1. **No.**

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2. **Title**

   Functional Relationship of PACAP on Suppressive Food Intake Due to Nicotine.

3. **Period**

   2018-2020

4. **Summary**

We investigated the contribution of neuropeptide PACAP signaling to the feeding suppression effect of nicotine. Treatment of mice with 0~3 mg/kg nicotine for 5 days decreased food intake and body weight in a concentration-dependent manner; in PACAP (-/-) mice, nicotine significantly decreased food intake and body weight compared to PACAP (+/+) mice. All nicotinic acetylcholine receptor subunits were increased in the hypothalamus of PACAP (-/-) mice compared to PACAP (+/+) mice. In particular, a significant increase in expression was observed in the α4 and β4 subunits. When PACAP was overexpressed in the ventromedial nucleus of the hypothalamus, the expression of the α4 subunit of the hypothalamic preparations was significantly increased. On the other hand, when PACAP expression in the ventromedial nucleus of the hypothalamus was knocked down, the expression level of the α4 subunit showed a decreasing trend. These results suggested that PACAP modulates nicotine-induced food intake inhibition through the regulation of nicotinic acetylcholine receptor subunit expression. However, the effect of PACAP in the ventromedial hypothalamic nucleus on the regulation of nicotinic acetylcholine receptor subunit expression was opposite to that of systemic PACAP. In the future, we will investigate which brain region's PACAP is involved in the regulation of nicotinic acetylcholine receptor subunit expression..