



# Forum

## Developmental and Functional Characterization of Synaptic Connectivity in the Mammalian Central Auditory System

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Date : 31 July (Tuesday), 2018

Time : 16:00 – 17:00

Venue: 1F Seminar Room, RIKEN CBS Central Bldg.

### Abstract:

The functional properties of synapses are critical in determining how individual neurons respond to sensory stimuli. In this talk, I will present work describing two novel aspects by which cortical synapses influence operation of neural circuits. In the primary auditory cortex, we have used electrophysiology and computational modelling to reveal how complementary plasticity of ON- and OFF-evoked synaptic inputs leads to the development of direction selectivity to frequency modulated sounds. We have also devised a new method to infer the strength of cortical synapses using the anatomical marker, mGRASP, a light microscopy technique that labels synaptic contacts. By combining optogenetics and mGRASP, we have mapped the number and strength of defined corticocollicular connections and reveal synaptic weighting of defined projections at the level of single neurons. Overall these data demonstrate how subtle variations in the functional organisation of cortical synapses influence overall circuit function.