

CURRICULUM VITAE – MARK L. GABRIELE, Ph.D.

Address for Correspondence

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Education

- 2000-2001 Postdoctoral Fellowship in Neuroscience
Wake Forest University School of Medicine, Winston-Salem, NC
Cortical-subcortical interactions mediated by the basal ganglia: Nigrotectal influences on orientation behaviors
Mentors: John G. McHaffie, Ph.D. and Barry E. Stein, Ph.D.
- 1995-2000 Ph.D. in Neurobiology and Anatomy
Wake Forest University School of Medicine, Winston-Salem, NC
Afferent pattern development in the inferior colliculus prior to the onset of hearing
Mentor: Craig K Henkel, Ph.D.
- 1991-1995 B.S. in Biology with honors
James Madison University, Harrisonburg, VA

Positions Held

- 2013-present Professor of Biology, James Madison University
- 2007-2013 Associate Professor of Biology, James Madison University
- 2001- 2007 Assistant Professor of Biology, James Madison University
- 2000-2001 Postdoctoral Research Fellow, Wake Forest University School of Medicine
- 1995-2001 Graduate Student, Wake Forest University School of Medicine

Teaching Experience

- 2001-present James Madison University, undergraduate/graduate human anatomy and histology, clinical anatomy and neuroscience for occupational therapy and physician assistant students, special topics in graduate seminars, and scientific presentations.
- 1997-2001 Wake Forest University School of Medicine, guest lecturer and laboratory instructor in medical gross anatomy, medical histology, and graduate sensory systems neuroscience

Professional Affiliations

- 1997-present Society for Neuroscience (SFN)
2003-present Association for Research in Otolaryngology (ARO)

Honors and Awards

- 2017 NIH-AREA R15 grant. Impact score of 20 (scale 10 to 90, 10 is best), \$427,274
Emergence of Modularity and Discrete Multimodal Maps in the Inferior Colliculus
- 2017 JMU Provost Research Grant Award, \$5,000
- 2016 State Council of Higher Education for Virginia (SCHEV)
Outstanding Faculty Award Finalist
The Commonwealth's highest honor for faculty at Virginia's public and private colleges and universities. <https://www.jmu.edu/academic-affairs/awards/schev.shtml>
- 2016 Madison Trust Grant Recipient, \$2,500
Harnessing Brain Plasticity for Treating Debilitating Hearing Disorders
- 2015 & 2016 JMU "Make Your Next Move" Award Nominee
- 2014-2015 Recipient of Madison Scholar Award – In recognition of cumulative accomplishments in scholarship at JMU – *Prize and Special Lecture*
- 2014 Recipient of oIP International Development Grant: \$500
Exploring student opportunities in research and the sciences for the semester in Salamanca (SIS) program
- 2013 Recipient of Provost Award for Excellence in Honors Teaching and Service
- 2013 Recipient of 4-VA Grant: \$5,000
Design of innovative virtual human anatomy modules to be shared across the Commonwealth
- 2012-2013 Nominated for Provost Award for Excellence in Honors Teaching and Service and the Provost Award for Excellence in Academic Advising
- 2012 NIH-AREA R15 grant recipient March 2012 – February 2015, \$320,135
Eph-ephrin Signaling in Mapping Auditory Midbrain Circuitry
- 2011, 2012 Nominated for JMU Alumni Association Distinguished Faculty Award
- 2009 Commonwealth Health Research Board grant recipient \$194,463
Establishing complex auditory circuits: Molecular mechanisms and functional implications for treating the hearing impaired
- 2009 JMU Adult Degree Program Advisor of the Year
- 2007-2008 Nominated for Provost Award for Excellence in Academic Advising
- 2006 NSF MRI grant recipient \$358,005
Acquisition of a spectral imaging confocal microscope to serve as a regional facility for research and education.
- 2006 James Madison University Sports Hall of Fame Inductee
- 2006 Featured Personality in the JMU "Be the Change" Campaign
- 2005 Jeffress Memorial Trust Research Grant Renewal \$10,000
- 2004 Jeffress Memorial Trust Research Grant Renewal \$10,000
- 2002 Jeffress Memorial Trust Research Grant Recipient, \$20,000
Understanding early circuit formation and the spatial arrangement of ascending and descending projection patterns in the developing auditory system prior to the onset of hearing.
- 2002 JMU College of Science and Mathematics Faculty Assistance Grant Recipient
- 2000 Norman S. Sulkin Award for Excellence in Neuroscience Research

1998-1999 Sensory System Training Grant Predoctoral Fellowship
1997 Mary A. Bell Award, Western Carolina Society for Neuroscience

Publications

Journal Articles

Dillingham CH, Gay SM, Behrooz R, **Gabriele ML**. 2017 *In Preparation*. Patch-matrix compartmental organization in developing multisensory shell regions of the mouse inferior colliculus. *J Comp Neuro*.

Wallace MM, Harris JA, Brubaker DQ, Klotz CA, **Gabriele ML**. 2016. Graded and discontinuous EphA-ephrinB expression patterns in the developing auditory brainstem. *Hearing Research*. 335:64-75.

Cramer KS, **Gabriele ML**. 2014. Axon guidance in the auditory system: Multiple functions of Eph receptors. *Neuroscience (Forefront Review)*. 277:152-162.

Liuzzo AM, Gray LC, Wallace MW, **Gabriele ML**. 2014. Effects of Eph-ephrin mutations on pre-pulse inhibition in mice. *J Physiol & Behavior*. 135:232-236.

Wallace MM, Kavianpour SM, **Gabriele ML**. 2013. Ephrin-B2 reverse signaling is required for topography but not pattern formation of lateral superior olivary inputs to the inferior colliculus. *J Comp Neurol*. 521(7):1585-1597.

Gabriele ML, Brubaker DQ, Chamberlain KA, Kross KM, Simpson NS, Kavianpour SM. 2011. EphA4 and ephrin-B2 expression patterns during inferior colliculus projection shaping prior to experience. *Developmental Neurobiology*. 71:182-199.

Fathke RL, **Gabriele ML**. 2009. Patterning of multiple layered projections to the auditory midbrain prior to experience. *Hearing Research*. 249:36-43.

Gabriele ML, Shahmoradian SH, French CC, Henkel CK, McHaffie JG. 2007. Early segregation of layered projections from the lateral superior olivary nucleus to the central nucleus of the inferior colliculus in the neonatal cat. *Brain Research*. 1173:66-77.

Gabriele ML, Smoot JE, Jiang H, Stein BE, and McHaffie JG. 2006. Early establishment of adult-like nigrotectal architecture in the neonatal cat: A double labeling study using carbocyanine dyes. *Neuroscience* 137(4):1309-1319.

Henkel CK, **Gabriele ML**, McHaffie JG. 2005. Quantitative assessment of developing afferent patterns in the cat inferior colliculus revealed with calbindin immunohistochemistry and tract tracing methods. *Neuroscience* 136(3):945-955.

McHaffie JG, Anstrom KK, **Gabriele ML**, and Stein BE. 2001. Distribution of the calcium binding proteins calbindin D-28k and parvalbumin in the superior colliculus of adult and newborn cat and rhesus monkey. *Exp Brain Res* 141:460-470.

Gabriele ML, Brunso-Bechtold JK, and Henkel CK. 2000. Plasticity in the development of afferent patterns in the inferior colliculus of the rat after unilateral cochlear ablation. *J Neuroscience* 20(18):6939-6949.

Gabriele ML, Brunso-Bechtold JK, and Henkel CK. 2000. Development of afferent patterns in the inferior colliculus of the rat: Projection from the dorsal nucleus of the lateral lemniscus. *J Comp Neurol* 416:368-382.

Henkel CK, **Gabriele ML**. 1999. Organization of the disynaptic pathway from the anteroventral cochlear nucleus to the lateral superior olivary nucleus. *J Anat and Embryol* 199:149-160.

Abstracts

Gay SM, Behrooz R, Dillingham CH, **Gabriele ML**. 2017 Calretinin as an extramodular marker in the lateral cortex of the inferior colliculus in developing mouse. *Assoc Res Otolaryngol Mtg*, PS-376.

Dillingham CH, **Gabriele ML**. 2016. Alignment of neurochemically defined modules in multimodal aspects of the mouse inferior colliculus. *Central Virginia Chapt Soc for Neurosci*, 23.

Dillingham CH, **Gabriele ML**. 2016. Neurochemical modularity in the developing mouse lateral cortex of the inferior colliculus. *Assoc Res Otolaryngol Mtg*, PS-647.

Balsamo JA, **Gabriele ML**. 2015. Modularity and multimodal connections in the inferior colliculus prior to experience. *Central Virginia Chapt Soc for Neurosci*, 04.

Balsamo JA, **Gabriele ML**. 2015. Somatosensory inputs to the lateral cortex of the inferior colliculus prior to auditory experience in mouse. *Assoc Res Otolaryngol Mtg*, PS-565.

Gerringer MR, **Gabriele ML**, Gray LC. 2015. Effect of EphA4 signaling mutations on auditory function. *Amer Auditory Society Conf*.

Noftz WA, Gray LC, **Gabriele ML**. 2014. Converging midbrain afferent patterns and auditory brainstem responses in ephrin-B3 mutant mice. *Assoc Res Otolaryngol Mtg*, PS-070.

Klotz CA, Wallace MM, Harris JA, **Gabriele ML**. 2013. Countergradients and modular expression patterns of Eph-ephrin signaling proteins in the developing auditory brainstem. *Assoc Res Otolaryngol Mtg*, 1013.

Wallace MM, Klotz CA, Harris JA, **Gabriele ML**. 2012. Complementary expression of ephrin-Bs and their role in inferior collicular development. *Soc for Neurosci*, 735.02.

Wallace MM, Kavianpour SM, **Gabriele ML**. 2012. Ephrin-B2 reverse signaling is not required for the formation of layered and modular lateral superior olivary inputs to the inferior colliculus in the developing mouse. *Assoc Res Otolaryngol Mtg*, 789.

- Rickenbach BL, Gray LC, Wallace MM, **Gabriele ML**. 2012. Ultrasonic vocalizations in Eph/ephrin mice. *Audiology Now*, PP1131
- Wallace MM, Cowan DR, **Gabriele ML**. 2012. Ephrin-B2 is necessary for accurate topography but not required for pattern formation of lateral superior olivary inputs to the inferior colliculus prior to hearing onset. *Central Virginia Chapt Soc for Neurosci*, 43.
- Klotz CA, Harris JA, Wallace MM, **Gabriele ML**. 2012. X-Gal staining of *lacZ* ephrin-B2 and ephrin-B3 mutant mice in the auditory midbrain prior to hearing onset. *Central Virginia Chapt Soc for Neurosci*, 44.
- Gabriele ML**, Kavianpour SM, Chamberlain KA, Cowan DR, Wallace MM, Reitano ML, Kokal RC, Brubaker DQ. 2011. Graded and modular expression patterns of EphAs and ephrin-Bs in the developing central nucleus and external cortex of the inferior colliculus. *Assoc Res Otolaryngol Mtg*, 447.
- Gabriele ML**, Chamberlain KA, Brubaker DQ, Stepniak I, Kavianpour SM. 2009. Eph/ephrin expression and the development of layered projections in the inferior colliculus of neonatal mouse. *Soc for Neurosci Mtg*, 258.8
- Gabriele ML**, Kross KM, Kavianpour SM, Motsko ML, Stepniak I. 2008. Pattern formation in the inferior colliculus of rat and mouse prior to the onset of hearing. *Soc for Neurosci Mtg*, 456.1.
- Fathke RL, **Gabriele ML**. 2007. Spatial registry of multiple layered inputs to the inferior colliculus in rat prior to experience. *Soc for Neurosci Mtg*, 504.1.
- Gabriele ML**, Kross KM, Simpson NS, Fathke RL. 2007. EphA4 expression patterns in the neonatal rat inferior colliculus. *Soc for Neurosci Mtg* 504.2.
- Fathke RL, McHaffie JG, Henkel CK, **Gabriele ML**. 2007. Patterns of convergence for multiple afferent projections to the central nucleus of the inferior colliculus prior to the onset of hearing. *Assoc Res Otolaryngol Mtg*, 829.
- Gabriele ML**, Fathke RL, Shahmoradian SH, French CC, Henkel CK, McHaffie JG. 2006. Segregation of multiple layered projections to the central nucleus of the inferior colliculus in the neonatal cat. *Soc for Neurosci Mtg* 520.6.
- Shahmoradian SH, James RL, Simpson NS, **Gabriele ML**. 2005. Banded ephrin-B3 expression patterns in the neonatal rat inferior colliculus. *Soc for Neurosci Mtg* 942.2.
- Gabriele ML**, Smoot JE, Jiang H, Stein BE, and McHaffie JG. 2005. Postnatal development of nigrotectal projections in the cat: A double-labeling study. *Soc for Neurosci Mtg* 507.3.
- Gabriele ML**, Robenolt J, Laz A, Jaynes CD. 2005. Involvement of ephrins and Eph receptors in establishing early pattern formation in the auditory midbrain. *Assoc Res Otolaryngol Mtg* 28(1):90.

- Gabriele ML**, Taylor ME, French CC, Smoot JE. 2004. Arrangement of ascending and descending afferent patterns in the developing auditory midbrain and thalamus. *Assoc for Res in Otolaryng Mtg* 27(1):43.
- Keegan KL, Sung K, **Gabriele ML**. 2003. Development of lateral superior olivary axonal patterns within the auditory midbrain. *SYNAPSE Mtg* Harrisonburg, VA; May 2003.
- Moore AR, Taylor ME, **Gabriele ML**. 2003. Development of afferent patterns in the medial geniculate of the rat: Projection from the inferior colliculus. *SYNAPSE Mtg* Harrisonburg, VA; May 2003.
- Smoot JE, Laz AA, **Gabriele ML**. 2003. Development of auditory pathways between the thalamus and primary auditory cortex. *SYNAPSE Mtg* Harrisonburg, VA; May 2003.
- Gabriele ML**, Jiang H, Stein BE, and McHaffie JG. 2001. Development of nigrotectal pathways in the cat: A postnatal study using carbocyanine dyes. *Soc for Neurosci Mtg* 27:Program No. 723.26.
- Jiang H, **Gabriele ML**, Stein BE, and McHaffie JG. 2001. Activation of crossed nigrotectal neurons inhibits sensory-evoked activity in the contralateral superior colliculus. *Soc for Neurosci Mtg* 27:Program No. 723.27.
- Henkel CK, **Gabriele ML**, McHaffie JG. 2001. Calcium-binding protein immunohistochemistry reveals afferent patterns in the inferior colliculus of adult cat. *Soc for Neurosci Mtg* 27:Program No. 930.11.
- Gabriele ML**, Brunso-Bechtold JK, and Henkel CK. 2000. Developmental plasticity of aural dominance bands in the inferior colliculus following unilateral cochlear ablation. *Soc for Neurosci Mtg* 26:676.
- McHaffie JG, **Gabriele ML**, Stein BE, Wallace MT, and Henkel CK. 2000. Banded distribution of calbindin D-28k immunoreactivity in the auditory brainstem of neonatal and adult cats. *Soc for Neurosci Mtg* 26:676.
- Jiang H, **Gabriele ML**, Stein BE, and McHaffie JG. 2000. Anatomy and physiology of the crossed nigrotectal system in the cat. *Soc for Neurosci Mtg* 26:1701.
- Gabriele ML**, Henkel CK. 2000. Changes in development of afferent patterns in the inferior colliculus of the rat following unilateral cochlear ablation. *Assoc for Res in Otolaryng Mtg* 23:180.
- McHaffie JG, **Gabriele ML**, Stein BE, Wallace MT, and Henkel CK. 2000. Distribution of calbindin D-28k immunoreactivity in the auditory brainstem and midbrain of the neonatal and adult cat. *Assoc for Res in Otolaryng Mtg* 23:179-180.
- Gabriele ML**, Henkel CK. 1999. Developmental plasticity of afferents to the inferior colliculus in the rat: Projection from the dorsal nucleus of the lateral lemniscus. *Assoc for Res in Otolaryng Mtg* 22:220.
- Henkel CK, **Gabriele ML**. 1997. Organizational patterns of projections from the medial nucleus of the trapezoid body to the lateral superior olivary nucleus. *Soc for Neurosci Mtg* 23(1):183.

Recent Invited Seminars

Gabriele ML. “Developing curiosities. Developing brain maps. Developing student minds.”
2014 JMU College of Science and Math Madison Scholar Lecture. Host: Dr. Joanna Mott
Harrisonburg, VA. 10/29/14.

Gabriele ML. “Eph-ephrin signaling in establishing auditory midbrain maps prior to experience.”
Instituto de Neurociencias de Castilla y León, University of Salamanca.
Hosts: Dr. Manuel S. Malmierca and Dr. Enrique Saldaña. Salamanca, Spain. 04/29/14.

Gabriele ML. “Blurring the lines of research and teaching: Rewarding careers at primarily
undergraduate institutions. Wake Forest University School of Medicine. Department of
Neurobiology and Anatomy. Host: Dr. Mike Tytell. Winston-Salem, NC. 01/31/14

Gabriele ML. “Playing to our strengths: Securing extramural funding by emphasizing undergraduate
research.” JMU; Center for Faculty Innovation. Host: Ed Brantmeier. Harrisonburg, VA.
10/21/13

Gabriele ML. “Assembling functional auditory circuits in the developing brain prior to experience.”
JMU; Department of Biology. Host: Dr. Corey Cleland. Harrisonburg, VA. 11/16/12

Gabriele ML. “EphA4 and ephrin-B2 involvement in establishing afferent patterns in the developing
inferior colliculus.” JMU; Department of Communication Sciences and Disorders.
Host: Dr. Christy Ludlow. Harrisonburg, VA. 12/01/10

Gabriele ML. “Developmental mechanisms shaping complex auditory circuits.”
Dickinson College. Host: Dr. Mary Niblock. Carlisle, PA. 03/31/09

Gabriele ML. “Pattern formation in the developing auditory midbrain.”
Johns Hopkins School of Medicine. Host: Dr. Dwight Bergles. Baltimore, MD. 02/11/08