

# **Elevated Histone H1 (MPF) and Mitogen-activated Protein Kinase Activities in Pig Oocytes Following In Vitro Maturation do not Indicate Cytoplasmic Maturation**

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## **Abstract**

Effects of different media (TCM 199 + BSA, TCM 199 + FCS, TCM 199 + NBCS, Whitten's medium + BSA) supplemented with estradiol-17 $\beta$  and two isolated and everted follicle shells on MPF and MAP kinase activities and the sensitivity to parthenogenetic activation of pig oocytes were examined at the end of culture (48 h). Elevated ( $P < 0.05$ ) activities of MAP kinase were recorded in metaphase II oocytes following culture in Whitten's medium, whereas MPF levels were lowest ( $P < 0.05$ ) in MII oocytes matured in TCM 199 supplemented with BSA. Oocytes matured in TCM 199 based media showed higher ( $P < 0.05$ ) activation rates when compared to oocytes incubated in Whitten's medium. Whitten's medium supplemented with different protein sources (amino acids, FCS, BSA) was used to study the effects of different exposure periods to eCG/hCG stimulation on MPF and MAP kinase activities and in vivo fertilisability following culture for 48 h. MPF and MAP kinase activities were significantly increased by eCG/hCG stimulation of COCs during maturation. Further, the continuous presence of eCG/hCG during culture (48 h) significantly increased the levels of both kinases in comparison to stimulation by gonadotrophins alone during the first 24 h of incubation. In vivo fertilisation of oocytes matured in Whitten's medium supplemented with eCG/hCG for 24 or 48 h led to a significant retardation of early embryonic development compared to ovulated oocytes. In conclusion, media composition and gonadotrophin stimulation affect MPF/MAP kinase activities and the susceptibility to parthenogenetic activation of IVM oocytes. However, elevated kinase levels in pig oocytes following culture do not indicate complete cytoplasmic maturation.

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