

Mouse Granulocyte-macrophage Colony-stimulating Factor Enhances Viability of Porcine Embryos in Defined Culture Conditions

S. H Jun, X. S Cui and N. H Kim

충북대학교 축산학과

Granulocyte-macrophage colony-stimulating factor (GM-CSF) is a multifunctional cytokine that has been implicated in the regulation of pre-implantation embryo development across several species. The aim of this study was to determine the effects of mouse granulocyte-macrophage colony-stimulating factor (mGM-CSF) on development of porcine parthenotes and nuclear transferred embryos, and on their expression of implantation-related genes. In the presence of bovine serum albumin, mGM-CSF did not increase the percentage of oocytes that developed to the blastocyst stage and at day 7 did not increase oocyte cell number. Addition of 10 mM GM-CSF to protein-free culture medium significantly increased the compaction and blastocoel formation of 1- to 2-cell parthenotes and cloned embryos developing *in vitro*. However, cell number was not increased when they were cultured in the presence of GM-CSF. Semi-quantitative reverse transcripts polymerase chain reaction (RT-PCR) revealed that mGM-CSF enhances mRNA expression of the leukemia inhibitory factor receptor, but does not influence interleukin-6 or sodium/glucose co-transporter protein gene expression in blastocyst stage parthenotes. These results suggest that mGM-CSF may enhance viability of porcine embryos developing *in vitro* in a defined culture medium.

Key words) *mGM-CSF, Parthenote, mRNA, Viability, Defined culture condition*