

**Tucker-Davis Symposium on Advances and Perspectives
in Auditory Neurophysiology
(APAN VIII)**

Friday, November 12, 2010

San Diego Marriott Hotel and Marina, Room: Marina Ballroom Salons F & G
333 West Harbor Drive, San Diego, CA 92101
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Scientific Program

- 8:30-9:00 Registration and Poster set-up (all posters)
- 9:00-9:05 Introduction (Andrew King)
- 9:05-10:00 **Keynote lecture:** Norman Weinberger (University of California at Irvine)
Auditory Cortex: Past, Present and Future
- 10:00-11:30 **Poster Session & Coffee Break**
- Slide Session** (Chair: Liz Romanski)
- 11:30-11:45 **Wireless multi-channel single unit recordings from the pre-motor cortex of freely roaming and vocalizing marmosets**
SABYASACHI ROY & XIAOQIN WANG
Dept. of Biomedical Engineering, Johns Hopkins University, Baltimore, MD
- 11:45-12:00 **Cortical mechanisms of auditory feedback effecting human vocal motor control**
EDWARD CHANG, SRIKANTAN NAGARAJAN & JOHN HOUDE
Departments of Neurological Surgery and Physiology, Keck Center for Integrative Neuroscience, University of California, San Francisco
- 12:00-12:15 **Responses of amygdalar neurons to social vocalizations in big brown bats**
*M. A. GADZIOLA^{1,2} & J. J. WENSTRUP^{1,2}
¹Anat. & Neurobio., NE Ohio Universities Col. of Med., Rootstown, OH; ²School of Biomed. Sci., Kent State Univ., Kent, OH
- 12:15-12:30 **Neural encoding of natural sounds in macaque auditory cortex probed with micro-electrocorticographic arrays**
M. FUKUSHIMA, R.C. SAUNDERS, D.A. LEOPOLD, M. MISHKIN & B.B. AVERBECK
Lab. Neuropsychology, NIMH/NIH, Bethesda, MD
- 12:30-12:45 **Cortical regions sensitive to sound movement in the monkey brain**
C. POIRIER, S. BAUMANN, C. I. PETKOV & T. D. GRIFFITHS
Newcastle Univ., Newcastle upon Tyne, United Kingdom
- 12:45-1:45 **Lunch** (*on your own*)
- Workshop: Quantitative Approaches to Studying Auditory Function**
(Chairs: Robert Liu & Tim Griffiths)
- 1:45-2:10 Israel Nelken, Alexander Silberman Institute of Life Sciences, Jerusalem
Using Information-theoretic Methods to Study Auditory Processing
- 2:10-2:35 Jennifer Linden, University College London

Modelling Responses to Complex Sounds

2:35-3:00 Cyrus Billimoria, Boston University
Using Spike Timing-Based Stimulus Filtering to Characterize Auditory Neurons

3:00-3:15 **Break**

3:15-3:40 Laurel Carney, Rochester University
Computational studies of “Molecular” Behavior and Physiology: Using Reproducible Noise Maskers to Reveal Neural Mechanisms

3:40-4:05 Jonathan Simon, University of Maryland
Auditory Neuroscience with Magnetoencephalography: New Quantitative Approaches

4:05-4:30 Ingrid Johnsrude, Queen’s University, Kingston, Ontario
Optimizing the Sensitivity of fMRI data in the Study of Language Processing

4:30-6:00 **Poster Session** (continued) plus **Cash Bar**

1. Integration of eeg-fmri in an auditory oddball paradigm using joint-independent component analysis

*J. MANGALATHU ARUMANA^{1,2}, E. LIEBENTHAL^{1,3} & S. BEARDSLEY^{2,4}

¹Dept. of Neurol., Med. Col. of Wisconsin, Milwaukee, WI; ²Dept. of Biomed. Engin., Marquette Univ., Milwaukee, WI; ³Natl. Res. Council Inst. for Biodiagnostics, Winnipeg, MB, Canada; ⁴Dept. of Biomed. Engin., Boston Univ., Boston, MA

2. Brain bases for auditory figure-ground segregation

SUNDEEP TEKI^{1,2}, MARIA CHAIT³, SUKHBINDER KUMAR^{1,2}, KATHARINA VON KRIEGSTEIN^{1,4}, & TIMOTHY D. GRIFFITHS^{1,2}

¹ Wellcome Trust Centre for Neuroimaging, University College London, London WC1N 3BG, United Kingdom; ² Newcastle Auditory Group, Medical School, Newcastle University, Newcastle-upon-Tyne NE2 4HH, United Kingdom; ³ UCL Ear Institute, University College London, London WC1X 8EE, United Kingdom; ⁴ Max Planck Institute for Human Cognitive and Brain Sciences, 04103 Leipzig, Germany.

3. The effect of temporal-lobe lesions on the perception of spectrotemporal modulation

*M. GRUBE¹, T.D. GRIFFITHS¹, S.K. SHIVAPOUR¹ & S. ANDERSON²

¹Med. Sch., Newcastle Univ., Newcastle-upon-Tyne, United Kingdom; ² Department of Neurology, University of Iowa, Iowa, IA, USA

4. Detection of amplitude modulation as a function of modulation frequency and stimulus duration: Comparisons between macaques and humans.

K. N. O’CONNOR^{1,2,3}, J. S. JOHNSON^{2,1}, M. NIWA^{1,2}, N. C. NORIEGA^{1,2}, E. A. MARSHALL^{1,2} & M. L. SUTTER^{1,2,3}

²Ctr. for Neurosci., ³Neurobiology, Physiol. and Behavior, ¹UC Davis, CA

5. Effects of noise on the behavioral detection of tones by nonhuman primates

MARGIT DYLLA, CHRISTOPHER RICE & RAMNARAYAN RAMACHANDRAN
Dept. Neurobiol & Anat, Wake Forest University Health Sciences, Winston-Salem, NC

6. Developmental changes in CBA/CaJ mouse vocalizations: an analysis of song structure

JASMINE GRIMSLEY, JESSICA MONAGHAN & JEFFREY WENSTRUP
Anatomy and Neurobiology, NEOUCOM, Ohio.

7. **Wireless multi-channel single unit recordings from the pre-motor cortex of freely roaming and vocalizing marmosets**
SABYASACHI ROY & XIAOQIN WANG
Dept. of Biomedical Engineering, Johns Hopkins University, Baltimore, MD, USA.
8. **Cortical mechanisms of auditory feedback effecting human vocal motor control**
EDWARD CHANG, SRIKANTAN NAGARAJAN & JOHN HOUDE
Departments of Neurological Surgery and Physiology, Keck Center for Integrative Neuroscience, University of California, San Francisco
9. **Responses of amygdalar neurons to social vocalizations in big brown bats**
*M. A. GADZIOLA^{1,2} & J. J. WENSTRUP^{1,2}
¹Anat. & Neurobio., NE Ohio Universities Col. of Med., Rootstown, OH; ²School of Biomed. Sci., Kent State Univ., Kent, OH
10. **Visual influences on voice-sensitive neurons**
C. PERRODIN¹, C. KAYSER¹, N.K. LOGOTHETIS^{1,2} & C.I. PETKOV^{1,3}
¹Dept. Physiology of Cognitive Processes, Max-Planck Institute for Biological Cybernetics, Tübingen, Germany, ²Imaging Science and Biomedical Engineering, University of Manchester, U.K., ³Institute of Neuroscience, Newcastle University, Newcastle upon Tyne, U.K.
11. **A brain region consisting of neurons with moderate sensitivity for voices**
C. PERRODIN¹, C. KAYSER¹, N.K. LOGOTHETIS^{1,3} & C.I. PETKOV^{1,2}
¹Dept. Physiology of Cognitive Processes, Max-Planck Institute for Biological Cybernetics, Tübingen, Germany, ²Institute of Neuroscience, Newcastle University, Newcastle upon Tyne, U.K., ³Imaging Science and Biomedical Engineering, University of Manchester, Manchester, U.K.
12. **Factors affecting neuronal activity in the primate ventral frontal lobe during discrimination tasks of emotional faces and vocalizations**
M. M. DIEHL, M. D. DILTZ & L. M. ROMANSKI.
University of Rochester Medical Center, Rochester, NY
13. **Effects of face and motion stimuli on auditory processing in the ventrolateral prefrontal cortex**
JAEWON HWANG¹ & LIZABETH M. ROMANSKI²
¹Brain & Cognitive Sciences, University Rochester, Rochester, NY; ²Department of Neurobiology & Anatomy, University of Rochester, NY
14. **Behavioral and neural integration of faces and voices in macaque monkeys**
CHANDRAMOULI CHANDRASEKARAN^{1,2}, LUIS LEMUS^{1,2}, MATTHIAS GONDAN³ & ASIF A GHAZANFAR^{1,2,4}
¹Neuroscience Institute and Departments of ²Psychology and ⁴Ecology & Evolutionary Biology Princeton University, Princeton, NJ 08540, USA
³Department of Psychology, University of Regensburg, D-93050, Regensburg, Germany
15. **Band-specific modulations of neural oscillations during habituation to vocalizations in the primate ventrolateral prefrontal cortex**
JOJI TSUNADA¹, ALLISON E. BAKER², KATE L. CHRISTISON-LAGAY¹ & YALE E. COHEN¹
¹Department of Otorhinolaryngology: Head and Neck Surgery, University of Pennsylvania School of Medicine; ²Department of Neurobiology, Harvard University
16. **Coding of vocalization variance in the auditory-cortex lateral belt**
J. LEE, K. CHRISTISON-LAGAY & Y.E. COHEN
Univ. of Pennsylvania Sch. of Med., Philadelphia, PA

- 17. Acoustic-phonetic processing and temporal complexity in the auditory ventral stream: a meta-analysis**
 IAIN DEWITT & JOSEF P. RAUSCHECKER
 Georgetown University Medical Center
- 18. Discriminating communication calls through selective versus differential responses in auditory cortex**
 KATHRYN N. SHEPARD¹, FRANK LIN^{1,2} & ROBERT C. LIU¹
¹ Emory University, Atlanta, GA ² Georgia Institute of Technology, Atlanta, GA
- 19. Effect of presentation rate on speech discrimination in the adult rat**
 ROSEN, T.M., SLOAN, A. M., ENGINEER, C., RENNAKER, R., ABDULALI, Z.M., CHEUNG, R.J. & KILGARD, M.P.
 The University of Texas at Dallas, 800 West Campbell Rd, Richardson, TX 75080-3021
- 20. Responses to communication sounds in the guinea pig auditory cortex during partial removal of intracortical inhibitions**
 EDELINE JEAN-MARC, HUETZ CHLOÉ, GOURÉVITCH BORIS & GAUCHER QUENTIN
 CNRS, UMR CNRS 8195, Bat 446, Université Paris-Sud, 91405 Orsay cédex.
- 21. Multiple, simultaneous recordings in the auditory cortex of the awake, behaving primate**
 ELLIOT SMITH & BRADLEY GREGER
 University of Utah
- 22. Dual pathways for sound discrimination in the rat auditory cortex**
 MASAHARU KUDOH¹, GO OGAWA¹ & YOKO NISHIDA^{1,2}
¹Dept Physiol, Teikyo Univ Sch Med, ²Teikyo Heisei Univ, Tokyo, Japan
- 23. Tone-elicited response patterns recorded directly from human auditory cortex on the posterior lateral superior temporal gyrus**
 M. STEINSCHNEIDER^{*1}, K. NOURSKI², H. KAWASAKI², H. OYA² & M. HOWARD²
 A Einstein Coll. Med.¹, Bronx, NY and Univ. of Iowa Coll. Med.², Iowa City, IA.
- 24. Temporal sensitivity of cochleotopic fields in human auditory cortex**
 LEAVER AM & RAUSCHECKER JP
 Georgetown University Medical Center
- 25. Neural encoding of natural sounds in macaque auditory cortex probed with micro-electrocorticographic arrays**
 M. FUKUSHIMA, R.C. SAUNDERS, D.A. LEOPOLD, M. MISHKIN & B.B. AVERBECK;
 Lab. Neuropsychology, NIMH/NIH, Bethesda, MD;
- 26. The caudomedial area of rhesus monkey auditory cortex revisited**
 KUŚMIEREK P & RAUSCHECKER JP
 Georgetown University Medical Center, Washington, DC, USA
- 27. Mapping the macaque auditory system using magnetic resonance imaging and complex sounds**
 *M. ORTIZ¹, D. A. ARTCHAKOV¹, I. DEWITT¹, P. KUSMIEREK¹, J. VANMETER² & J. P. RAUSCHECKER¹
¹Dept. of Physiol. and Biophysics, Georgetown Univ., WASHINGTON, DC; ²Ctr. for Functional and Mol. Imaging, Med. Ctr., Georgetown Uni, Washington, DC
- 28. Anatomical connections of the rostral supratemporal plane in rhesus monkeys**
 SCOTT, B.H., VINAL, H., MISHKIN, M. & SAUNDERS, R.C.

Laboratory of Neuropsychology, NIMH, NIH, Bethesda, MD 20892

29. Combined lesions of rostral superior temporal gyrus and rhinal cortex nearly abolish short-term memory in monkeys

J. B. FRITZ¹, M. MISHKIN² & R. C. SAUNDERS²

¹Neural Systems Lab, Inst. for Systems Res., Univ. of Maryland, College Park, MD; ²Lab of Neuropsychology, NIMH, Bethesda, MD

30. Prefrontal neuronal population activity during auditory recognition memory demand in non-human primates

BETHANY PLAKKE¹, CHI-WING NG¹, AND RYAN OPHEIM¹ & AMY POREMBA^{1,2}

¹Department of Psychology, Division of Behavioral and Cognitive Neuroscience, University of Iowa, Iowa City, IA 52242, ²Neuroscience Program, University of Iowa, Iowa City, IA 52242.

31. Local field potential activity in monkey dorsal temporal pole during auditory delayed matching-to-sample

JAMES BIGELOW¹, CHI-WING NG¹ & AMY POREMBA^{1,2}

¹ Department of Psychology, Division of Behavioral and Cognitive Neuroscience, University of Iowa, Iowa City, IA 52242; ² Neuroscience Program, University of Iowa, Iowa City, IA 52242.

32. Neuronal population encoding of auditory recognition memory within the primate temporal polar cortex

CHI-WING NG¹, BETHANY PLAKKE¹ & AMY POREMBA^{1,2}

¹Department of Psychology, Division of Behavioral and Cognitive Neuroscience, University of Iowa, Iowa City, IA 52242, ²Neuroscience Program, University of Iowa, Iowa City, IA 52242.

33. Task-related neuronal activity in primate primary auditory cortex during auditory delayed matching-to-sample task performance

RYAN OPHEIM¹ & AMY POREMBA^{1,2}

¹Department of Psychology, Division of Behavioral and Cognitive Neuroscience, University of Iowa, Iowa City, IA 52242, ²Neuroscience Program, University of Iowa, Iowa City, IA 52242.

34. Feature representation in the auditory and prefrontal cortices

A.S. LIU¹, J. MCDANIEL², T. PATEL² & Y. E. COHEN³;

¹Bioengineering, ²Dept. of Bioengineering, ³Dept. of Otorhinolaryngology, Univ. of Pennsylvania, Philadelphia, PA

35. Repetition suppression for a pitch stimulus

SUKHBINDER KUMAR, COLLINE POIRIER, SIMON BAUMANN & TD GRIFFITHS

Newcastle Auditory Group, Medical School, Newcastle University, Newcastle-upon-Tyne NE2 4HH, United Kingdom

36. The role of interactions between excitatory and inhibitory receptive field components in encoding harmonic structures in auditory cortex of awake marmosets

LEI FENG & XIAOQIN WANG

Laboratory of Auditory Neurophysiology, Department of Biomedical Engineering, Johns Hopkins University, Baltimore, Maryland

37. Anterior auditory core areas in macaques are specifically responsive to regular interval noise (RIN) at rates associated with human pitch perception

BAUMANN S, KUMAR S, SUN L, THIELE A & GRIFFITHS TD

Newcastle Auditory Group, Medical School, Newcastle University, Newcastle-upon-Tyne NE2 4HH, United Kingdom

38. Simultaneous neural and behavioural assessment of pitch discrimination in freely moving ferrets

*J. K. BIZLEY, K. M. WALKER, F. R. NODAL, A. J. KING & J. W. SCHNUPP
Department of Physiology, Anatomy and Genetics, University of Oxford, United Kingdom

39. Nonlinear temporal processing of natural sounds in auditory cortex

S.V. DAVID & S.A. SHAMMA
Institute for Systems Research, University of Maryland, College Park

40. Fast-spiking and regular-spiking neurons in A1 of the awake macaque: Laminar variability and response latencies

C.R. CAMALIER^{1,2}, LISA A DE LA MOTHE³, ANGELA C. VOYLES¹, MICHAEL L. GARCIA¹, SHU-EN LIM¹ & TROY A. HACKETT^{1,2,3}
¹Ctr. Integrative and Cognitive Neuroscience, Dept. of Psychology, ²Vanderbilt Brain Institute, ³Dept. of Speech and Hearing Science; Vanderbilt University, Nashville TN

41. Corticofugal influence on temporal modulation processing in auditory thalamus of awake marmosets

MARCUS JESCHKE^{1,2}, FRANK W. OHL^{2,3} & XIAOQIN WANG¹
¹Laboratory of Auditory Neurophysiology, Department of Biomedical Engineering, Johns Hopkins University, Baltimore, Maryland; ²BioFuture Res. Group, Leibniz Inst. for Neurobiology, Magdeburg, Germany; ³Inst. for Biol., Otto-von-Guericke Univ. Magdeburg, Magdeburg, Germany

42. Cortical regions sensitive to sound movement in the monkey brain

C. POIRIER, S. BAUMANN, C. I. PETKOV & T. D. GRIFFITHS
Newcastle Univ., Newcastle upon Tyne, United Kingdom

43. Inhibition modulates spatial response properties of neurons in the primary auditory cortex of awake marmoset

YI ZHOU & XIAOQIN WANG
Laboratory of Auditory Neurophysiology, Dept of Biomedical Engineering, Johns Hopkins University, Baltimore, MD

44. Neural responses to simulated echoes in the auditory cortex of the ferret

SANDRA TOLNAI¹, NEIL C RABINOWITZ¹, BEN D WILLMORE¹, RUTH Y LITOVSKY² & ANDREW J KING¹
¹Department of Physiology, Anatomy and Genetics, University of Oxford, United Kingdom; ²University of Wisconsin, Madison

45. Time course of adaptation to stimulus statistics in the perception and neural representation of auditory space

JOHANNES C DAHMEN, PETER KEATING & ANDREW J KING
Department of Physiology, Anatomy and Genetics, University of Oxford, United Kingdom

46. Contrast gain control in auditory cortex

BEN D. WILLMORE, NEIL C. RABINOWITZ, JAN. W. H. SCHNUPP & ANDREW J. KING;
Department of Physiology, Anatomy and Genetics, University of Oxford, United Kingdom

47. Adaptation to global temporal statistical structure of sounds in the mammalian auditory cortex

MARIA N. GEFFEN
University of Pennsylvania School of Medicine

48. The interplay of excitation and inhibition in the inferior colliculus and its relationship to adaptation for naturalistic stimuli

NADJA SCHINKEL-BIELEFELD¹, MAI EL-ZONKOLY¹, NICHOLAS LESICA², BENEDIKT GROTHE³ & DANIEL A. BUTTS¹

¹Department of Biology, University of Maryland, College Park, MD, USA ; ²Ear Institute, University College London, London, United Kingdom; ³Division of Neurobiology, Department Biology II, Ludwig Maximilians University Munich, Munich, Germany

49. Phase-locked neural oscillation predicts human auditory brainstem responses to musical intervals

E. W. LARGE & F. V. ALMONTE

Ctr. for Complex Systems & Brain Sci., Florida Atlantic Univ., Boca Raton, FL

50. Selective responses to salient acoustic stimuli in nucleus basalis of the behaving ferret

NICHOLAS D. LEACH¹, VICTORIA M. BAJO¹, ANDREW J. KING¹, STEPHEN V. DAVID², SHIHAB A. SHAMMA², MICHAEL BROSCHE³ & JONATHAN B. FRITZ²

¹ Department of Physiology, Anatomy and Genetics, University of Oxford, Oxford, United Kingdom, ² Neural Systems Lab, Institute for Systems Research, University of Maryland, College Park, MD, ³ Leibniz Institute for Neurobiology, Magdeburg, Germany.

51. Control of auditory cortical plasticity by the prefrontal cortex in the mouse

DANIEL E. WINKOWSKI, SHARBA BANDYOPADHYAY, SHIHAB A. SHAMMA & PATRICK O. KANOLD

Institute for Systems Research, University of Maryland, College Park, MD

52. Strength of extinction memory is accounted for by loss of cortical representational area

K.M. BIESZCZAD* & N.M. WEINBERGER

Center for the Neurobiology of Learning and Memory and Dept. of Neurobiology and Behavior, University of California, Irvine, CA.

53. Enhancement of gamma band activation parallels behavioral and physiological correlates across training sessions

D.B. HEADLEY & N. M. WEINBERGER

Dept. of Neurobiology and Behavior, University of California, Irvine, CA.

54. Basolateral amygdala induced cortical memory traces are discriminative

CHAVEZ, C.M., MCGAUGH, J.L. & WEINBERGER, N.M.

Department of Neurobiology and Behavior, Center for the Neurobiology of Learning and Memory, UCI, Irvine, CA

55. Hierarchical processing of vocalization signals in the auditory forebrain

JAMES JEANNE, TATYANA SHARPEE & TIMOTHY GENTNER

University of California, San Diego /Salk Institute

56. Neural correlates to auditory vocal recognition and learning in behaving European starlings

DANIEL KNUDSEN¹ & TIMOTHY GENTNER²

¹Neurosciences Graduate Program, University of California, San Diego

²Department of Psychology, University of California, San Diego

57. Learning-dependent and independent effects of noise on the representation of vocal communication signals across multiple regions of the auditory forebrain

EMILY CAPORELLO¹ & TIMOTHY Q. GENTNER^{1,2}

¹Neuroscience Graduate Program, ²Department of Psychology

University of California, San Diego

58. Manipulating physiological and environmental conditions to restore the sensory sensitive phase for song learning

NOOPUR AMIN & FREDERIC E. THEUNISSEN

U.C. Berkeley

- 59. Age related changes in spectro-temporal receptive fields in the guinea pig auditory cortex**
B. GOURÉVITCH & J.-M. EDELINÉ;
CNPS UMR CNRS 8195, Univ. Paris-Sud, Orsay Cedex, France
- 60. Auditory processing in normal versus aged animals assessed at the population level under challenging listening conditions**
ARAVINDAKSHAN PARTHASARATHY¹, PAUL CUNNINGHAM² & EDWARD BARTLETT^{1,2}
¹Department of Biological sciences, Purdue University; ²Weldon School of biomedical engineering, Purdue University
- 61. Cortical responses to cochlear implant stimulation in the awake marmoset**
*L. A. JOHNSON¹, C. C. DELLA SANTINA^{1,2} & X. WANG¹
¹Dept Biomed Eng, Johns Hopkins Univ., Baltimore, MD; ²Dept of Otolaryngology-Head & Neck Surgery, Johns Hopkins Univ., Baltimore, MD
- 62. Effects of microstimulation in the inferior colliculus on auditory perception in non-human primates: implications for the auditory midbrain implant**
DEBBIE ROSS & JENNIFER M. GROH
Duke University