1. No.
   2020G009

2. Title
   Risk Evaluation of E-cigarette of Caffeine and Its Influences on Organisms by LC-MS/MS Analysis

3. Period
   2020-2022

4. Summary

An LC-MS/MS method for determination of caffeine (Caf) in smoke from e-cigarette. A sampling system for Caf using a suction pump was designed and sampling conditions were optimized. The optimized LC-MS/MS conditions allowed the sensitive determination of Caf in smoke with a limit of detection of 0.03 ng/mL at a signal-to-noise ratio of 3. The method was applied to CSEs from five e-cigarette products and the concentration of Caf ranged from 0.9-3.3 μg/mL smoke (n = 3). Additionally, minor components related to Caf, such as theobromine, theophylline, and paraxanthine, were detected in CSE and in e-liquid at very low concentrations, indicating that they were impurities in e-liquid and vaporized along with Caf.

Moreover, pharmacokinetic profiles of Caf after per oral (*p.o.*) administration of Caf and inhalation of e-cigarette Caf smoke were evaluated by an LC-MS/MS method developed. The pharmacokinetic parameters such as Tmax, ka for the Caf inhalation were significantly different compared with those of *p.o.* administration. And a bioavairability of Caf was 3.8 times higher than that of *p.o.* administration. These showed the more rapid absorbability and higher efficiency of Caf by e-cigarette using compared with those of Caf. *p.o.* administration. These findings might be useful to evaluate the risk of e-cigarette on human health.