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Southern Illinois University
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EDUCATION

B.A., University of Wisconsin, Zoology
M.S., Syracuse University, Zoology/Sensory Communication
Ph.D., New York University, Biology/Neurobiology

PROFESSIONAL EXPERIENCE

Southern Illinois University School of Medicine, Springfield, IL, Distinguished Scholar and Res. Professor of Pharmacology & Surgery 2012-
Southern Illinois University School of Medicine, Springfield, IL, Distinguished Scholar and Professor of Pharmacology, 2004-2012

PROFESSIONAL SERVICE

Honors and Awards (see also invited symposia)

Founders Day Award, New York University, New York
Certificate of Merit, American Speech and Hearing Association
Advisor to the Committee on Hearing and Bioacoustics, National Academy of Science
Claude Pepper Award from the National Institute on Deafness and Other Communicative Disorders
Council Member, Association for Research in Otolaryngology
Member, Board of Directors, Center for Neural Communication Technology-University of Michigan
Nineteenth Outstanding Scholar, Southern Illinois University, 2003
Distinguished Scholar, Southern Illinois University, 2004
Sigma Xi Kaplan Research Award, 2005
Life Science Innovator, Illinois Biotechnology Industrial Organization-2006
Teacher of the Year, Southern Illinois University School of Medicine, 2009
Guest Editor: Special Issue of Hearing Research- *Aging and Hearing*, 2010
Board Member, Tinnitus Research Consortium, 2005-2016
Scientific Advisory Committee, American Tinnitus Association, 2005-2012

Membership in Professional Associations:

ASPET - American Society for Pharmacology and Experimental Therapeutics
Society for Neuroscience
Association for Research in Otolaryngology
Sigma Xi
American Tinnitus Association

Postdoctoral Fellows

M. J. Moore
 P.G. Finlayson
 P. Backoff
 R. Cai
 B.I. Kalappa

Doctoral Students

A. Raza
 P.S. Palombi
 J.C. Milbrandt
 T. Schatteman
 B. Richardson
 S. Sottile

Masters Students

S.D. Abbott

Visiting Graduate Students & Scholars

Daniel Duque Doncos; Nadia Pilati

Recent Research Activities in the Caspary Neurobiology Laboratory**Research Interest and Specialties:**

We have recently completed a series of studies examining the role of extrasynaptic GABA_A receptors in the auditory thalamus. We characterized the properties of the tonic currents mediated by these receptors using molecular neurochemistry and slice recordings from adult and aged auditory thalamus. We found a profound age-related loss in the number and function of extrasynaptic GABA_A receptors. Surprisingly we found an increase in the sensitivity of these receptors in animal models of tinnitus. These tinnitus results, supported the thalamocortical dysrhythmia hypothesis underpinning tinnitus pathology at the level of thalamus. Recordings from awake rat auditory thalamus showed increased spontaneous activity and increased sound-evoked activity in neurons in MGB of animals with tinnitus. Many tinnitus-related response changes correlated directly with the tinnitus score of the individual animal. Animals showing more tinnitus, showed more bursting and more spontaneous activity, etc.

More recently our work has focused on cholinergic inputs to the auditory thalamus. When a signal is difficult to detect or unusual, brainstem cholinergic neurons are activated by descending pathways from the auditory cortex and the hippocampus. The present studies are attempting to identify the location and age-related changes of nicotinic cholinergic receptors in the auditory thalamus.

In addition, understanding the role of bottom-up and top-down processing of acoustic information is critical to understanding age-related loss of speech understanding. Collectively these studies of plasticity in models of tinnitus and aging use both *in vitro* and *in vivo* electrophysiologic methods with a range of molecular neurochemical and imaging techniques to address these important neuroscience questions.

Grants Received (Active):

DOD-Congressionally Directed Medical Research Programs; PR180160 - *Nicotinic Receptor Pathology in Tinnitus: Auditory Cortex and Selective Desensitizing Nicotinic Agents*, \$391,754 ADC, 9/1/19 – 8/31/22
 Principal Investigator

National Institutes of Health NIDCD, RO1 DC00151- *Coding in Auditory Neurons: Effects of Amino Acids*, \$1,600,000, 12/1/15 - 11/31/20, Principal Investigator (Years 33-38)

Office of Naval Research, *Targeting attentional mechanisms in tinnitus*, \$879,325, 4/22/16 - 4/21/19, Principal Investigator

PUBLICATIONS

Articles in Professional Journals:

Caspary, D.M.: Classification of Subpopulations of Neurons in the Cochlear Nuclei of the Kangaroo Rat. Exp. Neurol., 37:131-151, 1972, PMID: 5077556.

Faingold, C.L. and D.M. Caspary: Changes in Reticular Formation Unit Response Patterns Associated with Pentylentetrazol-Induced Enhancement of Sensory Evoked Responses. Neuropharmacology, 16:143-147, 1977, PMID: 840372.

Rupert, A.L., D.M. Caspary and G. Moushegian: Response Characteristics of Cochlear Neurons to Vowel Sounds. Ann. Otol. Rhinol. Laryngol., 63:37-49, 1977, PMID: 835971.

Caspary, D.M., A.L. Rupert and G. Moushegian: Neuronal Coding of Vowel Sounds in the Cochlear Nuclei. Exp. Neurol., 54:414-431, 1977, PMID: 844520, PMID: 844520.

Faingold, C.L. and D.M. Caspary: Frequency Following Responses in Primary Auditory and Reticular Formation Structures: Alteration of Response Components with Masking and Pentobarbital. Electroenceph. Clin. Neurophysiol., 47:12-20, 1979, PMID: 88357.

Caspary, D.M., D.C. Havey and C.L. Faingold: Effects of Microiontophoretically Applied Glycine and GABA on Neuronal Response Patterns in the Cochlear Nuclei. Brain Res., 172:179-185, 1979, PMID: 466463.

Havey, D.C. and D.M. Caspary: A Simple Technique for Constructing "Piggy-Back" Multibarrel Microelectrodes. Electroenceph. Clin. Neurophysiol., 48:249-251, 1980, PMID: 615334.

Caspary, D.M., D.C. Havey and C.L. Faingold: Glutamate and Aspartate: Alteration in Threshold and Response Patterns of Auditory Neurons. Hearing Res., 4:325-333, 1981, PMID: 6267001.

Faingold, C.L., W.E. Hoffmann and D.M. Caspary: On the Site of Pentylentetrazol-Induced Enhancement of Auditory Responses of the Reticular Formation: Localized Cooling and Electrical Stimulation Studies. Neuropharmacology, 22:961-970, 1983, PMID: 6621826.

Moore, M.J. and D.M. Caspary: Strychnine Blocks Binaural Inhibition in Lateral Superior Olivary Neurons. J Neuroscience., 3:237-242, 1983, PMID 6822858.

Faingold, C.L., W.E. Hoffmann and D.M. Caspary: Bicuculline-Induced Enhancement of Sensory Responses and Cross-Correlations between Reticular Formation and Cortical Neurons. Electroenceph. Clin. Neurophysiol., 55:301-313, 1983, PMID: 6186462.

Caspary, D.M. and D.C. Havey: Effects of Acetylcholine on Cochlear Nucleus Neurons. Exp. Neurol., 82:491-498, 1983, PMID: 6628633.

Faingold, C.L., W.E. Hoffmann and D.M. Caspary: Effects of Iontophoretic Application of Convulsants on the Sensory Responses of Neurons in the Brain Stem Reticular Formation. Electroenceph. Clin. Neurophysiol., 58:55-64, 1984, PMID: 6203703.

Caspary, D.M., L. Rybak and C.L. Faingold: Baclofen Reduces Tone-Evoked and Spontaneous Activity of Cochlear Nucleus Neurons. Hearing Res., 13:113-122, 1984, PMID: 6325378.

Faingold, C.L., W.E. Hoffmann and D.M. Caspary: Mechanisms of Sensory Seizures: Brain-Stem Neuronal Response Changes and Convulsant Drugs. Fed. Proc., 44:2436-2441, 1985, PMID: 3886431.

Faingold, C.L., W.E. Hoffmann and D.M. Caspary: Comparative Effects of Convulsant Drugs on Sensory Responses of Neurons in the Amygdala and Reticular Formation. Neuropharmacology, 12:1221-1230, 1985, PMID: 4094658.

Faingold, C.L., M.A. Travis, G. Gehlbach, W.E. Hoffmann, P.C. Jobe, H.E. Laird and D.M. Caspary: Neuronal Response Abnormalities in the Inferior Colliculus of the Genetically Epilepsy Prone Rat. Electroenceph. Clin. Neurophysiol., 63:296-305, 1986, PMID: 2419087.

Faingold, C.L., G. Gehlbach and D.M. Caspary: Decreased Effectiveness of GABA-Mediated Inhibition in the Inferior Colliculus of the Genetically Epilepsy-Prone Rat. Exp. Neurol., 93:145-159, 1986, PMID: 3732456.

Faingold, C.L., G. Gehlbach, M.A. Travis and D.M. Caspary: Inferior Colliculus Neuronal Response Abnormalities in Genetically Epilepsy-Prone Rats: Evidence for a Deficit of Inhibition. Life Sci., 39:869-878, 1986, PMID: 3747711.

Caspary, D.M., K.E. Pazara, M. Kössl and C.L. Faingold: Strychnine Alters the Fusiform Cell Output from the Dorsal Cochlear Nucleus. Brain Res., 417:273-282, 1987, PMID: 3651816.

Finlayson, P.G. and D.M. Caspary: Synaptic Potentials of the Principal Cells of the Chinchilla Lateral Superior Olivary Nucleus. Hearing Res., 38:221-228, 1989, PMID: 254013.

Faingold, C.L., W.E. Hoffmann and D.M. Caspary: Effects of Iontophoresis of Agents Affecting the Action of Excitant Amino Acids on the Acoustic Responses of Neurons in the Inferior Colliculus. Hearing Res., 40:127-136, 1989, PMID: 2570054.

Gates, G.A., D.M. Caspary, W. Clark, H.C. Pillsbury, S.C. Brown and R.A. Dobie: Presbycusis, Invitational Geriatric Otorhinolaryngology Workshop, Otolaryngology, Head and Neck Surgery, 100:266-271, 1989, PMID.

Caspary, D.M. and C.L. Faingold: Non-NMDA Receptors May Mediate Ipsilateral Excitation at LSO Principal Cell Synapses. Brain Res., 503(1):83-90, 1989.

Faingold, C. L., G. Gehlbach and D.M. Caspary: On the Role of GABA as an Inhibitory Neurotransmitter in Inferior Colliculus Neurons: Iontophoretic Studies. Brain Res., 500(1):302-312, 1989.

Caspary, D.M., A. Raza, B.A. Lawhorn-Armour, J. Pippen and S.P. Arneric: Immunocytochemical and Neurochemical Evidence for Age-related Loss of GABA in the Inferior Colliculus: Implications for Neural Presbycusis. J Neurosci., 10(7):2363-2372, 1990.

Faingold, C.L., C. Boersma Anderson and D.M. Caspary: Involvement of GABA in Acoustically-Evoked Inhibition in Inferior Colliculus Neurons. Hearing Res., 52:201-216, 1991.

Finlayson, P.G. and D.M. Caspary: Low Frequency Neurons in the Lateral Superior Olive Exhibit Phase-Sensitive Binaural Inhibition. Neurophysiol., 65(3):598-605, 1991.

Palombi, P.S. and D.M. Caspary: GABA_A Receptor Antagonist Bicuculline Alters Response Properties of Posteroventral Cochlear Nucleus Neurons. J Neurophysiol., 67:738-746, 1992.

Finlayson, P.G. and D.M. Caspary: Excitatory and Inhibitory Response Properties In Young and Old Fisher-344 Rat Lateral Superior Olivary Nucleus. Neurobiol. of Aging, 14:127-139, 1993.

Backoff, P.M. and D.M. Caspary: Age-Related Changes in Auditory Brainstem Responses in F-344 Rats: Effects of Rate and Intensity. Hearing Res., 73:163-172, 1994.

Palombi, P.S., P.M. Backoff and D.M. Caspary: Paired Tone Facilitation in Dorsal Cochlear Nucleus Neurons: A Short Term Potentiation Model Testable *In Vivo*. Hearing Res., 75:175-183, 1994.

Raza, A., S.P. Arneric, J. Milbrandt and D.M. Caspary: Age-Related Changes in Brainstem Auditory Neurotransmitters: Measures of GABA and Acetylcholine Function. Hearing Res., 77:221-230, 1994.

- Evans, M.S., K.E. Viola-McCabe, D.M. Caspary and C.L. Faingold: Loss of Synaptic Inhibition During Repetitive Stimulation in Genetically Epilepsy-Prone Rats (GEPR). Epilepsy Res., 18:97-105, 1994.
- Milbrandt, J. C., R. L. Albin and D.M. Caspary. Age-related Decrease in GABA_B Receptor Binding in the Fischer-344 Rat Inferior Colliculus. Neurobiol. Aging, 15(6):699-703, 1994. PMID: 7891824.
- Nakayama, M., R.H. Helfert, H.R. Konrad and D.M. Caspary: Scanning Electron Microscopic Evaluation of Age-Related Changes in the Rat Vestibular Epithelium. Otolaryngol. Head and Neck Surg, 111:799-806, 1994. PMID: 7991262.
- Caspary, D.M., P.M. Backoff, P.G. Finlayson and P.S. Palombi: Inhibitory Inputs Modulate Discharge Rate within Frequency Receptive Fields of Anteroventral Cochlear Nucleus Neurons. J Neurophysiol, 72(5):2124-2133, 1994. PMID: 7884448.
- Milbrandt, J. C. and D.M. Caspary: Age-Related Reduction of [3H] Strychnine Binding Sites in the Cochlear Nucleus of the Fisher 344 Rat. Neuroscience, 67(3):713-719, 1995. PMID: 7675197.
- Caspary, D.M., J.C. Milbrandt and R.H. Helfert: Central Auditory Aging: GABA Changes in the Inferior Colliculus. Experimental Gerontology, 30 (3/4):349-360, 1995. PMID: 7556513.
- Palombi, P.S. and D.M. Caspary: GABA Inputs Control Discharge Rate Primarily Within Frequency Receptive Fields of Inferior Colliculus Neurons. J Neurophysiol., 75(6):2211-2219, 1996. PMID: 8793735.
- Milbrandt, J.C., R. L. Albin, S. M. Turgeon and D. M. Caspary: GABA_A Receptor Binding in the Aging Rat Inferior Colliculus, Neuroscience, 73(2) 449-458, 1996. PMID: 8783261.
- N'Gouemo, P., D.M. Caspary and C.L. Faingold: Decreased GABA effectiveness in inferior colliculus neurons during ethanol withdrawal in rats susceptible to audiogenic seizures. Brain Res., 724(2):200-204, 1996. PMID: 8828569.
- Palombi, P.S. and D.M. Caspary: Physiology of the Aging Fisher 344 Rat Inferior Colliculus: Responses to Contralateral Monaural Stimuli. J Neurophysiol., 76(5):3114-3125, 1996. PMID: 8930259.
- Palombi, P.S. and D.M. Caspary: Physiology of the Young Adult Fisher 344 Rat Inferior Colliculus: Responses to Contralateral Monaural Stimuli. Hearing Res., 100:41-58, 1996. PMID: 8922979.
- Palombi, P.S. and D.M. Caspary: Responses of Young and Aged Fischer 344 Rat Inferior Colliculus Neurons to Binaural Tonal Stimuli. Hearing Res., 100:59-67, 1996. PMID: 8922980.
- Milbrandt, J.C., C. Hunter and D.M. Caspary: Alterations of GABA_A Receptor Subunit mRNA Levels in the Aging Fischer 344 Rat Inferior Colliculus. J Comp. Neurol, 379:455-465, 1997. PMID: 9067836.
- Willott, J.F., J.C. Milbrandt, L. Seegers Bross and D.M. Caspary: Glycine Immunoreactivity and Receptor Binding in the Cochlear Nucleus of C57BL/6J and CBA/CaJ Mice: Effects of Cochlear Impairment and Aging. J Comp. Neurol., 385:405-414, 1997. PMID: 9300767.
- Backoff, P.M., P.S. Palombi and D.M. Caspary: Glycinergic and GABAergic Inputs Affect Short-term Suppression in the Cochlear Nucleus Hearing Res., 110(1-2):155-163, 1997. PMID: 9282898.
- Krenning, J., L.F. Hughes, D.M. Caspary and R.H. Helfert: Age-related glycine receptor subunit changes in the cochlear nucleus of Fischer-344 rats. Laryngoscope, 108(1):26-31, 1998. PMID: 9432062.
- Nakayama, M., D.M. Caspary, H.R. Konrad, J.C. Milbrandt and R.H. Helfert: Age-Related Changes in [3H] Strychnine Binding in the Vestibular Nuclei of Rats. Hearing Res., 127:103-107, 1999. PMID: 9925021.
- Caspary, D.M., T.M. Holder, J.C. Milbrandt, R. McKernan, D.K. Naritoku: Age-Related Changes in GABA_A Receptor Subunit Composition and Function in the Rat Auditory System. Neuroscience, 93(1):307-312, 1999. PMID: 10430494.

- Abbott, S. D., L.F. Hughes, C.A. Bauer, R.J. Salvi and D.M. Caspary: Detection of Glutamic Acid Decarboxylase Isoforms in Rat Inferior Colliculus Following Acoustic Exposure. Neuroscience, 93:1375-1381, 1999. PMID: 10501462.
- Backoff, P.M., P.S. Palombi, D.M. Caspary: GABAergic and glycinergic inputs shape coding of amplitude modulation in the chinchilla cochlear nucleus. Hearing Res., 134:77-88, 1999. PMID: 10452378.
- Wang, J., D.M. Caspary and R.J. Salvi: GABA_A Antagonist Causes Dramatic Expansion of Tuning in Primary Auditory Cortex. Neuroreport., 57:1137-1139, 2000. PMID: 10790896.
- Mossop, J.E., M. Wilson, D.M. Caspary and D.R. Moore: Down-Regulation of Inhibition Following Unilateral Deafening. Hearing Res., 147:183-187, 2000. PMID: 10962184.
- Milbrandt, J.C., T.M. Holder, M.C. Wilson, R.J. Salvi and D.M. Caspary: GAD Levels and Muscimol Binding in Rat Inferior Colliculus Following Acoustic Trauma. Hearing Res., 147:251-260, 2000. PMID: 10962189.
- Bauer, C.A, T.J. Brozoski, T.M. Holder and D.M. Caspary: Effects of chronic salicylate on GABAergic activity in rat inferior colliculus. Hearing Res., 147:175-182, 2000. PMID: 10962183.
- Palombi, P.S, P.M. Backoff and D.M. Caspary: Responses of young and aged rat inferior colliculus neurons to sinusoidally amplitude modulated stimuli. Hearing Res., 153:174-180, 2001. PMID: 11223307.
- Brozoski, T.J, C.A. Bauer and D.M. Caspary: Elevated Fusiform Cell Activity in the Dorsal Cochlear Nucleus of Chinchillas with Psychophysical Evidence of Tinnitus. J Neuroscience, 22(6):2383-90, 2002. PMID: 11896177.
- Wang, J., S.L. McFadden, D.M. Caspary and R.J. Salvi: Gamma-Aminobutyric Acid Circuits Shape Response Properties of Auditory Cortex Neurons. Brain Res., 944:219-231, 2002. PMID: 12106684.
- Caspary, D.M, P.S. Palombi and L.F. Hughes: GABAergic Inputs Shape Responses to Amplitude Modulated Stimuli in the Inferior Colliculus. Hearing Res., 68:163-173, 2002. PMID: 12117518.
- Turner, J.G., L.F. Hughes and D.M. Caspary: Divergent Response Properties of Layer V Neurons in Rat Primary Auditory Cortex. Hearing Res., 202:129-140, 2005. PMID: 15811705.
- Turner, J.G., J.L. Parrish, L.F. Hughes, L.A. Toth and D.M. Caspary: Hearing in Laboratory Animals: Strain Differences and Non-Auditory Affects of Noise. Comparative Medicine, 55:12-23, 2005. PMID: 15766204.
- Ling, L.L., L.F. Hughes and D.M. Caspary: Aged-Related Loss of the GABA Synthetic Enzyme glutamic acid decarboxylase in Rat Primary Auditory Cortex. Neuroscience, 132:1103-1113, 2005. PMID: 15857714.
- Turner, J.G., L.F. Hughes and D.M. Caspary: Effects of Aging on Receptive Fields in Rat Primary Auditory Cortex Layer V Neurons. J.Neurophysiol., 94:2738-2747, 2005. PMID: 16000522.
- Caspary, D.M., T.A. Schatteman and L.F. Hughes: Age-Related Loss of Response Inhibition in Rat Dorsal Cochlear Nucleus. J. Neuroscience, 23;25(47):10952-10959, 2005.
- Brozoski, T.J., D.M. Caspary and C.A. Bauer: Marking multi-channel silicon-substrate electrode recording sites using radiofrequency lesions. J. Neuroscience Methods, 150:185-191, 2006. PMID: 16095715.
- Turner, J.G., T.J. Brozoski, C.A. Bauer, J.L. Parrish, K. Myers, L.F. Hughes and D.M. Caspary: Rapid Tinnitus Screening in Rats Behavioral. Neuroscience., 120:188-195, 2006.
- Caspary, D.M., L.F. Hughes, T.A. Schatteman and J.G. Turner: Age-Related Changes in the Response Properties of Cartwheel Cells in Rat Dorsal Cochlear Nucleus. Hearing Res., 217:207-215. 2006. PMID: 16644158.

- Bauer, C.A., J.G Turner, D.M. Caspary, K.S. Myers and T.J. Brozoski: Tinnitus and inferior colliculus activity in chinchillas with three distinct patterns of cochlear trauma. J Neuroscience Res., 86(11):2564-2578, 2008. PMID: 18438941.
- Caspary, D.M., L.L. Lynne, J.G. Turner and L.F. Hughes: Inhibitory Neurotransmission, Plasticity and Aging in the Mammalian Central Auditory System. J Exp Biol., 211(Pt 11):1781-91. 2008. PMID: 18490394.
- Schatteman T.A., L.F. Hughes and D.M. Caspary: Aged-related loss of temporal processing: altered responses to amplitude modulated tones in rat dorsal cochlear nucleus. Neuroscience, 154(1):329-337, 2008. PMID: 18384967.
- Wang, H.N., L.L. Ling, T.J. Brozoski, J.G. Turner, L.F. Hughes, D.M. Caspary: Age-Related Changes in Glycine Receptor Subunit Composition and Binding in Dorsal Cochlear Nucleus. Neuroscience, 160(1):227-39, 2009. PMID: PMC19217931.
- Wang, H.N., T.J. Brozoski, J.G. Turner, L.L. Ling, J.L. Parrish, L.F. Hughes and D.M. Caspary: Plasticity at Glycinergic Synapses in the Dorsal Cochlear Nucleus of Rats with Behavioral Evidence of Tinnitus. Neuroscience, 2009 Dec 1;164(2):747-59, 2009 PMID: 19699270.
- Hughes L.F., J.G. Turner J.L. Parrish and D.M. Caspary: Processing of Broadband Stimuli Across A1 Layers in Young and Aged Rats. Hear Res., Jun 1;264 (1-2):79-85, 2010, PMID: 19772906.
- Brozoski T.J., D.M. Caspary, C.A. Bauer and B.D. Richardson: The Effects of Supplemental Dietary Taurine on Tinnitus and Auditory Discrimination. epub, Hearing Research, 2010, PMID: 20868734.
- Roberts LE, J.J. Eggermont, D.M. Caspary, S.E. Shore, J.R. Melcher and J.A. Kaltenbach: Ringing ears: the neuroscience of tinnitus. J Neuroscience., 2010 Nov 10;30(45):14972-9. Review, PMID: 21068300.
- Wang H., T.J. Brozoski, L. Ling, L. F. Hughes and D.M. Caspary: Impact of Sound Exposure and Aging on Brain Derived Neurotrophic Factor and TrkB Receptor Levels in Dorsal Cochlear Nucleus 80 Days Following Sound Exposure. Neuroscience, Jan 13;172:453-9, 2011 PMID: 21034795.
- Richardson, B.D., L.L. Ling, V.V. Uteshev and D.M. Caspary: Extrasynaptic GABA_A receptors and tonic inhibition in rat auditory thalamus. PLoS One., 2011 Jan 26;6(1):e16508. PMID: 21298071.
- Wang H., T.J. Brozoski and D.M. Caspary: Inhibitory Neurotransmission in Animal Models of Tinnitus: Maladaptive Plasticity. Hear Res., 2011 Sep;279 (1-2):111-7. Epub 2011 Apr 21. PMID: 21527325.
- Richardson, B.D., T.J. Brozoski, L.L. Ling and D.M. Caspary: Targeting inhibitory neurotransmission in tinnitus. Brain Res., Nov. 2012, 1485:77–87. Epub 2012 Feb 14. PMID: 2012.02.014.
- Turner, J.G., J.L. Parrish, L. Zuiderveld, S. Darr, L.F. Hughes, D.M. Caspary, E. Idrezbegovic and B. Canlon: Acoustic Experience Alters the Aged Auditory System. Ear & Hearing Ear, 18 October 2012 PMID: 23086424.
- Llano, D.A., J.G. Turner and D.M. Caspary: Diminished Thalamocortical Inhibition in an Aging Mouse model of Chronic Tinnitus., J Neuroscience., 2012 Nov 14;32(46):16141-8. PMID: 23152598.
- Caspary, D.M., L.F. Hughes and L.L. Ling: Age-Related GABA_A Subunit Changes in Rat Primary Auditory Cortex. Neurobiol Aging. 34 (2013), pp. 1486-1496 DOI information: 10.1016/Neurobiolaging. 2012.11.009 .
- Richardson, B.D., L.L. Ling, V.V. Uteshev and D.M. Caspary: Reduced GABA_A receptor-mediated tonic inhibition in aged rat auditory thalamus. J Neuroscience, 2013 Jan 16;33(3):1218-27a. PMCID: PMC3717293.
- Richardson B.D., K.E. Hancock and D.M. Caspary: Stimulus-specific adaptation in auditory thalamus of young and aged awake rats. J Neurophysiol., 2013 Oct;110(8):1892-902. Epub 2013 Jul 31. PMCID: PMC3798939.

- Duque D., M.S. Malmierca and D.M. Caspary: Modulation of stimulus-specific adaptation by GABAA receptor activation or blockade in the medial geniculate body of the anaesthetized rat. *J Physiol.*, 2014 Feb 15; 592(Pt 4):729-43. Epub 2013 Oct 7. PMID: PMC3934711.
- Cai, R., B.I. Kalappa, T.J. Brozoski, L.L. Lynne and D.M. Caspary: GABA Neurotransmission Enhanced in Auditory Thalamus Relative to Inferior Colliculus? *J Neurophysiol.*, 2014 Jan; 111(2):229-38. doi: 10.1152/jn.00556.2013. Epub 2013 Oct 23. PMID: 24155003.
- Henry, J.A., L.E. Roberts, D.M. Caspary, S.M. Theodoroff and R.J. Salvi: Underlying Mechanisms of Tinnitus: Review and Clinical Implications. *J Am Acad Audiol.* 2014 Jan; 25(1):5-22; quiz 126. doi: 10.3766/jaaa.25.1.2. PMID: 24622858.
- Kalappa B.I., T.J. Brozoski, J.G. Turner and D.M. Caspary: Single-unit hyperactivity and bursting in the auditory thalamus of awake rats directly correlates with behavioral evidence of tinnitus. *J Physiol.*, 2014 Nov 15; 592 (Pt 22):5065-78. doi: 10.1113/jphysiol.2014.278572. Epub 2014 Sep 12. PMID: 25217380.
- Cai, R., B.I. Kalappa, T.J. Brozoski, L.L. Lynne and D.M. Caspary: GABA Neurotransmission Enhanced in Auditory Thalamus Relative to Inferior Colliculus? *J Neurophysiol.*, 2014 Jan; 111(2):229-38. doi: 10.1152/jn.00556.2013. Epub 2013 Oct 23.
- Henry, J.A., L.E. Roberts, D.M. Caspary, S.M. Theodoroff and R.J. Salvi: Underlying Mechanisms of Tinnitus: Review and Clinical Implications. *J Am Acad Audiol.*, 2014 Jan; 25(1):5-22. doi: 10.3766/jaaa.25.1.2. Epub 2014. PMID: 24622858.
- Cai R., D.M. Caspary: GABAergic inhibition shapes SAM responses in rat auditory thalamus. *Neuroscience*, 2015 Jul 23; 299:146-55. doi: 10.1016/J.Neuroscience, 2015.04.062. Epub 2015 May 2.
- Sametsky EA, J.G. Turner, D.L. Larsen, L.L. Ling and D.M. Caspary: Enhanced GABAA-Mediated Tonic Inhibition in Auditory Thalamus of Rats with Behavioral Evidence of Tinnitus. *J Neuroscience*, 2015 June; 35(25):9369–9380. DOI:10.1523/JNEUROSCI.5054-14. 2015
- Stebbing K.A., C.W. Hyun, A. Ravindra, D.M. Caspary, J.G. Turner and D.A. Llano: Aging-related Changes in GABAergic Inhibition in the Mouse Auditory Cortex, Measured using In Vitro Flavoprotein Autofluorescence Imaging. *J Physiol.*, 2016 Jan 1;594(1):207-21. doi: 10.1113/JP271221. Epub 2015 Dec 14.
- Llano DA, D.M. Caspary: Auditory Thalamic Circuits and GABA_A Receptor Function: Putative Mechanisms in Tinnitus Pathology. *Hear Res.* 2016 Aug 21. pii: S0378-5955(16)30213-1.
- Cai R, B.D. Richardson and D.M. Caspary: Responses to Predictable vs. Random Temporally Complex Stimuli from Single Units in Auditory Thalamus: Impact of Aging and Anesthesia, *J Neurosci.* 2016 Oct 12;36(41):10696-10706.
- Sottile SY, Hackett TA, Cai R, Ling L, Llano DA, Caspary DM. Presynaptic Neuronal Nicotinic Receptors Differentially Shape Select Inputs to Auditory Thalamus and Are Negatively Impacted by Aging. *J Neurosci.* 2017 Nov 22;37(47):11377-11389. doi: 10.1523/JNEUROSCI.1795-17.2017. Epub 2017 Oct 23. PubMed PMID: 29061702.
- Cai R, Montgomery SC, Graves KA, Caspary DM, Cox BC. The FBN rat model of aging: investigation of ABR waveforms and ribbon synapse changes. *Neurobiol Aging.* 2017 Oct 9;62:53-63. doi: 10.1016/j.neurobiolaging.2017.09.034. [Epub ahead of print] PubMed PMID: 29107847.
- Sottile SY, Ling L, Cox BC, Caspary DM. Impact of ageing on postsynaptic neuronal nicotinic neurotransmission in auditory thalamus. *J Physiol.* 2017 Aug 1;595(15):5375-5385. doi: 10.1113/JP274467. Epub 2017 Jul 7. PubMed PMID: 28585699; PubMed Central PMCID: PMC5538226.
- Brozoski TJ, Wisner K, Randall M, Caspary DM. Chronic Sound-induced Tinnitus and Auditory Attention in Animals. *In Press Neuroscience 2019 Neuroscience.* 2018 Oct 18. pii: S0306-4522(18)30676-6. doi: 10.1016/j.neuroscience.2018.10.013. [Epub ahead of print] PMID:30342202

