1. No.

   2018T003

2. Title

   Development of a Selective Imaging Probe for Activated Microglia Subtype as a Therapeutic Target by Nicotine Receptor Stimulants

3. Period

   2018-2022

4. Summary

   Microglia are mobilized around cerebral vascular lesions such as cerebral ischemia and hemorrhage, and understanding microglial dynamics is expected to be useful for therapeutic target selection and prognosis prediction. We tried to explore the potential of nAChRα7 as a drug discovery target by examining the relationship between cerebrovascular diseases and microglia using *in vivo* imaging techniques and PET probes of the central nicotinic receptor α7 subtype (nAChRα7). For this purpose, we established animal models and explored novel imaging probes for PET in this project.

   In the results: 1. an M2-type dominant rat model was prepared using kainic acid; 2. the TSPO imaging probe ^{11}C-DAA1106 for microglial imaging showed the possibility of M2-rich microglial imaging; 3. We started development of F-18-labeled nAChRα7 imaging probes with higher selectivity, and obtained two lead compounds that were considered to be useful. However, *in vivo* studies showed that both compounds have less retention in the brain. We need to explore the use of this structure in the periphery and further improve the chemical structure to find better compounds in the future.