

神経生理学 (カスパー・フォークト)

Neurophysiology (VOGT Kaspar)



VOGT Kaspar, M.D.-Ph.D.
Associate Professor
WPI-IIS, International Institute for Integrative Sleep Medicine
University of Tsukuba

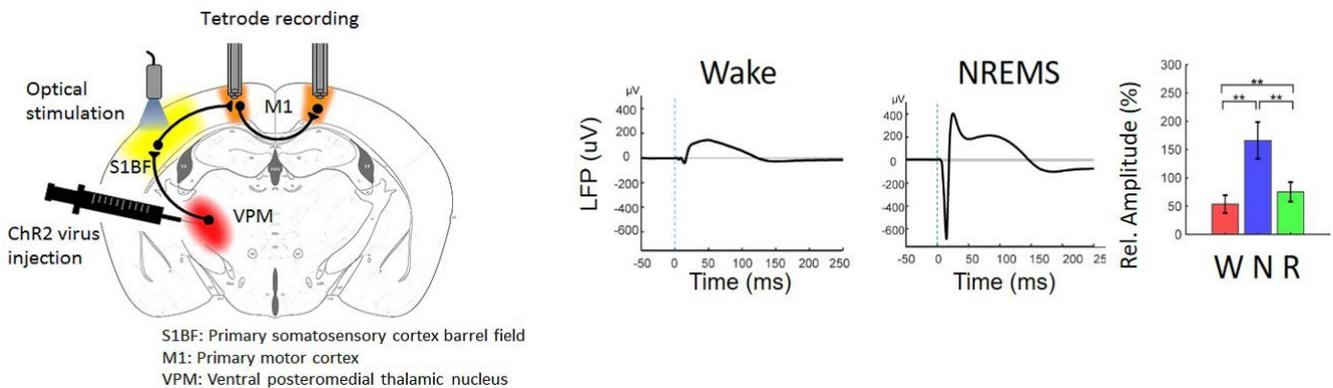


E-mail address: vogt.kaspar.fu@u.tsukuba.ac.jp
URL: <https://wpi-iis.tsukuba.ac.jp/research/member/detail/kaspervogt/>

What is Good Sleep? Cortical Activity in Waking and Sleep

In my group we research basic mechanisms of brain activity in waking and sleep. We record electrical activity from neurons *in-vivo* and *in-vitro* from mice. We also record electro-encephalograms (EEG) from mice and humans and develop new tools for their analysis. How is wake activity in the brain different from sleep activity and how does this help the brain to recover its function during sleep? So far we have uncovered that the outermost layer of the brain, the cortex, shows less organized, activity in sleep compared to waking, but we also found that cortex is much more reactive in sleep. We now want to uncover the cortical circuits that mediate this change – for this we use optogenetic and chemogenetic tools to target specific neuron types and circuits.

In humans we analyze EEG patterns to characterize differences in sleep depth and -quality and compare our findings to recordings from mouse models.



Recording cortical reactions to optogenetic stimuli over 24 hours. Neurons that carry information to the cortex are stimulated roughly every 5 sec. Notice that the response is much larger when the animal is in deep non rapid eye movement (NREM) sleep.