

The 54th Frontier Brain Science Seminar

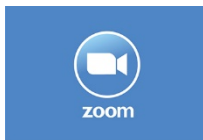
Sponsored by Research Center for Idling Brain Science (RCIBS)

Circuit mechanisms of associative memory in health and disease

Speaker: **Kei M Igarashi Ph.D**

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Date: **5th Nov. 2021 (FRI.) 10:30~12:00**
Online (Zoom live seminar)



Pre-registration is required. To register, please send us from your "University of Toyama" account (u-toyama.ac.jp)
We do NOT accept registration from free email (gmail, yahoo etc)
① your name ② your affiliation and ③ student number if you are student to the following address.

RCIBS@cts.u-toyama.ac.jp

Registration period : October 15th – November 2nd

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.

References

Dr Igarashi will talk on 2 topics appeared in Nature 2021 and Neuron 2020

Lee JY et al. Dopamine facilitates associative memory encoding in the entorhinal cortex. Nature, (2021)
Jun H et al. Disrupted Place Cell Remapping and Impaired Grid Cells in a Knockin Model of Alzheimer's Disease. Neuron, 107:1095-1112 (2020)

※ This seminar is eligible for credit accreditation for "High Order Brain Function" of Graduate School of Medicine and Pharmaceutical Sciences for Education.

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