

# Inhibitory control of female sexual motivation via medial preoptic area

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日時： 2023年3月23日（木）午後4時～

場所： 神戸大学大学院医学研究科 B棟2階 共同会議室



Mating is a fundamental aspect of animals' life and the species survival. Effective expression of sexual behavior is regulated by neural mechanisms that underlie social reward and motivation processing. While recent studies have started to reveal such mechanisms in males, little is known about 1) whether female mice modulate their sexual motivation during mating, 2) how sexual motivation is regulated in the female brain.

Here, by utilizing a female self-paced mating assay to measure sexual motivation, we found that female mice suppress their motivation to interact with a male animal significantly after mating-completion. Using whole-brain activity mapping, we further identified the medial preoptic area (MPOA) as a brain region responding to mating-completion. Next, by utilizing in vivo Calcium imaging technology, we found that unique ensembles in the MPOA respond significantly and specifically to mating completion. Lastly, reactivation of these neurons was sufficient to suppress sexual motivation. To sum, our results suggest that a subset of neurons in the MPOA encodes a negative feedback signal that sustains low sexual motivation after mating-completion in female mice.

1. Ishii et al., (2017) A Labeled-Line Neural Circuit for Pheromone-Mediated Sexual Behaviors in Mice. *Neuron*. 95(1), 123–137.e8.
2. Hashikawa et al., (2021) Pubertal sex hormones control transcriptional trajectories in the medial preoptic area. *bioRxiv*. , 2021.09.02.458782.