Focus	Establishment of in vitro fertilization systems for all mouse strains
PI	Naomi Nakagata　Center for Animal Resources & Development (CARD),Kumamoto University
Period	FY2012 - 2013
Overview	The Center for Animal Resources and Development (CARD), Institute of Resource Development and Analysis, Kumamoto University was established in 1998 based on recommendations published in the report “Preservation, Supply and Development of Genetically Engineered Animals” by the Ministry of Education, Culture, Sports, Science and Technology. We provide a comprehensive and integrated set of research services specifically for the mouse-based biological research community. All services are conducted in accordance with the highest standards of animal health and genetic quality and are delivered to meet the research goals of each researcher. To promote biological sciences worldwide, we produce genetically engineered mice and exchangeable gene trap ES clones, cryopreserve mouse embryos and sperm, supply these resources, and act as a hub for domestic and international networks of both mutagenesis and resource centers. Up to now, we have produced about 1,500 genetically engineered mouse strains and have more than 1,700 strains and stocks of mice for supply to the scientific community. Recently, in vitro fertilization has become one of the most important reproductive techniques in mice, as it allows us to produce embryos efficiently. In this program, we will attempt to establish in vitro fertilization systems for use with fresh, cold stored and cryopreserved sperm for all mouse strains, in order to attain fertilization rates of over 90%.
Progress	References ・ Nakagata N, Takeo T, Fukumoto K, Kondo T, Haruguchi Y, Takeshita Y, Nakamuta Y, Matsunaga H, Tsuchiyama S,Ishizuka Y, Araki K. Applications of cryopreserved unfertilized mouse oocytes for in vitro fertilization. *Cryobiology*. 2013 Oct;67(2):188-92. doi: 10.1016/j.cryobiol.2013.06.011. ・ Takeo T, Fukumoto K, Kondo T, Haruguchi Y, Takeshita Y, Nakamuta Y, Tsuchiyama S, Yoshimoto H,Shimizu N, Li MW, Kinchen K, Vallelunga J, Lloyd KC, Nakagata N. Investigations of motility and fertilization potential in thawed cryopreserved mouse sperm from cold-stored epididymides. *Cryobiology*. 2014 Feb;68(1):12-7. doi: 10.1016/j.cryobiol.2013.10.007. ・ Nakagata N, Takeo T, Fukumoto K, Haruguchi Y, Kondo T, Takeshita Y, Nakamuta Y, Umeno T, Tsuchiyama S. Rescue in vitro fertilization method for legacy stock of frozen mouse sperm. *J Reprod Dev*. 2014 Apr 24;60(2):168-71. doi: 10.1262/jrd.2013-141. ・ Takeo T, Horikoshi Y, Nakao S, Sakoh K, Ishizuka Y, Tsutsumi A, Fukumoto K, Kondo T, Haruguchi Y, Takeshita Y, Nakamuta Y, Tsuchiyama S,Nakagata N. Cysteine analogs with a free thiol group promote fertilization by reducing disulfide bonds in the zona pellucida of mice. *Biol Reprod*. 2015 Apr;92(4):90. doi: 10.1095/biolreprod.114.125443. ・ Takeo T, Nakagata N. Superovulation using the combined administration of inhibin antiserum and equine chorionic gonadotropin increases the number of ovulated oocytes in C57BL/6 female mice. *PLoS One*. 2015 May 29;10(5): e0128330. doi: 10.1371/journal.pone.0128330. eCollection 2015.