Anmar Khadra
McGill University

Title:
Markov State Models for P2X Receptor-Channels: Bistability and Beyond

Abstract:
Purinergic P2X receptors are a family of ATP-gated ion channels composed of seven subunits labelled P2X1-7. They are expressed in excitable and non-excitable cells, such as neurons and lymphocytes, and are involved in many biological processes (e.g., synaptic transmission, hormone secretion, inflammation and chronic pain). They possess three binding sites that, when occupied by ATP, lead to receptor activation and channel opening. We have developed Markov state kinetic models of two members of this family of receptors. Our goal was to explore possible mechanisms underlying the kinetic behavior and gating properties of these receptors upon ATP stimulation. More specifically, we investigated why these receptors exhibit two opposite activation-dependent changes, pore dilation and pore closing. A brief overview of these results will be presented in this talk.