1. No.
   2019G032

2. Title
   Effect of prenatal heat-not-burn cigarette on male reproduction and immune system in adult offspring mice.

3. Period
   2019-2021

4. Summary
   Background research into the legacy of disease and death that cigarette smoking imposes on the health of the population is extensive. The new heat-not-burn (HnB) type tobacco has been developed, which has added a new, less toxic possibility to smokers. HnB tobacco may be safer for both users and bystanders than conventional cigarette smoking, which is likely to lessen the burden of smoking-related diseases and deaths. However, the actual health effects on users, the effectiveness of HnB tobacco for smoking cessation are still under discussion. Moreover, the effects of fetal HnB tobacco exposure on male offspring's testicular function and immune system have not yet been sufficiently elucidated. Pregnant CD-1 mice were exposed to IQOS (HnB tobacco) aerosol from heat sticks, mainstream smoke from 3R4F (conventional cigarettes) or clean air, using a whole-body exposure system. Adult male offspring mice were divided into six groups: control (5- and 15-weeks-old offspring), IQOS (5 and 15-weeks-old) and 3R4F (5 and 15-weeks-old). Spermatogenesis, sperm characteristics, serum testosterone, and seminiferous tubule morphology were evaluated. Prenatal IQOS exposure increased abnormal seminiferous tubule morphology and decreased sperm production at 5 weeks, however 3R4F exposure did not. Prenatal exposure to IQOS aerosol delays sexual maturation of male offspring or adversely affects the male testicular function of the offspring more than smoke from a combustion cigarette. We found that the effects of fetal exposure to HnB tobacco on the reproductive system of male offspring are dose-dependently and may occur due to fetal growth delay.