1. No.

   2018G004

2. Title

   Effect of Tobacco Smoke Constituents on Paracellular Barrier of Lung Epithelial Cells and Development of Lung Disease Treatment

3. Period

   2018-2022

4. Summary

Abnormal expression of claudins (CLDNs), tight junctional proteins, has been reported in various respiratory diseases such as cancer and inflammation. However, the mechanism and pathophysiological function of CLDNs are still largely unresolved. In the present study, we found that the expression of CLDN1 and 11 is highly elevated in the lung tissues of chronic obstructive pulmonary disease. Acrolein, a toxicant in tobacco smoke, induced the elevation of CLDN1 expression and endocytosis of extracellular molecules in normal bronchial epithelium-derived BEAS-2B cells. On the other hand, nicotine and benzopyrene had no effect. Acrolein induced the elevation of CLDN1 expression and chemoresistance in human lung squamous cell carcinoma-derived RERF-LC-AI cells. Nrf2 is suggested to be involved in the reduction of chemosensitivity. Furthermore, we found that CLDN2 is involved in the chemoresistance of lung adenocarcinoma-derived A549 cells. The expression of CLDN1 or CLDN2 in the cancer cells was reduced by the treatment with flavonoids including kaempferide, chrysin, and luteolin, or caffeine. The chemicals and food ingredients, which can decrease the expression of CLDN1 and CLDN2, may be novel drugs against respiratory diseases.