

## **Division of Behavioral Neurobiology Seminar**

第 585 回日本動物学会北海道支部講演会

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### **Finding the auditory map of space in the mouse superior colliculus**

The superior colliculus (SC) is a midbrain area where sensory information is integrated to initiate motor commands. A number of advances in mouse molecular genetics, large-scale physiological recordings and SC-dependent visual behavioral assays have made the mouse an ideal model to understand the relationships between genetics, circuits and behavior in the visual system. However, the understanding of how auditory information is processed in the mouse SC is limited.

An important property of the auditory neurons in the SC is their tuning to sound source location. The topographic auditory spatial map in the deep SC has been characterized in species such as ferrets and barn owls, but not in mice. Therefore, we developed a system that presents auditory stimulation in a virtual space and recorded the response properties of deep SC neurons. We first measured the head-related transfer function—the sound modulation produced by the head and ears before the sound vibrates the ear drums—as a function of incident sound source directions and used this to produce the sound stimulus consistent with a specific source direction. This system allows flexible control of the stimuli and is compatible with large-scale recording systems that often create acoustic obstacles.

Using this experimental system we find neurons in the deep SC that are tuned to a specific (virtual) sound source direction. The spatial location of these neurons correlate with the receptive field location, showing the map of auditory space. These results demonstrate that the mouse is a good model to study mechanisms of auditory circuit formation and function.

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17:00~18:00

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