

Publication

Anaesthetic mechanisms : update on the challenge of unravelling the mystery of anaesthesia

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General anaesthesia is administered each day to thousands of patients worldwide. Although more than 160 years have passed since the first successful public demonstration of anaesthesia, a detailed understanding of the anaesthetic mechanism of action of these drugs is still lacking. An important early observation was the Meyer-Overton correlation, which associated the potency of an anaesthetic with its lipid solubility. This work focuses attention on the lipid membrane as a likely location for anaesthetic action. With the advent of cellular electrophysiology and molecular biology techniques, tools to dissect the components of the lipid membrane have led, in recent years, to the widespread acceptance of proteins, namely receptors and ion channels, as more likely targets for the anaesthetic effect. Yet these accumulated data have not produced a comprehensive explanation for how these drugs produce central nervous system depression. In this review, we follow the story of anaesthesia mechanisms research from its historical roots to the intensely neurophysiological research regarding it today. We will also describe recent findings that identify specific neuroanatomical locations mediating the actions of some anaesthetic agents.

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