

MARIA NEIMARK GEFFEN

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PROFESSIONAL EXPERIENCE

- 2018-present Associate Professor, University of Pennsylvania
Department of Otorhinolaryngology, Department of Neuroscience, Department of Neurology
- 2011-2018 Assistant Professor, University of Pennsylvania
Department of Otorhinolaryngology, Department of Neuroscience
- 2006-2010 Fellow, Rockefeller University
Center for Studies in Physics and Biology

EDUCATION

- 2006 Ph.D., Harvard University, Biophysics
Advisor: Prof. Markus Meister
Thesis: "Encoding of complex stimuli in early sensory systems".
- 2001 A.B., Princeton University, Molecular Biology, Certificates Biophysics and VisArts
Senior thesis advisor: Prof. John Hopfield
Thesis: "The mechanics of whisking: the first stage in the transduction of surface textures into neural signals".

Additional Training

- 2014, 2015 Penn STEM Faculty Pathways to Leadership course
- 2002 Riken Brain Science Institute Summer Program
- 2001 Woods Hole MBL Methods in Computational Neuroscience Summer Course

PUBLICATIONS

1. Wood, K.C., Angeloni, C. F., Oxman, K., Clopath, C., **Geffen, M.N.** Neuronal activity in sensory cortex predicts the specificity of learning. *BioRxiv* 10.1101/2020.06.02.128702.
2. Seay, M.J., Natan, R.G., **Geffen, M.N.**, and Buonomano, D.V. (2020) Differential Short-Term Plasticity of PV and SST Neurons Accounts for Adaptation and Facilitation of Cortical Neurons to Auditory Tones. *Journal of Neuroscience*, 40 (48) 9224-9235.
3. Park., Y., **Geffen, M.N.** (2020) A Unifying Mechanistic Model of Excitatory-Inhibitory Interactions in the Auditory Cortex. *BioRxiv* 626358. *PLoS Comput Biol* 16(7): e1008016
4. Blackwell, J.M., Rao, W., De Biasi, M., **Geffen, M.N.** (2020) The role of feedback from the auditory cortex in shaping responses to sounds in inferior colliculus. *BioRxiv* 584334. *eLife* 2020;9:e51890.
5. Williams. A, **Geffen, M.N.** (2019) Birds of a different feather sing together. *Nat Neuroscience*, 22(9):1381-1382.
6. Aizenberg, M., Rolon-Martinez S., Pham, T., Rao, W., Haass, J. S., **Geffen, M.N.** (2019) Projection from the amygdala to the thalamic reticular amplifies cortical sound responses. *BioRxiv* 623868. *Cell Reports* 28, 605–615.
7. Betzel, R.F., Wood, K.C., Angeloni, C.F., **Geffen, M.N.**, Bassett, D.S. (2019) Stability of spontaneous, correlated activity in mouse auditory cortex. *BioRxiv* 491936. *PLoS Comp Biology*, 15(12): e1007360.

8. Gervain, J., **Geffen, M.N.** (2019) Efficient neural coding in auditory and speech perception. *Trends in Neurosciences*, 42(1) 56-65.
9. Briguglio, J.J., Aizenberg, M., Balasubramanian, V., **Geffen, M.N.** (2018) Cortical neural activity predicts sensory acuity under optogenetic manipulation. *J Neuroscience*, 38 (8) 2094-2105.
10. Angeloni, C, **Geffen, M.N.** (2018) Contextual modulation of sound processing in the auditory cortex. *Current Opinion in Neurobiology*, 49, 8–1.
11. Natan, R.G., Rao, W., **Geffen, M.N.** (2017) Cortical interneurons differentially shape frequency tuning following adaptation. *Cell Reports*, 21, 1–13.
12. Blackwell, J.M., **Geffen, M.N.** (2017) Progress and challenges for understanding the function of cortical microcircuits in auditory processing. *Nature Communications*, 8, 2165.
13. Wood, K.C., Blackwell, J.M., **Geffen, M.N.** (2017). Cortical inhibitory interneurons control sensory processing. *Current Opinion in Neurobiology*, 46C, 200-207.
14. Natan, R.G., Carruthers, I.M., Mwilambwe-Tshilobo, L., **Geffen, M.N.** (2017) Gain Control in the Auditory Cortex Evoked by Changing Temporal Correlation of Sounds. *Cerebral Cortex*, 27(3), 2385-2402.
15. Gervain, J., Werker, J.F., Black, A., **Geffen, M.N.** (2016) The neural correlates of processing scale-invariant environmental sounds at birth. *NeuroImage*, 133:144-150.
16. Blackwell, J.M., Taillefumier, T.O., Natan, R.G., Carruthers, I.M., Magnasco, M.O., **Geffen, M.N.** (2016) Stable encoding of sounds over a broad range of statistical parameters in the auditory cortex. *European Journal of Neuroscience*, 43(6), 751–764.
17. Aizenberg, M., Mwilambwe-Tshilobo, L., Briguglio, J.J., Natan, R.G., **Geffen, M.N.** (2015) Bi-directional regulation of innate and learned behaviors that rely on frequency discrimination by cortical inhibitory interneurons. *PLoS Biology*, 13(12): e1002308.
18. Natan, R.G., Briguglio, J.J., Mwilambwe-Tshilobo, L., Jones, S., Aizenberg, M., Goldberg, E.M., **Geffen, M.N.** (2015) Complementary control of sensory adaptation by two types of cortical interneurons. *eLife* 2015; 4: e09868.
19. Carruthers, I.M., Laplagne, D.A., Jaegle, A., Briguglio, J.J., Mwilambwe-Tshilobo, L., Natan, R.G., **Geffen, M.N.** (2015) Emergence of invariant representation of vocalizations in the auditory cortex. *Journal of Neurophysiology*, 114(5):2726-40.
20. Mwilambwe-Tshilobo, L., Davis, A.J.O., Aizenberg, M., **Geffen, M.N.** (2015) Selective impairment in frequency discrimination in a mouse model of tinnitus. *PLoS ONE*, 10(9): e0137749.
21. Gervain, J., Werker, J.F., **Geffen, M.N.** (2014) Category-specific processing of scale-invariant sounds in infancy. *PLoS ONE*, 9(5): e96278.
22. Zaidi, Q., Victor, J.D., McDermott, J., **Geffen, M.N.**, Bensmaia, S., Cleland, T.A. (2013) Perceptual Spaces: Mathematical structures to neural mechanisms. *Journal of Neuroscience*, 33(45), 17597-17602.
23. Aizenberg, M., **Geffen, M.N.** (2013) Bidirectional effects of auditory aversive learning on sensory acuity are mediated by the auditory cortex. *Nature Neuroscience*, 16, 994–996.
24. Carruthers, I.M., Natan, R.G., **Geffen, M.N.** (2013) Encoding of ultra-sonic vocalizations in the rat auditory cortex. *Journal of Neurophysiology*, 109(7), 1912-1927.
25. **Geffen, M.N.**, Gervain, J., Werker, J.F., Magnasco, M.O. (2011) Auditory perception of self-similarity in water sounds. *Frontiers in Integrative Neuroscience*, 5:15.
26. **Geffen, M.N.**, Broome, B.M., Laurent, G., Meister, M. (2009) Neural encoding of rapidly fluctuating odors. *Neuron*, 61(4), 570-586.

27. **Geffen, M.N.**, de Vries, S.E.J., and Meister, M. (2007) Retinal ganglion cells can rapidly change polarity from Off to On. *PLoS Biology*, 5(3), e65.
28. Andermann, M.L., Ritt, J., **Neimark, M.A.**, Moore, C.I. (2004) Neural correlates of vibrissa resonance: band-pass and somatotopic representation of high-frequency stimuli. *Neuron*, 42, 451-463.
29. **Neimark, M.A.**, Andermann, M.L., Hopfield, J.J. and Moore, C.I. (2003) Vibrissa resonance as a transduction mechanism for tactile encoding. *Journal of Neuroscience*, 23(16), 6499-6509.

HONORS AND AWARDS

2020	Mentor, Ruth L. Kirschstein National Research Service Award (NRSA)
2019	Mentor, Ruth L. Kirschstein National Research Service Award (NRSA)
2018	Keynote speaker, Sense2Synapse conference, NYC
2017	Mentor, Ruth L. Kirschstein National Research Service Award (NRSA)
2017	Keynote speaker, University of Southern California, Hearing and Communication Neuroscience Retreat
2017	Keynote speaker, University of Washington, Seattle – Allen Institute of Science symposium
2017	Mentor, Saul Winegrad Award for Outstanding Dissertation
2016	Young Investigator Award, Advances and Perspectives in Auditory Neuroscience
2015	Keynote speaker, Celebration of Women in Neuroscience, Society for Neuroscience Meeting
2014	Human Frontiers in Science Young Investigator Award
2014	Mentor, NARSAD Young Investigator Award
2011	Klingenstein Fellowship Award in Neuroscience
2011	Certificate of Appreciation from the Leadership Alliance
2009	Raymond and Beverly Sackler Fellowship in Physics and Biology
2008	Burroughs Wellcome Fund Career Award at the Scientific Interface
2007	Cell Press award for best poster at the Gordon Research Conference
2006	Rockefeller University Fellowship in Physics and Biology
2006	Rockefeller University Women in Science Fellowship
2003	Harvard University Biophysics Program recognition award
2002	HHMI Pre-doctoral Fellowship
2001	Fulbright Scholarship awarded (declined)
2000	Presidential Scholarship, Princeton University
1999	Martin A. Dale Award, Princeton University
1997	Cane Scholar, Princeton University

RESEARCH SUPPORT

Active Support

2-R01-DC014479-06A (Geffen)	NIH	\$2,712,045	04/01/15-06/30/25
Circuit Mechanisms of Sound Processing and Detection in the Auditory Pathway			
The goal of the proposed research is to identify the circuit-level mechanisms in the auditory cortex and anterior cingulate cortex that underlie auditory prediction and to test the way these mechanisms contribute to behavioral detection of regularity in sounds and its violation.			
5R01DC015527-04 (Geffen)	NIH	\$1,670,960	04/01/17-3/31/22
Neuronal circuits supporting learning-driven changes in auditory perception			
The goal of the proposed research is to identify the circuits for auditory learning and perception. This is achieved by using a combination of electrophysiological, optogenetic and behavioral approaches in the mouse.			
1R01NS113241-02 (Geffen)	NIH	\$4,490,177	06/01/19-05/31/24
Neuronal circuits for context-driven bias in auditory categorization			
The goal of this project is to identify the neuronal mechanisms for how contextual signals bias auditory categorization.			

1R01EB028162-02 (Kording)	NIH	\$24,700	09/01/19-08/31/22
Quantifying causality for neuroscience, Geffen's role: Co-I, 0.5 CM			
The goal of this project is to develop a set of computational techniques that allow neuroscientists to quantify how neurons causally influence one another.			
Pilot Grant (Olsen)	Templeton Foundation	\$57,500	04/01/20-12/01/20
Testing Global Neuronal Workspace (GNW) and Integrated Information (IIT) theories of consciousness in animal models. Geffen's role: Co-PI			
New Initiative Award (Geffen, Gottfried)	Charles E. Kaufman Foundation	\$300,000	11/01/20-10/31/22
Neuronal circuits for auditory-olfactory integration			

Completed Support

Human Frontiers in Science Foundation	Geffen (PI)	\$750,000	09/01/2014-08/31/2018
<i>Development of brain mechanisms underlying speech preference in infants: is speech special?</i>			
Burroughs Wellcome Fund Career Award at the Scientific Interface	Geffen (PI)	\$500,000	08/01/2008-08/31/2018
<i>Perception and neural encoding of textured sounds.</i>			
NIH NIDCD R03DC013660-01	Geffen (PI)	\$480,000	12/01/2013-9/31/2017
The role of cortical interneurons in auditory processing and learning			
Klingenstein Fellowship Award	Geffen (PI)		07/01/2011-06/30/2014
Neural mechanisms of encoding of complex natural sounds			
PA Lions Hearing Research Foundation	Geffen(PI)	\$60,000	09/01/2016-08/31/2019
<i>Central brain circuits of supporting discrimination of signals in noise</i>			
University of Pennsylvania CNC	Geffen (PI)		07/01/2011-06/30/2012
<i>The role of cortico-cortical connections of the mammalian sensory cortex in information processing</i>			

TEACHING

2018-present	NGG 573. Systems and Integrative Neuroscience. <u>Course Director.</u>
2017	Harvard University, Methods in Biophysics. Guest Lecturer.
2016	Woods Hole Marine Biological Laboratory, Methods in Computational Neuroscience. Lecturer.
2016, 2017	NGG 573. Systems and Integrative Neuroscience. Modules on computational methods and on auditory processing. Lecturer.
2012-	Organizer, Auditory Journal Club.
2012, 2015	NGG 573. Systems and Integrative Neuroscience. Lecturer (auditory processing).
2011, 2014	Department of Otorhinolaryngology, Grand Rounds. Lecturer.
2014	Instructor. International School in Quantitative Biology, Trieste, Italy (3 lectures)
2013-present	IGERT Perception journal club. Faculty moderator/Guest lecturer.
2012	ENG 305. Introduction to Physiology. Guest Lecturer.
2013, 2011	NGG 598. Advanced Systems Neuroscience. Lecturer (auditory processing).
2012, 2011	Summer Course in Computational Neuroscience, Guest Lecturer.
2012	Penn Institute for Research in Cognitive Science summer workshop. Guest Lecturer.
2011	NGG 577, Core IV. Neuroscience graduate group seminar. <u>Course Director.</u>
2011	Psychology 217. Visual Neuroscience, Guest Lecturer.

SERVICE

Conference organizer

2020-2021	Organizer, E.A.R.S. monthly seminar series
2019-2022	Co-director, Cajal Course in Computational Neuroscience, Champalimaud, Portugal

2017 Co-organizer, eight week KITP workshop. Physics of Hearing.
 2016 General chair, Computational and Systems Neuroscience conference (CoSyNe), Salt Lake City, UT. *CoSyNe is a 6-day long premier international meeting in the field of systems and computational neuroscience, attracting upward of 750 participants.*
 2015 Program committee chair, CoSyNe
 2013, 2012 Program committee member, CoSyNe
 2010-2012 Working group at NIMBioS, Knoxville, TN, member
 2009 Abstract reviewer, CoSyNe

Reviewer

Grant Proposals NIH AUD research grant proposal review panel, permanent member 2018-2024
 NIH NIDCD special emphasis review panel, 2018
 Israel Science Foundation, 2017, 2018
 NIH AUD research grant proposal review panel, 2017
 NIH Brain Initiative research grant proposal review panel, 2017
 NIH NIDCD Fellowship proposal review panel, 2015, 2016, 2017
 Wellcome Trust, 2016, 2019, 2020
 Leverhulme Foundation, 2016
 NSF-NIH CRCNS review panel, 2013
 Keck Foundation, 2011

Journals *Nature, Nature Human Behavior, Nature Neuroscience, Journal of Neuroscience, Journal of Neurophysiology, Nature Communications, PNAS, PLoS Computational Biology, PLoS One, Cerebral Cortex, Current Biology, eLife.*

Service at Penn

2020 Department of Psychology GRE Working Group
 2020 Department of Otorhinolaryngology Diversity/Equity committee, member
 2020 Tenure review committee
 2018- present Computational Neuroscience Initiative seminar organizing committee, member
 2017, 2018 MindCORE seminar organizing committee, member
 2016 Interdisciplinary Mind/Brain seminar organizing committee, chair
 2016 Department of Otorhinolaryngology fellow admissions, interviewer
 2012 Department of Otorhinolaryngology resident admissions, interviewer
 2015 Department of Otorhinolaryngology Faculty Search committee, member
 2015 Neuroscience Graduate Group awards committee, member
 2012-2014 Neuroscience Graduate Group admissions committee, member
 2012, 2014 Penn CNC grant review committee, member

Service on editorial/advisory boards

2020- Quanta magazine advisory board member. Advise a general science online magazine on neuroscience content.

Community Outreach

2014, 2015, 2016, 2017 Instructor, Series of workshops on neuroscience with NGG at Independence Charter School, Philadelphia PA.
 2016 Discussion participant. Musical experimental performance. Philadelphia, PA
 2015 Music Hackathon, New York, NY, presenter
 2014, 2015, 2016, 2017 Philadelphia Science Festival, presenter
 2014 Instructor, Workshop at Penn Children Center, Philadelphia, PA.

Professional organization memberships

2012-present American Physiological Society, member
 2010-present Association for Research in Otolaryngology, member
 2006-present AAAS, member

2002-2003 Biophysical Society, member
2001-present Society for Neuroscience, member

RECENT INVITED TALKS

2021 LOOPs seminar
 University of Oregon

2020 Computational and Systems Neuroscience Workshop, Colorado
 University of Oxford, Oxford, UK
 Neuromatch meeting, global
 University of Michigan, Ann Arbor, Michigan
 Gordon Research Conference, California
 NEOMED, OH

2019 ARO mid-winter meeting
 Winter BRAIN meeting
 Harvard University, Program in Biophysics, Massachusetts
 Russian Higher School of Economics, Moscow, Russia
 CNRS, France
 Cold Spring Harbor Laboratory, New York
 Janelia HHMI Workshop, Virginia
 University of California, Los Angeles, California

2018 University of Maryland, Biology
 Marine Biological Laboratory, Woods Hole
 Auditory Cortex Gordon Research Conference, invited talk
 University of Pittsburgh, Department of Otolaryngology
 Yale University, Schwartz Center for Computational Neuroscience
 Duke University, Department of Neurobiology
 Columbia University Workshop on Brain Circuits, Memory and Computation
 Spain-US CRCNS workshop, Madrid, Spain
 Champalimaud Research Symposium, Lisbon, Portugal
 Cold Spring Harbor Laboratory Neocortex meeting
 CoSyNe workshop on synaptic plasticity
 Keynote speaker, Sense2Synapse conference, Rockefeller University, New York
 University College London
 University of Crete, Greece

2017 Keynote speaker, University of Washington, Seattle – Allen Institute of Science joint
 symposium on the brain
 Keynote speaker, University of Southern California, Hearing and Communication
 Neuroscience Retreat
 Computational and Systems Neuroscience meeting (COSYNE), invited talk
 University of Chicago, Neurobiology
 COSYNE workshop, invited talk
 Cold Spring Harbor Laboratory, Neurobiology
 John Hopkins University, Neurobiology
 Auditory Cortex meeting, Banff, Canada, invited talk
 Bioengineering Department, Penn
 Clinical Neurosciences Training Program, Penn

2016 Birdsong pre-SFN meeting
 Advanced and Perspectives in Auditory Neuroscience, Spotlight Young Investigator Seminar
 Massachusetts Eye and Ear Institute, Harvard University Medical School
 Duke University, Neurobiology
 Human Frontier in Science Program Meeting, Singapore
 Max Planck Institute for Brain Research, Frankfurt, Germany
 Federation of European Neuroscience Societies Forum, Copenhagen, Denmark
 Workshop on Unsolved Problems in Systems Neuroscience, Janelia Farm HHMI

- Imperial College, London
 University College London
 Universite Paris Descartes
 Rutgers University, Neurobiology
 Princeton University, Psychology Colloquium
- 2015 Keynote speaker, Celebration of Women in Neuroscience, Society for Neuroscience Meeting
 Food for Thought Lunch, University of Pennsylvania
 NYU, Center for Neural Science Colloquium
 University of Oregon, Neuroscience Colloquium
 Klingenstein-Simons Foundation Meeting, NYC
 Georgia Tech, Colloquium
 Emory University, Workshop
 University of Pennsylvania, Computational Neuroscience Initiative
- 2014 SISSA, Trieste
 University of Texas, Austin
 Hebrew University, Jerusalem, Workshop on Vocalizations
 University of Pennsylvania, Center for Cognitive Neuroscience
 University of Pennsylvania, Food for Thought Lunch
 UCL Ear Institute
 Harvard University Center for Brain Science
- 2013 University of Pennsylvania, Systems Lab Night
 Society for Neuroscience meeting, Platform presentation
 CoSyNe, Session Chair
 ARO Mid-Winter Meeting, Platform presentation
- 2012 Caltech
 Eastern Auditory Retreat, Baltimore
 CUNY, Initiative for Theoretical Science
 CoSyNe Workshop
- 2011 NSF/NIH CRCNS meeting, Princeton University
 NIMBiOS working group
 ARO Mid-Winter meeting, Platform presentation
- 2010 University of Pennsylvania, Mahoney Institute in Neurological Sciences
 Janelia Farm, Vibrissa meeting, Session chair

MENTORING

Post-doctoral Fellows: Mark Aizenberg, Ph.D. Weizmann Institute (2011 – 2017), Katherine Wood, Ph.D. UCL (2016 –); Linda Garami, Ph.D. Eotvos Lorand University (2017 –); Melanie Tobin, Ph.D. Institut Curie (2018 –), Alexandria Lesicko, Ph.D. UIUC (2018 –); Youngmin Park, Ph.D. University of Pittsburgh (2018 – 2019); Natan Vogler, Ph.D. University of Pittsburgh (2020 –), Janaki Sheth (2020 –).

Ph.D. students: Jared Collina, Neuroscience; Aaron Williams, M.D.-Ph.D. Neuroscience; Xiaomao Ding, Neuroscience; Solymar Rolon Martinez, Neuroscience; Chris Angeloni, Psychology; Jennifer Blackwell, Neuroscience (graduated in 2019, now IRACDA fellow at SUNY); John Briguglio, Physics (jointly supervised with Vijay Balasubramanian, graduated 2016, now postdoc at Janelia Farm HHMI); Ryan Natan, Neuroscience (graduated in 2016, Winegrad Award for Outstanding PhD thesis, now postdoc at Janelia Farm HHMI); Isaac Carruthers, Physics (graduated in 2015, now at Quant Consulting, NYC).

Rotation Ph.D. students: Sneha Narasimhan, Neuroscience; Andrew Jaegle, Neuroscience; Aaron Williams, M.D.-Ph.D. Neuroscience; Cedric Xia, M.D.-Ph.D. Neuroscience; Kyra Schapiro, Neuroscience; Daniel Kalamarides, Neuroscience; Harang Ju, Neuroscience; Xiaomao Ding, Neuroscience; David Lozano, Neuroscience; Sophie Rogers, Neuroscience.

Medical students: Adetokundo Obayemi (now resident in Otolaryngology at New York Presbyterian)

Undergraduate honors students: Nitay Caspi '18, Sara Jones '16 (now MD student at Johns Hopkins), Joshua Margolis '14 (now at Amazon), Andrew Davis '13 (now MD student at University of Pennsylvania), Liana Cheung '12 (now MD student at University of Brisbane).

Undergraduate technicians/summer students: Andrew Chen '17, Anh Nguyen '15, Danielle Mohabir '15, Lisa Liu '14, General Lee (Case Western), Norbert Cruz (University of Puerto Rico).

Qualifying Exam Committee: Hongfei Ji, Bioengineering; Yue Ji, Neuroscience; Yunshu Fan, Neuroscience; Morgan Taylor, Neuroscience; Adam Gifford, Neuroscience; Matt Churgin, Bioengineering; John Burke, Neuroscience; Opeyemi Obami, Neuroscience; Adeeti Aggarwal, Neuroscience; Kevin Goff, Neuroscience (chair), Ari Benjamin (advisor: Konrad Kording), Barnes Januzzi (advisor: Nicole Rust).

Thesis Committee: Morgan Taylor (advisor: Diego Contreras); Alex Keinarth (advisor: Vijay Balasubramanian); Patrick McClanahan, advisor: Chris Fang-Yen; Adeeti Aggarwal, advisor: Max Kelz; Elebin Ortiz (advisor: Michael Granato); Matt Schaff (advisor: Yale Cohen); Kevin Goff (advisor: Ethan Goldberg); Guan-En Graham (Rutgers Neuroscience, advisor: Kasia Bieszcad); Harang Ju (advisor: Dani Bassett); Ari Benjamin (advisor: Konrad Kording); Brenna Shortal (advisor: Alex Proekt).

Ph.D. external examiner: Stephane Deny, Institut de la Vision, Paris VI; Sanchari Gosh, CSHL; Sebastian Ceballo, CNRS.

PRESS INTERVIEWS: Brain Matters (<http://brainpodcast.com/page/3>), 2014

WHYY feature story on the Pulse (<http://www.newsworks.org/index.php/local/the-pulse/70702-ear-researcher-looks-at-how-your-brain-gets-meaning-from-sound>), 2014

Burroughs Welcome Fund Focus in Sound interview (<http://www.bwfund.org/newsroom/awardee-profiles/focus-sound-maria-geffen>), 2014

Behind the CV, 2019, MindCORE: <https://youtu.be/iX-iuBnI9Wg>

CONFERENCE PRESENTATIONS

Williams, A., Geffen, M.N. (2020) Sound improves neural encoding of stimulus direction in mouse V1. APAN.

Wood, K.C., Angeloni, C.F., Oxman, K., Clopath, C., Geffen, M.N. (2020) Neuronal activity in sensory cortex predicts the specificity of learning. APAN.

Ding, X., Wood, K.C., Geffen, M.N. (2020) Representations of complex sounds in AC are modulated by temporal context. APAN

Garami, L., Angeloni, C.F., Ding, X., Geffen, M.N. Predictable Stimulus Encoding in Auditory Cortex. APAN.
Lesicko, A., Geffen, M.N. The auditory cortex regulates deviance detection in the inferior colliculus of awake mice. APAN.

Angeloni, C.F., Wood, K.C., Garami, L., Geffen, M.N. Efficient coding in auditory cortex determines target detection behavior. APAN/

Tobin, M., Wood, K.C., Stiso, J., Bassett, D., Geffen, M.N. (2020) Role of interneurons in populations' neural coding and network properties in auditory cortex. APAN.

Rolón-Martínez, S., Geffen, M. N. (2020) Role of inhibitory neuron types of the TRN in auditory processing. APAN.

Rolón-Martínez, S., Geffen, Maria N. Role of inhibitory interneuron types of the TRN on auditory processing. 37. Gordon Research Seminar and Conference on Thalamocortical Interactions, Ventura Beach, 2020.

Tobin, M., Wood, K.C., Ding, X., Geffen, M.N., (2019) Role of interneurons in populations' neural coding in auditory cortex. Workshop "The Operating Regime of Neural Circuits as a Determinant for Computations", Janelia Research Campus, VA 2019

Angeloni, C.F., Ding,X., Geffen, M.N. (2019) Differential roles of somatostatin and parvalbumin-positive interneurons in contrast gain control. Society for Neuroscience meeting, Chicago, IL 574.20

Tobin, M., Wood, K., Ding, X., Geffen, M.N. (2019) Role of interneurons in populations' neural coding in auditory cortex. Society for Neuroscience meeting, Chicago, IL 574.28

Wood, K.C., Betzel, R., Bassett, D.S., Geffen, M.N. Activity in auditory cortex predicts specificity of fear learning. Advances and Perspectives in Auditory Neurophysiology, Chicago, IL 2019

Blackwell, J., Rao, W., Ridolphi-Starr, D., Geffen, M.N. Cortical excitatory and inhibitory neurons differentially affect collicular responses to sound. 394.03. Society for Neuroscience meeting, San Diego, CA 2018.

Garami, L., Angeloni, C., Wood, K.C., Geffen, M.N. Neurons in auditory cortex are sensitive to frequency pattern violation. 394.11. Society for Neuroscience meeting, San Diego, CA 2018.

Rolón-Martínez, S., Aizenberg, M., Geffen, M. N. Amygdala-TRN projections amplify tone-evoked activity in auditory thalamus and cortex. 573.25. *Platform presentation*. Society for Neuroscience meeting, San Diego, CA 2018.

Wood, K., Betzel, R., Bassett, D. S., Geffen, M. N. Reorganization of cortical population neuronal activity following auditory fear conditioning. 574.05. Society for Neuroscience meeting, San Diego, CA 2018.

Angeloni, C.F., Geffen, M.N. Increased cortical gain facilitates the detection of targets in noise. 766.21. Society for Neuroscience meeting, San Diego, CA 2018.

Wood, K.C., Bassett, D.S., Geffen, M.N. Reorganization of cortical population neuronal activity following auditory fear conditioning. Computational and Systems Neuroscience meeting, Denver, CO, 2018.

Rolon-Martinez, S., Aizenberg, M., Geffen, M.N. Amygdala-TRN projections amplify tone-evoked activity in auditory thalamus and cortex. Computational and Systems Neuroscience meeting, Denver, CO, 2018.

Wood, K.C., Betzel, R.F., Angeloni, C.F., Aizenberg, N., Bassett, D.S., Geffen, M.N. Auditory fear conditioning drives changes in frequency representation and functional organization of neuronal populations in the auditory cortex. Society for Neuroscience meeting, Washington, D.C. 2017. Also poster presentation at Advances and Perspectives in Auditory Neurophysiology, Washington, D.C. 2017.

Betzel, R.F., Wood, K.C., Angeloni, C.F., Geffen, M.N., Bassett, D.S. Meso-scale structure and quotidian variation of neuronal networks estimated from two-photon imaging of mouse auditory cortex. Society for Neuroscience meeting, Washington, D.C. 2017.

Angeloni, C., Aizenberg, M., Geffen, M.N. Robust discrimination of sounds embedded in noise by adapting cortical gain. Society for Neuroscience meeting, Washington, D.C. 2017. Also poster presentation at Advances and Perspectives in Auditory Neurophysiology, Washington, D.C. 2017.

Angeloni, C., Aizenberg, M., Geffen, M.N. Cortical gain adaptation to extract signals from background noise. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2017.

Blackwell, J., Aizenberg, M., Rao, W., Natan, R.G., Geffen, M.N. Activating distinct neuronal subtypes in auditory cortex differentially affects collicular responses. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2017. Also presented at Auditory Cortex meeting, Banff, Canada, 2017.

Natan, R.G., Rao, W., Geffen, M.N. Adaptation in auditory cortex is actively shaped by somatostatin-positive and not parvalbumin-positive interneurons. Society for Neuroscience meeting, San Diego, CA, 2016. 51.13. Also poster presentation at Advances and Perspectives in Auditory Neurophysiology, San Diego, CA, 2016.

Blackwell, J., Aizenberg, M., Mwilambwe-Tshilobo, L., Jones, S., Natan, R.G., Geffen, M.N. Two types of interneurons differentially modulate behavioral frequency discrimination acuity. Society for Neuroscience

meeting, San Diego, CA, 2016. 51.18. Also poster presentation at Advances and Perspectives in Auditory Neurophysiology, San Diego, CA, 2016.

Gervain, J., Werker, J.F., Black, A., Geffen, M.N. The neural correlates of processing scale-invariant environmental sounds in infancy. Boston University Conference on Language Development, Boston, MA, 2016.

Gervain, J, Geffen, M.N. Speech Perception: A new perspective from efficient neural coding. HFSP meeting, Singapore. 2016.

Geffen, M.N. Dynamic modulation of auditory acuity by circuits in the auditory cortex. FENS meeting, Copenhagen, 2016.

Natan, R.G., Xia, C.H., Rao, W., Geffen, M.N. Cortical adaptation is actively shaped by somatostatin-positive and not parvalbumin-positive neurons. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2016.

Xia, C.H., Natan, R.G., Rao, W., Geffen, M.N. Two subtypes of interneurons complementarily mediate behavioral detection of deviant sounds. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2016.

Blackwell, J., Aizenberg, M., Mwilambwe-Tshilobo, L., Jones, S., Natan, R.G., Geffen, M.N. Two types of cortical interneurons differentially modulate behavioral frequency discrimination acuity. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2016.

Natan, R.G., Briguglio, J., Mwilambwe-Tshilobo, L., Goldberg, E.M., Geffen, M, N. Multiple mechanisms for stimulus-specific adaptation in the primary auditory cortex. Society for Neuroscience meeting, Chicago, IL, 2015 57.07/J1. Also poster presentation at Advances and Perspectives in Auditory Neurophysiology, Chicago, IL, 2015.

Blackwell, J., Aizenberg, M., Mwilambwe-Tshilobo, L., Jones, S., Natan, R.G., Geffen, M.N. Two types of interneurons differentially modulate tone-evoked responses in the primary auditory cortex. Society for Neuroscience meeting, Chicago, IL, 2015 N226-652.04. Platform. Also presented at Advances and Perspectives in Auditory Neurophysiology, Chicago, IL, 2015.

Geffen, M.N., Cabrera, L., Werker, J.F., Gervain, J. The perception of natural sounds: an efficient neural coding perspective. Auditory Development, Seattle, WA, 2015

Natan, R.G., Briguglio, J., Mwilambwe-Tshilobo, L., Geffen, M, N. Multiple mechanisms for stimulus-specific adaptation in the primary auditory cortex. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2015.

Aizenberg, M., Mwilambwe-Tshilobo, L., Geffen, M.N. Cortical inhibition regulates frequency discrimination acuity and specialization of emotional learning. Platform Presentation, Society for Neuroscience Meeting, Washington, DC, 2014. Platform. Also platform presentation at Advances and Perspectives in Auditory Neurophysiology, Washington, DC, 2014.

Mwilambwe-Tshilobo, L., David, A.J.O., Geffen, M.N. Effects of noise-induced tinnitus on frequency discrimination acuity in mice. Society for Neuroscience Meeting, Washington, DC, 2014. Also presented at Advances and Perspectives in Auditory Neurophysiology, Washington, DC, 2014.

Briguglio, J., Natan, R.G., Mwilambwe-Tshilobo, L., Geffen, M, N. Effects of local inhibition on stimulus-specific adaptation across laminae of primary auditory cortex. Society for Neuroscience Meeting, Washington, DC, 2014. Also presented at Advances and Perspectives in Auditory Neurophysiology, Washington, DC, 2014. One of 3 posters selected for travel award at APAN.

Natan, R.G., Mwilambwe-Tshilobo, L., Geffen, M.N. The role of local inhibitory interneurons in stimulus-specific adaptation in primary auditory cortex. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2014. Platform presentation.

Carruthers, I.A., Natan, R.G., Jaegle, A.C., Mwilambwe-Tshilobo, L., Geffen, M.N. Noise correlations and invariance to basic acoustic transformations of vocalizations in the auditory cortex. Society for Neuroscience Meeting, 214.04, San Diego, CA 2013. Platform Presentation. Also presented at: Advances and Perspectives in Auditory Neurophysiology, San Diego, CA 2013, Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2014. Platform.

Natan, R.G., Carruthers, I.A., Geffen, M.N. Cellular and laminar specificity of stimulus-specific adaptation in the primary auditory cortex. Society for Neuroscience Meeting, 354.03, San Diego, CA 2013. Also presented at: Advances and Perspectives in Auditory Neurophysiology, San Diego, CA 2013.

Geffen, M.N. Specialization of the auditory cortex for temporal statistics of communication signals. Association for Research in Otolaryngology, Mid-Winter Meeting, Baltimore, MD 2013. Platform

Natan, R.G., Carruthers, I.A., Geffen, M.N. Adaptation to temporal correlation in the primary auditory cortex. Society for Neuroscience meeting, New Orleans, LA, 2012. Also presented at: Advances and Perspectives in Auditory Neurophysiology, New Orleans, LA, 2012; Eastern Auditory Retreat meeting, College Park, MD, 2012.

Carruthers, I.A., Natan, R.G., Geffen, M.N. A specialized mechanism for encoding con-specific vocalizations in the auditory cortex. Society for Neuroscience meeting, New Orleans, LA, 2012. Also presented at: Advances and Perspectives in Auditory Neurophysiology, New Orleans, LA, 2012; Eastern Auditory Retreat meeting, College Park, MD, 2012; Gordon Research Conference Auditory Systems, Lewiston, ME, 2012; Auditory Cortex, Lausanne, Switzerland, 2012.

Aizenberg, M., Geffen, M.N. Differential modulation of perceptual acuity by coarse and fine discriminative auditory fear conditioning. Society for Neuroscience meeting, New Orleans, LA, 2012. Also presented at: Advances and Perspectives in Auditory Neurophysiology, New Orleans, LA, 2012, Platform; Eastern Auditory Retreat meeting, College Park, MD, 2012; Gordon Research Conference Auditory Systems, Lewiston, ME, 2012.

Gervain, J., Werker, J.F., Geffen, M.N. Infants' perception of naturalness in water sounds: the role of scale-invariance. International Conference on Infant Studies Minneapolis, Minnesota, 2012.

Natan, R.G., Carruthers, I.A., Geffen, M.N. Adaptation to spectro-temporal correlation in the primary auditory cortex. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2012.

Carruthers, I.A., Natan, R.G., Geffen, M.N. Encoding of ultra-sonic vocalizations in the rodent primary auditory cortex. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2012.

Carruthers, I.A., Natan, R.G., Laplagne, D.A., Geffen, M.N. Encoding of ultra-sonic vocalizations in the rodent primary auditory cortex. Society for Neuroscience meeting, Washington, DC, 2011. Also presented at: APAN, Washington, DC 2011.

Laplagne, D.A., Geffen, M.N. Neurons in the auditory cortex adapt to the global temporal structure of the stimulus. Vibrissa meeting, JFRC/HHMI, Ashburn, VA, 2010. Also presented at APAN, San Diego CA, 2010.

Geffen, M.N., Taillefumier, T., Magnasco, M.O. The mammalian auditory cortex encodes information about global statistics of naturalistic sounds. Society for Neuroscience meeting, Chicago, IL 2009.

Geffen, M.N., Magnasco, M.O. Statistical analysis of natural sounds. Computational and Systems Neuroscience meeting, 2008. Salt Lake City, UT. Also presented at: Gordon Research Conference: Sensory Processing and the Natural Environment. Luca, Italy, 2008.

Geffen, M.N., Broome, B., Laurent, G., Meister, M. Temporal dynamics in the early olfactory system. Gordon Research Conference, Neural systems and plasticity, Newport, RI, 2007.

Neimark, M.A., Meister, M. Dynamic modulation of On and Off inputs to a retinal ganglion cell. Society for Neuroscience meeting, Washington, DC, 2005. Also presented at Gordon Research Conference, Neural Systems and Plasticity, Newport, RI, 2005.

Neimark, M.A., Meister, M. Salamander ganglion cell identity as on or off is determined by balance of differential inhibition on the two pathways. Computational and Systems Neuroscience meeting, Salt Lake City, UT, 2004.

Neimark, M.A., Meister, M. The classical receptive field of retinal ganglion cells changes from On to Off due to a peripheral shift. Society for Neuroscience meeting, San Diego, CA, 2004.

Neimark, M.A., Meister, M. Retinal Ganglion Cells Convert From OFF-type to ON-type During a Visual Saccade. Society for Neuroscience meeting, New Orleans, LA, 2003. Also presented at Gordon Research Conference: Neural Systems and Plasticity, Newport, RI, 2003.

Neimark, M.A., Andermann, M.L., Hopfield, J.J., Moore, C.I. A model of Texture Encoding by Vibrissa Resonance Properties, Society for Neuroscience Meeting, Orlando, FL 2002. Also presented at Barrels conference, San Diego, CA, 2001.