平成29年度　大学院特別セミナー

Left-right asymmetry of the rodent hippocampal synapses and its implications for functional laterality of the hippocampus.

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日時：12月4日(月)　17：00〜

場所：薬学部研究棟2　7階セミナー室(8)

While the crucial role of the hippocampus in spatial memory is well accepted by rodent studies, the anatomical and functional coupling of the bilateral hippocampi has not been systematically investigated until the recent decade. In a recent anatomical study (1), I have quantitatively characterized the intra-hippocampal connection to CA1, the output structure of the hippocampus. I find that the apical dendrites of CA1 pyramidal cells preferentially receive ipsilateral connections whereas the relationship is converse for the basal dendrites. Notably, apical dendrite spines have contrasting spine morphology and glutamate receptor subunit expression patterns depending on the lateral origin of the innervating axon from CA3 (2, 3). In addition to the morphological hippocampal asymmetry, I present that the asymmetrical functional coupling of the bilateral hippocampi can be modulated by experience (4, 5): enriched environment (EE) housing enhances the power and synchrony of interhemispheric theta-associated gamma oscillations in CA1 stratum radiatum (s.r.). Interestingly, the gamma power increase is expressed more prominently on the right side. In EE-reared rats, spine density increases are manifested in the right CA1 s.r. relative to the left of the same animal. As right-side dominance of hippocampal spatial memory is shown in a “split brain’ model in mice (6), these results suggest that though left and right hippocampi cooperate together via synaptic connections, there is show functional specializations of bilateral hippocampi in information processing.

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本セミナーは大学院単位認定の対象となります.

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