

## Lee, Seung-Hee, Ph.D.

### Associate Professor

Department of Biological Sciences  
Korea advanced Institute of Science and Technology (KAIST)

### Associate Director

Center for Synaptic Brain Dysfunctions  
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### EDUCATION

2002.03–2007.08 Ph.D. in Biological Sciences/Neurobiology, Seoul National University, Seoul, Korea

1998.03–2002.02 B.S. in Biology Education, Seoul National University, Seoul, Korea

### POSITIONS and EMPLOYMENTS

2022.07–Present Associate Director, Center for Synaptic Brain Dysfunction, IBS

2018.03–Present Associate Professor, Department of Biological Sciences, KAIST

2013.09–2018.02 Assistant Professor, Department of Biological Sciences, KAIST

2009.02–2013.08 Postdoctoral fellow, University of California, Berkeley, HHMI

2007.09–2009.02 Postdoctoral fellow, Seoul National University

### OTHER EXPERIENCE

2022–2024 Program Committee, Society for Neuroscience, USA

2018 Visiting Professor, EPFL, Switzerland

2009 Selected trainee for Cold Spring Harbor Laboratory Summer Course, USA

2007 Selected trainee for RIKEN Neuroscience Summer Course, Japan

2004–2005 Adjunct Internship Student, New York University School of Medicine, NY, USA

2004 Visiting Researcher, Columbia University, NY, USA

### EDITORIAL BOARDS

2020–Present Editorial board, Frontiers in behavioral neuroscience

2017–Present Editorial board, Frontiers in neural circuits

2021–Present Editorial board, Molecules and Cells

2018–Present Editorial board, Experimental Neurobiology

### REVIEW EXPERIENCE

Nature, Nature Neuroscience, Nature Communications, Science Advances, Cell Reports, eLife, Journal of Neuroscience, Current Opinion in Neurobiology, eNeuro, Molecular Brain, Scientific Reports, Frontiers, PLOS ONE

### PROFESSIONAL MEMBERSHIP

2014–present Member, Korean Society for Cell Biology

2013–present Member, Korean Society for Biochemistry and Molecular Biology

2008–present Member, Society for Neuroscience

2005–present Member, Korean Society for Brain and Neural Science

2003–present Member, Korean Society for Molecular and Cellular Biology

## HONORS and AWARDS

- 2021 ALBA-Elsevier Award Lecture on Brain Sciences 2021
- 2019 The Blue Ribbon Lecturer, The Korean Society for Molecular and Cellular Biology
- 2017 Scitech Young Scientist Award, The Korean Society for Brain and Neural Science
- 2017 Outstanding Junior Faculty Travel Award, International Behavioral and Neural Genetics Society
- 2017 Selected appointment, Ewon Assistant Professor, KAIST
- 2016 30 Young Scientists of Korea Award in Life Sciences, POSTECH/Dong-A ILBO
- 2015 World Economic Forum, Young Scientist Award
- 2014 Japan Neuroscience Meeting Travel Award, Japan Neuroscience Society
- 2013 NARSAD Young Investigator Award, Brain & Behavior Research Foundation
- 2012 Selected Speaker with the Gatsby travel award, Cosyne (Computational and systems neuroscience meeting)
- 2010 Best Poster Presentation Award, Gordon Research Conference on Neurobiology of Cognition
- 2009 Selected Attendee for Cold Spring Harbor Course on Structure, Function & Development of the Visual System
- 2007 Best Research Paper Award, the 5th Year-End Symposium, Institute of Molecular Biology and Genetics, Seoul National University
- 2007 Selected Attendee for RIKEN summer lecture course
- 2007 10 Outstanding Scientists Award, Korean Ministry of Science & Technology
- 2007 Best Thesis Award, College of Natural Sciences, Seoul National University
- 2007 Special Seoul Science Fellowship, Seoul City Government
- 2006 Outstanding Research Award, Association of Korean Neuroscientists (AKN)
- 2006 Seoul Science Fellowship for Graduate Students in Science and Technology, Seoul City Government
- 2004 Individual Fellowship for International Cooperative Research Program, Korea Science and Engineering Foundation (M07-2003-000-20322-0)
- 2003 Best Poster Presentation Award, the 1st Year-End Symposium, Institute of Molecular Biology and Genetics, Seoul National University

## RESEARCH EXPERIENCES

### 2002.03–2009.02 **Molecular mechanism of learning and memory in *Aplysia***

- General molecular experiments and biochemical assays (gene cloning, western blot, EMSA, etc.)
- General cell biological experiments (mammalian cell culture, primary neuronal culture, immunocytochemistry, live-cell imaging)
- Intracellular recordings in cultured *Aplysia* neurons (measuring synaptic facilitation)

### 2009.03–2013.08 **Neural circuit mechanism of visual processing and perception in mice**

- *In vivo* extracellular recordings using a silicon-based multi-channel electrodes in V1
- Mapping receptive field properties of V1 neurons
- Optogenetic manipulation of cell-type-specific microcircuits in V1
- Measuring perceptual behaviors in head-fixed mice performing visual discrimination tasks
- Histology of the mouse brain tissues (immunohistochemistry)
- Genetic labeling and tracing neural circuits by using viral tracers
- Viral vector packaging (AAVs, pseudotyped rabies virus)

### 2013.09–present **Neural circuit mechanism of multisensory integration and modulation in mice**

- Behavioral measurements of mouse audio-visual perception (head-fixed, freely moving, running on the treadmill)
- *In vivo* extracellular recordings and *in vivo* calcium imaging
- Whole-brain tracing (using chemical and viral tracers) and optogenetic manipulations of brain circuits

## PUBLICATIONS (Peer-reviewed)

### (As the corresponding author)

#### -Research articles

- Jeon, Y.-S.\*, Jeong, D.\*, Kwon, H., Kim, J.-H., Kim, C.Y., Oh, Y., Lee, Y.-H., Kim, C.H., Kim, S.-G., Jeong, J.-W., Kim, E., **Lee, S.-H.** (2023) Adolescent parvalbumin expression in the left orbitofrontal cortex shapes sociability in female mice. **Journal of Neuroscience** (\*equal contribution) <https://doi.org/10.1523/JNEUROSCI.0918-22.2023> (Selected as Featured Research)
- Choi, I., **Lee, S.-H.** (2022) Reduced activity of parvalbumin-positive interneurons in the posterior parietal cortex causes visually dominant multisensory decisions in freely navigating mice. **Molecular Brain** 15, 82. <https://doi.org/10.1186/s13041-022-00968-x>
- Hong, M., Kim, M., Yoon, J., **Lee, S.-H.\***, Baik, M.-H.\*, Lim, M.H.\* (2022) Excited-state intramolecular hydrogen transfer of compact molecules controls amyloid aggregation profiles. **JACS Au**, 2, 2001-2012 (\*co-corresponding)
- Han, J., Yoon, J., Shin, J., Nam, E., Qian, T., Li, Y., Park, K.\*, **Lee, S.-H.\***, Lim, M.H.\* (2022) Conformational and functional changes of the native neuropeptide somatostatin occur in the presence of copper and amyloid- $\beta$ . **Nature Chemistry** <https://doi.org/10.1038/s41557-022-00984-3> (\*co-corresponding)
- Kim, J.-H., Ma, D.-H., Jung, E., Choi, I., **Lee S.-H.** (2021) Gated feedforward inhibition in the frontal cortex releases goal-directed action. **Nature Neuroscience** <https://doi.org/10.1038/s41593-021-00910-9>
- Hwang, Y.-S., Maclachlan, C., Blanc, J., Dubois, A., Petersen, C.C.H., Knott, G., **Lee S.-H.** (2020) 3D ultrastructure of synaptic inputs to distinct GABAergic neurons in the mouse primary visual cortex. **Cerebral Cortex**. <https://doi.org/10.1093/cercor/bhaa378>
- Song, Y.-H.\*, Hwang, Y.-S. \*, Kim, K. \*, Lee, H.-R. \*, Kim, J.-H., Maclachlan, C., Dubois, A., Jung, M.W., Petersen, C.C.H., Knott, G., Lee, S.-H., **Lee, S.-H.** (2020) Somatostatin enhances visual processing and perception by modulating excitatory inputs to the parvalbumin-positive interneurons in V1. **Science Advances** 6(17), eaaz0517. DOI: 10.1126/sciadv.aaz0517
- Song, Y.-H.\*, Kim, J.-H.\*, Jeong, H.-W., Choi, I., Jeong, D., Kim, K., **Lee, S.-H.** (2017) A neural circuit for auditory dominance over visual perception. **Neuron** 93, 940-954 (\*equal contribution)
- Kim, J.-H., Jung, A.-H., Jeong, D., Choi, I., Kim, K., Shin, S., Kim, S.J., **Lee, S.-H.** (2016) Selectivity of neuromodulatory projections from the basal forebrain and locus ceruleus to primary sensory cortices. **Journal of Neuroscience** 36, 5314-5327.

#### -Review articles

- Song, Y.-H.\*, Yoon, J.\*, **Lee, S.-H.** (2021) The role of neuropeptide somatostatin in the brain and its application in treating neurological disorders. **Experimental & Molecular Medicine**. 53, 328-338. <https://doi.org/10.1038/s12276-021-00580-4> (\*equal contribution)
- Crochet, S.\*, **Lee, S.-H.\***, Petersen, C.C.H.\* (2018) Neural circuits for goal-directed sensorimotor transformations. **Trends in Neuroscience** DOI: <https://doi.org/10.1016/j.tins.2018.08.011> (\*co-corresponding)
- Choi, I., Kim, J.-Y., **Lee, S.-H.** (2018) Bottom-up and top-down modulation of multisensory integration. **Current Opinion in Neurobiology** 52, 115-122
- Rho, H.-J., Kim, J.-H., **Lee, S.-H.** (2018) Function of selective neuromodulatory projections in the mammalian cerebral cortex: comparison between the cholinergic and noradrenergic systems. **Frontiers in Neural Circuits** doi: 10.3389/fncir.2018.00047
- Kim, K., Kim, J.-H., Song, Y.-H., **Lee, S.-H.** (2016) Functional dissection of inhibitory microcircuits in the visual cortex. **Neuroscience Research** DOI: <http://dx.doi.org/10.1016/j.neures.2016.09.003>

### (As the first author)

- Lee, S.-H.\***, Shim, J.\*, Cheong, Y.-H.\*, Choi, S.-L., Jun, Y.-W., Lee, S.-H., Chae, Y.-S., Han, J.-H., Lee, Y.-S., Lee, J.-A., Lim, C.-S., Si, K., Kassabov, S., Antonov, I., Kandel, E.R., Kaang, B.-K., Jang, D.-J.

- (2016) ApCPEB4, a non-prion domain containing homolog of ApCPEB, is involved in the initiation of long-term facilitation. **Molecular Brain** DOI: 10.1186/s13041-016-0271-x (\*equal contribution)
- Do, J.\*, Xu, M.\*, **Lee, S.-H.\***, Chang, W.C., Zhang, S., Chung, S., Young, T., Fan, J.L., Miyamichi, K., Luo, L., Dan, Y. (2016) Cell type-specific long-range connections of basal forebrain. **eLife** DOI: <http://dx.doi.org/10.7554/eLife.13214> (\*equal contribution)
- Lee, S.-H.**, Kwan, A.C., Dan, Y. (2014) Interneuron subtypes and orientation tuning. **Nature** 508, E1-2. (Brief Communications Arising)
- Lee, S.-H.**, Shim, J., Kaang, B.-K. (2013) The role of cell adhesion molecules (CAMs) in defining synapse-specific function and plasticity. **Animal Cells and Systems** 17, 1-6.
- Lee, S.-H.**, Dan, Y. (2012) Neuromodulation of brain states. **Neuron** 76, 209-222.
- Lee, S.-H.**, Shim, J., Choi, S.-L., Lee, N., Lee, C.-H., Bailey, C.H., Kandel, E.R., Jang, D.-J., Kaang, B. K. (2012) Learning-related synaptic growth mediated by internalization of *Aplysia* cell adhesion molecule is controlled by membrane PI(4,5)P<sub>2</sub> synthetic pathway. **Journal of Neuroscience** 32, 16296-16305.
- Lee, S.-H.**, Kwan, A.C., Zhang, S., Phoumthipphavong, V., Flannery, J.G., Masmanidis, S.C., Taniguchi, H., Huang, Z.J., Boyden, E.S., Deisseroth, K., and Dan, Y. (2012) Activation of specific interneurons improves V1 feature selectivity and visual perception. **Nature** 488, 379-383.
- Lee, S.-H.\***, Lim, C.-S.\* , Park, H.\* , Lee, J.-A., Han, J.-H., Kim, H., Cheang, Y.-H., Lee, S.-H., Lee, Y.-S., Ko, H.-G., Jang, D.-H., Kim, H., Miniaci, M.C., Bartsch, D., Kim, E., Bailey, C.H., Kandel, E.R., Kaang, B.-K. (2007) Nuclear translocation of apCAM-associated protein activates transcription for long-term facilitation in *Aplysia*. **Cell** 129, 801-812. (\*equal contribution)
- Lee, S.-H.**, Han, J.-H., Choi, J.-H., Huh, E.-Y., K, Y.K., Kaang, B.-K. (2003) Effect of brain-derived neurotrophic factor (BDNF) on neuriteogenesis and synaptic plasticity in *Aplysia* neurons and a hippocampal cell line HiB5. **Molecules and Cells** 15, 233-239.

**(As a co-author)**

- Choi, J.E., Choi, D.I., Lee, J., Kim, J., Kim, M.J., Hong, I., Jung, H., Sung, Y., Kim, J.-I., Kim, T., Yu, N.-K., **Lee, S.-H.**, Choe, H.K., Koo, J.W., Kim, J.-H., Kaang, B.-K. (2022) Synaptic ensembles between raphe and D1R-containing accumbens shell neurons underlie postisolation sociability in males. *Science Advances*. 8, 41. <https://doi.org/10.1126/sciadv.abo7527>
- Park, J., Choi, Y., Jung, E., **Lee, S.-H.**, Sohn, J., Chung, W.-S. (2021) Microglial MERTK eliminates phosphatidylserine-displaying inhibitory post-synapses. **EMBO** e107121, <https://doi.org/10.15252/embj.2020107121>
- Song, J.H., Choi, W., Song, Y.-H., Kim, J.-H., Jeong, D., **Lee, S.-H.**, Paik, S.-B. (2020) Precise mapping of single neurons by calibrated 3-D reconstruction of brain slices reveals topographic projection in mouse visual cortex. **Cell Reports** 31, 107682.
- Choi, Y., Park, H., Kang, S., Jung, H., Kweon, H., Kim, S., Choi, I., Lee, S.Y., Choi, Y.-E., **Lee, S.-H.**, Kim, E. (2019) NGL-1/LRRC4C-mutant mice display hyperactivity and anxiolytic-like behavior associated with widespread suppression of neuronal activity. **Frontiers in Molecular Neuroscience**. <https://doi.org/10.3389/fnmol.2019.00250>
- Jeon, S., Kim, J.-H., Lee, H., Kim, Y.-K., Jun S.B., **Lee, S.-H.**, Ji, C.-H. (2019) Multi-wavelength light emitting diode-based disposable optrode array for in vivo optogenetic modulation. **Journal of Biophotonics** DOI: <https://doi.org/10.1002/jbio.201800343>
- Kim, Y., Lim, S., Ha, T., Song, Y.-H., Sohn, Y.-I., Park, D.-J., Paik, S.-S., Kim-Kaneyama, J., Song, M.-R., Leung, A., Levine, E.M., Kim, I.-B., Goo, Y.S., **Lee, S.-H.**, Kang, K.H., Kim, J.W. (2017) The LIM protein complex establishes a retinal circuitry of visual adaptation by regulating Pax6 alpha-enhancer activity. **eLife** DOI: <http://dx.doi.org/10.7554/eLife.21303>.
- Shin, S., Kim, J.-H., Jeong, J., Gwon, T.M., **Lee, S.-H.**, Kim, S.J. (2017) Novel four-sided neural probe fabricated by a thermal lamination process of polymer films. **Journal of Neuroscience Methods** 278, 25-35. DOI: <http://dx.doi.org/10.1016/j.jneumeth.2016.12.017>
- Jun, Y.-W., **Lee, S.-H.**, Shim, J., Lee, J.-A., Lim, C.-S., Kaang, B.-K., Jang, D.-J. (2016) Dual roles of the

- N-terminal coiled-coil domain for an *Aplysia* sec7 protein: homodimer formation and nuclear export. **Journal of Neurochemistry** DOI: 10.1111/jnc.13875
- Kim, D., Jeong, H., Lee, J., Ghim, J.-W., Her, E.S., **Lee, S.-H.**, Jung, M.W. (2016) Distinct roles of parvalbumin- and somatostatin-expressing interneurons in working memory. **Neuron** DOI: <http://dx.doi.org/10.1016/j.neuron.2016.09.023>.
- Um, J.W., Choi, T.-Y., Kang, H., Cho, Y.S., Choi, G., Uvarow, P., Park, D., Jeong, D., Jeon, S., Lee, D., Kim, H., **Lee, S.-H.**, Bae, Y.-C., Choi, S.-Y., Airaksinen, M.S., Ko, J. (2016) LRRTM3 regulates excitatory synapse development through alternative splicing and neurexin binding. **Cell Reports** 14, 1-15.
- Pinto, L., Goard, M.J., Estandian, D., Xu, M., Kwan, A.C., **Lee, S.-H.**, Harrison, T.C., Feng, G., Dan, Y. (2013) Fast modulation of visual perception by basal forebrain cholinergic neurons. **Nature Neuroscience** 16, 1857-1863
- Park, A.Y., Chae, Y.S., **Lee, S.H.**, Kaang, B.K., Lee, S. (2013) Presynaptic structure of *Aplysia* single live neuron by atomic force and confocal laser scanning microscope. **Journal of Physical Chemistry B** 117, 4779-4788.
- Lee, Y.-S., Choi, S.-L., Jun, H., Yim, S.-J., Lee, J.-A., Kim, H.F., **Lee, S.-H.**, Shim, J., Lee, K., Jang, D.-J., Kaang, B.-K. (2012) AU-rich element-binding protein negatively regulates CCAAT enhancer-binding protein mRNA stability during long-term synaptic plasticity in *Aplysia*. **Proceedings of the National Academy of Science U S A** 109, 15520-15525.
- Park, J.W., Park, A.-Y., Lee, S., Yu, N.-K., **Lee, S.-H.**, Kaang, B.-K. (2010) Detection of TrkB receptors distributed in cultured hippocampal neurons through bioconjugation between highly luminescent (quantum dot-neutravidin) and (biotinylated anti-TrkB antibody) on neurons by combined atomic force microscope and confocal laser scanning microscope. **Bioconjugate Chemistry** 21, 597-603.
- Chae, Y.-S., **Lee, S.-H.**, Cheang, Y.-H., Lee, N., Rim, Y.-S., Jang, D.-J., Kaang, B.-K. (2010) Neuronal RNA granule contains ApCPEB1, a novel cytoplasmic polyadenylation element binding protein in *Aplysia* sensory neuron. **Experimental and Molecular Medicine** 42, 30-37.
- Lee, Y.-S., Choi, S.-L., **Lee, S.-H.**, Kim, H., Park, H., Lee, N., Lee, S.-H., Chae, Y.-S., Jang, D.-J., Kandel, E.R., Kaang, B.-K. (2009) Identification of a serotonin receptor coupled to adenylyl cyclase involved in learning-related heterosynaptic facilitation in *Aplysia*. **Proceedings of the National Academy of Science U S A** 106, 14634-14639.
- Lee, S.-H., Choi, J.-H., Lee, N., Lee, H.-R., Kim, J.-I., Yu, N.-K., Choi, S.-L., **Lee, S.-H.**, Kim, H., Kaang, B.-K. (2008) Synaptic protein degradation underlies destabilization of retrieved fear memory. **Science** 319, 1253-1256.
- Jang, D.-H., Han, J.-H., **Lee, S.-H.**, Lee, Y.-S., Park, H., Lee, S.-H., Kim, H., Kaang, B.-K. (2005) Cofilin expression induces cofilin-actin rod formation and disrupts synaptic structure and function in *Aplysia* synapses. **Proceedings of the National Academy of Science U S A** 102, 16072-16077.
- Park, H., Lee, J.-A., Lee, C.-H., Kim, M.-J., Chang, D.-J., Kim, H., **Lee, S.-H.**, Lee, Y.-S., Kaang, B.-K. (2005) An *Aplysia* type 4 phosphodiesterase homolog localized at the presynaptic terminals of *Aplysia* neuron and regulates synaptic facilitation. **Journal of Neuroscience** 25, 9307-9045.
- Li, W., Lee, J., Vikis, H.G., **Lee, S.-H.**, Liu, G., Aurandt, J., Sheng, T.L., Fearon, E.R., Guan, J.-L., Han, M., Rao, Y., Hong, K., Guan, K.-L. (2004) Activation of FAK and Src are receptor-proximal events required for Netrin signaling. **Nature Neuroscience** 7, 1213-1221.
- Chang, D.-J., **Lee, S.-H.**, Lim, C.-S., Jang, D.-H., Lee, C.-H., Lee, Y.-D., Kaang, B.-K. (2004) Thiol oxidation-mediated cell death in *Aplysia* cultured sensory neurons. **Brain Research** 1007, 71-77.
- Chang, D.-J., Lim, C.-S., **Lee, S.-H.**, Kaang, B.-K. (2003) Hydrogen peroxide modulates K<sup>+</sup> ion currents in cultured *Aplysia* neurons. **Brain Research** 970, 159-168.
- Akalal, D.G., Bottenstein, J.E., **Lee, S.-H.**, Han, J.-H., Chang, D.-J., Kaang, B.-K., Nagle, G.T. (2003) *Aplysia* mollusk-derived growth factor is a mitogen with adenosine deaminase activity and is expressed in the developing central nervous system. **Brain Research Molecular Brain Research** 117, 228-236.
- Huh, M.-J., Han, J.-H., Lim, C.-S., **Lee, S.-H.**, Kim, S.-H., Kim, E.-J., Kaang, B.-K. (2003) Regulation of neuritegenesis and synaptic transmission by msec7-1, a guanine nucleotide exchange factor, in

cultured *Aplysia* neurons. **Journal of Neurochemistry** 85, 282-285.

Lee, J.-A., Lim, C.-S., **Lee, S.-H.**, Kim, H., Nukina, N., Kaang, B.-K. (2003) Aggregate formation and the impairment of long-term synaptic facilitation by ectopic expression of mutant huntingtin in *Aplysia* neurons. **Journal of Neurochemistry** 85, 160-169.

### **PATENT (granted)**

Patent number: 10-2303540-0000 (09/13/21)

Title of the invention: Apparatus and method for measuring perceptual cognition in laboratory animals

Inventor: Seung-Hee Lee

Patent number: 10-2303540-0000 (12/03/21)

Title of the invention: Apparatus and method for training or measuring perceptual cognition in the influence of locomotion of laboratory animals

Inventor: Seung-Hee Lee

Patent number: 10-2303540-0000 (12/23/21)

Title of the invention: Automated system and method for behavior training and measuring of perceptual cognition in laboratory animal

Inventor: Seung-Hee Lee

### **ORAL PRESENTATIONS**

*(Invited talks at international meetings and seminars)*

2022.09.29. International Conference KSMCB 2022, Jeju, Korea

2022.08.31. ISN-APSN 2022 Meeting, Hawaii, USA

2022.07.13. FENS Forum 2022, ALBA-Elsevier Award Lecture on Brain Sciences, Paris, France

2022.05.20. The 25<sup>th</sup> Annual Meeting of the KSBNS, Incheon, Korea

2022.01.14. Northwestern University, Feinberg School of Medicine, Dept. Neuroscience (Virtual)

2021.12.06. MCCS 2021 Symposium (Virtual)

2021.07.29. Japan Neuroscience Society, Japan (Virtual)

2021.05.11. ALBA Webinar on gender issues in brain research in East and South-East Asia (Virtual)

2020.12.11. OIST neuroscience online seminars (ONOS), Japan (Virtual)

2020.11.05. AKN eTALK, USA (Virtual)

2020.09.18. NIPS Research Meeting 2020, Japan (Virtual)

2020.07. JNS, Kobe, Japan (Virtual)

2020.07. FENS, Glasgow, Scotland (Virtual)

2020.07.09. King's College London, UK (Virtual)

2019.09.25. CJK symposium at the IBRO meeting, Daegu, Korea

2019.09.20. MCCS-Asia Meeting, Seoul, Korea

2019.05.30. UK-Korea Research Conference, Kavli Royal Society International Centre, UK

2019.03.30. 9<sup>th</sup> FAOPS Congress, Kobe, Japan

2018.12.03. KAIST-Academia Sinica Joint Symposium, Taipei, Taiwan

2018.11.30. National Yang-Ming University, Taipei, Taiwan

2018.10.05. NPAS Seminar, Academia Sinica, Taipei, Taiwan

2018.10.03. 13<sup>th</sup> International Conference of Neurons and Brain Diseases, Taipei, Taiwan

2018.08.29. KAIST Symposium 'Metabolism, Circuit and Behavior', KAIST, Korea

2018.07.26. The 41<sup>st</sup> Annual Meeting of the Japan Neuroscience Society, Kobe, Japan

2018.07.13. Department of Brain and Cognitive Sciences, MIT, USA

2018.06.05. 24<sup>th</sup> IUBMB Congress & 15<sup>th</sup> FAOBMB Congress, Seoul, Korea

2018.05.23. BMI seminar, EPFL, Switzerland

2018.03.15. Department of Neuroscience, Johns Hopkins University, USA

2018.03.08. Special Neuroscience Talk, Department of Neuroscience, Yale University, USA

2018.03.06. Cosyne 2018 Workshop on 'Cortical circuits: functions and models of long-range.

- connections', USA
- 2017.11.13. Society for Neuroscience Mini-symposium on 'State-dependent cortical processing', USA
- 2017.10.31. The 48<sup>th</sup> International Symposium, National Institute for Physiological Sciences, Japan
- 2017.09.18. Neuromodulation of Neural Microcircuits (NM2), Blue Brain Conference, EPFL, Switzerland
- 2017.09.06. Brain Circuits Course 2017, Karolinska Institute, Sweden
- 2017.06.26. Kavli Frontiers of Science Symposia, Irvine, California, USA
- 2016.10.19. The 2<sup>nd</sup> KSSEA workshop on Bio Technology, Sweden
- 2016.04.14. The 2<sup>nd</sup> KAIST-EPFL Symposium, Lausanne, Switzerland
- 2016.04.12. Neurosciences Seminar, University of Geneva, Switzerland
- 2016.04.06. Department Seminar, New York University, School of Medicine, USA
- 2016.04.04. Department of Psychiatry, Yale University School of Medicine, USA
- 2016.02.26. The 4<sup>th</sup> IIS Symposium, University of Tsukuba, Japan
- 2016.02.25. The 74<sup>th</sup> WPI IIS Seminar, University of Tsukuba, Japan
- 2015.09.15. The 8<sup>th</sup> UK/Korea Symposium, Cambridge, UK
- 2015.08.27. Department of Neuroscience, Physiological Society, Karolinska Institute, Sweden
- 2015.07.29. The 38<sup>th</sup> Annual Meeting of the Japan Neuroscience Society, Japan
- 2014.10.22. Workshop Bionut, KI/STH, KTH/KAIST, Karolinska Hospital, Huddinge, Sweden
- 2014.09.10. RIKEN BSI symposium, Japan
- 2014.09.09. National Institute of Physiological Sciences, Japan

*(Selected talks at international conferences)*

- 2022.11.14. SfN Neuroscience 2022 nanosymposium (selected as a talk, presented by a graduate student 'Jiwon Yoon')
- 2022.09.05. Keystone Symposia 'Neurocircuitry of Social Behavior' (selected as a short talk, presented by a graduate student 'Yi-Seon Jeon')
- 2021.02.25. Cosyne 2021 (selected as a talk, within 30 among 645 submissions, presented by a postdoc 'Jae-Hyun Kim')
- 2019.04.11. EMBO-EMBL Symposia 'Probing neural dynamics with behavioral genetics', Germany (selected as a short talk, presented by a graduate student 'Ilsong Choi')
- 2018.01.16. Keystone Symposia 'State of the brain', USA
- 2017.11.10. Cell Symposia for Neuroscience 2017, USA
- 2017.05.16. IBANGS GBB meeting, Madrid, Spain
- 2016.07.15. The 11<sup>th</sup> International Conference for Neurons and Brain Disease, Vancouver, Canada
- 2016.04.08. Neuronal Circuits, Symposium at the Cold Spring Harbor Laboratory, USA
- 2015.07.01. Cold Spring Harbor Asia 'Francis Crick Symposium: Advances in Neuroscience', Suzhou
- 2015.06.22. Gordon Research Conference 'Modulation of neural circuits and behavior', Hongkong
- 2015.03.15. Keystone Symposia 'Optogenetics', Denver, USA.
- 2014.09.11. Japan Neuroscience Meeting, Visual system I, Japan
- 2012.02.24. Cosyne, Salt Lake City, Utah, USA

**ORGANIZING SYMPOSIA and WORKSHOPS**

- 2019 KAIX Symposia 'Distinguished Neuroscientists Series', KAIST
- 2019 IBRO 2019 Local Organizing Committee
- 2018 The 2<sup>nd</sup> Sweden Korea Collaborative Symposium on 'Auditory processing in the mammalian brain', KI, KAIST
- 2018 Inscopix miniscope imaging and analysis workshop, KAIST
- 2018 COSYNE Workshop on "Cortical circuits: functions and models of long-range connections", USA
- 2018 KAIST-MIT workshop on circuit mapping, KAIST
- 2017 Mini-symposium on Neuroscience 'Neural circuit development and function', KI, KAIST
- 2016 Intelligent Brain 2016 (the 19<sup>th</sup> Korean Society for Brain and Neural Science Annual Meeting), Symposium 10 'Sensory Perception and Recognition'

- 2016 The 1<sup>st</sup> Korea-Sweden Workshop on 'Sensory Processing'
- 2015 Brain Conference 2015, Symposium IX 'Cortical Processing, Development and Plasticity'