1. **No.**

   FP01802042

2. **Title**

   Dissection of Mechanism in CSE-induced Cardiomyocyte Death by Genome-wide shRNA Screening

3. **Period**

   2016-2018

4. **Summary**

Cardiomyocyte (CM) death is the major cause of heart failure. While molecular mechanisms of apoptosis are well investigated, those of necrosis remain to be elucidated. Reactive oxygen species are one of well-known cell death inducers and reported to be involved in cellular damage induced by cigarette smoke extract. However, its role in CM necrosis is not fully investigated. To explore a novel molecular mechanism of non-apoptotic cardiac cell death and determine molecules involved, we attempt to perform genome-wide screening using lentiviral shRNA library. Firstly, we used shRNA library system, however it was not effective since the infection efficiency of lentivirus to cardiomyocyte was too low to optimize experimental conditions. Thus, we changed the method to use CRISPR/Cas9 system using sgRNA library which are more cost effective and successfully performed the next generation sequencing for sgRNA library targeted whole genome. We determined 90 genes of potential candidate for novel genes those which are related to necrotic CM death. We also established a platform for screening using human-induced Pluripotent Stem Cell-derived cardiomyocytes.