

Jennifer M. Groh

Duke University
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Personal: Married, 2 children, born 1999 and
2001.

Academic Positions

- 1997-2004 Assistant Professor, Department of Psychological and Brain Sciences, Center for Cognitive Neuroscience, Dartmouth.
2004-2006 Associate Professor, Department of Psychological and Brain Sciences, Center for Cognitive Neuroscience, Dartmouth
2006-present Associate Professor, Department of Neurobiology, Department of Psychology and Neuroscience, Center for Cognitive Neuroscience, Duke University

Education

- 1984-1988 Princeton University, AB *Summa cum laude* in Biology
1988-1989 University of Michigan, MS in Neuroscience
1989-1993 University of Pennsylvania, PhD in Neuroscience
Advisor: Dr. David L. Sparks
1994-1997 Stanford University, Postdoctoral Fellow in Neurobiology
Supervisor: Dr. William T. Newsome

Summer Courses Attended

- 1991 "Methods in Computational Neuroscience", Woods Hole Marine Biological Laboratories
1994 "Computational Vision", Cold Spring Harbor Laboratory

Honors and Awards

- 1987 National Science Foundation summer research fellowship
1988 Senior Book Prize in Biology, Princeton University
1988 Phi Beta Kappa
1988 Sigma Xi
1988 National Science Foundation Graduate Fellowship
1988 Rotary Fellowship (not used)
1988 University of Michigan Regents Fellowship (not used)
1989 National Defense Science and Engineering Graduate Fellowship
1992 Alfred N. Richards Predoctoral Fellowship in Biomedical Science
1994 Helen Hay Whitney Postdoctoral Fellowship
1994 Finalist, Donald B. Lindsley Prize in Behavioral Neuroscience
1994 Joanne S. Diamond Award Lecture in Behavioral Neurobiology, Duke University
1998 Alfred P. Sloan Foundation Research Fellowship
1998 McKnight Scholar Award
1998 Whitehall Foundation Research Grant

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1999 ONR Young Investigator Program Award
1999 John Merck Scholarship in the Biology of Developmental Disabilities in Children
2001 The Walter and Constance Burke Research Initiation Awards for Junior Faculty, Dartmouth
2002 EJLB Foundation Research Grant
2007 Kavli Frontiers of Science Fellow

Research Grants and Contracts

Previous:

Alfred P. Sloan Research Fellowship, \$35,000, 1998-2000, PI: **Groh.**
ONR Young Investigator Program Grant, “Neural algorithms for sensor fusion” \$343,000, 1999-2002, PI: **Groh.**
Whitehall Foundation Research Grant, “Coordinate transformations of spatial information” \$225,000, 1998-2001; renewal \$150,000 2001-2004, PI: **Groh.**
EJLB Foundation Grant, “Frames of Reference in the Auditory Pathway” \$300,000 CAN, 2002-2004, PI: **Groh.**
NINDS Program project grant (PI of project 2) (NIH NS 17778-19) "Program in Cognitive Neuroscience", "Cortical substrates of multisensory integration".1999-2005, Overall PI: Gazzaniga, PI of project 2: **Groh**
NEI R13 EY016649-01 “2005 (Oculomotor System Biology) Gordon Conference”, \$20,000, 2005-2006, PI: Neeraj Gandhi; **coPI: Groh.**
NEI R13, “2007 (Oculomotor System Biology) Gordon Conference”, \$30,000. PI: Neeraj Gandhi; **coPI: Groh.**

Active:

McKnight Scholar Award, \$150,000, “Neural Coordinate Transformations” 1998-present, PI: **Groh.**
John Merck Scholarship in the Biology of Developmental Disabilities in Children, \$240,000, 1999-present, PI: **Groh.**
NIH (NINDS) R01 NS50942-01, “Integrative Information Processing”, approx. \$922,674, 4 years, 2004-2008, PI: **Groh.**
NSF 0415634 “Eye position and the neural basis of sound localization”, approx. \$591,875, 4 years, 2005-2009, PI: **Groh.**
NEI R01EY016478-01 “Visual signals in auditory midbrain”, approx. \$1,758,900, 5 years, 2006-2011, PI: **Groh.**

Professional Affiliations

Society for Neuroscience
International Brain Research Organization
Association for Research in Vision and Ophthalmology
American Physiological Society

Professional Activities

Member, Society for Neuroscience Committee on Animal Research, 2006-2009
Reviewer for:

Jennifer M. Groh

Nature, Nature Neuroscience, Neuron, Journal of Cognitive Neuroscience, Journal of Neuroscience, Journal of Neurophysiology, Biological Cybernetics, Experimental Brain Research, Journal of Comparative Neurology, European Journal of Neuroscience, Behavioral Brain Research, Vision Research, Current Biology, Perception, Hearing Research

Associate Editor, Frontiers in Neuroscience

Grant Reviewing

Ad Hoc member of COG, AUD, CVP, IFCN-E-02 and CRCNS panels for NIH, misc. NSF panels, 1998-present

Member COG study section, 2006-2010.

Organizer and Chair of Symposium "Interpreting Neural Activity", Cognitive Neuroscience Society Meeting, 1999

Invited participant, 10th Annual Frontiers of Science Symposium, National Academy of Sciences, Irvine, CA, 1998

Organizer and Chair of Symposium "How our eyes affect our ears: visual intrusions into the domain of hearing", Society for Neuroscience, 2001.

Vice-Chair, Gordon Conference on Oculomotor System Biology, June 2005

Chair, Cosyne Workshop. "Parietal cortex: function and computations". With Yale Cohen. March, 2006.

Co-Chair. *Society for Neuroscience* Minisymposium. Going beyond "auditory" in auditory cortex. With Jonathon Fritz. October, 2006.

Chair, Gordon Conference on Oculomotor System Biology. With Neeraj Gandhi. June 2007

Invited Presentations and Colloquia

"Two models for translating auditory signals from head-centered to eye-centered coordinates."
Medical College of Virginia, Department of Physiology, 1992.

"Oculomotor coordinate transformations: auditory models and somatosensory experiments."
Stanford University, Department of Neurobiology, 1993.
The Salk Institute, 1993.

"Translating auditory and somatosensory signals into an eye-centered frame of reference."
Washington University, Computation and Neural Systems Seminar Series, 1994.
Office of Naval Research, Workshop on Sensor Fusion, National Academy of Sciences, Woods Hole, MA, 1994.

"Saccades to somatosensory targets: behavioral characteristics and collicular signals."
Stanford University, Department of Psychology, 1994.

"Effects of microstimulation in MT on saccades and smooth pursuit eye movements."
Stanford University, Department of Neurobiology, 1994.

"Transforming sensory signals into motor coordinates for generating eye movements."
Duke University, Department of Neurobiology, 1994.

"Sensorimotor integration for saccades and smooth pursuit."
Smith-Kettlewell Institute, 1995.

"How are sensory maps read out? Effects of stimulating visual cortex on eye movements"
University of California, San Francisco, 1995.

University of California, San Diego, 1995.

Bowman-Gray School of Medicine, Department of Neurobiology and Anatomy, Wake Forest University, 1996.

Salk Institute, San Diego, 1996.

Stanford University, Department of Psychology, February 1996.

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Harvard University, Department of Neurobiology, February 1996.
University of Chicago, Department of Organismal Biology and Anatomy, 1996.
Oxford University, Department of Physiology, Oxford, England, 1996.
University of California, Berkeley, Department of Molecular and Cellular Biology, 1996.
University of California, Berkeley, Department of Psychology, 1996.
Washington University, Department of Neurobiology and Anatomy, 1996.
Brown University, Department of Psychology, 1996.
Brown University, Department of Neuroscience, 1996
Georgetown University, Georgetown Institute for Cognitive and Computational Science, 1996.
City College of New York, Department of Biology, 1996.
Rockefeller University, 1996.
Columbia University, 1996.
Duke University, Department of Neurobiology, 1996.
University of California, Los Angeles, Brain Research Institute, 1996.
University of California, Los Angeles, Dept. of Psychology, 1996.
University of Rochester, Center for Visual Science, 1996
Dartmouth College, Dept. of Psychology, 1996
Cornell University, Dept. of Psychology, 1997
Cornell University, Dept. of Neurobiology and Behavior, 1997

"How the brain processes information"

Carnegie Mellon University, Center for the Neural Basis of Cognition, 1998

"How is a velocity signal extracted from MT?"

Cold Spring Harbor Laboratory, Computational Vision Course, 1998

"Frames of reference and multisensory integration"

Princeton University, 2000

Harvard University, 2001

New York University, 2001

University of Connecticut, 2002

Rutgers University, 2002

National Institutes of Health, May, 2003

Massachusetts Institute of Technology, 2nd Annual McGovern Symposium, 2003

University of Texas, Austin, January 2004

Baylor College of Medicine, January 2004

Stanford University Dept. of Neurobiology, January 2004

University of California, San Francisco, January 2004

University of California, Davis, January 2004

Dartmouth Medical School, Dept. of Physiology, April 2004

City University of New York, May, 2004

"Looking at sounds: neural computations for associating visual and auditory events"

Queen's University, Kingston, Ontario, Canada, Sept, 2004

Massachusetts Institute of Technology, Nov, 2004

University of Oregon, February, 2005

University of Maryland, February, 2005

Yale University, February, 2005

University of California, Berkeley, April, 2005

University of Michigan, May, 2005

Columbia University, September, 2005

Boston University, September, 2005

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Duke University, Center for Cognitive Neuroscience, September, 2005
Duke University, Dept. of Psychological and Brain Sciences, November, 2005.
University of Pittsburgh, November, 2005
North Carolina State University, Department of Electrical and Computer Engineering, October
2006
Barrow Neurological Institute, March, 2008
University of North Carolina, Department of Psychology, March, 2008
Johns Hopkins University, Department of Otolaryngology, April, 2008
University of Rochester, October, 2008

Teaching

Duke University:

“Perception and the Brain (Psychology 182), Spring 2007, Fall 2007, Fall 2008
“Visual perception” (Neurobio 257), Spring 2007 (team-taught)

Dartmouth College:

"Memory and Brain", (Psychology 51) Spring 1998; Fall 1998, Spring 2005
"Sensory Psychology - laboratory", (Psychology 64), Winter 1999, Winter 2001, Winter 2002, Winter
2004, Winter 2005, Winter 2006
"Proseminar - Neural Science I", (Psychology 113), Spring 1998*, Fall 1998*, Winter 2000, Fall
2000*, Spring 2003, Spring 2004*
* = course organizer
"Perception", (Psychology 21), Spring 2001
“Methods in Data Analysis”, (Psychology 111), Spring 2003, Fall 2003

Committee Service

Dartmouth College

1997 -2001 Psychological and Brain Sciences Graduate Committee
1997-2000 MD-PhD Admissions Committee
1997-1998 Cognitive Neuroscience Search Committee
2000-2001 Education Department Search Committee
2002-2005 Institutional Animal Care and Use Committee
2002-2006 Neuroscience Day Steering Committee
2001-2004 Dartmouth College Graduate Committee
2002 ARC Director Search Committee
2002-2003 Cognitive Neuroscience Search Committee
2002-2003 Behavioral Neuroscience Search Committee
2003 ARC Associate Veterinarian Search Committee

Duke University

2006-2007 Behavioral Neuroscience Search Committee
2007-present Undergraduate Neuroscience Major Committee (chair)

Advising

Postdoctoral Fellows:

Jennifer M. Groh

2000-2006 Dr. Uri Werner-Reiss
2000-2006 Dr. Ryan Metzger
2006-2008 Dr. Norbert Kopco
2007-present Dr. Joost Maier
2007-present Dr. Deborah Ross
2008-present Dr. Jung Ah Lee

Graduate Advising:

Advisor:

1997-2000: Kimberly Rose Clark
1999-2004: O'Dhaniel Mullette-Gillman* (jointly advised with Prof. Yale Cohen)
1997-1999: Ian Wickersham
2000-2004 Kristin Ann Kelly Porter*
2005-present David Bulkin
2008-present Dan Pages
* = completed Ph.D. in my laboratory

Thesis committee:

Mike Nelson
Leanne Boucher
Gordon Gifford
Huiheng Lei
Klaus Libertus
Stephen Shepherd
Sarah Donohue

Specialist (qualifying exam) committees:

Kimberly Rose Clark
Leanne Boucher
Kestas Kverega
O'Dhaniel Mullette-Gillman
Kristin Kelly
Gordon Gifford
Marian Berryhill
Brian Russ
Gideon Caplovitz
Ruey-Kuang Cheng

Rotation students:

Sarah Donohue
Shruti Agashe
Daniel Bowling
Joseph Harris
Daniel Pages
David Barack

Undergraduate Research Advising:

Thesis advisor:

1999-2000 Amanda Trause
2000-2001 Amy Dillon

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Other undergraduate research in laboratory:

2005-2006	Grace Chua
2007-present	Vanessa Kennedy
2008	Nicholas Del Grosso
2008	Holly Turner

Thesis committee:

1998-1999	Kristin Maczco
2006-2007	Ashley Nutter
2007-2008	Donna Werling
2007-2008	Jeremy Crawford
2008-2009	Leena Padhye

Honors and Awards won by my students

1999	Amanda Trause:	Waterhouse Grant, Dartmouth, summer research fellowship
1999	Amanda Trause:	Marie Center Fund, Dartmouth, summer research fellowship
1999	Leanne Boucher:	First place, The Dartmouth Graduate Student Poster Conference
2000	Amanda Trause:	Second place, Benjamin J. Benner 1969 Award for Excellence in Research in Psychology.
2000	Amy Dillon:	Benner Fellowship for undergraduate research in psychology
2001	Amy Dillon:	Second place, Benjamin J. Benner 1969 Award for Excellence in Research in Psychology.
2001	Amy Dillon:	Nickerson Prize, for outstanding undergraduate in psychology
2002	Kristin Kelly Porter:	Boston Area Neuroscience Group Travel Fellowship
2003	Kristin Kelly Porter:	The National Institute on Deafness and Other Communication Disorders Travel Fellowship
2003	Kristin Kelly Porter:	Marie Center 1982 Award for Excellence in Teaching, Dartmouth College

Fellowships held by my students or postdoctoral fellows

Kristin A. Kelly, graduate student: NRSA MD-PhD fellowship: “Eye Position Effects in Auditory Cortex”, National Institute of Neurological Disorders and Stroke. 2002-present.

Ryan Metzger, postdoctoral fellow: NRSA Postdoctoral fellowship: “Effects of Eye Position in the Auditory Pathway”, National Institute on Deafness and Other Communication Disorders. 2002-2004.

Articles about my work by others

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- Treue, S. and Ilg, U. G. 2000. Image segmentation: a tug-of-war for the eyeball. *Current Biology*, 10(20): R746-R749. (About: Born, RT, **Groh, JM**, Zhao, R., and Lukasewycz, S. J. 2000. Segregation of object and background motion in visual area MT: effects of microstimulation on eye movements. *Neuron*, 26:725-734.).
- Recanzone, G. 2001. [Preview]. Hearing and looking. *Neuron*, 29: 314-315. (About: **Groh JM**, Trause, A. S., Underhill, A. M., Clark, K. R, Inati, S. 2001. Eye position influences auditory responses in primate inferior colliculus. *Neuron*, 29: 509-518.).
- Pearson, H. 2001. Seeing is a hearing aid. *Nature Science Update*, (on-line publication), March 20, 2001, www.nature.com/nsu. A copy is also available at www.cs.dartmouth.edu/~groh/lab.
- Snyder LH. Frame-up. Focus on "eye-centered, head-centered, and complex coding of visual and auditory targets in the intraparietal sulcus". *J Neurophysiol* 94: 2259-2260, 2005.
- Popular press: Coverage of our work "Visual- and saccade-related signals in the primate inferior colliculus." (Porter, KK, Metzger, RR, and **Groh, JM**. 2007. *Proceedings of the National Academy of Sciences*. 104(45): 17855-60.) has appeared in Scientific American (ScientificAmerican.com), Fox News (foxnews.com), the CBC radio program "Quirks and Quarks", the Radio New Zealand program "Nights", the Telegraph, the Italian science magazine "Newton", and LiveScience.com and numerous other online science news web sites.

Articles

- Groh, JM** and Sparks, DL. 1992. Two models for transforming auditory signals from head-centered to eye-centered coordinates. *Biological Cybernetics*, **67**(4):291-302.
- Groh, JM** and Sparks, DL. 1996. Saccades to somatosensory targets: I. Behavioral characteristics. *Journal of Neurophysiology*, **75**: 412-427.
- Groh, JM** and Sparks, DL. 1996. Saccades to somatosensory targets: II. Motor convergence in primate superior colliculus. *Journal of Neurophysiology*, **75**: 428-438.
- Groh, JM** and Sparks, DL. 1996. Saccades to somatosensory targets: III. Influence of eye position on somatosensory activity in primate superior colliculus. *Journal of Neurophysiology*, **75**: 439-453.
- Groh, JM**, Born, RT, and Newsome, WT. 1996. Interpreting sensory maps in visual cortex. *International Brain Research Organization News*, **24**: 11-12.
- Groh, JM**, Seidemann, E, and Newsome, WT. 1996. Neural fingerprints of visual attention. *Current Biology*, **11**: 1406-1409.
- Groh, JM**, Born, RT, and Newsome, WT. 1997. How is a sensory map read out? Effects of microstimulation in area MT on smooth pursuit and saccadic eye movements. *Journal of Neuroscience*, 17:4312-4330.

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- Groh, JM.** 1998. Reading neural representations. *Neuron*, **21**:661-664.
- Wickersham, I. and **Groh, JM.** 1998. Electrically evoking sensory experience. *Current Biology*, **8**:R412-R414.
- Groh, JM.** 2000. Predicting perception from population codes. *Nature Neuroscience*, 3(3):201-202.
- Born, RT, **Groh, JM** , Zhao, R., and Lukasewycz, S. J. 2000. Segregation of object and background motion in visual area MT: effects of microstimulation on eye movements. *Neuron*, 26:725-734.
- Groh JM**, Trause, A. S., Underhill, A. M., Clark, K. R, Inati, S. 2001. Eye position influences auditory responses in primate inferior colliculus. *Neuron*, 29:509-518. (This article was featured on the cover of the journal).
- Groh, JM.** 2001. Converting neural signals from place codes to rate codes. *Biological Cybernetics*, 85:159-65.
- Boucher, L, **Groh JM**, Hughes HC. 2001. Afferent delays and the mislocalization of perisaccadic stimuli. *Vision Research*, 41: 2631–2644.
- Werner-Reiss, U, Kelly, KA, Trause, AS, Underhill, AM and **Groh, JM.** 2003. Eye position affects activity in primary auditory cortex of primates. *Current Biology*, 13:554-562.
- Groh, JM** and Gazzaniga, MS. How the brain keeps time. 2003. *Daedalus*, Spring, 56-61.
- Groh, JM**, Kelly KA and Underhill, AM. 2003. A monotonic code for sound azimuth in primate inferior colliculus. *Journal of Cognitive Neuroscience*, 15(8):1217-1231.
- Metzger RR, Mulette-Gillman OA, Underhill AM, Cohen YE, **Groh JM.** 2004. Auditory saccades from different initial eye positions: implications for coordinate transformations in the primate brain. *Journal of Neurophysiology*, 92:2622-2627.
- Mulette-Gillman, OA., Cohen, YE, **Groh, JM.** 2005. Eye-centered, head-centered, and complex coding of visual and auditory targets in the intraparietal sulcus. *Journal of Neurophysiology*, 94:2331-2352.
- Werner-Reiss U, Porter, KK, Underhill AM, **Groh JM.** 2006. Long-lasting attenuation by prior sounds in auditory cortex of awake primates. *Experimental Brain Research*, 168:272-6.
- Porter, KK, Metzger, RR, and **Groh, JM.** 2006. The representation of eye position in primate inferior colliculus. *Journal of Neurophysiology*, 95:1826-42.
- Porter, KK and **Groh, JM.** 2006. The “other” transformation required for visual-auditory integration: representational format. *Progress in Brain Research*, 155:313-23.
- Bulkin, DA and **Groh, JM.** 2006. Seeing sounds: Visual and auditory interactions in the brain. *Current Opinions in Neurobiology*, 16:415-9.

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- Metzger, RR, Greene, NT, Porter, KK and **Groh, JM**. 2006. Effects of reward and behavioral context on neural activity in the primate inferior colliculus. *Journal of Neuroscience*, 26:7468-76.
- Porter, KK, Metzger, RR, and **Groh, JM**. 2007. Visual- and saccade-related signals in the primate inferior colliculus. *Proceedings of the National Academy of Sciences*. 104(45): 17855-60.
- Werner-Reiss, U. and **Groh, JM**. 2008. A rate code for sound azimuth in monkey auditory cortex: implications for human neuroimaging studies. *Journal of Neuroscience*. 28:3747-3758.
- Mullette-Gillman, O. A., Cohen, Y. E. and **Groh, JM**. Motor-related signals in the intraparietal cortex encode locations in a hybrid, rather than eye-centered, reference frame. *Cerebral Cortex*, in press.
- Maier, J.X. and Groh, J.M. Multisensory guidance of orienting behavior. *Hearing Research*, in press.

Book Chapters (** denotes peer reviewed articles)

- Sparks, DL and **Groh, JM**. 1995. The superior colliculus: a window to problems in integrative neuroscience. In, The Cognitive Neurosciences, Michael S. Gazzaniga, ed. MIT Press, Cambridge MA.
- **Groh, JM** and Werner-Reiss, U. 2002. Visual and auditory integration. In, Encyclopedia of the Human Brain. V. S. Ramachandran, ed. Academic Press, San Diego, CA.
- **Kelly, KA**, Metzger, RR, Mullette-Gillman, OA., Werner-Reiss U., **Groh, JM**. 2003. Representation of sound location in the primate brain. In, Primate Audition: Behavior and Neurobiology, A. Ghazanfar, ed. CRC Press, Boca Raton, FL.
- Groh, JM** and Pai, D. 2008. Looking at sounds: neural mechanisms in the primate brain. In, Primate Neuroethology. A. Ghazanfar and M. Platt, eds. In press.

Theses

- Groh, JM**. 1988. Bachelor male feral horses: characteristics of group living and aggression. Senior thesis, Princeton University.
- Groh, JM**. 1993. Coordinate transformations, sensorimotor integration, and the neural basis of saccades to somatosensory targets. Ph.D. thesis, University of Pennsylvania.

Abstracts and Conference Presentations

- Groh, JM** and Sparks, DL. 1991. A model for transforming auditory signals from head-centered to eye-centered coordinates. *Soc. Neurosci. Abstr.*, **17**:458
- Aldridge, JW, Thompson, JF, Walters, EA, **Groh, JM** and Gilman, S. 1991. Neostriatal unit activity related to movement preparation in a go/no-go task in the cat. *Soc. Neurosci. Abstr.*, **17**:1217.

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- Groh, JM** and Sparks, DL. 1992. Characteristics of saccades to somatosensory targets. *Soc. Neuro. Abstr.*, **18**:701.
- Groh, JM** and Sparks, DL. 1993. Motor activity in the primate superior colliculus (SC) during saccades to somatosensory and visual targets. *Invest. Ophthalm. Vis. Sci.*, **34**:1137.
- Glimcher, PW, **Groh, JM** and Sparks, DL. 1993. Low-frequency collicular stimulation specifies saccadic amplitude gradually. *Invest. Ophthalm. Vis. Sci.*, **34**:1137.
- Groh, JM** and Sparks, DL. 1993. Somatosensory activity in the superior colliculus (SC) influenced by eye position. *Soc. Neurosci. Abstr.*, **19**:858.
- Shadlen, MN, **Groh, JM**, Salzman, CD and Newsome, WT. 1994. Responses of LIP neurons during a motion discrimination task: a decision process in action? *Soc. Neurosci. Abstr.* **20**:1279.
- Groh, JM**, Born, RT, and Newsome, WT. 1995. Effects of microstimulation of area MT on smooth pursuit eye movements. *Physiology and Anatomy of the Association Cortices (IBRO satellite symposium)*.
- Groh, JM**, Born, RT, and Newsome, WT. 1995. Microstimulation of area MT affects both saccades and smooth pursuit eye movements. *Soc. Neurosci. Abstr.*, **21**:281.
- Born, RT, **Groh, JM**, and Newsome, WT. 1995. Functional architecture of primate area MT probed with microstimulation: effects on eye movements. *Soc. Neurosci. Abstr.*, **21**:281.
- Groh, JM**, Born, RT, and Newsome, WT. 1996. A comparison of the effects of microstimulation in area MT on saccades and smooth pursuit eye movements. *Invest. Ophthalm. Vis. Sci.*, **37**(3):S472.
- Groh, JM**. 1997. A model for transforming signals from a place code to a rate code. *Soc. Neurosci. Abstr.*, **23**:1560.
- Groh, JM**. 1998. How are neural signals converted from 'digital' to 'analog' representations? Evidence from visual area MT and the superior colliculus. The Fifth International Congress of Neuroethology.
- Groh, JM**. 1999. Converting neural signals from 'digital' to 'analog' representations. Symposium: Interpreting Neural Activity (**JM Groh**, organizer), Cognitive Neuroscience Society Meeting.
- Boucher, L., **Groh, J.M.**, and Hughes, H.C. 1999. Contributions of visual processing delays to mislocalization of perisaccadic stimuli. *Soc. Neurosci. Abstr.*, **29**.
- Born, RT, Zhao, R., and Lukasewycz, S. J., **Groh, JM**. 1999. Representation of figure and ground in visual area MT. *Soc. Neurosci. Abstr.*
- Groh, JM**. 2000. Frames of reference and multisensory integration. McKnight Conference on Neuroscience.

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- Groh, JM.** 2000. Brain soup: sensory, motor, sensorimotor and cognitive signals - are these concepts or confounds? Symposium (LH Snyder, organizer). Neural Control of Movement 2000.
- Trause, A. S., Werner-Reiss, U., Underhill, A. M., **Groh, J. M.** 2000. Effects of eye position on auditory signals in primate auditory cortex. *Soc. Neurosci. Abstr.*, 26:1977.
- Clark, K. R., Trause, A. S., Underhill, A. M., **Groh, J. M.** 2000. Effects of eye position on auditory signals in primate inferior colliculus. *Soc. Neurosci. Abstr.*, 26:1977.
- Boucher, L., **Groh JM.**, Hughes, HC. 2000. Oculomotor localization of perisaccadic auditory targets. *Soc. Neurosci. Abstr.* 26:1329.
- Groh, JM.** 2001. How our eyes affect our ears: visual intrusions into the domain of hearing. Symposium, *Society for Neuroscience*, 2001. With E. I. Knudsen, Y. E. Cohen, T. R. Stanford.
- Groh, JM**, Underhill, AM. 2001. Coding of sound location in primate inferior colliculus. *Soc. Neurosci. Abstr.*, 27:60.1.
- Metzger, R R, Underhill, A. M. and **Groh, J. M.** 2001. Time course of eye position influence in primate inferior colliculus. *Soc. Neurosci. Abstr.*, 27 60.3.
- Werner-Reiss, U., Kelly, K.A., Underhill, A. M. and **Groh, J. M.** 2001. Eye position tuning in primate auditory cortex. *Soc. Neurosci. Abstr.*, 27:60.2.
- Groh, JM.** 2001. The eyes and ears both have it: Frames of reference in the auditory pathway. In, "Processing the Auditory Environment: From synaptic mechanisms to population codes.". 6th Biennial Symposium of the Center for Neural Science at New York University. June 10-11, 2001.
- Boucher, L., **Groh, JM**, Hughes, HC. 2001. Afferent delays and the mislocalization of perisaccadic stimuli. York Conference: Levels of Perception. Toronto, Canada. June 19-23, 2001.
- Kelly, K. A., Werner-Reiss, U., Underhill, AM, **Groh, JM.** 2002. History of recent past affects neural responses in auditory cortex of awake primates. Association for Research in Otolaryngology, St Petersburg Beach, FL.
- Metzger, RR and **Groh, JM.** 2002. Role of the primate inferior colliculus in sound localization. Multisensory Interactions Subserving Orienting Behavior. Naples, FL April 14-16, 2002.
- Kelly KA, Werner-Reiss U, Underhill AM, and **Groh JM.** 2002. Eye position affects a wide range of auditory cortical neurons in primates. *Soc Neurosci Abstr*: 845.1.
- Mullette-Gillman OA, Cohen YE, and **Groh JM.** 2002. Assessing the spatial alignment of auditory and visual responses in the inferior parietal sulcus. *Soc Neurosci Abstr.*:57.19.

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- Metzger RR and **Groh JM**. 2002. Linking primate inferior colliculus neural activity to sound localization performance. *Soc Neurosci Abstr.*, 845.2.
- Kelly, KA, Werner-Reiss, U, Underhill, AM and **Groh, JM**. 2003. Eye position signals change shape along the primate auditory pathway. *Soc Neurosci Abstr*,
- Metzger, RR, Mulette-Gillman, OA, Underhill, AM, Cohen, YE and **Groh, JM**. 2003. Effect of initial eye position on saccades to auditory targets in monkeys. *Soc Neurosci Abstr*,
- Mulette-Gillman, OA, Cohen, YE and **Groh, JM**. 2003. Similar eye position influences on auditory and visual responses in the lateral intraparietal area, LIP, of primates. *Soc Neurosci Abstr*,
- Werner-Reiss, U, Kelly, KA, Underhill, AM and **Groh, JM**. 2003. Long inter-stimulus intervals affect responses in primate auditory cortex. *Soc. Neurosci. Abstr.*
- Groh, JM**. 2003. Visual-auditory integration: the role of eye position information. *Advances in primate auditory neurophysiology* (Satellite symposium at the Society for Neuroscience Meeting). Joint work with Yale Cohen, Kristin Kelly, Ryan Metzger, O'Dhaniel Mulette-Gillman, Abigail Underhill, and Uri Werner-Reiss.
- Groh, JM**, Mulette-Gillman, O. A. and Cohen, Y.E. 2004. A comparison between the effects of eye position in primate auditory cortex and lateral intraparietal cortex (LIP). *International Multisensory Research Forum*, Barcelona, June 2-5.
- Mulette-Gillman, O.A.; Cohen, Y. E.; **Groh, JM**. 2004. Reference frame of auditory and visual signals in bimodal neurons of the primate lateral intraparietal area (LIP). *Soc. Neurosci. Abstr.*
- Metzger, RR, Kelly, KA, **Groh, JM**. 2004. Sensitivity to eye position in the inferior colliculus of the monkey during an auditory saccade task *Soc. Neurosci. Abstr.*
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