1. No.
   2022G017

2. Title
   Molecular Mechanisms of Inhibitory Effects of Cigarette Smoke Extract on SARS-CoV-2 Infection

3. Period
   2022-2024

4. Summary

   Inspired by reports that there are few smokers among people infected with SARS-CoV-2 or that there are few smokers who test positive for SARS-CoV-2, we have reported that the amount of ACE2, a receptor component of SARS-CoV-2, is reduced by CSE treatment and that a reduction in ACE2 expression inhibits viral infection. In this study, we tried to elucidate the molecular mechanism of ACE2 expression regulated by CSE.

   In most of the cell lines used, we observed an increase in the expression of the AHR target gene *CYP1A1* and a decrease in *ACE2* expression following CSE treatment, but the sensitivity to CSE varied greatly between cells. The time course of these gene expression changes differed greatly between single CSE treatment and repeated additional treatment every 24 hours. Analysis of the *ACE2* gene promoter suggested that CSE-induced changes in ACE2 expression occur at the transcriptional level.

   ACE2 expression, which is an important factor in the SARS-CoV-2 infection mechanism, is regulated at the transcriptional level, and it was shown that it may be regulated by components of tobacco smoke. It was suggested that these regulatory mechanisms may be shared to some extent between cells, and it was hoped that this would provide an indication for the development of future treatments.