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Presentation Abstract

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Presentation Title:	Detection of dendritic potentials from O-LM interneurons by voltage imaging
Location:	Halls B-H
Presentation time:	Wednesday, Nov 13, 2013, 9:00 AM -10:00 AM
Topic:	++B.10.c. Dendritic excitability and synaptic integration
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Abstract:	Experimental and modelling studies have demonstrated active dendritic properties of oriens lacunosum-moleculare (O-LM) interneurons, a classical type of dendrite-targeting GABAergic interneurons in the hippocampal CA1 area. Analysis of electron microscopy revealed that the synapse density of distal dendrites of O-LM interneurons is higher than that of proximal dendrites. Furthermore, action potentials (APs) can be initiated from axon-lacking dendrites upon strong dendritic current injection. However, whether AP initiation can be triggered from axon-lacking dendrites or dendritic sites distant from the axon of O-LM interneuerons by synaptic inputs remains unknown. To answer this question, we combined electrophysiology and voltage imaging to detect AP sequences along O-LM interneron dendrites and correlated them with the axon initation site from the *post hoc* morphological reconstruction. Our preliminary results showed that optical signals sampled at 10 kHz can adequately re-capitulate the waveform of electrically recorded APs. Further, we found that synaptically evoked APs were detected from the dendritic site closer to the axon earlier than those from the distant site.
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