1. **No.**

   FP01904078

2. **Title**

   The Effects of Cigarette Smoke on the Mechanism of Regeneration After Lung Injury.

3. **Period**

   2017-2020

4. **Summary**

   It has barely been reported that smoke-induced epithelial cell injury is recovered by cell regeneration process. We optimized the phenomenon that the damaged alveolar type 1 cells are regenerated by alveolar type 2 cells using lineage trace murine in chronic smoke exposure model. This regeneration process is decreased by age, resulted in obvious emphysema in lungs. In bronchial epithelial injury model, naphthalene model, cigarette smoke impaired club cell regeneration in spite of normal club cell proliferation. Furthermore, we tested hyperoxia addition to bleomycin induced lung injury model. Hyperoxia stress significantly suppressed lung remodeling, followed by airspace dilatation. Since fibroblast activation by club cell is necessary for the transformation in which club cells differentiate into alveolar type 2 cells. In immature newborn lung model, hyperoxia impaired early alveolar septal formation after birth. Those evidences strongly suggested that smoke exposure and oxidative stress might impair epithelial cell regeneration in emphysematous lung tissue by suppressing cell migration addition to cell apoptosis, inflammation and protease activity..