

# 東京大学グローバル COE 特別セミナー

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理学系研究科 生物化学専攻セミナー

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演者 : **Dr. Takaki Komiyama**

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演題 : Cellular imaging in behaving mice reveals  
learning-related fine-scale specificity in motor  
cortex circuits

日時 : 2009 年 12 月 8 日 (火) 16:00~17:00

場所 : 東京大学理学部 3 号館 3 2 7 号室

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Cortical neurons are connected into highly specific neural networks, but the relationship between network dynamics and behavior is poorly understood. Two-photon calcium imaging can monitor activity of multiple, spatially defined cells in the mammalian cortex. Here we applied this technique to image activity in the motor cortex of mice performing a learned choice behavior. We developed an odor discrimination task in which head-fixed mice learned to lick in response to one of two odors and withhold licking for the other odor. Mice routinely learned this task within a single behavioral session. Imaging in layer 2/3 of candidate tongue motor cortical areas from mice learning this task revealed neurons with diverse response types. Activity in approximately half of the imaged neurons distinguished trial types associated with different actions. Many neurons showed modulation coinciding with or preceding the action, consistent with their involvement in motor control. This approach revealed precise and dynamic representation of licking in the primary motor cortex of behaving mice during learning.

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