

Development of Parthenotes Produced by Various Treatments in Bovine

S. L. Lee, J. G. Yoo, G. J. Rho, H. J. Lee and S. Y. Choe*

College of Veterinary Medicine, Gyeongsang National University

Development of effective activation protocols is of great importance for improving the success of cloning and subsequent transgenic. Three methods for oocyte activation, including 5 μ M ionomycin (5 min) alone, ionomycin + 1.9 mM 6-dimethylaminopurine (DMAP, 3 hrs) and ionomycin + 10 μ g/ml cycloheximide (CHX, 3 hrs) were compared for their effects of pronuclei (PN) formation, development, developmental velocity and ploidy of parthenotes to IVF control in bovine. In group of ionomycin + DMAP, the oocytes having more 3 PN were significantly ($P < 0.05$) higher than in groups of ionomycin alone and of ionomycin + CHX (45.5% vs. 0 and 0%, respectively). Activation with the ionomycin alone, ionomycin + DMAP and ionomycin + CHX resulted in cleavage rates of 30, 85.5 and 57.9%, respectively. The blastocysts rate of parthenotes activated by ionomycin + DMAP treatment was significantly higher (12.3%, $P < 0.05$) than those of other treated groups. Chromosome analysis shows that ionomycin + DMAP treatment greatly increases the incidence of chromosomal abnormality of the parthenotes. When compared the developmental velocity at 24 hrs after insemination and activation, 27% eggs in IVF control and 55% in DMAP treatment out of total cleaved eggs developed to 2-cell stage, respectively. Developmental velocity of parthenotes activated by ionomycin + DMAP treatment was significantly ($P < 0.05$) faster than others.

From the results, we may conclude that DMAP treatment to the oocytes accelerates developmental velocity resulting in both the higher incidence of chromosome abnormality and of PN formation suggesting that CHX combined with ionomycin is suitable DMAP for the purpose of successful nuclear transplantation.

(Key words: activation, chromosome, pronuclear formation, developmental velocity, bovine oocyte)

본 연구는 2000년 농림기술개발사업 기획연구과제의 연구비 (MAF-SGRP, 300012-5)로 수행되었음.