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*Discovering Neuronal Firing Patterns Underlying Anesthetic-induced Slow Waves*

**Abstract**

Slow waves are a key feature of an anesthetized brain, but the underlying neuronal firing patterns remain poorly characterized. Here, we propose to use simultaneous multiphoton calcium imaging and electrophysiology recording to examine how cortical neurons participate in slow wave cycling and how their responses to incoming synaptic inputs are modulated by slow waves. By comparing slow waves induced by anesthetics with those that occur during sleep, this study aims to provide new information to a long-standing controversy in anesthesiology - how similar is general anesthesia to non-rapid-eye-movement sleep? The goal of this project is to gain a better understanding of anesthetic-induced brain states. We hope this knowledge can ultimately lead to novel applications of anesthetics in neuropsychiatric disorders.