BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Xiaoqin Wang	Professor
eRA COMMONS USER NAME	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Sichuan University, Sichuan, China	B.S.	1984	Electrical Engineering
University of Michigan, Ann Arbor, MI	M.S.E.	1986	Electr. Engi.&Comp Sci.
Johns Hopkins University, Baltimore, MD	Ph.D.	1991	Biomedical Engineering
University of California, San Francisco, CA	Postdoctoral	1991-1995	Neurophysiology

A. Positions and Honors

Professional Experience

2005-present Professor, Departments of Biomedical Engineering, Neuroscience and Otolaryngology, Johns Hopkins University School of Medicine
2002-2005 Associate Professor, Departments of Biomedical Engineering and Neuroscience, Johns Hopkins University School of Medicine
1995-2002 Assistant Professor, Departments of Biomedical Engineering and Neuroscience, Johns Hopkins University School of Medicine

Honors

1999 Presidential Early Career Award for Scientists and Engineers (PECASE)
1992 The Kleberg Foundation Postdoctoral Fellowship.

Professional Services

Ad hoc members: *NIH AUD Study Section (2006), IFCN-8 Study Section (2001), NIDCD R21 &. R03 Study Sections (1998-2000), NSF Grant Review Panelists (2001, 2005)*

Reviewers: *Science, Nature, Nature Neuroscience, PNAS, Neuron, Journal of Neuroscience, Journal of Neurophysiology, Neuroscience, Cerebral Cortex, Brain Research, Journal of Comparative Neurology, Behavioral Neuroscience, Journal of Acoustic Society of America, Hearing Research, Journal of Association of Research in Otolaryngology, Neural Computation, Journal of Computational Neuroscience, Annals of Neurology, IEEE Transaction on Biomedical Engineering*.

Co-organizer of "Advances and Perspectives in Auditory Neurophysiology (APAN)", a satellite symposium at Society for Neuroscience Annual Meeting (2003-2006).

Organizer of Computational and Systems Neuroscience (CoSyNe) Auditory Workshop (2005)

Invited Presentations in National and International Meetings (past 5 years)

2007 Invited symposium speaker at 30th Association for Research in Otolaryngology Annual Meeting.
2006 Invited mini-symposium speaker at 36th Society for Neuroscience Annual Meeting.

2006 Invited speaker at “International Conference on Auditory Cortex: The Listening Brain”, U.K.
2005 Invited plenary speaker at Chinese Neuroscience Society Annual Meeting, Chongqing, China.
2005 Invited symposium speaker at 28th Association for Research in Otolaryngology Annual Meeting.
2004 Invited speaker at "30 Years of Communication Acoustics" symposium, Univ. of Bochum, Germany.
2004 Invited speaker at "Auditory Processing of Vocalizations" meeting, Cold Spring Harbor Laboratory, NY.
2004 Invited speaker at "Neural Control of Behavior" conference, University of California, Los Angeles, CA.
2003 Invited speaker at U.K. Physiological Society Symposium "Sensory Receptors and Sensory Coding", Cambridge University, U.K.
2003 Invited speaker at "Origins of Language Reconsidered" symposium, Kyoto, Japan.
2003 Invited speaker at International Conference on Auditory Cortex, Magdeburg, Germany.
2003 Invited speaker at Satellite Symposium to the 6th IBRO World Congress of Neuroscience, “Plasticity of the central auditory system and processing of complex acoustic signals”, Prague, Czech Republic.
2002 Invited speaker at European Science Foundation Exploratory Workshop “Neurobiology of Communication: Comparative and evolutionary perspectives on receptive language”, Cambridge, U.K.
2002 Invited speaker at “Symposium on Neuroscience and Biophysics”, organized by Chinese Neuroscience Society, Chengdu, China.
2002 Invited speaker at “Pitch: Neural Coding and Perception” conference, Hanse-Wissenschaftskolleg, Delmenhorst, Germany.
2002 Invited speaker at Gordon Research Conference, “Sensory Coding and the Natural Environment Probabilistic models of perception”.
2001 Invited speaker at I.U.P.S. Satellite Symposium on "Organization and Processing in the Cerebral Cortex for Sensation and Perception", Sydney, Australia.
2001 Invited symposium speaker at 141st Meeting of the Acoustical Society of America, Chicago.

B. Selected peer-reviewed publications (in chronological order)

PDF-files of the publications are available at: www.bme.jhu.edu/~xwang/papers.html

Wang, X. and M.B. Sachs. Coding of envelope modulation in the auditory nerve and anteroventral cochlear nucleus. *Phil. Trans. Royal Soc. Lond. [B]*, 336: 399-402 (1992).

Wang, X. and M.B. Sachs. Neural encoding of single-formant stimuli in the cat I. Response of auditory nerve fibers. *J. Neurophysiology*, 70: 1054-1075 (1993).

Wang, X. and M.B. Sachs. Neural encoding of single-formant stimuli in the cat II. Responses of anteroventral cochlear nucleus units. *J. Neurophysiology,* 71: 59-78 (1994).

Wang, X. and M.B. Sachs. Transformation of temporal discharge patterns in a VCN stellate cell model: Implications for physiological mechanisms. *J. Neurophysiology*, 73: 1600-1616 (1995).

Wang, X., M.M. Merzenich, R. Beitel and C.E. Schreiner. Representation of a species-specific vocalization in the primary auditory cortex of the common marmoset: temporal and spectral characteristics. *J. Neurophysiology* 74: 2685-2706 (1995).

Wang, X., M.M. Merzenich, K. Sameshima and W.M. Jenkins. Remodeling of Hand Representation in Adult Cortex Determined by Timing of Tactile Stimulation. *Nature*, 378: 71-75 (1995).

Tallal, P., S. L. Miller, G. Bedi, G. Byma, X. Wang, S. S. Nagarajan, C. Schreiner, W. M. Jenkins and M. M. Merzenich. Language Comprehension in Language-Learning Impaired Children Improved with Acoustically Modified Speech. *Science*. 271:81-84 (1996).

Spengler, F., T. P. L. Roberts, D. Poeppel, N. Byl, X. Wang, H. A. Rowley, M. M. Merzenich. Learning transfer and neuronal plasticity in humans trained in tactile discrimination. *Neuroscience Letters* 232: 151-154 (1997).

Nagarajan, S. S., Wang, X., Merzenich, M. M., Schreiner, C. E., Johnston, P., Jenkins, W., Miller, S. and Tallal, P. Speech modifications algorithms used for training language-learning impaired children. *IEEE Trans. Rehabilitation Engineering* 6: 257-268 (1998).

S.W. Cheung, S.S. Nagarajan, P.H. Bedenbaugh, C.E. Schreiner, X. Wang, A. Wong. Auditory Cortical Neuron Response Differences under Isoflurane versus Pentobarbital Anesthesia. *Hearing Res*. 156:115-127 (2001).

Lu, T. and X. Wang. Temporal discharge patterns evoked by rapid sequences of wide- and narrow-band clicks in the primary auditory cortex of cat. *J. Neurophysiology* 84:236-246 (2000).

Wang, X. On cortical coding of vocal communication sounds in primates. *Proc. Natl. Acad. Sci. USA* 97:11843-11849 (2000).

Lu, T., L. Liang and X. Wang. Neural representation of temporally asymmetric stimuli in the auditory cortex of awakw primates. *J. Neurophysiology,* 85: 2364-2380 (2001).

Wang, X. and S. C. Kadia. Differential representation of species-specific primate vocalizations in the auditory cortices of marmoset and cat. *J. Neurophysiology*, 86: 2616-2620 (2001).

Lu, T., L. Liang and X. Wang. Temporal and rate representations of time-varying signals in the auditory cortex of awake primates. *Nature Neuroscience*, 4:1131-1138, (2001).

Liang, L., T. Lu and X. Wang. Neural representations of sinusoidal amplitude and frequency modulations in the primary auditory cortex of awake primates. *J. Neurophysiology*, 87: 2237-2261 (2002).

Barbour, D. and X. Wang. Temporal coherence sensitivity in auditory cortex. *J. Neurophysiology*, 88: 2684-2699 (2002).

Kadia, S.C. and X. Wang. Spectral integration in the primary auditory cortex of awake primates: Neurons with single-peaked and multi-peaked tuning curves. *J. Neurophysiology*, 89: 1603-1622 (2003).

Eliades, S.J. and X. Wang. Sensory-motor interaction in the primate auditory cortex during self-initiated vocalizations. *J. Neurophysiology*, 89: 2194-2207 (2003).

Barbour, D. and X. Wang. Contrast tuning in auditory cortex. *Science*, 299: 1073-1075 (2003).

Wang, X. Lu T, and Liang L. Cortical Processing of Temporal Modulations. *Speech Communication*, 41: 107-121 (2003).

Barbour, D. and X. Wang. Auditory cortical responses elicited in awake primates by random spectrum stimuli. *J. Neuroscience* 23: 7194-7206 (2003).

Beitel, R. E., C. E. Schreiner, S. W. Cheung, X. Wang, and M. M. Merzenich. Reward-dependent plasticity in the primary auditory cortex of adult monkeys trained to discriminate temporally modulated signals. *Proc. Natl. Acad. Sci. USA* 100:11070-11075 (2003).

Lu, T. and X. Wang. Information content of auditory cortical responses to time-varying acoustic stimuli. *J. Neurophysiology* 91:301-313 (2004).

Wang, X. The unexpected consequences of a noisy environment. *Trends Neurosci*. 27: 364-366 (2004).

Bartlett, E. L. and X. Wang. Long-lasting modulation by stimulus context in primate auditory cortex. *J. Neurophysiology* 94:83-104 (2005).

Eliades, S.J. and X. Wang. Dynamics of auditory-vocal interaction in monkey auditory cortex. *Cerebral Cortex* 15:1510-1523 (2005)

Wang, X., T. Lu, R.K. Snider and L. Liang. Sustained firing in auditory cortex evoked by preferred stimuli. *Nature* 435: 341-346 (2005).

Mohseni, P., K. Najafi, S. J. Eliades and X. Wang, Wireless multichannel biopotential recording using an integrated FM telemetry circuit. *IEEE Trans. Neural Systems and Rehabilitation Engineering* 13: 263-271 (2005).

Bendor, D. A. and X. Wang. The neuronal representation of pitch in primate auditory cortex. *Nature* 436:1161-1165 (2005).

Miller, C. T. and X. Wang. Sensory-motor interactions modulate a primate vocal behavior: antiphonal calling in common marmosets. *J. Comp Neurobiol. A.* 192:27-38 (2006).

DiMattina, C. and X. Wang. Virtual vocalization stimuli for investigating neural representations of species-specific vocalizations. *J. Neurophysiology* 95: 1244-1262 (2006).

Pistorio, A.L., S.H. Hendry, X. Wang. A modified technique for high-resolution staining of myelin. *J. Neurosci. Methods* 153: 135-146 (2006)

Pistorio, A.L., B. Vintch, and X. Wang**,** Acoustical analysis of vocal development in a New World primate, the common marmoset (*Callithrix jacchus*). *J. Acoust. Soc. Am.* 120:1655-1670 (2006)

Bendor, D. A. and X. Wang. Cortical representations of pitch in monkeys and humans. *Curr Opin Neurobiol*. 16: 391-399 (2006)

Bartlett E.L. and X. Wang. Neural representations of temporally-modulated signals in the auditory thalamus of awake primates. *J Neurophysiol*. 97:1005-1017 (2007)

C. Research Support. List selected ongoing or completed (during the last three years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application. Briefly indicate the overall goals of the projects and responsibilities of principal investigator identified above.

R01-DC03180 Xiaoqin Wang (P.I.) 1/1/2005-12/31/2009
NIH/NIDCD
Neural Basis of Communication Sound Perception

The overall goal of this study is to understand neural mechanisms for representing species-specific vocalizations in auditory cortex of awake marmosets and the fundamental neural mechanisms that subserve cortical representations of these biologically important sounds.
Role: P.I.

R01-DC005808 Xiaoqin Wang (P.I.) 12/01/2006-11/30/2011
NIH/NIDCD
Auditory-Vocal Interaction Mechanisms in Primates

The overall goal of this study is to reveal behavioral and physiological mechanisms underlying auditory-vocal interactions in non-human primates using the common marmoset as the model. The specific aims of this project are to study how the vocal production system modulates neural processing in auditory cortex, and whether marmoset vocalizations exhibit experience-based plasticity.
Role: P.I.

R01- DC00115 Eric Young (P.I.) 4/1/2005-3/31/2010
NIH/NIDCD
Information Processing In the Primate Inferior Colliculus

The objective of this study is to understand information processing mechanisms in inferior colliculus of awake marmoset.
Role: co-P.I.