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Education:

University of Texas at Austin: Ph.D., Zoology, Section of Neurobiology
Degree conferred: November 2000

Ithaca College: B.A., *cum laude*, double major: Psychology and Anthropology
Degree conferred: May 1993

Coursework at other institutions:

Cold Spring Harbor Laboratories: Physiological Approaches to Ion Channels 2001

Cornell University, Shoals Marine Laboratory: Systems Neurobiology 1993

Professional Employment:

2012-Pres: Associate Professor of Biological Sciences, Lehigh University

2006-2012: Assistant Professor of Biological Sciences, Lehigh University

2005-2006: Alexander von Humboldt Foundation Fellow, University of Munich (LMU)

2000-2005: NRSA/Senior Postdoctoral Fellow University of Washington

1994-2000: Graduate Research Assistant University of Texas at Austin

1993-1994: Laboratory Technician, Cornell University

Professional Societies:

Association for Research in Otolaryngology

Society for Neuroscience

American Physiological Society

Publications:

Book Chapters:

Coleman, W.L. and **Burger, R. M.** *Extracellular Recording and Neuropharmacological Methods*. In: Basic Methods in Electrophysiology. Eds. Covey, E. and Carter, M. Oxford University Press. *In Press*.

Burger, R. M. and Rubel, E. W. *Encoding of interaural timing for sound localization*. The Senses: a Comprehensive Reference, Audition. Eds. Hoy, R., Dallos, P., and Oertel, D., Elsevier Inc., Dec 2007.

Refereed Research Papers:

Fischl, M.J. and **Burger, R.M.** (2014) Glycinergic transmission modulates GABAergic inhibition in the avian auditory pathway. *Frontiers in Neural Circuits* Mar 14; 8:19
doi:10.3389/fncir.2014.00019
PMCID: PMC3954080

Fischl, M.J., Weimann, S.R., Kearse, M., and **Burger, R. M.** (2014) Slowly emerging glycinergic transmission enhances inhibition in the sound localization pathway of the avian auditory system. *The Journal of Neurophysiology* 111(3):565-72
doi: 10.1152/jn.00640.2013
PMCID: In process

Oline, S.N. and **Burger, R.M.** (2014) Short-term synaptic depression is topographically distributed in the cochlear nucleus of the chicken. *The Journal of Neuroscience*. 34(4):1314-24 doi: 10.1523/JNEUROSCI.3073-13.2014.

Burger, R.M. (2012) Inhibitory synaptic release properties are topographically distributed in auditory circuitry. *Journal of Physiology: London*, 590 (16): 3639-3640 Review. PMCID PMC3476621

Fischl, M.J., Combs, T.D., Klug, A.K., Grothe, B., and **Burger, R.M.** (2012) Modulation of synaptic input by GABA_B receptors improves coincidence detection for computation of sound location. *Journal of Physiology: London*, 590(13):3047-66 PMCID: PMC3406390

Gerhart, S.V., Eble, E.M., **Burger, R.M.**, Oline, S.N., Vacaru, A., Edepli, K.S., Jefferis, R., Iovine, M.K., (2012) Differential subcellular localization of Cx40.8 is determined by a small domain within its carboxy terminus. *Plos One*, 7(2):e31364 PMCID: PMC3275562

Tabor, K., Coleman, W.L., Rubel, E.W., and **Burger, R.M.** (2012) Tonotopic organization of the superior olivary nucleus in the chicken (*Gallus gallus*). *The Journal of Comparative Neurology*, 520: 1493-1508. PMCID in process

Coleman, W.L., Fischl, M.J., Weimann, S.R., and **Burger, R.M.** (2011) GABAergic and glycinergic inhibition modulate monaural auditory response properties in the avian

superior olivary nucleus. *The Journal of Neurophysiology*, May; 105(5):2405-20. PMID: PMC3094186

Burger, R.M., Fukui, I., Ohmori, H., and Rubel, E.W. (2011) Inhibition in the balance: binaurally coupled inhibitory feedback in sound localization circuitry. *The Journal of Neurophysiology*, Jul. 106(1):4-14. Review. PMID: PMC3129726

Fukui, I., **Burger, R.M.**, Ohmori, H., and Rubel, E.W., (2010) GABAergic inhibition sharpens the frequency tuning and enhances phase locking in chicken nucleus magnocellularis neurons. *The Journal of Neuroscience*, 30: 12075 - 12083 PMID: PMC3376706

Howard, M.A., **Burger, R.M.**, and Rubel, E.W., (2007) A developmental switch from GABAergic excitation to inhibition controlled by K⁺ conductances. *The Journal of Neuroscience*, 27(8):2112-2123.

Burger, R.M., Pfeiffer, J.D., Westrum, L.E., Bernard, A., and Rubel, E.W. (2005) Expression of GABA_B receptor in the avian auditory brainstem: ontogeny, afferent deprivation, and ultrastructure. *Journal of Comparative Neurology*, 489(1): 11-22

Lu, Y., **Burger, R.M.**, and Rubel, E.W. (2005) GABA_B Receptor Activation Modulates GABA_A Receptor-mediated Inhibition in Chicken Nucleus Magnocellularis Neurons. *Journal of Neurophysiology*, 93(3): 1429-1438,

Burger, R.M., Cramer, K.S., Pfeiffer, J.D., and Rubel, E.W. (2005) The avian superior olivary nucleus provides divergent inhibitory input to parallel auditory pathways. *Journal of Comparative Neurology*. 481(1): 6-18

Pollak G.D., **Burger, R.M.**, Klug A. (2003) Dissecting the circuitry of the auditory system. *Trends in Neurosciences*. 26(1): 33-9. Review.

Pollak G.D., **Burger, R.M.**, Park T.J., Klug A., Bauer E.E. (2002) Roles of inhibition for transforming binaural properties in the brainstem auditory system. *Hearing Research*. 168(1-2): 60-78.

Burger, R.M. and Pollak, G. D. (2001) Reversible inactivation of the dorsal nucleus of the lateral lemniscus reveals its role for processing multiple sound sources in the inferior colliculus. *The Journal of Neuroscience*. 21(13): 4830-4843.

Klug, A.K., Khan, A., **Burger, R.M.**, Bauer, E.E., Hurley, L.M., Yang, L., Grothe, B., Halvorsen, M.B., and Park T.J. (2000) Latency as a function of intensity in auditory neurons: transformations along the neuraxis. *Hearing Research*, 148:107-123.

Burger, R.M. and Pollak, G.D. (1998) Analysis of the role of inhibition in shaping responses to sinusoidally amplitude-modulated signals in the inferior colliculus. *Journal of Neurophysiology* 80: 1686-1701.

Published conference proceedings:

Fukui, I., **Burger, R.M.**, Ohmori, H., and Rubel, E.W. (2008) Role of inhibition on the cochlear nucleus of chicken in vivo. *Neuroscience Research*, 61:S246.

Pfeiffer, J.D., **Burger, R.M.**, Klug, A., and Grothe, B. (2006) Axonal tracing and calyceal imaging in the mammalian medial nucleus of the trapezoid body. *Journal of Investigative Medicine*, 54:S143

Other Press:

Work Featured in *Hearing Health Magazine*:

Morrison, J (2009) "*DRF support Leads to Major NIH Grant*," in Under the Scope: Hearing Health Magazine, Summer Issue, pg 46-47. Publisher: *Deafness Research Foundation, NY, NY. *Now called The Hearing Health Foundation

Professional Assignments, Honors and Awards:

Associate Guest Chief Editor, *Frontiers in Neural Circuits: Special Topic "Inhibitory function in auditory processing"* Eds. R.M Burger, Conny Kopp-Scheinpflug, and Ian Forsythe

Faculty Grant for International Connections, Lehigh U. 2011

Alexander von Humboldt Return Fellowship, 2011

Inducted into Sigma Xi, 2008

Alexander von Humboldt Foundation Fellowship, 2005-2006

National Research Service Award, National Institutes of Health, 2000-2003

Cold Spring Harbor Laboratories Course Scholarship, 2001

Zoology Scholarship Endowment for Excellence, UT Dept. of Zoology

Professional Development Award, UT Graduate School

Grass Foundation Scholarship, Cornell University (SML) 1993

Psi Chi: Psychology Honors Society, Ithaca College, 1992

Cum Laude: Ithaca College, 1993

Research Funding (current funding in ***bold italics***):

2009-2015 ***NIH/NIDCD: R01, role: Principal Investigator, \$1.8 Million total cost***

2010-2012 *NIH: R03, role: Senior Personnel \$225,000 total cost, PI:lovine*

2009 BDSI course development support: \$34,000

Collaborator: Dr. Mayuresh Kothare

2008 Deafness Research Foundation Project Grant, PI \$25,000

2008 HHMI Biosystems Dynamics Grant, Co-PI \$58,000

Collaborators: Drs. Linghai Zhang, and Ping-Shi Wu

2007 HHMI Biosystems Dynamics Grant, Co-PI \$62,000

Collaborator: Dr. Linghai Zhang

2006 Lehigh Faculty Research Grant, PI \$2,000

2005-2006 Alexander von Humboldt Foundation Postdoctoral Fellowship, PI

2000-2003 Ruth Kirschstein National Research Service Award, NIH

Editor/editorial review boards:

Editorial Board: *The Journal of Neurophysiology*. American Physiological Society. 2014-2017

Associate Guest Chief Editor, *Frontiers in Neural Circuits: Special Topic "Inhibitory function in auditory processing"* Eds. Burger, R.M., Kopp-Scheinflug, C., Forsythe, I.

Scholarly Presentations:

**Invited Lectures:*

Burger, R. M. "Topographical representation of short-term synaptic plasticity in the avian cochlear nucleus" Institute for Biology General Zoology and Neurobiology, Universität Leipzig, Leipzig Germany, April 4, 2014.

Burger, R. M. "Topographical representation of short-term synaptic plasticity in the avian cochlear nucleus" Ludwig-Maximilians Universität München, Graduate Program in Neuroscience., Munich, Germany. Jan 17, 2014.

Burger, R.M. "Tuning the brain for sound: Topographical representation of short-term synaptic plasticity in the auditory brainstem" *Interdisciplinary Program in Neuroscience, Florida State University, Oct. 23, 2013.*

Burger, R.M. " "Tuning the brain for sound: Topographical representation of short-term synaptic plasticity in the auditory brainstem" Dept. of Biology, Muhlenberg College, Oct 30, 2013.

Burger, R.M. "Topographical representation of short-term synaptic plasticity in the avian cochlear nucleus" *Tenth International Workshop on Auditory Processing*, Cody, Wyoming, August 2013

Burger, R.M. "It's a matter of time: tuning neural responses with inhibition for sound localization" *Department of Biological Sciences, Cedar Crest College*. Oct. 4, 2011.

Burger, R.M. "The role of feedback inhibition in sound localization circuitry of birds" invited lecture, *Ninth International Workshop on Auditory Processing*, Cody, Wyoming, Sept. 2011.

Burger, R.M. "The role of feedback inhibition in sound localization circuitry of birds" invited lecture, *Dept. of Biology II, University of Leipzig, Germany* July, 2011.

Burger, R. M. Synaptic gain control by GABA_B receptors improves precision in sound localization circuitry" invited lecture, *U. of Colorado School of Medicine*, Denver Colorado, January 2011.

Burger, R. M. Synaptic gain control by GABA_B receptors improves precision in sound localization circuitry" invited speaker, Symposium "*When is an inhibitory synapse NOT inhibitory?*" Chair, C. Kopp-Scheinpflug, Ph.D., *Winter Conference on Brain Research*, Keystone CO, January 2011.

Burger, R. M. " Synaptic gain control by GABA_B receptors improves precision in sound localization circuitry" invited lecture, *The University of Texas at Austin: Section of Neurobiology*, April 2010.

Burger, R. M. "Inhibition in the auditory brainstem: implications for sound localization" Invited Lecture, *National Institute for Deafness and other Communication Disorders*, NIH March 2007.

Rubel, E.W*. Harris, J.A., Howard, M.A. and Burger, R. M. "Regulation of a Unique Physiological Phenotype and Neuron Number in Developing Cochlear Nucleus" *Abstracts of the 30th Midwinter Research Meeting of the Association for Research in Otolaryngology*, New Orleans, LA, Feb. 2007.

Burger, R. M. "Inhibition in the auditory brainstem: implications for sound localization" Invited Lecture, *Dept. of Otolaryngology, University of West Virginia*. January 2007.

Burger, R. M. "Developmental Plasticity in an auditory time coding circuit" Invited Lecture, *Auditory Group, Dept. of Neurobiology, Northeast Ohio Medical University*, Dec 8, 2006.

Burger, R. M. "Inhibition in the auditory brainstem: implications for sound localization" Invited Lecture, *Dept. of Neurobiology, Northeast Ohio Medical University*, Dec 7 2006.

Burger, R.M. "Inhibition in the auditory brainstem: implications for sound localization" Symposium: The Calyx of Held: A model for studying synaptic transmission in mammals. *Institute for Biologie II, University of Leipzig*, Dec. 2005.

*Recent Refereed Presentations and abstracts accepted for presentation (prior to 2005 omitted):

Fischl, M.J., Weimann, S.R., Kearse, M.G. and Burger, R.M. "Glycine receptors expressed in "timing" neurons of the avian auditory brainstem modulate GABAergic inhibition." Abstracts of the 36th annual midwinter meeting of the Association for Research in Otolaryngology, Baltimore, Md. Feb 2013.

- Oline, S.N. and Burger, R. M. Competing Mechanisms of short-term synaptic plasticity in the chick coclear nucleus." Abstracts of the 36th annual midwinter meeting of the Association for Research in Otolaryngology, Baltimore, Md. Feb 2013.
- Fischl, M.J., Weimann, S.R., Kearse, M.G. and Burger, R.M. "Glycine occludes GABAergic inhibition in the avian sound localization circuit." Abstracts of the Meeting of the Society for Neuroscience, New Orleans, LA, Oct. 2012.
- Fischl, M.J., Weimann, S.R., and Burger, R.M. "Glycine occludes GABAergic inhibition in the avian sound localization circuit." Abstracts of the Pennsylvania Network Meeting - Physics and Chemistry of Biological Systems, Lehigh University, Bethlehem, PA, Sept. 2012.
- Oline, S.N and Burger, R.M. "Tonotopic specialization of cellular and synaptic properties in nucleus Magnocellularis: implications for input integration." Pennsylvania Network Meeting, Physics and Chemistry of Biological Systems, Lehigh University, 2012.
- Fischl, M.J., and Burger R.M. "Heterogeneity of intrinsic membrane properties in the avian superior olivary nucleus" *Abstracts of the Meeting of the Society for Neuroscience*, Washington, DC, Nov. 2011.
- Fischl, M., Coleman, W., Oline, S., Weimann, S., and Burger, R.M., *Sorting Synaptic Inputs: Novel Inhibitory Function in Neural Circuits for Sound Localization*. Academic Symposium: Exhibition of Student Research and Scholarship, Lehigh University, Bethlehem, PA, March 2011.
- Leese, J.M., Weimann, S.R., Burger, R.M., and Itzkowitz, M. "A comparison of acoustic repertoires of sympatric damselfish" *Lehigh Valley Ecology and Evolution Symposium*, April 2011.
- Tabor, K., Coleman, W., Rubel, E., and Burger, R.M. "Tonotopic Organization of the Superior Olivary Nucleus in Chicken (*Gallus gallus*)" *Abstracts of the 34th Midwinter Research Meeting of the Association for Research in Otolaryngology*, Baltimore, Md., Feb. 2011.
- Coleman, W., Weimann, S., and Burger, R.M., "Monaural Response Properties in the Avian Superior Olivary Nucleus are Modulated by GABAergic and Glycinergic Inhibitory Inputs: and *In Vivo* Study" *Abstracts of the 34th Midwinter Research Meeting of the Association for Research in Otolaryngology*, Baltimore, Md., Feb. 2011.
- Fischl, M., Oline, S., and Burger, R.M., "GABA and Glycinergic Synaptic Input to the Avian Superior Olivary Nucleus" *Abstracts of the 34th Midwinter Research Meeting of the Association for Research in Otolaryngology*, Baltimore, Md., Feb. 2011.

- Coleman, W.L., Fischl, M.J., Trause, D.A., and Burger, R.M. "Physiological heterogeneity of the avian superior olivary nucleus" *Abstracts of the 33rd Midwinter Research Meeting of the Association for Research in Otolaryngology*, Anaheim, CA, Feb. 2010.
- Combs, T.D., Fischl, M.J., Klug, A.K., Grothe, B., and Burger, R.M. "GABAB receptor activation as a possible mechanism for maintaining precise ITD selectivity across varying stimulus conditions: an In Vitro study" *Abstracts of the 33rd Midwinter Research Meeting of the Association for Research in Otolaryngology*, Anaheim, CA, Feb. 2010.
- Fischl, M., Combs, T.D., and Burger, R.M. "Response characteristics of the avian superior olivary nucleus." *Abstracts of the 32nd Midwinter Research Meeting of the Association for Research in Otolaryngology*, Baltimore, MD, Feb. 2009.
- Burger, R.M., Alexandrova, O., Grothe, B., and Klug, A. "The role of GABA_B receptors in development of inhibitory projections to the MSO" *Abstracts of the 30th Midwinter Research Meeting of the Association for Research in Otolaryngology*, New Orleans, LA, Feb. 2007.
- Burger, R. M., Rubsamen, R., and Rubel, E. W. Inhibition shapes monaural response properties in avian Nucleus Magnocellularis neurons. Submitted: *Abstracts of the 28th Midwinter Research Meeting of the Association for Research in Otolaryngology*, New Orleans, LA, Feb. 2005.