

C. Daniel Meliza, Ph.D.

Department of Organismal Biology and Anatomy
The University of Chicago
1027 East 57th Street
Chicago, IL 60637 USA

work: +1-773-702-8090
cell: +1-773-257-3896
dmeliza@uchicago.edu

RESEARCH INTERESTS

I am interested in social communication and the underlying neuronal mechanisms of pattern learning and recognition. I study how vocalizations are used by social songbirds, how social experience affects auditory perception, and how circuits in the auditory forebrain represent the features of socially important signals.

CURRENT & PREVIOUS POSITIONS

- 2011– Research Associate (Assistant Professor), University of Chicago
- 2010–2011 Postdoctoral Scholar, University of Chicago.
- 2007–2010 NIH NRSA Postdoctoral Fellow, University of Chicago.
- 2006–2007 Postdoctoral Scholar, University of Chicago.

EDUCATION

- 2005 PhD in Molecular and Cell Biology, University of California, Berkeley

Dissertation: *Spike timing dependent plasticity of receptive fields in primary visual cortex.*
Committee: Yang Dan (advisor), Mu-Ming Poo, Ehud Isacoff, Frédéric Theunissen
- 1999 BA in Biochemistry, Lewis & Clark College, *summa cum laude*

TEACHING EXPERIENCE

- 2009–2010 Lecturer, *Anatomy and physiology of the hearing and speech systems*, Rush University
- 2009 Guest lecturer, “Hormones and behavior”, *Neuroethology*, University of Chicago
- 2003 Graduate student instructor, *Introduction to Neurobiology*, UC Berkeley
- 2002 Graduate student instructor & guest lecturer (“Early visual pathway”), *Mammalian Neuroanatomy*, UC Berkeley

PUBLICATIONS & TALKS

JOURNAL ARTICLES

- 2011 **C. D. Meliza**. Effects of auditory recognition learning on the perception of vocal features in European starlings (*Sturnus vulgaris*). *Journal of the Acoustical Society of America*, in press.

- B. A. Toth, M. Kostuk, **C. D. Meliza**, D. Margoliash, H. D. I. Abarbanel. Dynamical estimation of neuron and network properties I: Variational methods. *Biological Cybernetics*, in press.
- 2010 **C. D. Meliza**, Z. Chi, D. Margoliash. Representations of conspecific song by starling secondary forebrain auditory neurons: towards a hierarchical framework. *Journal of Neurophysiology* 103(3):1195–208.
- 2006 **C. D. Meliza** and Y. Dan. Receptive-field modification in rat visual cortex induced by paired visual stimulation and single cell spiking. *Neuron* 49(2):183–9.
- 1999 J. R. Abney, **C. D. Meliza**, B. Cutler, M. Kingma, J. E. Lochner, B. A. Scalettar. Real-time imaging of the dynamics of secretory granules in growth cones. *Biophysical Journal* 77(5):2887–95.
- 1998 J. E. Lochner, M. Kingma, S. Kuhn, **C. D. Meliza**, B. Cutler, B. A. Scalettar. Real-time imaging of the axonal transport of granules containing a tissue plasminogen activator/green fluorescent protein hybrid. *Molecular Biology of the Cell* 9(9):2463–76.

UNPUBLISHED MANUSCRIPTS

C. D. Meliza, D. Margoliash. Cortical patterns of auditory processing in the avian forebrain. Submitted (Neuron).

P. Adret, **C. D. Meliza**, D. Margoliash. Early song exposure biases higher-order auditory neurons in pre-singing zebra finches. Submitted (Journal of Neurophysiology).

D. G. Zaraza, **C. D. Meliza**, D. Margoliash. Interactions between representations of old and new memories during learning. In preparation.

M. Kostuk, B. A. Toth, **C. D. Meliza**, D. Margoliash, H. D. I. Abarbanel. Dynamical estimation of neuron and network properties II: Path integral Monte Carlo methods. In preparation.

C. D. Meliza, S. C. Keen, D. R. Rubenstein. Pitch detection in songbirds: a novel method for assessing vocal similarity. In preparation.

S. C. Keen, **C. D. Meliza**, D. R. Rubenstein. Recruitment of relatives after dispersal in a cooperatively breeding songbird. In preparation.

SCIENTIFIC PRESENTATIONS

- 2011 S. C. Keen, D. R. Rubenstein, C. D. Meliza. Identifying pathways to cooperation: flight calls and kin selection in superb starlings. American Ornithologists' Union.
- 2010 C. D. Meliza, D. Margoliash. The emergence of selectivity for elements of conspecific song in the starling auditory pathway. Soc Neurosci Abstr **36**:207.12. [Poster]
- H. D. Abarbanel, M. Kostuk, R. Farsian, D. Margoliash, C. D. Meliza. The use of dynamical electrophysiology to probe nucleus HVC. Soc Neurosci Abstr **36**:108.4. [Poster]
- 2009 C. D. Meliza, D. Margoliash. Receptive fields for elements of conspecific song in the starling auditory forebrain. Advances and Perspectives in Auditory Neurophysiology VII. [Poster]
- 2008 C. D. Meliza, Z. Chi, D. Margoliash. Mechanisms of complex feature selectivity in the auditory forebrain. Computational and Systems Neuroscience annual meeting. [Presentation]
- 2007

- C. D. Meliza, Z. Chi, D. Margoliash. Auditory features of song motifs learned during a perceptual learning task are sparsely coded. *Soc Neurosci Abstr* **33**:505.12 [Poster]
- C. D. Meliza, Z. Chi, D. Margoliash. Avian forebrain neurons code for disjoint auditory features of learned songs. *International Congress of Neuroethology*. [Poster]
- C. D. Meliza, Z. Chi, D. Margoliash. Auditory features of song motifs learned during a perceptual discrimination task are sparsely coded. *GRC Neural Circuits and Plasticity*. [Poster]
- 2004 C. D. Meliza, N. Caporale, Y. Dan. Spike timing-dependent plasticity of visually evoked synaptic responses. *Society for Neuroscience annual meeting*. [Poster]
- 2002 C. D. Meliza, R. C. Froemke, Y. Dan. The role of actin dynamics in spike timing dependent plasticity in the visual cortex. *Society for Neuroscience annual meeting*. [Poster]
- 1999 C. D. Meliza, B. A. Scalettar, J. E. Lochner. Analysis of the sorting signals required for regulated secretory trafficking of tissue plasminogen activator using green fluorescent protein hybrids. *American Society of Biochemistry and Molecular Biology annual meeting*. [Poster]

INVITED SEMINARS

- 2010 “Perceptual Learning and Individual Recognition in European Starlings.” 23 March 2010, Columbia University, Neurolunch Seminar Series.
- “Neuronal Representations and Perceptual Learning of Conspecific Songs by European Starlings.” 21 January 2010, University of Wyoming, Neuroscience and Physiology Seminar Series.
- 2007 “How Songbirds Tell Themselves Apart: Pattern Recognition and Perceptual Learning.” 13 February 2007, Lewis & Clark College, Departments of Biochemistry and Molecular Biology.

GRANTS & AWARDS

- 2007–2010 NIH-NIDCD National Research Service Award F32DC008752. *Receptive field correlates of starling song recognition behavior.*
- 2000–2003 NSF Graduate Research Fellow
- 1997–1999 Barry M. Goldwater Scholarship and Excellence in Education Scholar

SERVICE

PEER REVIEW

National Science Foundation, Neural Systems Cluster
Bioacoustics

OUTREACH

- 2011 Workshop leader, “Learning and the Brain”, University of Chicago Laboratory Schools.

OPEN-SOURCE SOFTWARE

- 2011 **chirp**: pitch detection in bioacoustic signals
- 2010 **znote**: extracting vocal components of bioacoustic signals (with Zhiyi Chi)
- 2009 **libtfrspec**: time-frequency reassignment spectrogram library
- 2007 **decide**: operant apparatus control and auditory stimulus presentation
- 2005 **metaphys**: data acquisition and visual stimulus presentation system for intracellular physiology

REFERENCES