1. **No.**

   FP01810127

2. **Title**

   Assessment of Human Exposure and Toxicity to Quinoid Compounds Inducing Oxidative Stress Through Tobacco Smoke

3. **Period**

   2016-2019

4. **Summary**

Polycyclic aromatic hydrocarbon quinones (PAHQs) produce reactive oxygen species (ROS) and cause oxidative stress. The identification and quantification of PAHQs in the combustion particulates including cigarette smoke samples and their toxicities based on oxidative potentials (ROS activity) were evaluated. PAHQs easily generated under high temperature combustion conditions such as an automobile engine and benzoquinones were the main components in wood combustion and tobacco smoke samples because of low-temperature combustion. Furthermore, PAHQs were identified and quantified in the mainstream smokes from the heart-not-burn (HnB) tobacco cigarettes and their concentrations were significantly lower than those in the main- and side-stream smoke of the conventional cigarette. The extracts of the smokes from the conventional and HnB cigarettes had ROS activity, and the activities of the HnB cigarette smokes were about 30% of a conventional cigarette smoke and the contribution of PAHQ was about 1% of the total activity of the extracts. As a model of thirdhand cigarette smoke, the sidestream smoke of a conventional cigarette was treated with light irradiation and the generation of two PAHQs with high ROS activity was observed. This study is the first to clarify the concentration and toxicity of PAHQs in cigarette smokes and their generation from the smoke in the environment, and continuous investigations of their exposure level and oxidative stress through ROS generation are essential.