

Thesis Title Porcine Oviductal Cells Support
In Vitro Bovine Embryo Development

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Abstract

This study was designed to investigate the development competency of in vitro matured, in vitro fertilized bovine embryos co-cultured in a) bovine oviductal cells (BOC), b) porcine oviductal cells (POC), c) bovine condition medium (BCM), d) porcine condition medium (PCM) and e) frozen porcine oviductal cells (FPOC). The oviductal epithelial cells were scrapped from luminal tissue of intact oviduct and cultured in TALP + 10% heat treated fetal calf serum. Condition media were collected from the secretions of similar epithelial cell preparation incubated for 3-5 days. Porcine oviductal epithelial cells were freezed at -196°C in liquid nitrogen by using glycerol as the cryoprotectant and thawed them before using. The results revealed that the efficiency between the cells and condition media in both species for embryo development were not significantly different at 2- and 6 to 8 cell stages whereas the percentage of development at 16 to 32 cell and morula stage co-cultured in condition media was significantly lower than those co-cultured with epithelial cells. Interesting, POC co-culture could support embryo development better than BOC. Frozen-thawed porcine oviductal epithelial cells could also support bovine embryo development but, it was significantly lower than that of fresh cells. To investigate the mechanisms by which the oviductal cells or condition medium in supporting the bovine embryo development in vitro, we examined differences in protein secretion by oviductal cells from both species during three phases of the ovarian cycle by SDS-PAGE. It was found that proteins secreted by oviductal cells in both species during the three phases of estrous cycle were similar in pattern.

The results indicated that both bovine and porcine oviductal epithelial cells and condition medium could support the development of bovine embryos produced in vitro. The cells could be frozen, even the efficiency was less than the freshy cells. The protein secretion by oviductal epithelial cells from both species during three phases of the ovarian cycle was similar as demonstrated by SDS-PAGE.