Michael C. Wiest

Curriculum Vitae

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EDUCATION

PhD. Michigan State University. 1997
Theoretical High-Energy Physics.

M.S. Michigan State University. 1993
Theoretical High-Energy Physics.

B.A. Cum Laude. Dartmouth College. 1991
Physics. Citation in French.

Graduate with Highest Honors. 1987
International School of Kenya, Nairobi, Kenya.

RESEARCH INTERESTS

Systems neurobiology: top-down modulation of sensory processing, sensory integration, neural plasticity and learning. These are all facets of my interest in the brain basis of perception.

Approaches: multi-electrode recordings in behaving rodents; focal brain inactivation; intra-cranial micro-stimulation; optogenetic cell-specific manipulation; computational modeling.

RESEARCH POSITIONS

2015-present Associate Professor, Neuroscience Department — Wellesley College

2008-2014 Assistant Professor, Neuroscience Program — Wellesley College

2001-2008 Research Associate, Laboratory of Miguel Nicolelis, Department of Neurobiology and Center for Neuroengineering, Duke University, NC: Used ensemble electrophysiology and computer modeling to understand sensory representation by neurons in the whisker system of behaving rats.

1998-2001 Keck Center for Computational Biology Postdoctoral Fellow, Laboratory of Read Montague, Center for Theoretical Neuroscience, Baylor College of Medicine, TX: Used computer simulations and patch-clamp electrophysiology to study the sensitivity of neurons to extracellular calcium signals; fMRI studies of dopamine function in human reward expectancy.

1997 Volunteer, Laboratory of Steve Heidemann, Department of Microbiology and Molecular Genetics, Michigan State University, MI: Tested hypothetical mechanisms of tension-induced axonal growth and the role of diffusion in slow axonal transport.

1991-1997 Graduate Student, Laboratory of Daniel Stump, Department of Physics and Astronomy, Michigan State University, MI: Calculated constraints on electroweak parameters and supersymmetric extensions to the Standard Model from proposed particle collider experiments.

TEACHING POSITIONS

2015-present	Associate Professor, Neuroscience Department	Wellesley College
2008-2014	Assistant Professor, Neuroscience Program	Wellesley College
2006	Neurobiology Teaching Assistant to Dr. Nicolelis	Duke University
1991-1997	Physics Laboratory Instructor	Michigan State University
	Physics Teaching Assistant	Michigan State University
	Person In Charge, student help and testing office, Independent study program	Michigan State University
1990	Mathematics Instructor	School for International Training Jakarta, Indonesia

GRANTS

2017-18 National Science Foundation (IOS grant code 26228)
Title: “RUI: Color Processing in Inferior Temporal Cortex of Macaque Monkey”
Role: Principal Investigator (transferred from Bevil Conway)
End Date: 8/31/2018 Budget: $89,722

2011-16 National Science Foundation (IOS-1121689)
Title: "RUI: Adaptive integration of bilateral inputs to rat somatosensory cortex"
Summary: The goal of this study is to characterize adaptive task-relevant changes to the functional connectivity between hemispheres of primary somatosensory cortex, by focally inactivating one hemisphere and recording ensemble neural activities bilaterally while rats behaviorally discriminate wide from narrow apertures using their facial whiskers.
Role: Principal Investigator Budget: $500,000

2013 National Science Foundation Supplement to fund an additional undergraduate summer research student. Budget: $6,000

2012 National Science Foundation Supplement to fund an additional undergraduate summer research student. Budget: $5,775

2011 Support of Mentors and their Students in the Neurosciences (SOMAS Grant #490)
Title: “Neural correlates of auditory detection in rat frontal and parietal cortex”
Summary: SOMAS-URM grant from the Howard Hughes Medical Institute (Grant 52006292 to Davidson College) and National Science Foundation grants (DUE-0426266 and DUE-0930153 to Dr. Julio J. Ramirez), targeted at students from under-represented minorities, to support summer research in neuroscience.
Role: Principal Investigator Budget: $7,000

2001 Kane Family Foundation Fellow, Baylor College of Medicine. A private foundation postdoc grant.

1998-2000 Keck Center for Computational Biology Postdoctoral Fellow, Baylor College of Medicine

1991-94 GAANN Department of Education Fellowship, Michigan State University.

Professional Societies

Society for Neuroscience	2001-present
Faculty for Undergraduate Neuroscience	2010-present

Reviewer

Journal of Neuroscience
Trends in Neurosciences
Neuroscience
Frontiers in Neural Circuits
Frontiers in Psychology
Frontiers in Neuroscience
Springer Books
Columbia University Press
Quarterly Reviews in Biology
Brain Sciences
Symmetry
Journal of Personalized Medicine
Nature Biomedical Engineering

INVITED TALKS

2019, 2018 Hunter College, Computer Science Department. Talks on the neuroscience of consciousness for Professor Susan Epstein's "Science of Intelligence" classes.

2011 Wheaton College, Physics Department.

2009 Massachusetts Institute of Technology, McGovern Institute for Brain Research, lab of Christopher Moore.

2008 Rutgers University Department of Psychology.

2008 Michigan State University Department of Physiology.

2008 Cincinnati Children's Hospital Research Foundation, Department of Anaesthesiology.

2008 Wellesley College Neuroscience Program.

2008 University of Miami, Ohio, Department of Psychology.

2007 University of California at Irvine, Department of Neurobiology.

2000 California Institute of Technology, Division of Biology, lab of Giles Laurent.

PUBLICATIONS *(bold font indicates undergraduate authors)*

**Nanda, P, Morris A, Kelemen, J, Yang, J, ***Wiest, MC (2020). Evoked Frontal and Parietal Field Potential Signatures of Target Detection and Response Inhibition in Rats Performing an Equiprobable Auditory Go/No-Go Task. *eNeuro* 7(1): 1-18. DOI: https://doi.org/10.1523/ENEURO.0055-19.2019

Ju, P, Volic, I, *Wiest, MC (2019). Detecting functional states of the rat brain with topological data analysis. *Advanced Technologies, Systems, and Applications III*, Springer: 3-12.

Bohon, K, *Wiest, MC (2014). Role of medio-dorsal frontal and posterior parietal neurons during auditory detection performance in rats. *PLoS ONE* 9(12): e114064. Doi: 10.1371/journal.pone.0114064.

Herzog L, Salehi K, Bohon KS, *Wiest MC (2014). Pre-stimulus Frontal-Parietal Coherence Predicts Auditory Detection Performance in Rats. *J. Neurophysiology* 111(10):1986-2000. doi: 10.1152/jn.00781.2012. Epub 2014 Feb 26.

Imada, A, Morris, A, *Wiest, MC (2013). Deviance detection by a P3-like response in rat posterior parietal cortex. *Frontiers in Integrative Neuroscience* 6(127):1-11. doi: 10.3389/fnint.2012.00127. eCollection 2012.

Pais-Vieira, M, Lebedev, MA, *Wiest, MC, Nicolelis, MAL (2013). Simultaneous top-down modulation of the primary somatosensory cortex and thalamic nuclei during active tactile discrimination. *J. Neuroscience* 33(9): 4076-4093.

Lafer-Sousa R, Liu YO, Lafer-Sousa L, *Wiest MC, Conway BR (2012). Color tuning in alert macaque V1 assessed with fMRI and single-unit recording shows a bias towards daylight colors. *J. Optical Society Am A* 29(4): 29(5): 657-670.

*Wiest, MC, Thomson, E, Pantoja, J, Nicolelis, MAL (2010). Changes in S1 neural responses during tactile discrimination learning. *J. Neurophysiology* 104: 300-312.

Pantoja, J, Ribeiro, S, *Wiest, MC, Soares, ES, Gervasoni, D, Lemos, N, Nicolelis, MAL (2007). Neuronal activity in the primary somatosensory thalamocortical loop is modulated by reward contingency during tactile discrimination. *J. Neuroscience* 27(39): 10608- 10620.

Pereira, A, Ribeiro, S, *Wiest, MC, Moore, LC, Pantoja, J, Lin, S-C, Nicolelis, MAL (2007). The processing of tactile information by the hippocampus. *PNAS* 104(46):18286-91.

*Wiest, MC, Bentley, N, Nicolelis, MAL (2005). Heterogeneous integration of bilateral whisker signals by neurons in primary somatosensory cortex of awake rats. *J. Neurophysiology* 93: 2966-2973.

Krupa, DJ, *Wiest, MC, Shuler, MG, Laubach, M, Nicolelis, MAL (2004). Layer-specific somatosensory cortical activation during active tactile discrimination. *Science* 304: 1989-1992.

*Wiest, MC and Nicolelis, MAL (2003). Behavioral detection of tactile stimuli during 7-12 Hz cortical oscillations in awake rats. *Nature Neuroscience* 6(9): 913-914.

Montague, PR, Berns, GS, Cohen, JD, McClure, SM, Pagnoni, G, Dhamala, M, *Wiest, MC, Karpov, I, King, RD, Apple, N, Fisher, RE (2002). Hyperscanning: Simultaneous fMRI during linked social interactions. *NeuroImage* 16: 1159-1164.

King, RD, *Wiest, MC, and Montague, PR (2001). Extracellular calcium depletion as a mechanism of short-term synaptic depression. *J. Neurophysiology* 85: 1952-1959. (First two authors contributed equally.)

*Wiest, MC, Eagleman, DM, King, RD and Montague, PR (2000). Dendritic spikes and their influence on extracellular calcium signaling. *J. Neurophysiology* 83: 1329-1337.

King, RD, *Wiest, MC, Montague, PR, Eagleman, DM (Jan 2000). Do extracellular Ca2+ signals carry information through neural tissue? *Trends Neurosci.* 23(1): 12-13.

Stump, DR, *Wiest, MC, Yuan, CP (1996). Detecting a light gravitino at linear collider to probe the SUSY breaking scale. *Phys. Rev. D* 54: 1936-1943.

*Wiest, MC, Stump, DR, Carlson, DO, Yuan, CP (1995). Studying anomalous WWγ and WWZ couplings with polarized p-pbar collisions. *Phys. Rev. D* 52: 2724-2736.

Book Chapters & Reviews

Ian A. Harrington, William Grisham, D. J. Brasier, Shawn P. Gallagher, Samantha S. Gizerian, Rupa G. Gordon, Megan H. Hagenauer, Monica L. Linden, Barbara Lom, Richard Olivo, Noah J. Sandstrom, Shara Stough, Ilya Vilinsky, and Michael C. *Wiest (2015). An Instructor's Guide to (Some of) the Most Amazing Papers in Neuroscience. *J Undergrad Neurosci Educ.* 2015 Fall; 14(1): R3–R14.

*Wiest, MC (2014). Review of *Brains Top Down Is Top-Down Causation Challenging Neuroscience? Quarterly Reviews in Biology* 89:1 (March 2014): 65-66.

*Wiest MC, Thomson E, Nicolelis MAL (2007). Twenty Five Years of Multi-Electrode Recordings in the Somatosensory System: It is all about Dynamics. In: The Senses: A Comprehensive Reference. RR Hoy, GM Shepherd, AI Basbaum, A Kaneko and G Westheimer (eds) Elsevier, Oxford.

*Wiest MC, Thomson E, Meloy J (2007). Multi-electrode recordings in the rat somatosensory system. In: Methods for Neural Ensemble Recordings, Second Edition. MAL Nicolelis (ed), CRC Press.

Selected Abstracts (bold font indicates undergraduate authors)

*Wiest, MC**, Bohon, KS*** (2014) Role of medio-dorsal frontal and posterior parietal neurons during auditory detection performance in rats. Presented at the annual Society for Neuroscience meeting November in Washington DC.

Morris, AV, Mahmud, F, *Wiest, MC (2013) Neural correlates of attention for correct response production and inhibition: ERP and Coherence Analysis. Presented at the Faculty for Undergraduate Neuroscience meeting satellite to the annual Society for Neuroscience meeting in San Diego, CA.

Miranda, P and *Wiest, MC (2013) Illuminating the role of gamma synchrony in sensory processing using optogenetics. Presented at the Faculty for Undergraduate Neuroscience meeting satellite to the annual Society for Neuroscience meeting in San Diego, CA.

Bohon, KS, *Wiest, MC (2013) Role of frontal and parietal neurons during auditory detection performance in rats. Presented at the Faculty for Undergraduate Neuroscience meeting satellite to the annual Society for Neuroscience meeting in San Diego, CA.

*Wiest, M, **Herzog, L, Salehi, K** (2012) Long-range frontal-parietal gamma coherence is associated with sustained attention in rats. Soc. Neurosci. Abstr. 913.19.

Imada, A, *Wiest, M (2012) Deviance detection by a P3-like response in rat posterior parietal cortex. Presented at the Faculty for Undergraduate Neuroscience meeting satellite to the annual Society for Neuroscience meeting in New Orleans, LA, October, 2012.

Herzog, L, Salehi K, *Wiest, M (2012) Elevated Frontal-Parietal Gamma Coherence Precedes Successful Signal Detection during a Sustained Attention Task in Rats. Presented at the Faculty for Undergraduate Neuroscience meeting satellite to the annual Society for Neuroscience meeting in New Orleans, LA, October, 2012.

Herzog, L, Salehi, K, *Wiest, M (2011) Frontal-parietal gamma coherence as a possible correlate of attention in rats. Presented at the Faculty for Undergraduate Neuroscience poster session of the 2011 Society for Neuroscience meeting.

Salehi, K, Herzog, L, *Wiest, M (2011) Modulation of neuronal spiking activity in frontal and parietal rat cortex during behavioral detection of auditory tones. Presented at the Faculty for Undergraduate Neuroscience poster session of the 2011 Society for Neuroscience meeting.

*Wiest, M, Thomson, E, Nicolelis, M (2007) Tactile discrimination learning changes the S1 representation of aperture width. *Soc. Neurosci. Abstr.* 402.16.

*Wiest, M, Pereira, A, Thomson, E, Nicolelis, M (2005) Using reversible inactivation of individual S1 hemispheres to study bilateral integration in freely moving rats performing a tactile discrimination task. *Soc. Neurosci. Abstr.* 883.7.

Pereira, A, *Wiest, M, Thomson, E, De Araujo, I, Nicolelis, M (2005) Neural ensemble correlates of texture discrimination in the behaving rat's somatosensory system. *Soc. Neurosci. Abstr.* 538.13.

Thomson, E, *Wiest, M, Pereira, A, Nicolelis, M (2005) A behavioral paradigm for the study of category discrimination in the rat whisker system. *Soc. Neurosci. Abstr.* 883.6.