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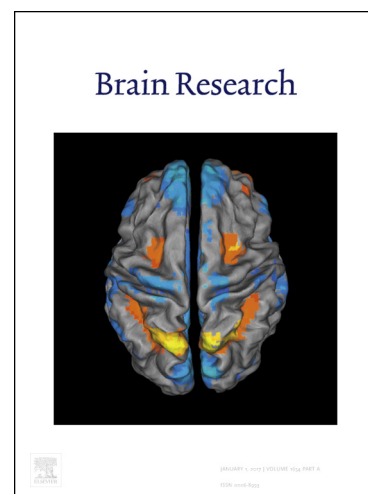
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Microwave Radiation Leading to Shrinkage of Dendritic Spines in Hippocampal Neurons Mediated by SNK-SPAR Pathway

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Abstract

The popularization of microwave raised concerns about its influence on health including cognitive function which is associated greatly with dendritic spines plasticity. SNK-SPAR is a molecular pathway for neuronal homeostatic plasticity during chronically elevated activity. In this study, Wistar rats were exposed to microwaves (30 mW/cm² for 6 min, 3 times/week for 6 weeks). Spatial learning and memory function, distribution of dendritic spines, ultrastructure of the neurons and their dendritic spines in hippocampus as well as the related critical molecules of SNK-SPAR pathway in rats hippocampus were examined at different time points after microwave exposure. There was deficiency in spatial learning and memory in rats, loss of spines in granule cells and shrinkage of mature spines in pyramidal cells, accompanied with alteration of ultrastructure of hippocampus neurons. After exposure to 30 mW/cm² microwave radiation, the up-regulated SNK induced decrease of SPAR and PSD-95, which was

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