1. No.
   2019G013

2. Title
   Nicotine-mediated fibrosis signaling via α7 nicotinic acetylcholine receptor in liver

3. Period
   2019-2023

4. Summary
   Activation of the α7 nicotinic acetylcholine receptor (α7nAChR) has been reported to be involved in liver fibrosis, but the detailed molecular mechanism remains unclear. In this study, we found that (1) activation of α7nAChR activates liver fibrosis signaling, and (2) nicotine alone does not cause liver fibrosis, but long-term exposure to nicotine in a liver fibrosis model significantly worsens liver fibrosis. Furthermore, as a mechanism of α7nAChR-mediated fibrosis promotion, we found that (1) injured hepatocytes induce choline acetyltransferase (ChT)-induced expression, synthesize and secrete ACh, and increase collagen-producing capacity by acting on activated hepatic stellate cells expressing α7nAChR, (2) activation of α7nAChR promotes the production of FGF23 possibly in Kupffer cells, and is involved in collagen production, and (3) activation of α7nAChR may induce M1/M2 macrophage polarity to M2 and increase collagen production through TGF-β production. These findings not only help to elucidate the mechanism of nicotine mediated acceleration of liver fibrosis, but also may be useful as new drug seeds for the treatment of liver fibrosis.