual due to COVID
13. Neuropeptide neurons and neuromodulation in the auditory midbrain, Department of Otolaryngology-Head and Neck Surgery, The Ohio State University, 03/2022, Columbus, OH
14. Neuropeptide neurons and neuromodulation in the auditory midbrain, Johns Hopkins University, 05/2022, virtual due to COVID
15. Regulation of synaptic integration and recurrent excitation in the auditory midbrain, University of Rochester, 03/2023, Rochester, New York
16. Neuromodulation in the auditory midbrain: possible roles in hearing loss and hearing restoration, Wayne State University, Detroit, Michigan, 12/2023 (virtual Grand Rounds for Dept. of Otolaryngology)
17. Regulation of sound processing by local circuits in the auditory midbrain, University of Wisconsin, 10/2024, Madison, Wisconsin
18. Regulation of sound processing by local circuits in the auditory midbrain, Wayne State University, 12/2024, Detroit, Michigan
19. Determining the structure and function of microcircuits in the auditory midbrain, Association for Research in Otolaryngology online seminar series, 08/2025
20. Determining the structure and function of microcircuits in the auditory midbrain, University of Texas at San Antonio, 09/2025, San Antonio, Texas

Intramural Invited Presentation

Seminar

1. VIP and NPY neurons in the auditory midbrain: Identification of two classes of principal neurons that project to auditory and non-auditory brain regions, Biopsychology, University of Michigan, 01/2019, Ann Arbor, MI
2. Neuropeptide neurons and neuromodulation in the auditory midbrain, Molecular and Integrative Physiology, University of Michigan, 10/2021, Ann Arbor, MI
3. Neuropeptide Y regulates recurrent excitation in the auditory midbrain, University of Michigan Neuroscience Conference, University of Michigan, 06/2023, Ann Arbor, MI

Publications/Scholarship

(Co-First Author *; Corresponding author **; Co-Last author ***)

Peer-Reviewed

Journal Article

1. Dreixler JC, Bian J, Cao Y, **Roberts MT**, Roizen JD, Houamed KM: Block of rat brain recombinant SK channels by tricyclic antidepressants and related compounds. *Eur J Pharmacol.*401(1): 1-7, 07/2000. PM10915830
2. Cao Y, Dreixler JC, Roizen JD, **Roberts MT**, Houamed KM: Modulation of recombinant small-conductance Ca(2+)-activated K(+) channels by the muscle relaxant chlorzoxazone and structurally related compounds. *J Pharmacol Exp Ther.*296(3): 683-689, 03/2001. PM11181893
3. Findlay GS, Phelan R, **Roberts MT**, Homanics GE, Bergeson SE, Lopreato GF, Mihic SJ, Blednov YA, Harris RA: Glycine receptor knock-in mice and hyperekplexia-like phenotypes: Comparisons with the null mutant. *Journal of Neuroscience.*23(22): 8051-8059, 09/2003. PM12954867
4. **Roberts MT**, Phelan R, Erlichman BS, Pillai RN, Ma L, Lopreato GF, Mihic SJ: Occupancy of a single anesthetic binding pocket is sufficient to enhance glycine receptor function. *J Biol Chem.*281(6): 3305-3311, 02/2006. PM16361257
5. **Roberts MT**, Bender KJ, Trussell LO: Fidelity of complex spike-mediated synaptic transmission between inhibitory interneurons. *J Neurosci.*28(38): 9440-9450, 09/2008. PM18799676

6. **Roberts MT**, Trussell LO: Molecular layer inhibitory interneurons provide feedforward and lateral inhibition in the dorsal cochlear nucleus. *J Neurophysiol.*104(5): 2462-2473, 11/2010. PM20719922
7. **Roberts MT***, Seeman SC*, Golding NL: A mechanistic understanding of the role of feedforward inhibition in the mammalian sound localization circuitry. *Neuron.*78(5): 923-935, 06/2013. PM23764291
8. van der Heijden M, Lorteije JA M, Plauška A, **Roberts MT**, Golding NL, Borst JG G: Directional hearing by linear summation of binaural inputs at the medial superior olive. *Neuron.*78(5): 936-948, 06/2013. PM23764292
9. **Roberts MT**, Seeman SC, Golding NL: The relative contributions of MNTB and LNTB neurons to inhibition in the medial superior olive assessed through single and paired recordings. *Front Neural Circuits.*8: 49, 01/2014. PM24860434
10. Franken TP, **Roberts MT**, Wei L, Golding NL, Joris PX: In vivo coincidence detection in mammalian sound localization generates phase delays. *Nat Neurosci.*18(3): 444-452, 03/2015. PM25664914
11. Long P, Wan G, **Roberts MT**, Corfas G: Myelin development, plasticity, and pathology in the auditory system. *Dev Neurobiol.*78(2): 80-92, 02/2018. PM28925106
12. Goyer D, Silveira MA, George AP, Beebe NL, Edelbrock RM, Malinski PT, Schofield BR, **Roberts MT****: A novel class of inferior colliculus principal neurons labeled in vasoactive intestinal peptide-Cre mice. *eLife.*8(e43770)04/2019. PM30998185
13. Goyer D, **Roberts MT****: Long-range Channelrhodopsin-assisted Circuit Mapping of Inferior Colliculus Neurons with Blue and Red-shifted Channelrhodopsins. *J Vis Exp.*(156)02/2020. PM32090997
14. Silveira MA, Anair JD, Beebe NL, Mirjalili P, Schofield BR, **Roberts MT****: Neuropeptide Y Expression Defines a Novel Class of GABAergic Projection Neuron in the Inferior Colliculus. *J Neurosci.*40(24): 4685-4699, 06/2020. PM32376782
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