

The pharmacological and physiological effects of odor components on the rat nervous system

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It was reported that so called “green odor” may have some effects on human health by stimulation of olfactory system. In our hypothesis, intake of green odor may also have some effects on the mammals. Previously, we find that oral administration of *n*-hexanal, one of green odor components, changed dopamine release in the brain striatum of living rat. Direct stimulation of brain striatum also enhanced dopamine release in Ca²⁺-dependent-manner. In this study, whether the administrated *n*-hexanal reached to brain.

The rats were intraperitoneal administrated *n*-hexanal. The brain lavage was performed by perfusion of saline under ether anesthesia, and the brain was dissected. The *n*-hexanal concentration in brain was measured by HPLC-UV. The concentration of *n*-hexanal in the rat brain was slightly increased by administration of *n*-hexanal. In addition, direct perfusion of *n*-hexanal to brain from heart was performed. The brain *n*-hexanal concentration was significantly increased. These data suggested that administered *n*-hexanal might reach to brain and affected to brain neurotransmission.

Tetrahydrobiopterin (BH4) is known as the cofactor of tyrosine hydroxylase. Moreover, it was reported that BH4 enhanced dopamine release from rat brain and rat pheochromocytoma (PC12) cells. Stimulation with higher concentrations (0.25-1%) of *n*-hexanal and *n*-hexanol enhanced dopamine and BH4 release from PC12 cells. In lower concentration of *n*-hexanal (0.01-0.1%) decreased BH4 release against *n*-hexanol did not. BH4 release was also caused in rat brain slices. These data suggested that green odor may modulate not only dopamine release but also BH4 release. We want to measure the BH4 concentration and tyrosine hydroxylase expression in PC12 cells and rat brain slices.