

Scott C. Molitor, Ph.D.
Professor of Bioengineering
Sr. Assoc. Dean Academic Affairs

University of Toledo
College of Engineering
Toledo, OH 43606-3390

scott.molitor@utoledo.edu
(419) 530-8044 (phone)
(419) 530-8006 (fax)

EDUCATION

Ph.D. Biomedical Engineering, Johns Hopkins University School of Medicine, Baltimore MD, December 1997
B.S.E. Engineering Science, University of Michigan, Ann Arbor MI, May 1990

POSITIONS HELD

2/19 – present Sr. Associate Dean for Academic Affairs, University of Toledo College of Engineering, Toledo OH
7/18 – present Professor, Department of Bioengineering, University of Toledo College of Engineering, Toledo OH
7/14 – 1/19 Associate Dean of Undergraduate Studies, University of Toledo College of Engineering, Toledo OH
8/06 – 6/18 Associate Professor, Department of Bioengineering, University of Toledo College of Engineering, Toledo OH
9/01 – present Undergraduate Program Director, Department of Bioengineering, University of Toledo College of Engineering, Toledo OH
11/00 – present Assistant Professor, Department of Bioengineering, University of Toledo College of Engineering, Toledo OH
7/99 – 10/00 Postdoctoral Fellow, Department of Surgery, Otolaryngology - Head and Neck Surgery, University of North Carolina School of Medicine, Chapel Hill NC
10/97 – 6/99 Postdoctoral Fellow, Department of Otolaryngology - Head and Neck Surgery, Johns Hopkins University School of Medicine, Baltimore MD
7/90 – 9/97 Graduate Research/Teaching Assistant, Department of Biomedical Engineering, Johns Hopkins University School of Medicine, Baltimore MD
May-Aug 87-89 Engineering Intern, Automotive Safety Engineering, Environmental Activities Staff, General Motors Corporation, Warren MI

FUNDING

PFI: An Innovative Model for a New Advanced Energy Workforce. National Science Foundation Partnerships for Innovation, 7/15/09 – 12/31/14, \$600k. Calzonetti PI; King-Blandford and Traband co-I; Molitor co-I (0%).

A national model for engineering mathematics education. Subcontract from Wright State University, Nathan Klingbeil PI, 7/1/06 – 6/30/13, \$150k. Brian Randolph and Constance Schall co-I; Molitor co-I (33%).

NURTURES: Networking Urban Resources with Teachers and University to enRich Early Childhood Science. National Science Foundation Math Science Partnership, 7/1/11 – 6/30/16, \$10M. Charlene Czerniak PI; Joan Kaderavek & Bob Mendenhall co-I; Molitor co-I (15%).

COFFEE: Choose Ohio First for Engineering Entrepreneurship. Ohio Department of Higher Education Choose Ohio First program, 7/1/17 - 6/30/19, \$914,028. Molitor PI (100%).

NURTURES Phase II: Expansion and Evaluation. National Science Foundation, 7/1/17 - 6/30/20, \$2.3M. Czerniak PI; Susanna Hapgood & Joan Kaderavek co-I; Molitor co-I (15%).

Mechanisms of complex spiking in dorsal cochlear nucleus cartwheel cells. University of Toledo DeArce Memorial Endowment Fund in Support of Medical Research and Development, 5/1/01 – 12/31/01, \$14,631. Molitor PI (100%).

Simple and complex spiking mechanisms in dorsal cochlear nucleus neurons. Deafness Research Foundation, 1/1/02 – 12/31/02, \$20,000. Molitor PI (100%).

Fluorescence imaging of neuronal activity at the subcellular level. University of Toledo DeArce Memorial Endowment Fund in Support of Medical Research and Development, 5/1/02 – 4/30/03, \$12,000. Molitor PI (100%).

Electrophysiologic properties of DCN cartwheel cells. National Institute of Deafness and Communicative Disorders, 5/1/03 – 4/30/07, \$213,000. Molitor PI (100%).

Hybrid neuron-model systems for use in neurophysiologic experiments in the auditory brainstem. National Organization for Hearing Research, 1/1/05 – 12/31/05, \$15,000. Molitor PI (100%).

Northern Ohio center of excellence in product development. State of Ohio Third Frontier Product Development Pilot Program, Subcontract from CAMP, Inc. Stephen Gage PI, 4/1/05 – 3/31/07, \$140k. Brent Cameron PI; Patricia Relue and Vijay Goel co-I; Molitor co-I (25%).

FUNDING (CONTINUED)

Northern Ohio center of excellence in product development (equipment). Ohio Department of Development, 4/1/05 – 3/31/07, \$232k. Cameron PI; Relue co-I; Molitor co-I (33%).

Calcium Signals and Actin dynamics in Netrin/DSCAM-Mediated Growth Cone Guidance. University of Toledo Interdisciplinary Research Awards Program, 6/21/10 – 9/30/11, \$75,000. Guofa Liu PI; Molitor co-I (5%).

REFEREED PUBLICATIONS

Qiu X., Dao H., Heston A., Garcia, K.M., Sangal A., Wang M., Dowling A.R., Faulkner, L.D., Molitor, S.C., Elias C.F., Hill J.W. (2015) Insulin and leptin signaling interact in the Kiss1 neuron during the peripubertal period. *PLoS One* 10(5): 0121974. URL: <https://www.ncbi.nlm.nih.gov/pubmed/25946091>. DOI: 10.1371/journal.pone.0121974.

Shimano T, Fyk-Kolodziej B, Mirza N, Asako M, Tomoda K, Bledsoe S, Pan ZH, Molitor S, Holt AG. (2013) Assessment of the AAV-mediated expression of channelrhodopsin-2 and halorhodopsin in brainstem neurons mediating auditory signaling. *Brain Research* 1511:138-152. URL: <https://www.ncbi.nlm.nih.gov/pubmed/23088961>. DOI: 10.1016/j.brainres.2012.10.030.

Goel VK, Molitor SC (2010) Effects of rate of loading on viscoelastic supraspinous ligament inflammation and cumulative lumbar disorder. *Spine Journal* 10(12):1086-8. URL: <https://www.ncbi.nlm.nih.gov/pubmed/21094469>. DOI: 10.1016/j.spinee.2010.09.022.

Skopin M., and Molitor, S.C. (2009) Effects of infrared laser exposure in a cellular model of wound healing. *Photodermatology, Photoimmunology & Photomedicine* 25:75–80. URL: <https://www.ncbi.nlm.nih.gov/pubmed/19292782>. DOI: 10.1111/j.1600-0781.2009.00406.x.

Molitor, S.C., Tong, M. and Vora, D. (2006) MATLAB-based simulation of whole-cell and single-channel currents. *Journal of Undergraduate Neuroscience Education* 4(2):A74-A82. URL: <https://www.ncbi.nlm.nih.gov/pubmed/23493427>.

Rex, E., Molitor, S., Henderson, M. and Komuniecki R. (2004) Tyramine receptor isoforms in *Caenorhabditis elegans*. *J. Neurochem.* 91:1104-1115. URL: <https://www.ncbi.nlm.nih.gov/pubmed/15569254>. DOI: 10.1111/j.1471-4159.2004.02787.x.

Manis, P.B., Molitor, S.C. and Wu, H. (2003) Subthreshold oscillations generated by TTX-sensitive Na⁺ currents in dorsal cochlear nucleus pyramidal cells. *Exp. Brain Res.* 153: 443-451. URL: <https://www.ncbi.nlm.nih.gov/pubmed/14508631>. DOI: 10.1007/s00221-003-1639-6.

Molitor, S.C. and Manis, P.B. (2003) Dendritic Ca²⁺ transients evoked by action potentials in rat dorsal cochlear nucleus pyramidal and cartwheel neurons. *J. Neurophysiol.* 89: 2225–2237. URL: <https://www.ncbi.nlm.nih.gov/pubmed/12612001>. DOI: 10.1152/jn.00709.2002.

Molitor, S.C. and Manis, P.B. (1999) Voltage-gated Ca²⁺ conductances in acutely isolated guinea pig dorsal cochlear nucleus neurons. *J. Neurophysiol.* 81: 985-998. URL: <https://www.ncbi.nlm.nih.gov/pubmed/10085327>.

Molitor, S.C. and Manis, P.B. (1997) Evidence for functional metabotropic glutamate receptors in the dorsal cochlear nucleus. *J. Neurophysiol.* 77:1889-1905. URL: <https://www.ncbi.nlm.nih.gov/pubmed/9114243>.

Manis, P.B. and Molitor, S.C. (1996) N-methyl-D-aspartate receptors at parallel fiber synapses in the dorsal cochlear nucleus. *J. Neurophysiol.* 76:1639-1656. URL: <https://www.ncbi.nlm.nih.gov/pubmed/8890282>.

Paprzycki, P., Tuttle, N., Czerniak, C. M., Molitor, S., Kaderavek, J., Mendenhall, R. (2017) The impact of an inquiry science instruction on literacy and mathematics achievement in PreK-3 classrooms. *Journal of Research in Science Teaching* 54(9): 1174-1196. URL: <http://onlinelibrary.wiley.com/doi/10.1002/tea.21400/full>. DOI: 10.1002/tea.21400

Tuttle, N., Mentzer, G. A., Strickler-Eppard, L., Bloomquist, D., Molitor, S., Kaderavek, J., Czerniak, C. M. (2017) Exploring how families do science together: Adult-child interactions at community science events. *School Science and Mathematics* 117:175-182. URL: <http://onlinelibrary.wiley.com/doi/10.1111/ssm.12221/abstract>. DOI: 10.1111/ssm.12221.

Tuttle, N., Kaderavek, J. N., Molitor, S., Czerniak, C. M., Johnson-Whitt, E., Bloomquist, D., Namatovu, W., Wilson, G. (2016) Investigating the impact of NGSS-aligned professional development on PK-3 teachers' science content knowledge and pedagogy. *Journal of Science Teacher Education* 27:717–745. URL: <http://www.tandfonline.com/doi/full/10.1007/s10972-016-9484-1>. DOI: doi:10.1007/s10972-016-9484-1.

REFEREED PUBLICATIONS (CONTINUED)

Reinhart, M., Bloomquist, D., Strickler, L., Czerniak, C. C., Moser, A., Kaderavek, J. N., & Molitor, S. C. (2015) Taking science home: Connecting schools and families through early childhood science activity packs. *School Science and Mathematics* 116:3-16. URL: <http://onlinelibrary.wiley.com/doi/10.1111/ssm.12152/abstract>. DOI: 10.1111/ssm.12152.

Kaderavek, J. N., North, T., Rotshtein, R., Dao, H., Liber, N., Milewski, G., Molitor, S. C., & Czerniak, C. M. (2015) SCIENCE: creation & pilot implementation of an NGSS-based instrument to evaluate early childhood science teaching. *Studies in Educational Evaluation* 45:27-36. URL: <http://www.sciencedirect.com/science/article/pii/S0191491X15000218>. DOI: 10.1016/j.stueduc.2015.03.003.

CONFERENCE PAPERS

Gilbert, A., Stanley, W., Kaderavek, J., & Molitor, S. (2016) Nurturing inquiry in the early childhood classroom. Ohio Association for the Education of Young Children (OAEYC), Sandusky, OH, April 2016.

Kaderavek, J.N., Molitor, S.C. Milewski, G., Rotshtein, R., North, T., Dao, H. Liber, N., & Czerniak, C.M. (2014) Teacher change in primary grades inquiry science classroom practices following professional development. National Association for Research in Science Teaching (NARST), Pittsburgh, PA, April 2014.

Molitor, S.C., Kaderavek, J.N., Dao, H. Liber, N., Rotshtein, R., Milewski, G., & Czerniak, C.M. (2014) Engineering teaching behaviors in PK-3 classrooms. American Society for Engineering Education (ASEE), Indianapolis, IN, June 2014.

Strickler-Eppard, L., Reinhart, M., Czerniak, C.M., Kaderavek, J., & Molitor, S. (2014) Nurturing early childhood science: Community events and public broadcasting learning segments. Association for Science Teacher Educators, San Antonio, TX, January 2014.

Bloomquist, D., Gilbert, A., Johnson-Whitt, E., Czerniak, C.M., Kaderavek, J., & Molitor, S. (2014) Nurturing early childhood science: The development of a summer science and engineering workshop for early childhood teachers. Association for Science Teacher Educators, San Antonio, TX, January 2014.

Gilbert, A., Bloomquist, D., Reinhart, M., Czerniak, C.M., Kaderavek, J., & Molitor, S. (2014) Nurturing early childhood science: Family science packs. Association for Science Teacher Educators, San Antonio, TX, January 2014.

Allen, A.E., Johnson-Whitt, E., Reinhart, M., North, T., Czerniak, C., Kaderavek, J., & Molitor, S. (2013) Making thinking visible in preschool science investigations. Midwestern Educational Research Association (MWER), Evanston, IL, November 2013.

Reinhart, M., Bloomquist, D., Gilbert, A., Strickler-Eppard, L., Czerniak, C.M., Kaderavek, J., & Molitor, S. (2013) Design and evaluation of early childhood family science packs. European Science Education Research Association (ESERA), Nicosia, Cyprus, September 2013.

Kaderavek, J.N., North, T., Rotshtein, R., Dao, H., Liber, N., Milewski, G., Molitor, S.C., & Czerniak, C.M. (2013) SCIENCE: the creation of a coding system to evaluate early childhood science teaching. National Association for Research in Science Teaching (NARST), Rio Grande, Puerto Rico, April 2013.

Strickler-Eppard, L., Lemle, T., Czerniak, C., Molitor, S., & Mendenhall, R. (2013) Connecting Schools, Families and Community: Development and Implementation of Outreach Materials and Events Focused on Family Engagement. NSF MSP Learning Network Conference, Washington D.C., February 2013.

Klingbeil, N., Molitor, S., Randolph, B., Brown, S., Olsen, R., & Cassady, R. (2011) The Wright State Model for Engineering Mathematics Education: Highlights from a CCLI Phase 3 Initiative, Volume 2. American Society for Engineering Education (ASEE), Vancouver, BC, June 2011.

OTHER PUBLICATIONS

Molitor S.C. (2012) Review of Prize Fight - The Race and the Rivalry to be the First in Science, by Morton A. Meyers. *Journal of the American Medical Association* 308(21):2282-2283.

Molitor, S.C. (2010) Review of Brain, Mind and the Structure of Reality, by Paul L. Nunez. *Journal of the American Medical Association* 304(19):2183.

Molitor, S.C. (2010) Review of Biodesign by Zenios et al. *Journal of the American Medical Association*, 303(20):2085-2086.

OTHER PUBLICATIONS (CONTINUED)

- Molitor, S.C. (2009) Review of Principles of Cognitive Neuroscience by Purves et al. *Journal of the American Medical Association*, 301(5):550-551.
- Molitor, S.C. (2008) Review of Neuroscience 4th edition by Purves et al. *Journal of the American Medical Association*, 299(2):2689-90.
- Molitor, S.C. and Goel, V.K. (2007) Review of Handbook of Neural Engineering edited by Metin Akay. *Journal of the American Medical Association*, 298(8):929-930.
- Tong, M., Molitor, S.C. and Goel, V.K. (2002) Complex spiking: is it all in the dendrites? *BMES Bulletin* 26(2).
- Manis, P.B., Molitor, S.C. and Kanold, P.O. (1998) Cellular physiology of pyramidal and cartwheel cells of the dorsal cochlear nucleus. In: *Psychophysical and Physiological Advances in Hearing* (A.R. Palmer, A. Rees, A.Q. Summerfield, and R. Meddis, eds.), pp. 221-227. Whurr Publishers, London.
- Sachs, M.B., Wang, X. and Molitor, S.C. (1992) Cross-correlation analysis and phase-locking in a model of the ventral cochlear nucleus stellate cell. In: *The Mammalian Cochlear Nuclei: Organization and Function* (M.A. Merchán, J.M. Juiz, D.A. Godfrey, and E. Mugnaini, eds.), pp. 411-420. Plenum Press, New York.

REVIEWED ABSTRACTS

- Fyk-Kolodziej, B., Skopin M.D., Molitor S.C., Holt, A.G. (2011) Two pore domain potassium channels: differential expression and neuronal excitability in the cochlear nucleus. *Abstr. Assoc. Res. Otolaryngol.* 34:874.
- Skopin M.D. and Molitor S.C. (2009) Effects of leak currents in computational models of cochlear nucleus neurons. *Midwest Bioengineering Conference*, Ann Arbor MI.
- Skopin M.D., Ohneck, J. and Molitor S.C. (2008) Effects of infrared laser exposure in a cellular model of wound healing. *Society for Laser Surgery and Medicine meeting*, Orlando FL.
- Skopin M.D. and Molitor S.C. (2007) Suprathreshold response modes in a computational model of DCN cartwheel cells. *Computational and Systems Neuroscience meeting*, Salt Lake City UT.
- Zhou, J. and Molitor, S.C. (2006) GABAergic regulation of suprathreshold cartwheel cell responses. *Abstr. Assoc. Res. Otolaryngol.* 29:1332.
- Tong, M. and Molitor, S.C. (2004) Suprathreshold and subthreshold responses of DCN cartwheel cells. *Abstr. Assoc. Res. Otolaryngol.* 27:902.
- Molitor, S.C., Tong, M. and Vora, D. (2003) MATLAB-based simulation of whole-cell and single channel currents as a teaching tool for an engineering biophysics course. *Soc. Neurosci. Abstr.* 27:24.14.
- Vora, D. and Molitor, S.C. (2003) A MATLAB-based image acquisition and reconstruction system for PVCAM cameras. *Soc. Neurosci. Abstr.* 27:218.7.
- Tong, M. and Molitor, S.C. (2002) Mechanisms of complex spiking in dorsal cochlear nucleus cartwheel cells. *Soc. Neurosci. Abstr.* 26:844.5.
- Menezes, A., Kapoor, V.J., Smith, L., Komisarek, M., Oberst, R. and Molitor, S.C. (2002) Neuroelectronic MEMS. *Electrochemical Society Abstract* 201:A1-004.
- Manis, P.B. and Molitor, S.C. (2001) Subthreshold TTX-sensitive voltage oscillations in DCN pyramidal cells. *Abstr. Assoc. Res. Otolaryngol.* 24:698.
- Molitor, S.C. and Manis, P.B. (1999) Active conductances in the dendrites of dorsal cochlear nucleus neurons. *Second Symposium on Molecular Mechanisms in Central Auditory Function and Plasticity*.
- Manis, P.B., Rothman, J.S., Kanold, P.O. and Molitor, S.C. (1999) Ionic conductances regulating the discharge patterns of cochlear nucleus neurons. *Institute for Mathematics and its Applications, Workshop in Audition*.
- Molitor, S.C. and Manis, P.B. (1996) Calcium signaling in the dendrites of dorsal cochlear nucleus neurons. *Soc. Neurosci. Abstr.* 22:647.
- Manis, P.B. and Molitor, S.C. (1996) Evoked calcium transients in dendrites of rat dorsal cochlear nucleus neurons. *Abstr. Assoc. Res. Otolaryngol.* 19:169.

REVIEWED ABSTRACTS (CONTINUED)

Molitor, S.C. and Manis, P.B. (1994) Voltage-sensitive calcium conductances in isolated guinea pig dorsal cochlear nucleus neurons. *Abstr. Assoc. Res. Otolaryngol.* 17:16.

Manis, P.B. and Molitor, S.C. (1993) Identification of cells possessing NMDA receptors in the guinea pig dorsal cochlear nucleus. *Soc. Neurosci. Abstr.* 19:534.