1. No.
   2021G015

2. Title
   Identification of long non-coding RNA associated with smoking-induced lung cancer and fibrosis

3. Period
   2021-2023

4. Summary

   First, we identified lncRNA *ELIT-1*, which is induced by TGF-β and induces gene expression related to fibrosis and epithelial-to-mesenchymal transition. In 2021, we identified *ELIT-2* and *ELIT-3* (*lincNMR*) as lncRNAs related to *ELIT-1*. Among these, the expression of *ELIT-3* was significantly increased by CSE treatment.

   In 2022, we found that *lincNMR* is induced to express through the TGF-β-Smad pathway and is involved in the induction of APOBEC3B expression, which catalyzes DNA mutations. Furthermore, *lincNMR* and APOBEC3B were found to be poor prognostic factors for lung cancer. When *lincNMR* expression increases due to smoking or TGF-β signals, APOBEC3B, which catalyzes DNA mutations, increases, which may be involved in the progression of lung cancer.

   Conversely, in 2023, *LINC00173* was identified as a lncRNA whose expression decreased with TGF-β and CSC treatment. It has been suggested that *LINC00173* functions to suppress lung cancer by forming the *LINC00173*-SNAIL-*FHIT* axis that positively controls *FHIT* expression through suppression of SNAIL.

   These lncRNAs discovered in this study are expected to serve as molecular targets for lung cancer prognosis and treatment.