

## Sleep for memory

### Principal Investigator

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### Major Scientific Interests of the Group

How brain consolidates memory during sleep?

How adult-born neurons integrate into memory circuit?

We hope our curiosity to these questions to discover new therapeutic strategies to cure disorders including PTSD and Alzheimer's disease.

### Projects for Regular Students in Doctoral or Master's Programs

- 1) Mechanisms of adult-born neurons for memory consolidation during sleep
- 2) Role of memory replay in adult-born neurons during REM sleep
- 3) Function of synaptic plasticity for memory consolidation during sleep

### Study Programs for Short Stay Students (one week – one trimester)

- 1) Learning basis of optogenetic application for memory research
- 2) Learning basis of *in vivo* imaging for hippocampal activity

### Selected Publications (\*Corresponding=Sakaguchi)

- 1) Vergara and Sakaguchi\*, Mechanisms underlying memory consolidation by adult-born neurons during sleep, *Front Cell Neurosci* in printing
- 2) Kumar and Sakaguchi\* et al., Sparse activity of hippocampal adult-born neurons during REM sleep is necessary for memory consolidation, *Neuron* 107:552-65, 2020
- 3) Srinivasan and Sakaguchi\* et al., Miniaturized microscope with flexible light source input for neuronal imaging and manipulation in freely behaving animals, *BBRC* 517:520-4, 2019
- 4) Koyanagi and Sakaguchi\* et al., Memory consolidation during sleep and adult hippocampal neurogenesis, *Neural Regen Res* 14(1):20-23, 2019
- 5) Akers and Sakaguchi\* et al., Regulatory influence of sleep and epigenetics on adult hippocampal neurogenesis and cognitive and emotional function, *Stem Cells* 36:969-76, 2018
- 6) Purple and Sakaguchi\* et al., Auditory conditioned stimulus presentation during NREM sleep impairs fear memory in mice, *Sci Rep* 7:46247, 2017
- 7) Fujinaka and Sakaguchi\* et al., Effect of context exposure after fear learning on memory generalization in mice, *Mol Brain* 9:2, 2016