

## Taekwan Lee, Ph.D.

Principal Researcher  
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### EDUCATION

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

### RESEARCH EXPERIENCE

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**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

<b>MRI</b>	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
<b>Animal skills</b>	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
<b>Biochemistry</b>	Expression and purification of proteins in <i>E. coli</i> , fluorescent immuno-histochemistry
<b>Analysis</b>	Analysis of MRI data using MRI software packages (AFNI & FSL) Statistical analysis of MRI, physiology and behavioral data using EXCEL, SPSS, LabVIEW and Matlab
<b>Software &amp; Hardware</b>	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
<b>Communication</b>	Publications of research in academic journals and oral presentations in professional conferences

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## SUPERVISORY EXPERIENCE

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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)

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## PUBLICATIONS

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- 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

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- 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 $\beta$ 4 mutant mice. Annual conference of the Society for Neuroscience.

## SCHOLARSHIPS

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

## PROFESSIONAL MEMBERSHIPS

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Member of the Society for Neuroscience  
Member of the Pavlovian Society