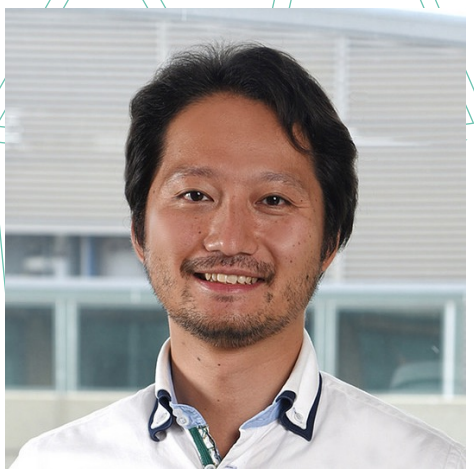
NEURO GLOBAL Seminar



Speaker

Kei Igarashi, Ph.D
Assistant Professor,
Department of Anatomy and Neurobiology,
University of California, Irvine

Title

Circuit mechanisms of associative memory in health and disease

Time / Venue

Oct. 28 (Thursday) 13:00 – 14:30 JST, **ONLINE**

Registration

Refer to the message from the NGP office

Related website

http://www.igarashilab.org/

●Neuro Globalプログラム生（Neuro Global Program Students）
【脳科学セミナーシリーズEx】／【先進脳科学セミナーシリーズEx】セミナー 1ポイント
【Brain Science Seminar Series Ex】／【Advanced brain science seminar series Ex】 1 point
●医学系研究科（Graduate School of Medicine）
【医学履修課程】国際交流セミナー
この講演会は医学履修課程「国際交流セミナー（アドバンスド講義科目）」を兼ねています。（1回分の出席とみなす）
【Medical Science Doctoral Course】International Interchange Seminar
This lecture will be combined with “International Interchange Seminar (Advanced Lecture course)” for Medical Science Doctoral Course. (It will be regarded as 1 attendance)
●生命科学研究科（Graduate School of Life Sciences）
【単位認定セミナー】
単位認定セミナーとして2ポイントを付与します。
【Credit-granted seminar】
2 points will be granted to the students who will attend this seminar.

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NEURO GLOBAL
Tohoku University

NEURO GLOBAL
Seminar

Abstract

Mounting evidence shows that dopamine in the striatum is critically involved in reward-based reinforcement learning. However, it remains unclear how dopamine reward signals influence the entorhinal-hippocampal circuit, another brain network critical for learning and memory. Using in vivo optogenetic and electrophysiological approaches, we recently found that dopamine signals from the ventral tegmental area/substantia nigra control encoding of cue-reward association rules in layer 2a fan cells of the lateral entorhinal cortex (LEC) (Lee, Jun, Soma, Nakazono et al., *Nature*, 2021). Our results suggest that LEC fan cells represent a cognitive map of abstract task rules, and LEC dopamine facilitates the incorporation of new memories into this map. I would like to discuss how we can unify the roles of two central, but previously independent, players in learning – dopamine and the entorhinal-hippocampal circuit – in future studies.

In the second part of the talk, I will share our results on how neuronal activities in the entorhinal-hippocampal memory circuit are lost in a mouse model of Alzheimer's disease (Jun et al., *Neuron* 2020), and discuss how the systems neuroscience approach can contribute to the understanding of Alzheimer's disease pathogenesis.

Reference:

Lee JY, Jun H, Soma S, Nakazono T, Shiraiwa K, Dasgupta A, Nakagawa T, Xie JL, Chavez J, Romo R, Yungblut Y, Hagihara M, Murata K, and Igarashi KM* (2021)

Dopamine facilitates associative memory encoding in the entorhinal cortex

Nature, https://www.nature.com/articles/s41586-021-03948-8?fbclid=IwAR2UsmrmdvY8KpeX-aFudsXOe_dbS11S7Hq1vqsI6Risq5tC2ewN2_LcNxU

Jun H, Bramian A, Soma S, Saito T, Saido TC, Igarashi KM* (2020)

Disrupted Place Cell Remapping and Impaired Grid Cells in a Knockin Model of Alzheimer's Disease

Neuron, 107:1095-1112