1. No.
   2020G004

2. Title
   Progressive Effect and Mechanism of Nicotine on Urinary Bladder Carcinogenesis

3. Period
   2020-2022

4. Summary
   Tobacco smoking is a major risk factor for human cancers including urinary bladder carcinoma. We focused on nicotine, which is one of the major components in smoking, and examined progression effects by nicotine with rat models. We also examined effects of luteolin, which has been reported to have antioxidant and antitumor effects, on nicotine-induced bladder carcinogenesis. In a 4-week experiment, nicotine induced simple hyperplasia with up-regulation of cell proliferation, apoptosis and oxidative stress on urothelium, whereas luteolin suppressed them. In addition, genes whose expression was altered by nicotine were associated with cancer categories. In a two-stage rat bladder carcinogenesis model, nicotine treatment for 52 weeks did not increase the number of tumors, but significantly increased the incidence of invasive carcinomas. Nicotine also induced cell proliferation on bladder tumors. Meanwhile, nicotine did not induce tumor by itself. Luteolin reduced cell proliferation on nicotine-promoted bladder tumors, but did not inhibit bladder tumor progression. In conclusion, nicotine promoted urinary bladder carcinogenesis with induction of cell proliferation, but did not induce tumors by itself. Luteolin suppressed nicotine-induced effects on urothelium in the short experiment, but did not reduce bladder carcinogenesis by nicotine.