



第 370 回 つくば分子生命科学セミナー

TSUKUBA MOLECULAR LIFE SCIENCE SEMINAR

演題 : **Surface dynamics of glutamate receptors : lateral shaping of synaptic plasticity**

演者 : **Dr. Laurent Ladépêche**

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日時 : 平成 25 年 4 月 4 日 (木) 16:00-17:00

会場 : 医科学棟 2F 204 講義室

要旨 :

Glutamate synapse mediates most synaptic excitation in the brain and changes in its strength constitute a cellular basis for learning and memory processes. These adaptive properties often require the calcium influx following the opening of the ionotropic glutamate NMDA receptor (NMDAR). Although surface NMDAR were initially considered to be rather static, recent studies demonstrated that their distribution is dynamically shaped by lateral diffusion. Whether NMDAR surface dynamics and their regulation play an instrumental role in synapse adaptation emerged thus as a possibility. To investigate this question, we used a combination of classical and high resolution single nanoparticle imaging approaches.

We observed that the induction of glutamate synapse long-term potentiation (LTP) redistributes surface NMDAR within the postsynaptic area. Strikingly, reducing NMDAR surface diffusion before LTP induction altered its subsequent expression, through an altered recruitment of CAMKII to the spine. In addition, NMDAR surface distribution is specifically shaped by the presence of either NMDAR coagonist, glycine or D-serine. Finally, NMDAR surface dynamics appeared to be modulated *via* their direct interaction with dopamine D1 receptor, so modulating LTP. Altogether this indicates that NMDAR surface distribution is dynamically regulated and plays a unexpected tuning of the plastic range of synapses.

備考 : 講師の Dr. Ladépêche は、昨年 11 月 1, 2 日に開催された The 7th Tsukuba Medical Science Research Meeting において Outstanding Speaker Award を受賞されました。

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