

## P-18 Effect of Flavonoid on the Development and Gene Expression of Bovine in vitro Fertilized Embryo

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**Objectives:** The culture of embryos with a high concentration oxygen produces free oxygen radicals which have been implicated as major causes of in vitro embryos development arrest and cell death. Superoxide dismutase (SOD) and others that serve as radical scavengers were known to have beneficial effects on embryonic development in vitro. This study was to compare the treatment effect of a type of flavonoid and SOD as anti-oxidants on the bovine embryo development in vitro.

**Methods:** In vitro produced day 2 ( $\geq 2 \sim 8$  cell) bovine embryos were treated with various concentrations of flavonoids (3,4-dihydroxyflavone; 5, 10, 50 and 100  $\mu\text{M}$ ) or SOD (300 and 600 IU) for 6 days. The treatment effect was assessed by in vitro blastocyst development rate, total cell/inner cell number, ROS production, apoptotic index and internal anti-oxidant gene expression level.

**Results:** In flavonoid test, 1 and 10  $\mu\text{M}$  treatment groups were indicated higher development rates (40.0 and 42.1%) than control group (30.4%), while 50 and 100  $\mu\text{M}$  treatment groups were not effect (24.5 and 30.0%) compared to control group, respectively. In SOD test, 300 IU treatment group was shown similar development rate (31.8%) to control group (30.8%), while 600 IU SOD treatment was not good for the embryo development (22.7%). When the effects of 10  $\mu\text{M}$  flavonoid or 300 IU SOD on the bovine embryo development rate and total cell numbers were compared, 10  $\mu\text{M}$  flavonoid treatment group (42.1%,  $104.2 \pm 13.9$ ) was higher than 300 IU SOD treatment group (31.8%,  $94.6 \pm 0.3$ ), control group (30.2%,  $90.0 \pm 17.7$ ), respectively. We then measured intracellular ROS production using the oxidant-sensitive fluorescent dye, the results of the addition of SOD and flavonoid groups showed lower generation of fluorescent DCF in the blastocysts than control. Also, TUNEL assay of DNA fragmentation indicated the lowest apoptotic index was in 10  $\mu\text{M}$  flavonoid treatment group compared than other groups ( $p < 0.05$ ). In addition, transcripts levels of anti-oxidant gene (Mn SOD) and anti-apoptotic gene (survivin, BaxI) were significantly higher in the flavonoid treatment group than other groups ( $p < 0.05$ ).

**Conclusion:** This result indicated that a special type of flavonoid treatment supports for the in vitro developmental capacity of bovine embryos. Thus, flavonoid can be a good radical scavenger of poor in vitro environment for the embryo development.

## P-19 생쥐 자궁 및 자궁내막기질세포에서 BMP2 및 Wnt4 유전자의 발현

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**Objectives:** 스테로이드호르몬인 프로게스테론과 에스트로젠은 수정된 배아의 자궁으로의 착상에 있어 매우 중요한 역할을 한다. 프로게스테론은 자궁내막기질세포 (endometrial stromal cells)을 탈락막세포 (decidual cells)로