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学位の種類	博士 (医学)
報告番号	乙第1926号
学位記番号	論第1682号
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授与年月日	令和5年3月24日
学位論文の題名	<p>Reduction of acetylcholine in the hippocampus of hippocampal cholinergic neurostimulating peptide precursor protein knockout mice (海馬由来コリン作動性神経刺激ペプチドノックアウトマウス海馬ではアセチルコリンが低下している)</p> <p>Scientific Reports, 11: 22072, 2021</p>
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[Abstract]

The cholinergic efferent network from the medial septal nucleus to the hippocampus plays an important role in learning and memory processes. This cholinergic projection can generate theta oscillations in the hippocampus to encode novel information. Hippocampal cholinergic neurostimulating peptide (HCNP), which induces acetylcholine (ACh) synthesis in the medial septal nuclei of an explant culture system, was purified from the soluble fraction of postnatal rat hippocampus. HCNP is processed from the N-terminal region of a 186-amino acid, 21-kDa HCNP precursor protein, also known as Raf kinase inhibitory protein and phosphatidylethanolamine-binding protein 1. To confirm the involvement of HCNP in the synthesis of ACh in the septo-hippocampal neuronal network in vivo, we monitored the concentration of ACh in the ventral hippocampus of freely moving mice under arousal state by using the microdialysis method. We confirmed direct reduction of ACh release in the hippocampus of HCNP-pp knockout mice. The levels of vesicular acetylcholine transporter (VAChT) were also decreased in the hippocampus of these mice in comparison with those in control mice, suggesting there was decreased incorporation of ACh into the synaptic vesicle. These results potently indicate that HCNP may be a cholinergic regulator in the septo-hippocampal network.