1. No.
   2019G026

2. Title
   Functional analysis of nicotinic acetylcholine receptors for cell differentiation maturation and tissue engraftment

3. Period
   2019-2023

4. Summary
   In this study, we used mouse ES cells and human iPS cells to induce differentiation into primitive macrophages, which are precursors of microglia, and dopaminergic neurons and analyzed the role of nAChRs in this process. We found that the α6 nAChR subtype is expressed at a later stage of maturation, when dopaminergic neuron subpopulations are forming, and may particularly enhance the efficiency of differentiation into the DA2 subtype, which projects to the substantia nigra-striatum. On the other hand, α7 nAChR subtype promotes the proliferation of primitive macrophages, and the α2 nAChR subtype is also involved in the migration of primitive macrophages to the embryonic brain, which is expected to affect microglial population formation as well as brain development and development. Based on these results, we would like to continue our research on the functions of nAChRs during embryonic and developmental stages, which may affect brain development as well as individual brain functions.
   We would like to express our sincere gratitude to the Smoking Research Foundation for the five-year grant.