Thalamocortical Assemblies: How Ion Channels, Single Neurons and Large-Scale Networks Organize Sleep Oscillations

Alain Destexhe, Terrence J. Sejnowski
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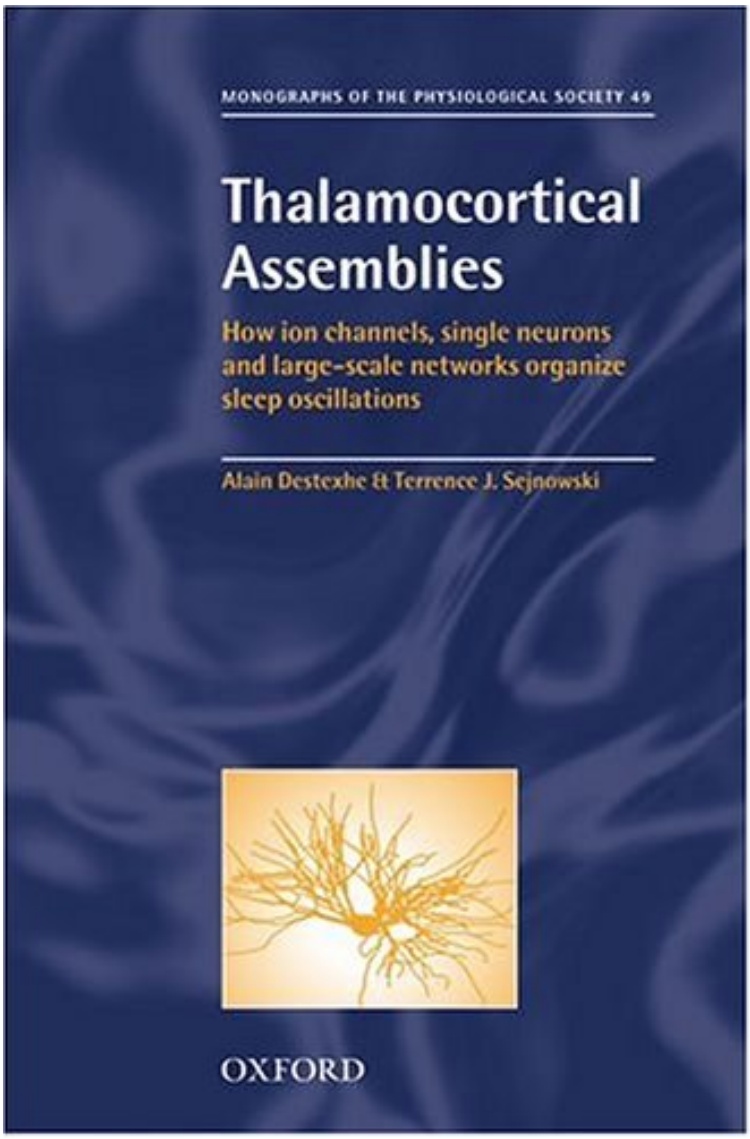

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Alain Destexhe, Terrence J. Sejnowski : Thalamocortical Assemblies: How Ion Channels, Single Neurons and Large-Scale Networks Organize Sleep Oscillations before purchasing it in order to gage whether or not it would be worth my time, and all praised Thalamocortical Assemblies: How Ion Channels, Single Neurons and Large-Scale Networks Organize Sleep Oscillations:

3 of 3 people found the following review helpful. excellent overview but for specialistsBy Karl HookThis book presents a very complete overview of the physiology of thalamic neurons. It covers both single neuron and circuit properties. It explores the mechanisms underlying normal and pathological oscillations in which the thalamus is involved. I liked very much the last chapter which speculates about the role of oscillations in memory consolidation. The book is very clearly organized, goes in the detail. The only criticism is that it is rather for a specialized audience with a solid background in electrophysiology.

During sleep, the mammalian brain generates an orderly progression of low frequency oscillations. The nature of these oscillations changes as the brain moves from sleep onset into deep sleep. Although readily measured and recorded, the underlying neural mechanisms involved and the purpose of these oscillations have remained unclear. However, as we learn more about the properties of neurons in the thalamus and cerebral cortex and their interactions, it has become possible to suggest a role for these occurrences.This book reviews the molecular components and ionic mechanisms underlying sleep oscillations, including their distorsion into epileptic seizures. It reviews the properties of ion channels, synaptic interactions, intrinsic cellular behaviour, and how these elements assemble into oscillating circuits and networks. The precision experimental data collected has provided a foundation for the study of dynamic activity in the central nervous systems and it is now possible to suggest a role for thalamocortical oscillations in memory consolidation. Thalamocortical Assemblies is for neuroscientists, neurobiologists, physiologists and other researchers interested in sleep and memory processes.

About the AuthorAlain Destexhe is at Unite de Neurosciences Integratives et Computationelles, CNRS, Gif-sur-Yvette, France. Terrence Sejnowski is at Computational Neurobiology Laboratory, Howard Hughes Medical Institute, Salk Institute, La Jolla, USA.