1. No.
   2020Y008

2. Title
   Elucidation of the Mechanism of Chromosomal Instability Effect of Butyraldehyde in Tobacco Smoke on Mouse Embryos and the Genetic and Epigenetic Status Effects on the Next Generation Embryos.

3. Period
   2020-2022

4. Summary
   [Background] Our previous studies suggest that butyrradehyde in cigarette smoke causes chromosomal instability in human lung cells. On the other hand, induction of chromosomal instability in embryos is known to be involved in fertility and miscarriage. Therefore, the purpose of this study was to elucidate the mechanism and presence of butyraldehyde inducing chromosomal instability in early development. This year, we attempted to verify abnormalities in the DNA repair pathway on butyraldehyde-treated hiMSC cells.
   [Methods] The optimal conditions for administration of butyraldehyde in hiMSCs using western blot method were examined. It was examined for the key factors of each repair pathway containing FA pathway.
   [Results] As a result, little significant changes in protein expression were observed between human mesenchymal stem cells in the butyraldehyde-treated and non-treated groups for FANCA, FANCB and BACH1, which is one of the FA pathway key factors of various DNA repair systems.
   [Conclusion] Butyraldehyde has been suggested to have little effect on the disruption of the FA pathway in human mesenchymal stem cells. Therefore, it was considered that at least butyraldehyde may affect the disruption of the FA pathway of the DNA repair system only in cells with advanced differentiation, not in relatively undifferentiated stem cells.