

Effect of Bovine Oviductal Tissue Extract and Humane Follicular Fluid on the Mouse Oocyte-Cumulus Complex

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In most mammals, mature oocyte-cumulus complex(COC) ovulate into the oviduct where fertilization by sperm takes place. However, the complex that fail to fertilize eventually undergo degeneration while they reside in the oviduct. Yet there is no known mechanism how both oocyte and cumulus cells degenerate. Using human follicular fluid (hFF), bovine oviductal tissue extract(BOX) and mouse oocyte-cumulus complex, the present study aimed to find how the oviduct influence the viability of the oocyte and cumulus cells *in vitro*. Immature COC were obtained from 3 week-old ICR mouse, and mature preovulatory or mature ovulated COC were obtained from 8 week-old mice. After culture in the presence or absence of BOX, viability of oocyte and cumulus cells were examined morphologically and their nuclei were further examined by staining with DAPI and by TUNEL assay. There was no difference of oocyte maturation rate between the control and BOX-treated groups. However, there was a significant difference in cumulus cells between two groups. Cumulus cells cultured in the presence of hFF alone underwent initially expansion and then they formed monolayer in the culture dish. After 72 hr, they proliferated well and showed fibroblast-like morphology. Cumulus cells cultured in the presence of both hFF and BOX also expanded, however, after 72 hr culture, they eventually detached and degenerated. Cumulus cells cultured in the BOX alone gave a similar drastic result. When cumulus cells 1 hr before ovulation or 8 hr after ovulation were compared after culture in the absence of BOX, postovulatory cumulus cells proliferated more slowly than those of preovulatory ones. When the cumulus cells cultured in the presence of BOX were stained with DAPI, their nuclei showed partial condensation and fragmentation. After detailed analysis of these cells by TUNEL assay, many nuclei of them exhibited well stained spots indicating the signs of apoptosis. Based upon these observations, it is suggested that BOX might possess a factor that leads mouse cumulus cells to undergo apoptosis *in vitro*.