1. **No.**

   FP01908140

2. **Title**

   The Effect of Nicotine on Implantation of Embryo

3. **Period**

   2018-2020

4. **Summary**

   While Japan's fertility rate is declining, fertility treatment outcomes are hitting a ceiling, and elucidation of the embryo implantation environment is desired for a breakthrough. Through this study, we were able to examine macrophages and implantation in detail. Macrophages can be classified into M1 and M2 macrophages, and we have shown that M2 macrophages are important for implantation using mouse and human data. We found that M2 macrophages are important for implantation by balancing M1 macrophages and not increasing TNF-α expression in the endometrial environment. In relation to smoking, we found that α7 nicotinic receptor agonists bias macrophages toward M2. In other words, from the perspective of M1 and M2 macrophages, nicotine may not work against them. In fact, we found that administration of α7 nicotinic receptor agonist to mice did not reduce pregnancy rate.