1. No.
   2019G023

2. Title
   Effect of nicotine and thyroid hormone on the insulin secretion from human pancreatic β cell.

3. Period
   2019-2021

4. Summary
   We are aiming to clarify the effects of nicotine on the functions of pancreatic islet β-cells using human βlike cells differentiated from human induced pluripotent stem cells (hiPSCs). We studied the effects of nicotine on the differentiation from undifferentiated hiPS cells to definitive endoderm, primitive gut tube, and posterior foregut. Nicotine did not have significant effect on the population of SOX17, HNF4α, and PDX1 positive cells which differentiated from hiPSCs. These results suggest that nicotine may not have an effect on the differentiation from undifferentiated hiPS cells to definitive endoderm, primitive gut tube, and posterior foregut.
   We also investigated the nicotinic acetylcholine receptor (nAChR) subunit (α4, α7, β2, β4) mRNA expression in undifferentiated hiPScs, definitive endoderm, posterior foregut, and pancreatic βcells (CD49a positive cells). α4 subunit mRNA levels in CD49a positive cells was decreased compared with those in undifferentiated cells. α7 and β4 mRNA levels in CD49 positive cells were not significantly different compared with those of undifferentiated cells. β2 subunit mRNA levels in CD49 positive cells was increased compared with those of undifferentiated cells. These results suggest that nAChR subunit mRNA levels are individually expressed during the differentiation from undiferentiated cells to pancreatic β cells.