1. **No.**

   FP01912069

2. **Title**

   Functional Analysis of Metallothionein Against Chronic Obstructive Pulmonary Disease (COPD)

3. **Period**

   2018-2020

4. **Summary**

   In this study, we aimed to analyze the efficacy of metallothionein (MT) in a cigarette smoke (CS)-dependent COPD model and to analyze its molecular mechanisms using an in vitro system. Using alveolar epithelial cells, we found that an approved drug containing zinc (polaprezinc) significantly suppressed cadmium (a toxic metal contained in cigarette smoke)-induced alveolar epithelial cell injury by inhibiting reactive oxygen species (ROS) production through MT induction. From the analysis using genetically modified mice, we found that porcine pancreatic elastase and CS-dependent lung injury were worse in MT-deficient mice than in wild-type mice. Furthermore, using an in vivo imaging system, we found that ROS production in the lung was enhanced in MT-deficient mice. These results suggest that MT inhibits lung injury caused by various stresses such as CS by suppressing ROS production in the lung. In the future, we would like to prove the efficacy of MT against COPD by conducting analyses in a model of long-term exposure to CS and in vitro molecular mechanism analyses.