1. **No.**

   FP01812217

2. **Title**

   Effects of Nicotine on Impairments of Social Behavior and Endophenotypes of Autism Spectrum Disorder in Mice

3. **Period**

   2016-2018

4. **Summary**

   In Tsc2(+/-) brain, expression levels of a thousand genes were significantly altered and recovered by rapamycin administration. These genes were enriched in signal transduction of neoplasm formation and inflammation. Among genes in acetylcholine neurotransmission, the expression levels of Chat and Ache were increased in Tsc2(+/-) brain and these increases were suppressed by rapamycin administration. These gene expression changes in Tsc2(+/-) brain were significantly correlated with gene expression data of smoking in public database, but these relationships were not highly correlation. The dataset of Tsc2(+/-) mice was also slightly correlated with a gene expression data of pregnant exposure of tobacco. Tsc2(+/-) mice exhibited anxiety behaviours compared to wild-type mice and these significant differences were canceled by donepezil administration. Our findings suggested an increased acetylcholine turnover and involvement of acetylcholine neurotransmission with ASD-related behavioural impairments in Tsc2(+/-) mice.

   Our data also suggested that smoking and pregnant tobacco exposure may not highly contribute to ASD susceptibility.