

PSRM2025

Workshop

Sunway city, 2025.11.7-9

Sunway Pyramid Convention Centre (Sunway City, Kuala Lumpur, Malaysia)

Increasing cAMP levels in oocytes by mimicking FSH stimulation enhanced mitochondrial function and improved developmental performance in bovine oocytes

Shu Hashimoto

IVF Namba Clinic, Osaka Metropolitan University, Osaka, Japan

The method of culturing oocytes from small follicles to obtain mature oocytes (IVM) has attracted attention in reproductive medicine and livestock production. This method does not require the administration of gonadotropic hormones and yields more oocytes. However, IVM's clinical results are lower than those of conventional stimulation protocols, hindering its use. Oocytes recovered after FSH administration have higher developmental capacity than those not administered FSH. Since oocytes lack FSH receptors, FSH stimulation is obtained via the surrounding cumulus cells; this stimulation increases the amount of cGMP in the cells, resulting in an increase in cAMP levels in the oocyte. An increase in cAMP levels in oocytes has been shown to improve the development of bovine oocytes, but the mechanism remains unknown. We used next-generation sequencing to comprehensively analyze the gene expression changes induced by this cAMP elevation and elucidate the functional changes in oocytes. The cell cycle did not progress while cAMP levels in the oocytes were elevated. Meanwhile, the expression of proteins controlling the electron transport system increased, as did mitochondrial function. Our study reveals one mechanism by which FSH stimulation improves oocyte development and is expected to improve the clinical outcome of IVM.