

## Virtual DANDRITE Lecture

**Thursday 15 October 2020  
12.00 – 13.00**

**Online via Zoom**

Please find Zoom link via the Outlook calendar invitation. If you have not received this, please write an e-mail to Kathrine: kh@dandrite.au.dk



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### **Memory modulation by noncanonical hippocampal-subcortical circuits**

The human hippocampus plays a crucial role in episodic memory; the who, what, where memories that define our lives. In the rodent, well-defined anatomy and physiology make the structure an ideal model system; amenable to circuit manipulations and observations designed to test hypotheses concerning how memories are formed and used. Here I will present our recent work in mice which combines anatomical characterization, genetic interventions and in vivo recording to address how noncononical subcortical inputs and outputs influence information flow in the hippocampus, and ultimately, impact memory and behavior. I will first introduce work identifying a novelty signaling hub in the hypothalamus – the supramammillary nucleus (SuM). Unique about this region is that it not only responds broadly to novel stimuli, but segregates and selectively routes different types of information to discrete cortical targets, the dentate gyrus (DG) and CA2 fields of the hippocampus, for the modulation of mnemonic processing. Next, I will describe ongoing work focused on a poorly characterized excitatory connection between the hippocampus and medial septum (MS). The MS is crucial for integration of sensory and motor information, the generation of the theta oscillation and the encoding and expression of memory. While recent work has uncovered specific roles for ascending cholinergic, glutamatergic and GABAergic inputs from the MS to the hippocampus in these processes, much less is known about the role of the descending hippocampal efferents. I will describe our identification and characterization of a novel descending glutamatergic projection from hippocampal CA2 pyramidal cells to PV+ neurons in the MS that can regulate hippocampal cholinergic tone. I will highlight the involvement of this pathway during different memory phases and share the consequences of manipulations of this circuit.