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Sommario/riassunto

General anesthesia is a standard medical procedure in today's hospital practice. Although in most cases the administration of anesthetics does not affect severely the patients health, side effects of anesthesia are well-known, such as nausea or cognitive impairment. Moreover 1-2 out of 1000 patients under surgery report a partial wake up from anesthesia during the operation. The reason for such a partial lack of control of depth of anesthesia is that medical procedures are highly optimized based on experience but the neural dynamics during general anesthesia is far from being understood. One reason for this lack of understanding is both the complex neural interactions of neurons on different spatial and temporal scales and the poorly understood action of anesthetics on neural populations. For instance, anesthetic agents act on synaptic receptors on a microscopic scale essentially evoking a macroscopic change of population activity, such as Local Field Potentials, EEG/MEG or resulting change of cerebral blood flow. This population effect then triggers the loss of consciousness in patients. This Research Topic aims to address recent theoretical and experimental advances in the field. The theoretical and experimental studies represent a good overview over the current state of research in the field and provides a deeper insight into the underlying neural mechanisms. Each article in the issue focusses on a specific current research topic in general anesthesia research and several articles introduce to the topic in a pedagogical way. The issue covers various

types of anaesthesia and the most important topics in the field, such as (but not limited to) recent advances in theoretical models and states of consciousness reflected in experimental data, the connectivity changes observed during anesthesia or effects of specific drugs on brain activity. The introduction style of the papers facilitates the reader to understand the background of the research aspect and even allows readers not familiar with general anesthesia research to enter the research domain. Hence the Research Topic aims to provide on one hand an overview of the current state of the art and on the other hand a good starting point for new researchers in the field.