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## Polyamine Prevent Apoptotic Cell Death by Regulation of Apoptosis Related Gene Expression in Porcine Parthenotes

Xiang-Shun Cui, Yong-Xun Jin, Kyu-Chan Hwang and Nam-Hyung Kim

Chungbuk National University

Polyamines, namely putrescine, spermidine, and spermine, are biogenic low-molecular-weight aliphatic amines. Polyamines play important roles in DNA stabilization, RNA and protein synthesis, membrane stabilization, modulation of ion channels, and protection against oxygen radicals and are essential for cell homeostasis, cell growth, and tumorigenesis. The aim of this study was to determine the effects of polyamines on the viability and development of porcine diploid parthenotes developing *in vitro*. The addition of 0.05, 0.1 or 1.0  $\mu$ M polyamines to the culture medium enhanced the development of 4-cell parthenotes to the blastocyst stage and total nucleus at the blastocysts. Apoptosis in the blastocysts was decreased by the polyamines, furthermore, real time polymerase chain reaction revealed that polyamines decreased the mRNA expression of Fas/Bcl<sub>x</sub>L, Bak/Bcl-xL and caspase 3, and enhanced ornithine decarboxylase (ODC) and spermidine synthase enzyme of polyamine biosynthetic pathway mRNA expression. While D, L-alpha-Difluoromethyl ornithine (DFMO) and cyclohexylamine (CHA) are a well known inhibitor of ODC and spermidine synthase respectively, that had reverse effect on 4-cell porcine parthenotes developing *in vitro*.

**Key words:** *Pig embryo, Polyamine, Apoptosis, Blastocyst*