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EDUCATION:

- 1992 B.S. Biology. University of Illinois at Urbana-Champaign, IL (UIUC)
2000 Ph.D. Molecular and Integrative Physiology. UIUC
“Information processing in the auditory thalamus of *Myotis lucifugus*:
Implications for temporal pattern recognition.” Advisor: Albert S. Feng, Ph.D.
2002 (Honors) M.D. University of Illinois, Urbana, IL.

POSTDOCTORAL TRAINING:

- 2002-03 Internship in Internal Medicine,
Massachusetts General Hospital/Harvard Medical School.
2003-06 Residency in Neurology,
Massachusetts General Hospital/Brigham and Women’s Hospital,
Harvard Medical School.
2007 MGH/MIT/HMS Athinoula A. Martinos Center for Biomedical Imaging
Visiting Fellowship Program in fMRI
2006-08 Post-doctoral research, Laboratory of Dr. Murray Sherman
Research Fellow, Cognitive and Behavioral Neurology, University of Chicago.

POSITIONS AND EMPLOYMENT:

- 2006-08 Instructor, Department of Neurology, University of Chicago, Chicago, IL
2008-10 Associate Medical Director, Neuroscience Development, Abbott Laboratories
2010-17 Assistant Professor, Dept of Molecular and Integrative Physiology, UIUC
(ACGME number 160752)
2010- Staff Neurologist, Cognitive and Behavioral Neurology
Carle Hospital and Carle Neuroscience Institute, Urbana, Illinois
2010- Full-time faculty member, Beckman Institute for Advanced Science and
Technology, University of Illinois, Urbana-Champaign
2017- Associate Professor with Tenure, Dept of Molecular and Integrative Physiology, UIUC

LICENSE AND CERTIFICATION:

- 2003-2007 Massachusetts Full Medical License Registration
2006- Illinois Full Medical License Registration
2008- Diplomate, American Board of Psychiatry and Neurology, Certificate #54519

HONORS AND AWARDS:

- 1991 Howard Hughes Undergraduate Research Award
1992 National Institutes of Mental Health, Program of Minority Students Fellow
1993 Walter Rice Craig Fellow, University of Illinois
1999 Outstanding Thesis Award, Dept of Molecular and Integrative Physiology, UIUC
1999 Dr. P.S. and Kalpagam Ramachandran Research Award
2002 Alpha Omega Alpha, Medical Honor Society
2006 Excellence in Teaching, Harvard Medical School
2011 American Neurological Assn, Invited Symposium Speaker on “Brain and Language.”
2012 Guest editor, *Brain and Language*
2012-2017 Excellence in Teaching Recognition (every year, every course taught), UIUC
2013 Keynote Speaker, Molecular and Cellular Biology Commencement Ceremonies, UIUC
2015 Golden Apple Teaching Award, University of Illinois College of Medicine
2016 Advances in Medicine Award, Carle Hospital, Urbana, IL.
2017 Helen Corley Petit Scholar, UIUC
2017 Benjamin R. and Elinor W. Bullock and Edwin E. and Jeanne Bullock
Goldberg Professorial Scholar

FUNDING:

(Chronological by end-date)

As Principal Investigator:

National Institute on Deafness and Other Communications Disorders
1R01DC013073-01 (Llano, PI) 4/01/2015 – 3/31/2020
“Functional organization of the auditory corticocollicular system”
\$250,000/year x 5 years, Direct

Kiwanis Spastic Paralysis Research Foundation
(Llano, PI) 7/01/2014 – 6/30/2019
“Seeing phantom sounds: Imaging the neural correlates of tinnitus”
\$20,000/year x 5 years, Direct

National Science Foundation (NSF) Division of Information and Intelligent Systems
1515587 8/16/2015 – 8/15/2018
(Llano, PI, Berger-Wolf, co-PI, Kenyon, co-I)
“CRCNS: Community Dynamic Imaging of Corticothalamic Projections”
\$250,000/year x 3 years, Direct

Carle Neuroscience Institute 6/1/2017 – 5/30/2018
“Strategic Processing Ability in Mild Cognitive Impairment”
(Llano, PI, Mudar co-PI)
\$15,000/year x 1 years, Direct

NIH-Office of Research Infrastructure Programs
S10OD023569-01 (Llano, PI) 3/01/2017 – 2/28/2018
“An upright multiphoton microscope for biomedical research applications”

National Institute on Deafness and Other Communications Disorders
R21 DC014765-01 (Llano, PI) 6/23/2015-5/31/2017
“Thalamic reticular nucleus modulation of auditory thalamocortical function”
\$275,000 over two years, Direct

National Institute on Aging (NIA)
L30 AG045918-02 (Llano, PI) 7/01/2015-6/30/2017
“Biomarkers for Subjective Cognitive Impairment”
\$12,000/year x 2 years, Direct

UIUC Campus Research Board
(Llano, PI) 10/06/2015-4/30/2017
“Impact of developmental PCB exposure on synaptic inhibition in the rodent auditory cortex”
\$25,000/year x 1 year, Direct

Beckman Institute Seed Grant
(Llano, Ceman, Sutton, co-PIs) 5/16/2014 - 8/15/2016
“Development of novel optogenetic and brain imaging approaches to study top-down control mechanisms”
\$100,000/year x 2 years, Direct

National Institute on Aging (NIA)
L30 AG045918-01 (Llano, PI) 7/01/2013-6/30/2015
“Biomarkers for Subjective Cognitive Impairment”
\$12,000/year x 2 years, Direct

National Institute on Deafness and Other Communications Disorders

1R03DC012125-01 (Llano, PI) 9/26/2011 – 5/31/2015
“Age-Related changes in GABAergic influence on auditory corticothalamic projection.”
\$100,000/year x 3 years, Direct

Alzheimer Association
NIRG-12-242848 (Llano, PI) 9/01/2012 – 8/31/2014
“Diminished cortical GABAergic inhibition in mouse model of Alzheimer Disease”
\$50,000/year x 2 years, Direct

Social Science Brownbag, UIUC 6/01/2013-5/31/2014
(Co-PI, with Matt Dye, Speech/Hearing Science, UIUC)
“iHear: Promoting Hearing Sciences at the University of Illinois”
\$2500/year x 1 year, Direct

American Federation for Aging Research
AFAR 2011-03147 (Llano, PI) 7/01/2011 – 6/30/2013
“Changes in Auditory Cortical Circuitry in Aging: Exploration of the Links between Aging and the Cortical
Circuitry of Attention”
\$50,000/year x 2 years, Direct

National Institute on Deafness and Other Communications Disorders
K08 DC008320 (Llano, PI) 6/01/2006-6/01/2008
“Functional Organization of Auditory Corticothalamic Projection Systems.”

Brain Research Foundation Seed Grant 6/01/2007-5/31/2008
(Llano, PI)
“Investigation of attentional modulation via fronto-thalamic networks.”
\$50,000/year x 1 year, Direct

National Institute on Deafness and Other Communications Disorders
L30 DC009286-01 (Llano, PI) 7/01/2007-6/30/2009
“Development of an Aphasia Database”

Systems and Integrative Physiology Predoctoral Training Grant
NRSA T32 8/01/1995-7/31/1998
“Neural correlates of fluttering target detection in the echolocating bat”

As Co-Investigator:

Center for Nutrition Learning and Memory, UIUC
Grant (PI: Barbey, Co-I: Llano) 6/1/2012 - 5/31/2017
“Nutritional Intake, Cognitive Function, and Measures of Brain Aging”
\$250,000/year x 5 years, Direct

Center for Health, Aging and Disability, UIUC
Grant (PI: Mudar, Co-I: Llano) 9/1/2012 – 8/31/2013
“Neural Markers of Strategic Learning in Individuals with Subject Memory Impairment”
\$30,000/year x 1 year, Direct

As Mentor:

National Institute on Aging (NIA)
Individual Predoctoral NRSA for M.D./Ph.D. Fellowships
F30AG055283-01 (PI: Cerjanic) 9/15/2017 – 9/15/2020
“Developing quantitative biomarkers for monitoring longitudinal changes in brain microvascular health”
\$30,000/year x 3 years, Direct

National Institute on Deafness and Other Communications Disorders (NIDCD)
Individual Predoctoral Fellowship (National Research Service Award)
F31 DC 015967-01 (PI: Lesicko) 1/01/2017 – 12/31/2019
“Functional modularity and multisensory convergence in the lateral cortex of the mouse inferior colliculus”
\$30,000/year x 3 years, Direct

Beckman Graduate Fellows Award 8/16/2016-8/15/2017
(PI: Stebbings, co-mentor: Justin Rhodes, Psychology, UIUC)
“Redox mechanisms of exercise-induced rescue of decline in neural function with aging”
\$30,000/year x 1 year, Direct

National Institute on Deafness and Other Communications Disorders (NIDCD)
Individual Predoctoral Fellowship (National Research Service Award)
F31 DC013501-01 9/1/2013-8/31/2016
(PI: Slater, co-mentor: Lee Cox, UIUC)
“The role of the thalamic reticular nucleus in temporal processing in the medial geniculate body”
\$30,000/year x 3 years, Direct

Beckman Postdoctoral Fellows Award 9/1/2013-8/31/2015
(PI: Sadowski, Primary mentor: Susan Schantz, Comparative Biosciences, UIUC)
“Effects of developmental PCB exposure on activation of the adult auditory cortex and hippocampus”
\$50,000/year x 2 years, Direct

Beckman Graduate Fellows Award 8/16/2013-8/15/2014
(PI: Slater, co-mentors: Matt Dye, Speech/Hearing Science and Brad Sutton, Biomedical Eng., UIUC)
Declined since another award was in place
“The impact of hearing loss on cross-modal plasticity: An interdisciplinary investigation using optogenetic approaches in a novel in vitro system”
\$30,000/year x 1 year, Direct

PUBLICATIONS:

1. **Llano D.A.** and Ramirez V.D. (1994) Isolation of DARP (dopamine-releasing protein) from fetal rat brain and effects of DARP immunoneutralization on fetal mesencephalic dopamine levels. *Molecular and Cellular Neuroscience*. Dec;5(6):649-57.
2. **Llano D.A.** and Feng A.S. (1999) Response characteristics of neurons in the medial geniculate body of the little brown bat to simple and temporally-patterned sounds. *Journal of Comparative Physiology [A]*. 184: 371-385.
3. Galazyuk A.V., **Llano D.** and A.S. Feng (2000) Temporal dynamics of acoustic stimuli enhance amplitude tuning of inferior colliculus neurons. *Journal of Neurophysiology*. Jan;83(1):128-38.
4. **Llano D.A.** and A.S. Feng (2000) Computational models of temporal processing in the auditory thalamus. *Biological Cybernetics*. 83: 419-433.
5. **Llano D.A.** and R.S. Abernethy (2004) Severe depression, obsessive-compulsive disorder, and pulmonary embolism. *Psychosomatics*. Jul-Aug;45(4):364-5.
6. Galazyuk A.V., Lin W., **Llano D.** and A.S. Feng. (2005) Leading inhibition and oscillation in time-domain processing in the auditory midbrain. *Journal of Neurophysiology*. Jul;94(1):314-26.

7. **Llano D.A.** and S.M. Sherman (2008) Evidence for non-reciprocal organization of the mouse auditory thalamocortical-corticothalamic projection systems. *Journal of Comparative Neurology*. 507:1209-1227.
8. **Llano D.A.**, Theyel B.B., Mallik A., Sherman S.M. and N.P. Issa (2009) Rapid and sensitive mapping of long range connections in vitro using flavoprotein autofluorescence imaging combined with laser photostimulation. *Journal of Neurophysiology*. 101(6):3325-40
9. **Llano D.A.** and S.M. Sherman (2009) Differences in intrinsic properties and local network connectivity of identified layer 5 and layer 6 adult mouse auditory corticothalamic neurons support a dual corticothalamic projection hypothesis. *Cerebral Cortex*. Dec;19(12):2810-26.
10. Small S.L. and **Llano D.A.** (2009) Biological therapy for aphasia. *Current Neurology and Neuroscience Reports*. Nov;9(6):443-50.
11. Lu E., **Llano D.A.** and S. M. Sherman. (2009) Different distributions of calbindin and calretinin immunostaining across the medial and dorsal divisions of the mouse medial geniculate body. *Hearing Research*. Nov;257(1-2):16-23.
12. Theyel B.B., **Llano D.A.** and S. M. Sherman. (2010) Evidence for a cortico-thalamocortical pathway for cortical communication. *Nature Neuroscience*. 13(1):84-8.
13. Luo F., Seifert T., Roesner B., Hradil V., Hillen H., Ebert U., Day M., **Llano D.A.**, Rustay N.R. and G.B. Fox. (2010) MRI detection and time course of cerebral microhemorrhages during A β antibody treatment in living APP transgenic mice. *Journal of Pharmacology and Experimental Therapeutics*. Dec;335(3):580-8.
14. **Llano D.A.**, Laforet, G. and V. Devanarayan (2011) Derivation of a new ADAS-cog composite using tree-based multivariate analysis: Prediction of conversion from mild cognitive impairment to Alzheimer's disease. *Alzheimer's Disease and Associated Disorders*. Jan-Mar;25(1):73-84.
15. Chin C-L, Carr R.A., **Llano D.A.**, Barret O., Xu H., Marsh K.C., Tamagnan G., Decker M.W., Day M., and G.B. Fox. (2011) Displacement of [123I]-5IA-85380 Binding in baboons by the nicotinic α 4 β 2 receptor partial agonist ABT-089 - Implications of dosing regimens. *Journal of Pharmacology and Experimental Therapeutics*. Mar;336(3):716-23.
16. Theyel B.B., **Llano D.A.**, Issa N., Mallik A. and S. M. Sherman. (2011) Laser photostimulation with flavoprotein autofluorescence imaging *in vitro*. *Nature Protocols*. Apr;6(4):502-8.
17. Luo F. Rustay N., Ebert U., Hradil V., Cole, T., **Llano, D.A.**, Mudd, S., Zhang, Y. and G.B. Fox (2012) Characterization of 7 and 19 month old Tg2576 mice using multimodal in-vivo imaging: Limitations as a translatable model of brain glucose metabolism in Alzheimer's disease. *Neurobiology of Aging*. May;33(5):933-44.
18. Li J., **Llano D.A.**, Ellis T., LeBlond D., Lenz R. and J. F. Waring. (2012) Effect of CSF draw frequency on A β levels in human subjects. *Alzheimer's and Dementia*. Jul;8(4):295-303.
19. **Llano D.A.**, Li J., Lenz R.A., Ellis T., Cassar S., Groebe D., Gopalakrishnan M. and J.F. Waring (2012) Cerebrospinal fluid cytokine dynamics differ between Alzheimer disease patients and elderly controls. *Alzheimer's Disease and Associated Disorders* Oct;26(4):322-8.
20. Yang S., Yang S., Cox C.L., **Llano D.A.** and Feng A.S. (2012) Cell's intrinsic biophysical properties play a role in the systematic decrease in time-locking ability of central auditory neurons. *Neuroscience*. 2012 Apr 19;208:49-57.

21. **Llano D.A.**, Caspary D. and J. Turner (2012) Diminished cortical inhibition in an aging mouse model of chronic tinnitus. *Journal of Neuroscience* Nov 14;32(46):16141-8.
22. **Llano D.A.**, Simon A. and V. Devanarayan (2013) Evaluation of plasma proteomic data for Alzheimer's Disease state classification and for prediction of progression from mild cognitive impairment to Alzheimer Disease. *Alzheimer Disease and Associated Disorders* Jul-Sep;27(3):233-43.
23. **Llano D.A.** (2013) Functional imaging of the thalamus in language. *Brain and Language*. Jul;126(1):62-72.
24. **Llano D.A.** (2013) Voices below the surface: A role for the thalamus in language? (commentary) *Brain and Language*. Jul;126(1):20-1.
25. Hasadsri L., Wang B.H., Lee J.V., Erdman J.W., **Llano D.A.**, Barbey A.K., Wszalek T., Sharrock M.F. and H. Wang (2013) Omega-3 fatty acids for treatment of traumatic brain injury. *Journal of Neurotrauma*. 2013 Jun 1;30 (11):897-906.
26. Slater B.J., Willis A.M and **D.A. Llano** (2013) Evidence for layer-specific differences in auditory corticocollicular neurons. *Neuroscience*. Jan 15;229:144-54.
27. **Llano D.A.**, Slater B.J., Lesicko A.M. and K.A. Stebbings (2014) An auditory colliculo-thalamocortical brain slice preparation in mouse. *Journal of Neurophysiology*, Jan;111(1):197-207.
28. Stebbings K.A., Lesicko A.M.H. and **D.A. Llano** (2014) The auditory corticocollicular system: Molecular and circuit-level considerations. *Hearing Research*, Aug;314C:51-59.
29. Wang H., Wang B., Normoyle K., Jackson K., Spitler K., Sharrock M.F., Miller C., Best C., **Llano D.** and R. Du (2014) Brain temperature and its fundamental properties: A review for clinical neuroscientists (review) *Frontiers in Neuroscience*, Oct 8;8:307.
30. Hasson U., **Llano D. A.**, Miceli G. and A.S. Dick (2014) Does it talk the talk? On the role of basal ganglia in emotive speech processing (commentary). *Behavioral and Brain Sciences*, Dec;37(6):556-7.
31. Lenz R.A., Pritchett Y., Berry S.M., **Llano D.A.**, Han S., Berry D.A., Sadowsky D.A., Abi-Saab W.M. and M.D. Saltarelli (2015) Adaptive, dose-finding phase 2 trial evaluating the safety and efficacy of ABT-089 in mild-to-moderate Alzheimer's Disease. *Alzheimer Disease & Associated Disorders*, Jul-Sep;29(3):192-9.
32. Wang, H, Wang, B, Jackson, K, Miller CM, Hasadsri L, **Llano D**, Rubin R, Zimmerman J, Johnson C and B. Sutton (2015) A novel head-neck cooling device for concussion injury in contact sports. *Translational Neuroscience*, Volume 6, Issue 1, p20-31.
33. Slater B.J., Fan A., Stebbings K.A., Saif T., **Llano D.A.** (2015) Modification of a colliculo-thalamocortical mouse brain slice, incorporating 3-D printing of chamber components and multi-scale optical imaging. *Journal of Visualized Exp*, Sep 18;(103).
34. Fan, A, Stebbings KA, **Llano DA** and T Saif (2015) Stretch Induced Hyperexcitability of Mice Callosal Pathway. *Frontiers in Cellular Neuroscience*, Aug 5;9:292.

35. Normoyle K.P., Kim M., Farahvar A., **Llano D.** and H. Wang (2015) The emerging neuroprotective role of mitochondrial UCP2 in TBI translational neuroscience. *Translational Neuroscience*, 6(1), 179-186.
36. Willis A.M., Slater B.J., Gribkova E. and **D.A. Llano** (2015) Open-loop organization of thalamic reticular nucleus and dorsal thalamus: A computational model. *Journal of Neurophysiology* Oct;114(4):2353-67.
37. Ma C., Forbes A.G., **Llano D.A.**, Berger-Wolf T. and R.V. Kenyon (2016) SwordPlots: Exploring neuron behavior within dynamic communities of brain networks. *Journal of Imaging Science and Technology*. Volume 60, Number 1, pp. 10405-1-10405-13(13).
38. Stebbings K.A., Choi H.W., Ravindra A., Caspary D.M., Turner J.G. and **D.A. Llano** (2016) Aging- related changes in GABAergic inhibition in the mouse auditory cortex, measured using in vitro flavoprotein autofluorescence imaging. *Journal of Physiology*. Jan 1;594(1):207-21.
39. Wang H., Kim M., Normoyle K.P. and **D. Llano** (2016) Thermal regulation of the brain – an anatomical and physiological review for clinical neuroscientists. *Frontiers in Neuroscience*, Jan 21;9:528.
40. Stebbings K.A., Choi H.W., Ravindra A., and **D. A. Llano** (2016) 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;42:101-9.
41. Sadowski R.N., Stebbings K.A., Slater, B.J., Bandara, S.B., **Llano, D.A.** and S.L. Schantz (2016) Developmental exposure to PCBs alters the activation of the auditory cortex in response to GABA_A antagonism. *Neurotoxicology*. Jul 12;56:86-93.
42. Paul K., Cauller L.J. and **D.A. Llano** (2016) Presence of a chaotic region at the sleep-wake transition in a simplified thalamocortical circuit model. *Frontiers in Computational Neuroscience*, Sep 1;10:91.
43. Lesicko A.M.H., Hristova T.S., Maigler K.C., and **D.A. Llano** (2016) Connectional modularity of top-down and bottom-up multimodal inputs to the lateral cortex of the inferior colliculus. *Journal of Neuroscience*, Oct 26;36(43):11037-11050.
44. Lesicko A.M.H. and **D.A. Llano** (2017) Impact of peripheral hearing loss on top-down auditory processing. *Hearing Research*, Jan;343:4-13
45. Patel M., Sons S., Yudintsev G., Lesicko A.M.H., Yang L., Taha G.A., Pierce S.M. and **D.A. Llano** (2017) Anatomical characterization of subcortical descending projections to the inferior colliculus in mouse. *Journal of Comparative Neurology*, Mar 1;525(4):885-900.
46. Caspary D.M. and **D.A. Llano** (2017) Auditory thalamic circuits and GABA_A receptor function: Putative mechanisms in tinnitus pathology. *Hearing Research*, Jun;349:197-207.
47. **Llano, D.A.**, Mudar R., Bundela S. and D. Devanarayan (2017) A multivariate predictive modeling approach reveals a novel CSF peptide signature for both Alzheimer's Disease state classification and for predicting future disease progression. *PLOS One*, In Press.
48. Ibrahim B.A., Wang H., Lesicko A.M.H., Bucci B., Paul K. and **D.A. Llano** (2017) Effect of temperature on FAD and NADH-derived signals and neurometabolic coupling in the mouse auditory and motor cortex. *JPflügers Archiv - European Journal of Physiology*, In Press.

BOOK CHAPTERS:

1. Varela, C., **Llano D.A.** and B.B. Theyel. (2012) “Brain slice electrophysiology.” In Neuronal Network Analysis, Fellin T, Hallasa M, eds. Springer Publishers.
2. **Llano D.A.** (2015) “Thalamus and Language” In The Neurobiology of Language. Small S. and Hickok G. eds. Elsevier Publishers.
3. **Llano D.A.** and Small S. L. (2015) “Pharmacotherapy for Aphasia” In The Neurobiology of Language. Small S. and Hickok G. eds. Elsevier Publishers.
4. Small S.L. and **Llano D.A.** (2015) “Biological Approaches to Treatment of Aphasia” In Handbook on Adult Language Disorders, Hillis A., eds. Taylor & Francis Publishers.
5. Huynh, N, Lee C. and **Llano D.A.** (2017) “Injections of viral optogenetic tracers into the cerebral cortex of neonatal mouse” In Neuromethods: Basic Neurobiology Techniques. Wright N. ed. Springer Publishers. (Invited, in preparation)
6. Yudintsev G. and **Llano D.A.** (2017) “Transcranial imaging of the mouse auditory cortex in the GCaMP6 mouse” In Neuromethods: Basic Neurobiology Techniques. Wright N. ed. Springer Publishers. (Invited, in preparation)

CONFERENCE PROCEEDINGS:

1. Ma C., Kenyon R.F., Forbes A., Berger-Wolf T., Slater B.J. and **D.A. Llano** (2015) Visualizing dynamic brain networks using an animated dual-representation. *Eurographics Conference on Visualization (EuroVis)*, May 25-29.
2. Patel M. B., Sons S., Yang L., Taha G.A., Lesicko A.M.H., Yudintsev, G. and **D.A. Llano** (2015). The thalamotectal system: An ancient projection for modulating the auditory midbrain. *Proceedings of Meetings on Acoustics*, 25(1).

ABSTRACTS:

1. **Llano D.A.** and V.D. Ramirez (1993) Evidence for the presence of a potent dopamine-releasing protein in the sera of rats and humans. *Society for Neuroscience* #427.9
2. Kuhananthan S., **Llano D. A.**, Laurence T. and V.D. Ramirez (1993) Evidence that sera from Parkinson's (PD) and age-matched controls contain a highly potent dopamine releasing protein (DARP). *Endocrine Society*. #1792.
3. **Llano D.A.** and V.D. Ramirez (1994) Evidence for the role of DARP in the development of rat dopaminergic neurons and the adrenal gland. *Society for Neuroscience*. #452.20.
4. **Llano D.A.** and V.D. Ramirez (1994) Evidence for the role of DARP during the prenatal development of mesencephalic dopaminergic neurons. *Society for the Study of Reproduction*. #264.
5. **Llano D.A.** and A.S. Feng (1996) Auditory response characteristics of neurons in the medial geniculate body of the FM bat, *Myotis lucifugus*. *Association for Research in Otolaryngology*. #444.
6. **Llano D.A.** and A.S. Feng (1997) Subdivision differences in representation of temporal and spectral sound parameters by neurons in the medial geniculate body of the FM bat, *Myotis lucifugus*. *Association for Research in Otolaryngology*. #563.
7. Galazyuk A.V., **Llano D.A.** and A.S. Feng (2001) Oscillation, paradoxical latency shift and temporal processing. *6th International Conference for Neuroethology*. #160.
8. **Llano D.**, Lee C., Covic E. and S.M. Sherman (2006) Evidence for dual auditory corticothalamic projection systems in the mouse. *Society for Neuroscience* #543.18.

9. **Llano D.**, Muren G. and S.M. Sherman (2007) Functional properties of identified auditory layer 5 corticothalamic projection neurons. *Society for Neuroscience* #120.1.
10. Theyel B.B., **Llano D.A.** and S.M. Sherman (2008) The cortico-thalamo-cortical relay: a potent circuit for intercortical information flow, *Society for Neuroscience* #178.17.
11. **Llano D.A.**, Theyel B.B., Mallik A., Sherman S.M. and N.P. Issa (2008) Rapid and sensitive mapping of long range connections in vitro using flavoprotein autofluorescence imaging combined with laser photostimulation, *Society for Neuroscience* #395.18.
12. Pritchett Y., Lenz R., Han S., **Llano D.**, Abi-Saab W., Saltarelli M. and S. Berry (2010) Bayesian adaptive randomization design for a phase 2 Alzheimer's Disease clinical trial. *American Society for Clinical Neuropharmacology*.
13. Slater B.J. and **D. A. Llano** (2011) Layer-specific differences in physiological properties in the mouse auditory corticocollicular system. *Society for Neuroscience* #912.02.
14. Slater B.J., Stebbings K. and **D.A. Llano** (2012) Development of a colliculo-thalamo-cortical slice. *Society for Neuroscience* #460.09
15. Willis A. and **D.A. Llano** (2012) Enhanced thalamocortical activity secondary to thalamic reticular nucleus activation: A computational model. *Society for Neuroscience* #368.16.
16. Stebbings K., Turner J., Caspary D. and **D.A. Llano** (2012) *In vitro* flavoprotein imaging to study age-related changes in auditory cortical GABAergic function. *Association for Research in Otolaryngology* #334.
17. Stebbings K., Turner J., Caspary D., and **D.A. Llano** (2013). Aging-related decreases GABAergic synaptic signaling in mouse auditory cortex. *Association for Research in Otolaryngology* #624.
18. Fan A., Stebbings K., **Llano D.**, and T. Saif (2014) Stretch induced effects on callosal pathway flavoprotein autofluorescence. *Biomedical Engineering Society*
19. Ma C., Kenyon R.V., Berger-Wolf T., and **D.A. Llano**. 2014 Visualizing Communities in Dynamic Mouse Brain Networks. In *Proceedings of the IEEE Information Visualization Conference (InfoVis '14)* Paris, France.
20. Slater B.J., Willis A.M. and **D.A. Llano** (2014) Modification of thalamocortical transmission by the thalamic reticular nucleus: Computational and optical studies. *Society for Neuroscience* #814.01.
21. Stebbings K., Slater B. and **D.A. Llano** (2014) The auditory corticocollicular system in mouse: Synaptic and cellular properties. *Society for Neuroscience* #814.14.
22. Yudintsev G., Lesicko A.M.H. and **D.A. Llano** (2014) Layer-specific differences in the mouse auditory corticocollicular pathway: An anatomical study. *Society for Neuroscience* #814.16.
23. Patel M.B., Lesicko A.M.H., Yang L., Taha G.A. and **D.A. Llano** (2015) Characterization of the auditory thalamotectal projection in mouse. *Association for Research in Otolaryngology* #PS-574.
24. Lesicko A.M.H. and **D.A. Llano** (2015) Connectional and neurochemical modularity of the mouse inferior colliculus. *Association for Research in Otolaryngology* #PS-564.

25. Ma C., Kenyon R.V., Forbes A., Berger-Wolf T. and **D.A. Llano** (2015) Visualizing dynamic brain networks using a dual-representation In *Proceedings of the IEEE Information Visualization Conference (InfoVis '15)*.
26. Sadowski R.N., Stebbings K.A., Slater B.J., Bandara S.B., **Llano D.A.** and S.L. Schantz (2015) Increased activation in the auditory cortex of developmentally PCB-exposed rats following GABA_A antagonism. *Society of Toxicology*
27. Fan A., Stebbings K., **Llano D.**, and T. Saif (2015) Stretch induced hyperexcitability of mice callosal pathway *Biomedical Engineering Society*
28. Liu S.C., Lee M.K., Slater B.J., Naseri Kouzehgarani G., Yu M., Cangellaris O.V., **Llano D.A.**, Kong H.J. and M.U. Gillette (2015) Engineering a 3D platform to mimic *in vivo* neural network morphology and activity. *Society for Neuroscience* # 29.09/A23
29. Gribkova K. and **D. Llano** (2015) Computational studies of a thalamocortical network containing the thalamic reticular nucleus, using a novel mutual information estimator to measure network performance. *Society for Neuroscience* #596.14/J27
30. Slater B.J. and **D. Llano** (2015) Making inhibition work for you. An electrophysiological study of chemical and photochemical stimulation of the thalamic reticular nucleus *Society for Neuroscience* #507.16/M29
31. Lesicko A. and **D. Llano** (2015) Neurons projecting from the mouse inferior colliculus lateral cortex to the auditory thalamus are organized into distinct clusters correlating with glutamic acid decarboxylase-positive modules. *Society for Neuroscience* #507.14/M27
32. Yudintsev G. and **D. Llano** (2015) Layer 5 and 6 auditory corticocollicular neurons have different distribution patterns to their subcortical targets in the mouse. *Society for Neuroscience* #596.12/J25
33. Stebbings K.A., Choi H., Ravindra A., Caspary D.M., Turner J. and **D. Llano** (2015) Age related changes in GABAergic inhibition in mouse auditory cortex, measured using *in vitro* flavoprotein autofluorescence imaging. *Society for Neuroscience*. #305.13/E24
34. Davis E.A., Dailey M.J. and **D.A. Llano** (2015) K-12 Brain Awareness Event: Graduate student driven outreach education. *Society for Neuroscience*
35. **Llano, D.A.** (2015) Frogs, thalamotectal neurons and other things I learned about from Al Feng. *Acoustical Society of America Meeting*. 1aAB4.
36. Lesicko A.M. and **D.A. Llano** (2016) Intracollicular inputs to neurons in layer 2 of the lateral cortex of the inferior colliculus. *Association for Research in Otolaryngology* PS 646.
37. Slater B.J., Sons S. and **D.A. Llano** (2016) Uncaging the auditory cortex: Using laser photo-stimulation to characterize inputs into the corticocollicular system. *Association for Research in Otolaryngology* PS 726
38. **Llano D.A.**, Mudar R. and V. Devanarayan (2016) Identification of a novel CSF peptide signature that is useful for both Alzheimer's disease diagnosis and predicting future disease progression *Alzheimer's Association International Conference* P4-118

39. Ibrahim B.A., Wang H., Bucci B., Paul K. and **D.A. Llano** (2016) Effect of temperature on FAD and NADH-derived signals and neurometabolic coupling in brain slices. *Society for Neuroscience* 632.06 / EEE1
40. Slater B.J. and **D.A. Llano** (2016) Synaptic or Intrinsic, that is the question; Parsing out synaptic currents in mapping the corticocollicular inputs with glutamate uncaging *Society for Neuroscience* 236.01 / EE5
41. Paul K. and **D.A. Llano** (2016) Sensory cross-modulation in thalamo-reticular interactions *Society for Neuroscience* 244.08 / PP12
42. Brown J.W. and **D.A. Llano** (2016) Multi-channel open-loop thalamo-reticular architectures support thalamocortical wave propagation *Society for Neuroscience* 327.02 / DD14
43. Lee C.M., Sadowski R.N., **Llano D.A.** and S.L. Schantz (2016) Changes of inhibitory and excitatory input to Layer 2/3 auditory cortex induced by developmental exposure to polychlorinated biphenyls. *Advances and Perspectives in Auditory Neuroscience*
44. Yudintsev G. and **D.A. Llano** (2017) Layer 5 and 6 Neurons Projecting to the Inferior Colliculus Comprise Two Distinct and Heterogeneous Populations in the Cortex in Mouse. *Association for Research in Otolaryngology* PS 457.

AD HOC JOURNAL REVIEWER (since 2010):

Austin Journal of Clinical Neurology, Brain and Cognition, Brain and Language, Brain Imaging and Behavior, Brain Research, Cerebral Cortex, Clinical Interventions in Aging, Ear and Hearing, European Journal of Neuroscience, Frontiers in Human Neuroscience, Frontiers in Neural Circuits, Frontiers in Neuroanatomy, Frontiers in Systems Neuroscience, Hearing Research, Journal of Neurophysiology, Journal of Neuroscience, Journal of Neuroscience Methods, Journal of Neurotrauma, Journal of the Neurological Sciences, Language and Cognition, Nature Communications, Neurobiology of Aging, Neuroscience, Neuroscience Letters, Neuroscience Research, Noise and Health, Nutritional Neuroscience, Pain, PLOS One. Proceedings of the National Academy of Sciences, The Neuroscientist, Trends in Neuroscience

GRANT REVIEWER:

- 2011: Alzheimer Association International Grant Program Reviewer
- 2012: Invited Panelist, NSF Division of Mathematical Sciences/NIGMS Review Board
- 2014: Action on Hearing Loss, International Grant Program Reviewer
- 2014: Neurological Foundation of New Zealand Grant Reviewer
- 2015: Health Research Council of New Zealand Grant Reviewer
- 2015: University of Illinois Research Board
- 2016: Wellcome Trust Senior Research Fellowship in Basic Biomedical Science, UK
- 2016: Agir Pour L'Audition Foundation, France
- 2016: Medical Research Council Review, UK
- 2016: Neural Systems, NSF (invited, could not attend)
- 2016: AUD Study Section, ad hoc NIH
- 2017: Panelist, NSF Collaborative Research in Computational Neuroscience/Information & Intelligent Systems Division Review
- 2017: Neurological Foundation of New Zealand
- 2017: French National research Agency (ANR)

INVITED LECTURES:

- 2006: Massachusetts General Hospital/Brigham and Women's Hospital Resident Conference, "The role of the thalamus in cortical function."
- 2007: University of Chicago Neurology Grand Rounds, "The role of the thalamus in cortico-cortical communication."

- 2007: University of Chicago Neuroscience Roundtable,
“Proposal for fMRI investigation of the role of the thalamus in attention.”
- 2009: Abbott Neuroscience Grand Rounds,
“The use of biomarkers in Alzheimer’s Disease drug development.”
- 2010: New Faculty Talk, Cell and Molecular Biology & Molecular Biophysics Training Grants - 23rd
Annual Research Symposium, UIUC. “A role for the thalamus in cortical function.”
- 2010: UIUC Neuroscience Program Colloquia Talk
“A role for the thalamus in cortical function.”
- 2010: Southern Illinois University, Department of Pharmacology
“A role for the thalamus in auditory cortical function.”
- 2011: Grand Rounds, Department of Medicine, Carle Hospital
“Management of Behavioral Symptoms of Alzheimer Disease”
- 2011: American Neurological Association, Symposium Speaker
“The role of the thalamus in language”
- 2011: Northeast Ohio University College of Medicine, Department of Anatomy and Neurobiology.
“A role for the thalamus in auditory cortical function.”
- 2012: Ear Day Symposium at Rush University, Chicago, IL.
“Studies on the mouse auditory forebrain in normal and pathological states”
- 2013: UIUC, Department of Molecular/Integrative Physiology Seminar
“Studies on mouse auditory forebrain processing”
- 2013: UIUC, Department of Psychology Brownbag Seminar
“Sounds from the deep: Studies of auditory subcortical processing”
- 2013: University of Iowa, Department of Neurosurgery Seminar
“Flavoprotein imaging as a potential tool in functional neurosurgery”
- 2013: Ear Day Symposium at Rush University, Chicago, IL.
“Sounds from the deep: Insights on subcortical auditory processing”
- 2013: University of Wisconsin-Madison. Bioengineering Imaging Seminar
“Top-down modulation of auditory processing in the mouse midbrain and thalamus.”
- 2014: Illiana Alzheimer Disease Conference, Covington, IN
“MCI and Early Alzheimer’s: Screening, Assessment and Intervention”
- 2014: Kiwanis Club Annual Meeting, Bloomington, IL
“Seeing phantom sounds: Imaging the neural correlates of tinnitus”
- 2014: Purdue University, Biological Sciences Seminar
“Sounds from the deep: New insights on auditory subcortical processing”
- 2014: Ear Day, Rush University
“Bottom up meets top-down: Studies of auditory corticofugal projections”
- 2015: Illiana Alzheimer Disease Conference, Urbana, IL
“New therapies for mild cognitive impairment and Alzheimer disease”
- 2015: Illinois Summer Neuroscience Institute, Distinguished Lecture
“Mechanisms of top-down auditory control”
- 2015: Acoustic Society for America, semi-annual meeting
“Frogs, thalamotectal neurons and other things I learned about from Al Feng”
- 2015: Ear Day Symposium at Rush University, Chicago, IL.
“The thalamotectal system: an ancient projection for modulating the auditory midbrain”
- 2016: *Synapse: A Collaborative Neuroscience Symposium*, Beckman Institute, Urbana, IL
“What’s new in the treatment of Alzheimer’s Disease?”
- 2016: Molecular and Integrative Physiology Seminar, UIUC
“Bottom up meets top-down: Modulation in the auditory system”
- 2016: Department of Cancer Biology and Pharmacology, University of Illinois at Peoria
“Top-down modulation in the mouse auditory system”
- 2016: University of Wisconsin-Madison, “Brain and Bagels” seminar series
“Descending projections in the mouse auditory system”
- 2017: Carle Brain Injury Symposium
“Vascular Dementia: An Update”
- 2017: Clinical and Translational Neuroscience Workshop

Interdisciplinary Health Sciences Initiative, UIUC
“Maladaptive auditory cortical network changes associated with aging and hearing loss”

TEACHING:

1992-2000:

Graduate Teaching Assistant: University of Illinois, Urbana-Champaign:
Medical Neuroscience, Introduction to Human Physiology,
Cellular and Molecular Physiology, Systems and Integrative Physiology,
Ecology and Organismic Biology and General Chemistry.

2005: St. Mary of Nazareth Hospital, Chicago, IL. Family practice residency educational lecture,
“The neurologic exam.”

2007: University of Chicago, Lecture for neurology residents,
“The thalamus.”

2007-2011:

University of Chicago undergraduate course: Workings of the Human Brain,
“Hearing, language and music.”

2008: University of Chicago, graduate course: Neurobiology of Disease,
“Language and aphasia.”

2008: University of Chicago, Lecture for neurology residents
“Aphasia prognosis.”

2008: Rush University, Department of Communication Disorders and Sciences, graduate course: Auditory Neuroscience.: “The auditory thalamus.”

2009: University of Chicago, Chicago Academic Medicine Program,
“The pathophysiology and treatment of Alzheimer’s Disease.”

2010: University of Chicago, graduate course: Neurotheology: Brain, Mind and
Religion. “Attention and transcendental meditation.”

2010: University of Chicago, graduate course: Human Memory.
“Pharmacological enhancement of human memory?”

2011: Lecture to Internal Medicine Residency Program, University of Illinois
“Non-Alzheimer Dementia”

2011: Lecture to Geriatric Fellowship Program, Carle Hospital
“Update on Alzheimer Disease”

2013: “Ethics in Dementia Care,” Carle Hospital Seminar Series.

2014: “Dementia overview: Diagnosis and management,” Carle Hospital Seminar Series.

2012-2014:

Step 1 USMLE Review for Medical Neuroscience, UIUC College of Medicine.

2016: “Evaluation of memory loss,” Carle primary care provider lecture, Mattoon, IL.

2004-Current:

Falcon/Becker USMLE Reviews Lecturer:

Step 1: Physiology, Biostatistics, Pharmacology, Neuroscience, Behavioral Science

Step 2: Neurology, Pharmacology

2012-Current:

Course Director and Primary Lecturer, UIUC College of Medicine M1

Brain, Behavior and Human Development.

Ranked as Excellent by students 2012-2017 (UIUC ICES system).

2012-Current:

Lecturer, MCB 493/320, Mechanisms of Human Disease, UIUC

“Mechanisms of Neurological Disease.”

Ranked as Excellent by students 2012-2017 (UIUC ICES system).

2015-Current:

Lecturer, M2 Pathophysiology

“Movement Disorders” and “Dementia”

2016-Current:

Lecturer, Neuroscience survey course (NEUR 598)

“Translational neuroscience” and “Dementia”

CLINICAL RESEARCH:

- 2006 Principal Investigator, "Development of an Aphasia Patient Database," University of Chicago. IRB #14851B.
- 2008 Sub-Investigator, "Phase 3 clinical trial of bapineuzumab (AAB-001) for the treatment of mild to moderate Alzheimer's disease." Wyeth and Elan.
- 2008 Study Director, "Safety and Efficacy Study of ABT-XXX in Adults With Mild to Moderate Alzheimer's Disease." Abbott Laboratories.
- 2008 Study Director, "A Study of the Long-Term Safety of ABT-XXX for Subjects With Mild-to-Moderate Alzheimer's Disease Who Participated in the M06-876 Study." Abbott Laboratories.
- 2009 Study Director, "A Safety and Tolerability Study of ABT-XXX in Elderly." Abbott Laboratories.
- 2009 Study Director, "Pharmacokinetic and Exploratory Biomarker Study of ABT-XXX In Healthy Volunteers." Abbott Laboratories.
- 2009 Study Director, "Pharmacokinetic and Tolerability Study of ABT-XXX, Dosed Twice Daily, In Healthy Volunteers." Abbott Laboratories.
- 2010 Study Director, "Exploratory CSF biomarker study In Healthy Volunteers." Abbott Laboratories.
- 2010 Medical Monitor, "Safety and Efficacy Study for Cognitive Deficits in Adult Subjects With Schizophrenia." Abbott Laboratories.
- 2012- Physician Investigator (K. Federmeier, PI), "Electrophysiological Signals to Predict Age-Related Cognitive Decline." Carle-UIUC collaboration.
- 2012- Physician Investigator (A. Barbey, PI), "Nutritional Intake, Cognitive Function, and Measures of Brain Aging." Carle-UIUC collaboration.
- 2012- Physician Investigator (R. Mudar, PI), "Neural Markers of Strategic Learning in Individuals with Subject Memory Impairment." Carle-UIUC collaboration.

ACADEMIC SERVICE:

- Research Committee, College of Medicine, UIUC, 2010-.
- Seminar Committee, Department of Molecular and Integrative Physiology, UIUC, 2011-.
- Admissions Committee, Neuroscience Program, UIUC, 2011-2012.
- Medical Student Research Award Committee, UIUC, 2011-2013.
- Search Committee, Division of Biomedical Sciences Research Specialist, UIUC. 2012.
- Steering Committee, Medical Scholars Program, UIUC, 2012-
- Search Committee, Molecular and Integrative Physiology New Faculty, UIUC. 2013-2014.
- Academic Distinction Committee, Molecular and Cellular Biology, UIUC. 2013-
- Co-Organizer, Brain Awareness Day, at Orpheum Theater Children's Museum, UIUC, 2014-2015
- Executive Committee, Neuroscience Program, UIUC, 2014-
- Seminar Committee, Neuroscience Program, UIUC, 2014-2016
- Alzheimer's Association Research Engagement Committee, 2016-
- Search Committee, Carle Illinois College of Medicine, for Director, Biomedical Science and Engineering and Associate Dean for Research, 2017-

RESEARCH MENTORING:

Current Trainees in the Llano Laboratory:

- Ekaterina Gribkova (Graduate student, Neuroscience Program)
- Alexandria Lesicko (Graduate student, Neuroscience Program)
- Kevin Stebbings (Graduate student, Neuroscience Program)
- Georgiy Yudintsev (Graduate student, Neuroscience Program)
- Dr. Kush Paul (Research scientist)
- Dr. Jeffrey Brown (Post-doctoral researcher)
- Dr. Baher Ibrahim (Post-doctoral researcher)
- Dr. Christopher Lee (Post-doctoral researcher)

Laboratory Alumni:

- Dr. Adam Willis (Postdoct. researcher 2011-2012): Currently a neuro-ICU fellow at UT Southwestern

Dr. Renee Sadowski (Postdoct. researcher 2014-2016): Currently a Senior Scientist at AbbVie Pharmaceuticals

Dr. Bernard Slater (Ph.D., Neuroscience, 2016): Currently a post-doctoral researcher in Dr. Jeffrey Isaacson's laboratory, UCSD

Graduate Student Training Committees (year of first exam listed):

Shane Crandall (Neuroscience, UIUC, PhD Thesis): 2011

Lin Feng (Pharmacology, SIU-COM, PhD Thesis): 2012

Sam Irving (Molecular and Integrative Physiology, UIUC, Qualifying Exam): 2012

Jenessa Seymour (Neuroscience, UIUC, Qualifying Exam): 2013

Chris Boven (Neuroscience, UIUC, Qualifying Exam): 2013

Sara Schmidt (Neuroscience, UIUC, Qualifying Exam): 2013

Lily Chau (Neuroscience, UIUC, PhD Thesis): 2013

Suren Bandara (Neuroscience, UIUC, PhD Thesis): 2014

Amogh Belagodu (Neuroscience, UIUC, Qualifying Exam, Prelim Exam): 2014

Mariam Bonyadi (Neuroscience, UIUC, Diagnostic, Qualifying Exam): 2014

Lydia Nguyen (Neuroscience, UIUC, Diagnostic, Qualifying): 2014

Richard Oliver Bido Medina (Neuroscience, UIUC, Diagnostic, Qualifying): 2014

Alex Asilador (Neuroscience, UIUC, Diagnostic): 2015

Sarah Sottile (Pharmacology, SIU-COM, Qualifying Exam, Prelim Exam, Final Defense): 2015

Mickeal Key (Neuroscience, UIUC, Diagnostic): 2015

Richard Sanders (Comparative and World Literature, UIUC, Prelim Exam): 2016

Carlos Dostal (Neuroscience, UIUC, Diagnostic, Qualifying Exam, Prelim Exam, Final Defense): 2017

Elizabeth Davis (Neuroscience, UIUC, Diagnostic, Qualifying Exam): 2017

Ryan Loh (Psychology, UIUC, Prelim Exam, Final Defense): 2017

Sean Collins (Psychology, UIUC, Prelim Exam): 2017

Formal undergraduate laboratory research mentoring (for credit, alphabetical):

Bethany Bucci (Molecular and Cellular Biology [MCB]), Karthic Chandran (MCB), Henry Choi (MCB), Macey Coppinger (MCB), Joe Edwards (MCB), Michaela Fisch (MCB), Jairong Fu (MCB), Dan Gonzalez (MCB), Ekaterina Gribkova (Mathematics, *Senior Thesis*), Syed Haider (MCB), Nhan Huynh (MCB, *Senior Thesis*), Nikita Jain (Bioengineering), Vanessa Kalinowska (MCB), Alexandria Lesicko (MCB, *Senior Thesis*), Junyu Li (MCB), Katie Maigler (MCB), Diana Masolak (MCB), Kathy Mirza (MCB), Patrick Mulligan (MCB), Kathleen Murphy (Physics), Devika Nair (MCB), Mili Patel (MCB, *Senior Thesis*), Vraj Patel (MCB), Scott Pierce (Integrative Biology, *Senior Thesis*), Aditya Ravindra (MCB, *Senior Thesis*), Robin Rice (MCB), Elizabeth Rivera-Cruz (MCB), Shruti Shah (MCB), Craig Soares (MCB), Stacy Sons (MCB, *Senior Thesis*), Kate Srikant (Psychology), Gehad Taha (MCB, *Senior Thesis*), Danica Vendiola (MCB), Luye Yang (MCB, *Senior Thesis*), Georgiy Yuditsev (MCB, *Senior Thesis*), Omar Zaki (MCB), Kendra Zwonitzer (MCB)