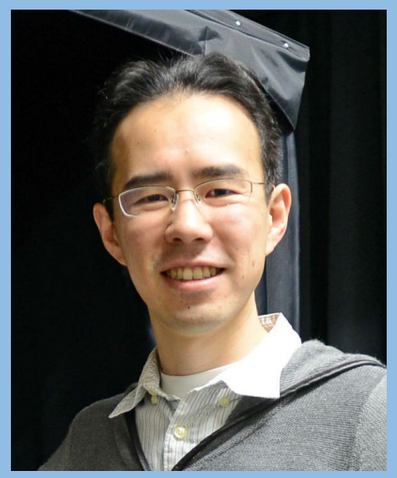
DANDRITE LECTURE

Mechanisms of activity-dependent synaptic competition in developing mitral cells

In developing brains, activity-dependent remodelling facilitates the formation of precise neuronal connectivity. Synaptic competition is known to facilitate synapse elimination; however, it has remained unknown how different synapses compete with one another within a post-synaptic cell. Here, we investigate how a mitral cell in the mouse olfactory bulb prunes all but one primary dendrite during the developmental remodelling process. We find that spontaneous activity generated within the olfactory bulb is essential. We show that strong glutamatergic inputs to one dendrite trigger branch-specific changes in RhoA activity to facilitate the pruning of the remaining dendrites: NMDAR-dependent local signals suppress RhoA to protect it from pruning; however, the subsequent neuronal depolarization induces neuron-wide activation of RhoA to prune non-protected dendrites. NMDAR-RhoA signals are also essential for the synaptic competition in the mouse barrel cortex. Our results demonstrate a general principle whereby activity-dependent lateral inhibition across synapses establishes a discrete receptive field of a neuron.

Host: Keisuke Yonehara



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Date: **Thursday 7 September 2023**
Time: **2:00 pm – 3:00 pm**
Venue: **1324-025**
Address: **Bartholins Allé 10**
8000 Aarhus C

OPEN TO ALL INTERESTED.

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