1. **No.**

   FP01812201

2. **Title**

   Effect of Nicotine on Differentiation Potency of Pituitary Stem/progenitor Cells in Growing Male Rats

3. **Period**

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4. **Summary**

   Nicotine, a toxic component of smoking, has been reported to adversely affect the growth and reproduction of animals by reducing the secretion of anterior pituitary hormone, but it is unclear whether nicotine inhibits the supply of endocrine cells in the pituitary gland. In this study, we aimed to reveal the effect of persistent nicotine treatment on the differentiation potency of pituitary stem/progenitor cells. Nicotine did not affect the expression level of the pituitary stem cell marker Sox2 and the number of these positive cells. Interestingly, nicotine reduced the expression level of the pituitary progenitor cell marker Prrx1 and the number of these positive cells, leading to the decreased number of GH-positive cells by about 14%. Next, DNA methylation status was compared to investigate the cause of the decreased Prrx1 expression. Nicotine induced hypermethylation at characteristic CpG sites of Prrx1 first intron. Thus, we show that persistent nicotine exposure in young animals inhibits expression of Prrx1 in pituitary stem/progenitor cells through an epigenetic regulation, leading to delayed supply of GH-producing cells.