

Modelling dopamine systems in neurons and nephrons

Eduardo Mendoza

Recent studies have reinforced the important role of synaptic processes, in particular in enabling synaptic plasticity, for understanding brain function as well as neuropsychiatric diseases (e.g. [1], [2]). Despite its importance for understanding diseases such as schizophrenia or Parkinson's disease, detailed models of the dopamine synapse have been rare until recently. The first part of the talk will discuss two recent models of the pre-and postsynapses [3],[4] as well as an ongoing effort to integrate them.

Dopamine is also expressed in nephrons (the basic functional units of the kidney) and plays an important role in sodium regulation, with the system's dysfunction strongly associated with essential hypertension. The second part of the talk will discuss the adaptation of the previously discussed synapse models to the dopamine system in renal proximal tubules of nephrons [5].

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[5] C. Zeng, M. Zhang, L. Asico, G. Eisner, P. Jose, The dopaminergic system in hypertension (2007), *Clinical Science* 112, p. 583-597