実中研オープンセミナー

（主催：マーモセット医学生物学研究部）

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Marmoset as a model system for studying neural basis of vocal communication

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Vocal communication is one of the most important natural behaviors of both humans and many animal species. In the past, studies of echolocating bats and songbirds have provided important insights into neural mechanisms of vocal communication. In comparison, much less has been learned from non-human primates. Several factors have contributed to the slow progress in this field. Under captive conditions, most non-human primate species are not vocal as they are in the natural environment, especially for species with large body sizes. The common marmoset (*Callithrix jacchus*), a New World non-human primate species, has emerged in recent years as a promising model system for studying neural basis of vocal communication. Marmoset offers several critical advantages over other non-human primate species. In the past 20 years, my laboratory has pioneered a number of behavioral and electrophysiological techniques to study single-neuron activity under awake and behaving conditions in the marmoset, including extracellular and intracellular recordings and wireless neural recordings from freely roaming marmosets. Recently, we have developed a cochlear implant model in marmoset. Using these techniques, we have identified non-linear transformations of time-varying signals in auditory cortex and discovered a pitch-processing center in the marmoset brain that mirrors a similar region in the human brain. We also showed that cortical representations of self-produced vocalizations are shaped by auditory feedback and vocal control signals during vocal communication. These findings have important implications for understanding how the brain processes speech and music. They also demonstrate the tremendous potentials of the marmoset in studying the neural basis of vocal communication and social interactions.

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