

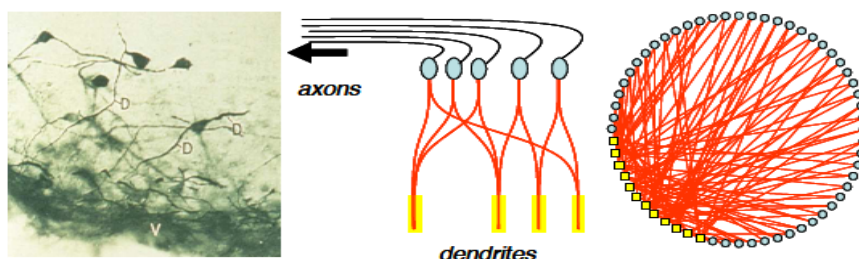
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Modelling model systems

CASCIMODOT



COLLOQUIUM

Peptides in the hypothalamus are not like conventional neurotransmitters; their release is not particularly associated with synapses, and their long half-lives mean that they can diffuse to distant targets. Peptides can act on their cells of origin to facilitate the development of patterned electrical activity, they can act on their neighbours to bind the collective activity of a neural population into a coherent signalling entity, and the coordinated population output can transmit waves of peptide secretion that act as a patterned hormonal analogue signal within the brain. At their distant targets, peptides can re-programme neural networks, by effects on gene expression, synaptogenesis, and by functionally rewiring connections by priming activity-dependent release. My lab has studied mainly the oxytocin and vasopressin neurones of the hypothalamus, these neurones fire in distinctive patterns that govern and in turn are governed by the peptide secretion that they induce. Oxytocin cells display remarkable synchronised bursts that arise through emergent properties of an interactive network; vasopressin cells also burst, but asynchronously in a very different way and for very different reasons. In their different ways, these two neuronal systems have become important “model systems in neuroscience; in this talk I will talk about modelling these model systems.