Jea Kwon
Curriculum Vitae

Ceneter for Cognition and Sociality
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Experience

2022 – now	**Post Doc**, *Institute for Basic Science (IBS), South Korea*.
2018 – 2020	**Researcher**, *Center for Cognition and Sociality (CCS)*, Institute for Basic Science (IBS).
2017 – 2020	**Technical Research Personnel**, Mandatory military service in the Republic of Korea.
2014 – 2018	**Student Researcher**, *Center for Functional Connectomics (CFC)*, Korea Institute of Science and Technology (KIST).

Education

2014 – 2022	**PhD in Neuroscience**, *KU-KIST Graduate School of Converging Science and Technology, Korea University (KU), South Korea*.
	Advisor : C. Justin Lee
	Dissertation : The Role of Tonic GABA in Modulation of Spontaneous Motor and Circadian Behavior
2008 – 2012	**Bachelor of Engineering**, *Electrical and Electronic Systems, Saitama University (SU), Japan*.
	Scholarship : Full Scholarship Korea - Japan Joint Government Program

Skills

Languages	**Korean**, **English**, Japanese
Programming	**Python**, **PyTorch**, **Matlab**, Tensorflow, R, JavaScript
Experiments	**Electrophysiology**, **Animal behavior**, Brain slice-Imaging, Molecular works

Honors & Awards

2022	**Best Poster Presentation Award**, *2022 KSMCB circadian rhythm workshop*, Retina-attached slice recording reveals light-triggered tonic GABA signaling in suprachiasmatic nucleus.
2022	**Best Poster Presentation Award**, *2022 KSBNS conference*, ABCD-analysis - Mapping animal behavior and differential analysis of kinematic features without selection bias.
2022	**Committee member**, *2022 Business Science Belt in AI-Bio division*.
2021	**Best Poster Presentation Award**, *2021 IBS 3rd workshop*, Mapping Behavior with DECLARE, Deep Embedded Clustering of Action Representation.
2020	**Founding member**, *KAIST NeuroAI research group*.
2019	**Excellent Poster Presentation Award**, *2019 FAOPS congress*, Development of a Low-cost, Comprehensive Recording System for Circadian Rhythm Behavior.

Invited talks & Seminar

2022	**Invited speaker**, *IBS Data Science Group seminar*, Resolving clustering bias during animal behavior mapping and kinematic profiling, (Online).

2021 **Oral presentation**, *IBS 2021 2nd workshop*, Age-dependent motor coordination analysis by three-dimensional posture estimation using AVATAR.

2020 **Seminar organizer**, *KAIST NeuroAI research group*, Backpropagation and Brain.

2019 **Invited speaker**, *KSMCB 2019 circadian rhythm workshop*, Development of a Low-cost, Comprehensive Recording System for Circadian Rhythm Behavior.

2019 **Oral presentation**, *IBS 2019 year-end workshop*, Deep learning with NMDA receptor inspired activation function.

Publications

In Conference Proceedings

2022 Dong-Kyum Kim*, **Jea Kwon***, Meeyoung Cha, and C. Justin Lee. Transformer needs nmda receptor nonlinearity for long-term memory. In *NeurIPS 2022 Memory in Artificial and Real Intelligence workshop*, 2022.

2022 Daegun Kim, Jineun Kim, Wongyo Jung, Jungoon Park, Mingyu Kim, Anna Shin, Yong-Cheol Jeong, Seahyung Park, Gwanhoo Shin, Ye Won Lee, **Jea Kwon**, and Daesoo Kim. Avatar: Ai vision analysis for three-dimensional action in real-time. In *CVPR 2022 CV4Animals: Computer Vision for Animal Behavior Tracking and Modeling workshop*, 2022.

Journal Articles

2022 Moonsun Sa, Eun-Seon Yoo, Wuhyun Koh, Mingu Gordon Park, Hyun-Jun Jang, YR Yang, J Lim, Woojin Won, **Jea Kwon**, Mridula Bhalla, et al. Hypothalamic gabra5-positive neurons control obesity via astrocytic gaba. *BioRxiv*, 2022.

2022 Jung Moo Lee, Moonsun Sa, Heeyoung An, Jong Min Joseph Kim, **Jea Kwon**, Bo-Eun Yoon, and C Justin Lee. Generation of astrocyte-specific maob conditional knockout mouse with minimal tonic gaba inhibition. *Experimental Neurobiology*, volume 31, page 158. Korean Society for Brain and Neural Science, 2022.

2022 Yeon Ha Ju, Mridula Bhalla, Seung Jae Hyeon, Ju Eun Oh, Seonguk Yoo, Uikyu Chae, **Jea Kwon**, Wuhyun Koh, Jiwoon Lim, Yongmin Mason Park, et al. Astrocytic urea cycle detoxifies aβ-derived ammonia while impairing memory in alzheimer's disease. *Cell Metabolism*, volume 34, pages 1104–1120. Elsevier, 2022.

2021 Joungha Won, Hasan Hüseyin Kazan, **Jea Kwon**, Myungsun Park, Mehmet Ali Ergun, Sureyya Ozcan, Byung Yoon Choi, Won Do Heo, and C Justin Lee. Ultimate covid-19 detection protocol based on saliva sampling and qrt-pcr with risk probability assessment. *Experimental neurobiology*, volume 30, page 13. Korean Society for Brain and Neural Science, 2021.

2021 **Jea Kwon***, Minwoo Wendy Jang, and C Justin Lee. Retina-attached slice recording reveals light-triggered tonic gaba signaling in suprachiasmatic nucleus. *Molecular brain*, volume 14, pages 1–10. BioMed Central, 2021.

2021 Minwoo Wendy Jang, Tai Young Kim, Kushal Sharma, **Jea Kwon**, Eunyoung Yi, and C Justin Lee. A deafness associated protein tmem43 interacts with kcnk3 (task-1) two-pore domain k+ (k2p) channel in the cochlea. *Experimental Neurobiology*, volume 30, page 319. Korean Society for Brain and Neural Science, 2021.

2020 Kayoung Han, Myunghee Lee, Hyun-Kyoung Lim, Minwoo Wendy Jang, **Jea Kwon**, C Justin Lee, Seong-Gi Kim, and Minah Suh. Excitation-inhibition imbalance leads to alteration of neuronal coherence and neurovascular coupling under acute stress. *Journal of Neuroscience*, volume 40, pages 9148–9162. Soc Neuroscience, 2020.

2019 Soo-Jin Oh, Jung Moo Lee, Hyun-Bum Kim, Jungpyo Lee, Sungmin Han, Jin Young Bae, Gyu-Sang Hong, Wuhyun Koh, **Jea Kwon**, Eun-Sang Hwang, et al. Ultrasonic neuromodulation via astrocytic trpa1. *Current Biology*, volume 29, pages 3386–3401. Elsevier, 2019.

2019   Young-Eun Han, **Jea Kwon**, Joungha Won, Heeyoung An, Minwoo Wendy Jang, Junsung Woo, Je Sun Lee, Min Gu Park, Bo-Eun Yoon, Seung Eun Lee, et al. Tweety-homolog (ttyh) family encodes the pore-forming subunits of the swelling-dependent volume-regulated anion channel (vracswell) in the brain. *Experimental neurobiology*, volume 28, page 183. Korean Society for Brain and Neural Science, 2019.

2018   Junsung Woo, Joo Ok Min, Dae-Si Kang, Yoo Sung Kim, Guk Hwa Jung, Hyun Jung Park, Sunpil Kim, Heeyoung An, **Jea Kwon**, Jeongyeon Kim, et al. Control of motor coordination by astrocytic tonic gaba release through modulation of excitation/inhibition balance in cerebellum. *Proceedings of the National Academy of Sciences*, volume 115, pages 5004–5009. National Acad Sciences, 2018.

2018   **Jea Kwon**[*], Min Gu Park, Seung Eun Lee, and C Justin Lee. Development of a low-cost, comprehensive recording system for circadian rhythm behavior. *Experimental Neurobiology*, volume 27, pages 65–75. The Korean Society for Brain and Neural Science, 2018.

2017   **Jea Kwon**[*], Heeyoung An, Moonsun Sa, Joungha Won, Jeong Im Shin, and C Justin Lee. Orai1 and orai3 in combination with stim1 mediate the majority of store-operated calcium entry in astrocytes. *Experimental Neurobiology*, volume 26, page 42. Korean Society for Brain and Neural Science, 2017.

2016   Go Eun Ha, Jaekwang Lee, Hankyul Kwak, Kiyeong Song, **Jea Kwon**, Soon-Young Jung, Joohyeon Hong, Gyeong-Eon Chang, Eun Mi Hwang, Hee-Sup Shin, et al. The ca2+-activated chloride channel anoctamin-2 mediates spike-frequency adaptation and regulates sensory transmission in thalamocortical neurons. *Nature communications*, volume 7, pages 1–13. Nature Publishing Group, 2016.