第 39 回 最先端脳科学セミナー

Nano, Opto and cFos: Technologies to Understand Memory

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場 所: 日医工オーディトリアム（医薬イノベーションセンター1F）

要 旨

Understanding how the circuits of the brain interact to guide behavior is a fundamental goal of neuroscience. Dr. McHugh`s team, in RIKEN BSI, employs a highly multidisciplinary approach that extends from molecules to circuits and behavior utilizing genetic approaches, in vivo electrophysiology and neurochemistry. Dr. McHugh`s team showed that, using transgenic mouse model lacking CA3 synaptic transmission, CA3 input is required for the precise temporal coordination of CA1 spiking (1). Furthermore, they found that CA3 pyramidal cells are necessary for Kainic acid (KA)-induced seizure activity. This establishes CA3 as the key locus for KA-induced pathophysiology and will aid in designing better models and interventions to understand and control seizures (2).

In a means towards understanding the hippocampal circuits, Dr. Mc Hugh`s team aimed to check the role of CA2 region as a regulator of network processing in hippocampus. Dramatically, chronic blockade of CA2 transmission led to hyperexcitability in the recurrent CA3 network, resulting in distinct pathophysiological states both during exploration and rest. Altogether, CA2 plays a role in establishing the dynamic excitation and inhibition (E/I) balance required for proper network function (3, 4).

References:
(1) ***Nature Neuroscience***, 19 (7) 945-951 (2016)
(2) ***ENEURO.***, 3 (1) 0003-16 (2016)
(3) ***Trends in Neuroscience***, 34 (10) 526-535 (2011)
(4) ***Neuron***, 94 (3) 642–655, (2017)

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