

東京大学 グローバル COE 『統合生命学』 特別セミナー

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東京大学大学院 理学系研究科 生物化学専攻

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演者：Dr. Daniel R. Storm

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演題：The Role of Signal Transduction Cross-Talk  
in Memory Formation

日時：平成 21 年 9 月 14 日 (月) 14:00~16:00

場所：東京大学理学部 3 号館 4 階 416 号室

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The central nervous system has the remarkable capacity to process and store enormous amounts of information. Consequently, there is intense interest in molecular and cellular mechanisms underlying the formation and persistence of memory. One of the transcriptional pathways required for consolidation of hippocampus-dependent memory is CRE-(cAMP, Ca<sup>2+</sup>, Response, Element) mediated transcription. Although a number of signal transduction systems contribute, calmodulin (CaM)-stimulated adenylyl cyclases and Erk/MAP kinases (MAPK) play a major role in Ca<sup>2+</sup> activation of CRE-mediated transcription in neurons during formation of memory. Our lab has discovered that the nuclear translocation and activation of MAPK in neurons during contextual memory formation depends upon CaM-stimulated adenylyl cyclases. Furthermore, activation of MAPK also depends on proteolytic degradation of SCOP (SCN Circadian Oscillatory Protein) by calpain. Interestingly, the persistence of contextual memory is maintained by the circadian oscillation of the cAMP/MAPK/MSK1/CREB transcriptional pathway in area CA1 of the hippocampus, an oscillation that depends upon CaM-stimulated adenylyl cyclases. The goal of this presentation is to show how all these signaling components act synergistically to produce memory traces in the hippocampus.

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