Prof.
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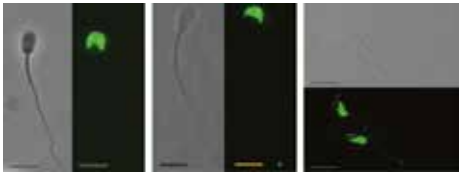
Basic and applied research on mammalian gametes (maturation, fertilization and early development)

We are studying on gametes in mammals including humans during gametogenesis, maturation, fertilization and early development, to develop efficient systems for embryo production in vitro. We are also undertaking basic and applied studies to improve the efficiency in the production of more value-added useful animals.

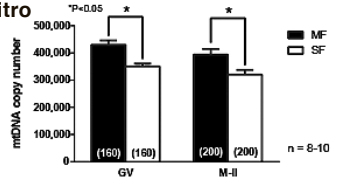
Intracytoplasmic sperm injection



Distribution of phosphodiesterase-5 (green) in different mammalian sperm (right, boar; center, bull; right, mouse)

Development of new systems to produce embryos in vitro from oocytes collected from small diameter follicles

For in vitro embryo production in mammals, especially domestic animals, usually oocyte-cumulus complexes derived from middle follicles with a diameter of 3-6 mm have been used. However, a large number of small follicles with less than 3 mm in diameter, rather than middle follicles, dominantly exist on the surface of ovaries. On the other hand, the developmental competence of the oocytes from small follicles (in meiosis and early development following fertilization) has been known to be much lower than those from middle follicles. We're trying to make clear the molecular reasons about differences in the developmental competence and to make effort to improve the ability by various modifications.



mtDNA copy number in porcine oocytes

Microinjection of mitochondria