

Taekwan Lee, Ph.D.

Principal Researcher
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EDUCATION

Yale University , New Haven, CT, USA	Ph.D. , Psychology, December 2006
Korea University , Seoul, South Korea	M.A. , Psychology, February 2000
Korea University , Seoul, South Korea	B.E. , Electrical Engineering, February 1998

RESEARCH EXPERIENCE

DaeguGyeongbuk Medical Innovation Foundation (DGMIF) – Laboratory Animal Center, Daegu, Korea
 (2013- present) Principal Researcher

- Investigate disease mechanisms & drug efficacy
- *In vivo* imaging using MRI, PET, SPECT & optical imaging equipment

Massachusetts Institute of Technology (MIT)–Biological Engineering, Cambridge, MA (2009 - 2013)
 Research Associate (P.I.: Alan Jasanoff, Ph.D.)

- Investigate spatiotemporal mapping of dopamine releases by deep brain stimulations using Dopamine sensitive MRI contrast agent in the rat
- Study serotonin reuptake mechanisms in the brain using a serotonin sensitive MRI contrast agent
- Validated and applied a novel zinc sensitive MRI contrast agent in the rodent brain, in collaboration with Prof. Steven Lippard's group in Chemistry Department
- Research chronic stress effects on the mouse brain using manganese enhanced MRI and diffusion tensor imaging, in collaboration with Prof. Ki Goosens in the Brain, Cognitive Science Department

University of Wisconsin-Milwaukee–Psychology, Milwaukee, WI (2007 - 2008)
 Research Associate (P.I.: Fred Helmstetter, Ph.D.)

- Published MRI study of chronic stress effects on volume changes in brain structures and adrenal gland of rats, in collaboration with Prof. Shi-Jiang Li at the Medical College of Wisconsin
- Explored brain activations related to fear memory in rats using BOLD imaging, in collaboration with Prof. Anthony Hudetz at the Medical College of Wisconsin

Yale University–Psychology (Behavioral Neuroscience), New Haven, CT (2001 - 2006)
 Ph.D. candidate (advisor: Allan Wagner, Ph.D. & Jeansok Kim, Ph.D.)

- Conducted functional MRI in the conscious rabbit to study brain mechanism of learning and memory, in collaboration with Prof. R. Todd Constable in Department of Diagnostic Radiology
- Investigated cerebellar mechanisms for bilateral eyeblink responses in the rabbit
- Studied differential effects of separate brain lesions on classical conditioning

Korea University, - Psychology (Physiological Psychology), Seoul, South Korea (1998 - 2000)
 M.A. candidate and researcher (advisor: Hyun-Taek Kim, Ph.D.)

- Diagnosed cerebellar dysfunction in transgenic mice, in collaboration with Prof. Hee-Sup Shin at Pohang University of Science and Technology
- Evaluated brain circuits for latent inhibition in eyeblink conditioning in the rat

MRI	Various $T1$, $T2$ & $T2^*$ -weighted MRI using gradient echo, fast spin echo, echo planar imaging, diffusion tensor imaging sequences using a Bruker 9.4 T magnet <i>In vivo</i> molecular imaging using MRI contrast agents $T2$ & $T2^*$ -weighted MRI using a Siemens 3T magnet Design and conduct structural and functional MRI experiments in small animals Maintenance & trouble-shooting MRI equipment and operation
Animal skills	Handling, restraint, surgery and drug injection (IP, IM, IV, and brain injection) in rodents and rabbits Create and update animal research protocols for Institutional Animal Care and Use Committee
Biochemistry	Expression and purification of proteins in <i>E.coli</i> , fluorescent immuno-histochemistry
Analysis	Analysis of MRI data using MRI software packages (AFNI & FSL) Statistical analysis of MRI, physiology and behavioral data using EXCEL, SPSS, LabVIEW and Matlab
Software & Hardware	Bruker Paravision 4 & 5 (Attend Paravision Operation & Application course from Bruker, November 2009) Program for hardware control and data acquisition with LabVIEW In-depth knowledge of experimental hardware and electronics Proficient in Linux commands and shell scripts
Communication	Publications of research in academic journals and oral presentations in professional conferences

SUPERVISORY EXPERIENCE

Supervise and instruct a technician to conduct MRI study in rodents at MIT (2010 – present)
Supervised a graduate student in stress project at the University of Wisconsin-Milwaukee (2007-2008)

PUBLICATIONS

- Lee, T., Zhang, X., Dhar, S., Faas, H., Lippard, S. J., & Jasanoff, A. (2010). *In vivo* imaging with a cell-permeable porphyrin-based MRI contrast agent. *Chemistry & Biology*, 17 (6), 665-673.
- Lee, T., Jarome, T., Kim, J. J., Li, S. J., & Helmstetter, F. J. (2009). Chronic stress selectively reduces hippocampal volume in rats: a longitudinal magnetic resonance imaging study. *Neuroreport*, 20 (17), 1554-8.
- Lee, T., Kim, J. J., & Wagner, A. R. (2009). Discriminative Conditioning With Different CS-US Intervals Produces Temporally Differentiated Conditioned Responses in the Two Eyes of the Rabbit (*Oryctolagus cuniculus*). *Behavioral Neuroscience*, 123 (5), 1085-1094.
- Lee, T., Kim, J. J., & Wagner, A. R. (2008). Bilateral Nature of the Conditioned Eyeblink Response in the Rabbit: Behavioral Characteristics and Potential Mechanisms. *Behavioral Neuroscience*, 122 (6), 1306-1317.
- Lee, T. & Kim, J. J. (2004). Differential Effects of Cerebellar, Amygdalar and Hippocampal Lesions on Classical Eyeblink Conditioning in Rats. *Journal of Neuroscience*. 24 (13), 2342-2350.

- Miyata, M., Kim, H. T., Hashimoto, K., **Lee, T. K.**, Cho, S. Y., Jiang, H., et al. (2001). Deficient long-term synaptic depression in the rostral cerebellum correlated with impaired motor learning in phospholipase C beta4 mutant mice. *European Journal of Neuroscience*, 13(10), 1945-1954.
- Lee, T. K.**, Kim, M. J., & Kim, H. T. (2000). Study of latent inhibition in eyeblink conditioning of the unrestrained albino rat. *Korean Journal of Biological and Physiological Psychology*, 12(1), 51-63.

PRESENTATIONS

- Lee, T.**, Cai, L., Jasanoff, A. (2012). Molecular level functional MRI of dopamine release in the ventral striatum. Gordon Research Conference: In vivo Magnetic Resonance.
- Lee, T.**, Shapiro, M., Westmeyer, G., et al. (2011). Functional molecular imaging in the brain using MRI contrast agents. TechConnect World Conference & Expo.
- Lee, T.** (2011). Bloodless fMRI: In Vivo Molecular Imaging of the brain Using MRI Contrast Agents. Neuroscience Research Institute in Gachon University of Medicine. (Invited Talk)
- Lee, T.** (2011). fMRI without BOLD: In Vivo MRI of Neuro-chemical Signaling Using Contrast Agents. Medical College in Seoul National University. (Invited Talk)
- Lee, T.**, Zhang, X., Dhar, S., Faas, H., Lippard, S. J., & Jasanoff, A. (2010). In vivo imaging with a cell-permeable porphyrin-based MRI contrast agent. Gordon Research Conference: In vivo Magnetic Resonance.
- Lee, T.** Molecular Neuro-Imaging with Zinc Dependent MRI Contrast Agent. (2009). Department of Psychology, Yale University. (Invited Talk)
- Lee, T.**, Zhang, X. A., Faas, H., Lippard, S. J., & Jasanoff, A. (2009). Molecular neuroimaging with a zinc-dependent MRI contrast agent. Annual conference of the Society for Neuroscience. (Oral Presentation)
- Lee, T.**, & Helmstetter, F.J. (2008). Plasticity in sensory pathways following Pavlovian fear conditioning: an fMRI study in the rat. Annual conference of the Society for Neuroscience.
- Helmstetter, F.J., **Lee, T.**, Jarome, T., Li, S. J., & Kim, J. J. (2008). Chronic stress selectively reduces hippocampal volumes in rats. Annual conference of the Society for Neuroscience.
- Lee, T.**, & Helmstetter, F.J. (2008). Plasticity in sensory pathways following Pavlovian fear conditioning: an fMRI study in the rat. Annual conference of the Pavlovian Society. (Oral Presentation)
- Lee, T.** & Wager, A. R. (2006). Differential timing of the lateralized conditioned eyeblink responses of the two eyes of the rabbit (*Oryctolagus cuniculus*). Annual conference of the Society for Neuroscience.
- Lee, T.** & Kim, J. J. (2003). Differential Effects of Cerebellar, Amygdalar, and Hippocampal Lesions on Classical Eyeblink Conditioning. Annual conference of the Society for Neuroscience.
- Lee, T.**, Han, J. S., Lee, H. J., & Kim, J. J. (2002). Selective Neurotoxin Lesions of the Basolateral and Central Amygdala Differentially Affect 22kHz Ultrasonic Vocalization of Rats in Fear Conditioning. Annual conference of the Society for Neuroscience.
- Lee, T. K.**, Kim, M. J., & Kim, H. T. (2000). The study of latent inhibition with the eyeblink conditioning of the albino rat. Korean psychology annual meeting.
- Lee, T. K.**, Chung, M. S., Kim, H. T., Kim, C., Jun, K., & Shin, H. S. (2000). Classical eyeblink conditioning of PLC β 4 mutant mice. Annual conference of the Society for Neuroscience.

SCHOLARSHIPS

- Yale University Dissertation Fellowship: 2005
 John F. Enders Fellowship: 2005
 Summer Program at RIKEN Brain Science Institute in Japan: 2004

PROFESSIONAL MEMBERSHIPS

Member of the Society for Neuroscience
Member of the Pavlovian Society