1. No.

   2019G010

2. Title

   Effect of next-generation tobacco om growth and differentiation in cancer stem cells

3. Period

   2019-2021

4. Summary

[Background] Epidemiological studies have suggested that cigarette smoking is related to increased cancer risk in several types of cancer including lung cancer. Next-generation cigarette smoking has been recently developed and is considered to be less toxic. However, the relationship between the new cigarette and cancer development are not fully understood. Growing evidence suggests that development of cancer, such as lung cancer, is originated from cancer stem cells (CSC), which are a minor population of tumor and contribute to cellular heterogeneity. In the present study, we investigated the effects of cigarette smoke extract (CSE) on several types of lung CSC *in vitro*.

[Methods] Lung CSC are identified in human lung cancer cell line, using flow cytometry with a functional marker aldehyde dehydrogenase (Stem Cell Technology). RT-PCR was performed with the QuantiTect SYBR Green RT-PCR Kit (QIAGEN) using an ABI PRISM 7900HT sequence detection system (Applied Biosystems). CSE from IQOS, glo and PloomS were kindly provided from Dr. Horinouchi (Hokkaido University).

[Results] We examined the effects of CSE from IQOS, glo and PloomS on increase in lung CSC. As a result, each CSE induced ALDEFLUOR-positive cells in CSC. In addition, CSE induced expression of stem cell markers, such as Oct3/4.

[Conclusions] CSE from several heated tobacco products increased CSC-like cells *in vitro* via expression of stem cell markers.