1. No.
   2020Y009

2. Title
   Analysis on the Structure and Function of Synaptic Circuits in the Mice Fetally-exposured by Nicotine.

3. Period
   2020-2022

4. Summary
   Electrophysiological studies showed that oral nicotine feeding to mice in the late gestation period increased neuronal excitability in the medial frontal lobe in the pups born to these mothers. The pups also exhibited impulsivity as assessed by jumping from a height, suggesting that these pups may be useful as an animal model of impulsive-type ADHD. Mice with mutations in the SIK1 gene, which is part of a signaling system activated by nicotine, also exhibited neurophysiological and behavioral characteristics similar to those of nicotine-exposed mice, but their behavioral physiological abnormalities were found to be alleviated by risperidone. Although the full molecular mechanism by which prenatal nicotine exposure induces ADHD symptoms remains unclear, further research using the SIK1 gene, which serves as a hub of the PKA signaling pathway, as a starting point may lead to the development of treatments for ADHD, which is caused not only by prenatal nicotine exposure, but also by various other factors. This research is expected to lead to the development of treatments for ADHD caused by various factors, not only prenatal nicotine exposure.