

## Kevin Ambrose Stebbings

[stebbin2@illinois.edu](mailto:stebbin2@illinois.edu)

2514 Beckman Institute, M/C 251; 405 North Mathews Avenue, Urbana, Illinois 61801-2325.

Tel (cell): 630-418-3688

### Education

2011 B.S. Biology Magna Cum Laude, Duquesne University, Pittsburgh, PA  
2011+ Neuroscience Program (Ph.D.), University of Illinois, Urbana, IL

### Publications

- Sadowski, R. N., **K. A. Stebbings**, B. J. Slater, S. B. Bandara, D. A. Llano, and S. L. Schantz. "Developmental Exposure to Pcb's Alters the Activation of the Auditory Cortex in Response to GABA<sub>A</sub> Antagonism." **Neurotoxicology (Sep 2016)**
- Stebbing, K. A.**, H. W. Choi, A. Ravindra, and D. A. Llano. "The Impact of Aging, Hearing Loss, and Body Weight on Mouse Hippocampal Redox State, Measured in Brain Slices Using Fluorescence Imaging." **Neurobiology of Aging (Jun 2016)**
- Stebbing, K. A.**, H. W. Choi, A. Ravindra, D. M. Caspary, J. G. Turner, and D. A. Llano. "Ageing-Related Changes in Gabaergic Inhibition in Mouse Auditory Cortex, Measured Using in Vitro Flavoprotein Autofluorescence Imaging." **The Journal of Physiology (Jan 2016)**
- Fan, A., **K. A. Stebbings**, D. A. Llano, and T. Saif. "Stretch Induced Hyperexcitability of Mice Callosal Pathway." **Frontiers in Cellular Neuroscience (2015)**
- Slater, B. J., A. Y. Fan, **K. A. Stebbings**, M. T. Saif, and D. A. Llano. "Modification of a Colliculo-Thalamocortical Mouse Brain Slice, Incorporating 3-D Printing of Chamber Components and Multi-Scale Optical Imaging." **Journal of Visualized Experiments (2015)**
- Llano, D. A., B. J. Slater, A. M. Lesicko, and **K. A. Stebbings**. "An Auditory Colliculothalamocortical Brain Slice Preparation in Mouse." **Journal of Neurophysiology (2014)**
- Stebbing, K. A.**, A. M. Lesicko, and D. A. Llano. "The Auditory Corticocollicular System: Molecular and Circuit-Level Considerations." **Hearing Research (2014)**
- Wang, S., A. K. Ghosh, N. Bongio, **K. A. Stebbings**, D. J. Lampe, and M. Jacobs-Lorena. "Fighting Malaria with Engineered Symbiotic Bacteria from Vector Mosquitoes." **Proc Natl Acad Sci USA (2012)**

### Manuscripts in Preparation

Ma, C., **Stebbing, K.A.**, Fabrizio, U.D., Kenyon, R.V., Berger-Wolf, T.Y., Llano, D.A.  
"A Novel Dynamic Network Imaging Analysis Method Reveals Aging-Related Fragmentation of Cortical Networks in Mouse." **Neuroimage**. (Revisions Submitted.)

### Most Recent Conference Presentations

- Stebbing, K.A.**, Choi, H., Ravindra, A., Caspary, D.M., Turner, J., Llano, D. "Age Related Changes in GABAergic Inhibition in Mouse Auditory Cortex, Measured Using In Vitro Flavoprotein Autofluorescence Imaging." The Society for Neuroscience (2015).
- Stebbing, K.A.**, Slater, B. J., Llano, D. "The Auditory Corticocollicular System in Mouse: Synaptic and Cellular Properties." The Society for Neuroscience (2014). Poster #814.
- Stebbing, K.A.**, Turner, J., Caspary, D., Llano, D. "Aging-Related Decreases in GABAergic Synaptic Signaling in Mouse Auditory Cortex." Assoc. for Res. in Otolaryngology Abstracts (2013) #624.

## Grants/Fellowships

Arnold O. Beckman Graduate Fellowship. **Fellow:** full tuition and salary, 2016-2017.  
Association for Research in Otolaryngology, Graduate Student/Postdoctoral Fellow **Travel Award**,  
February 2013, \$500.  
American Society for Biochemistry and Molecular Biology, **Undergraduate Research Award**,  
June-October 2010; \$1000.

## Techniques Acquired

### **1. Laboratory of Daniel Llano, MD, PhD, Univ. of Illinois Beckman Institute**

- a. **Optogenetics**
  - i. Knowledge of serotypes, expression characteristics, channel properties.
  - ii. Experience with viral expression and mouse injections.
  - iii. Laser activation of optogenetically-expressing tissue.
- b. **Imaging**
  - i. Data Analysis: Simultaneous multi-function fitting of temporal response profiles of responses in globally stimulated in vitro slices
  - ii. Flavoprotein imaging in vitro combined with electrical stimulation of pathways to determine pathway integrity in slices and quantify neuronal activation.
  - iii. Redox imaging. Use of NADH and FAD<sup>+</sup> filters and imaging analysis to determine redox ratio of tissue in vitro.
  - iv. Voltage-sensitive dye imaging.
- c. **Electrophysiology**
  - i. Whole cell patch clamp
- d. **Stimulation**
  - i. Laser photouncaging of glutamate to map monosynaptic inputs
  - ii. Electrical stimulation-pulse patterning
  - iii. Glutamate pipette
- e. **Hearing Measurements**
  - i. Auditory brainstem responses in mice from post-natal day-9 through old mice.
- f. **Slicing**
  - i. Extreme proficiency with auditory thalamocortical slice.
  - ii. Off coronal slicing for Inferior colliculus connectivity.
  - iii. Descending cortico-collicular slice.
- g. **Histology**
  - i. Intracellular labeling with Biocytin
  - ii. Camera Lucida
  - iii. Cell reconstruction

### **2. Laboratory of David Lampe, PhD, Duquesne University: Creating paratransgenic bacteria which secrete anti-malarial peptides in the mosquito mid-gut.**

- a. **DNA Preparation/Sequencing/Design**
  - i. Plasmid isolation and minipreps: Restriction endonuclease digestion: Agarose electrophoreses; gel extraction: DNA ligation reactions: PCR-ligation/overlap: Double Digests: Sequencing reactions
- b. **Bacterial transformation**
  - i. Electro- and chemical competent cell generation
- c. **Protein**
  - i. Soluble and insoluble protein separation: 6-His purification: SDS-page: Western Blot: Antibody optimization