

# 第48回最先端脳科学セミナー

## Spontaneity and Manifolds in Network Activity

**演者:** 池谷 裕二 教授

東京大学 大学院 薬学系研究科 薬品作用学教室 教授

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### 要旨

The excitation-to-inhibition ratio in neuronal activity of the hippocampus, like other brain regions, is homeostatically balanced over time. The hippocampus creates enormous quantities of memories throughout a lifetime, but its neurons and synapses are limited in number. Therefore, an active system must exist that prevents the saturation of memory engrams. We recently discovered that mouse hippocampal sharp wave/ripple oscillations serve as intrinsic events that trigger long-lasting synaptic depression and restore memory capacity. Real-time optogenetic feedback inhibition of sharp wave/ripples prevented the spontaneous downregulation of synaptic weights during slow-wave states and then impaired the learning of new memories. Our findings are consistent with the role of slow-wave states in refining memory engrams by removing recent memory-irrelevant neuronal activity. In this presentation, I explain our findings with the research backgrounds and will try to hypothetically extend their significance to a clinical dimension.

※ 本セミナーは、大学院医学薬学教育部「脳科学特論」の一環です。履修者は、[レポートの提出](#)が必要です。また、大学院の単位認定の対象となります。

主催: 医・生化学 井ノ口 馨

第48回セミナー世話人: 医・生化学 Khaled Ghandour 内線 7227