1. **No.**

   FP01902047

2. **Title**

   Development of New Methods for Mammalian Sperm Selection Using Nicotinic Receptor Signaling

3. **Period**

   2018-2020

4. **Summary**

   In this study, we were able to clarify for the first time the physiological role of the nicotine-type acetylcholine receptor ε subunit expressed in sperm in fertilization. The ε subunit is localized in the acrosome, and the experimental results using specific antagonists revealed that it is involved in the suppression of the acrosome reaction in the mouse model. Since the acrosome reaction is induced just before fertilization, it may function as a factor that regulates the timing of fertilization *in vivo*. More interestingly, expression of the ε orγsubunit was not observed in all spermatozoa. Given that individual spermatozoa have different sensitivities to acetylcholine, a ligand secreted from the uterus and fallopian tubes, the presence or absence of receptor expression may function as some spermatozoa selection mechanism.