1. **No.**

   FP01807100

2. **Title**

   The effect of nicotine on the mitochondrial dysfunction of Parkinson's disease -Nicotine and Mitophagy-

3. **Period**

   2016-2019

4. **Summary**

   In the present study, the relationship between nicotine and mitophagy, which is involved in the pathogenesis of Parkinson’s disease (PD), was investigated. When SH-SY5Y cells were treated with CCCP, which depolarizes mitochondria membrane potential, the protein levels of phosphorylated ubiquitin (pUb) and PINK1 that are both markers of mitophagy were increased and mitochondria clearance was observed in GFP-Parkin expressing cells. The expressions of pUb and PINK1 were increased in a concentration-dependent manner by α7nAChR agonist PNU282987 (hereafter referred to as PNU). In addition, since CCCP-induced cell death was slightly improved by PNU, it may have a neuroprotective function. The effect of PNU on mitophagy was then observed by confocal microscopy, which showed a trend toward enhanced mitochondrial aggregation and clearance. Furthermore, protein expression of HDAC6, a mitophagy-related molecule, was increased by PNU. Based on the above, PNU increased HDAC6, which has the potential to promote mitochondrial aggregation and fusion of autophagosome with lysosome, as a novel target for the treatment of PD.