

## **Significant Improvement in Porcine Cloning Efficiency by Phytohaemagglutinin**

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Phytohemagglutinin (PHA) is a plant derived lectin with wide variety of biological activities including mitogenesis, cell recognition and cell agglutination. This study investigated the effect of PHA on porcine embryos produced by parthenogenesis (PA) or somatic cell nuclear transfer (SCNT). Results showed that in case of PA, PHA significantly improved the blastocyst rate ( $68.9 \pm 1.5\%$  Vs  $43.1 \pm 4.1\%$ ), hatching rate ( $25.8 \pm 3.1\%$  Vs  $8.9 \pm 2.0\%$ ) and total nuclei number ( $95.5 \pm 9.3$  Vs  $63.4 \pm 4.3$ ) when compared to control group ( $P > 0.05$ ). Blastocysts in PHA group were less predisposed to apoptosis and had decreased expression ratio of *BAX/BCL-XL* and enhanced relative abundance of *IGF2* transcripts. In case of SCNT embryos, PHA increased blastocyst rate from  $12.5 \pm 0.3$  to  $27.7 \pm 0.7\%$ , hatching rate from  $9.7 \pm 3.8\%$  to  $33.6 \pm 1.8\%$  and total nuclei number from  $34.3 \pm 6.4$  to  $45.5 \pm 9.0$ . These blastocyst also showed lower TUNEL ( $7.8 \pm 0.2$  vs.  $10.7 \pm 0.3$ ) and fragmentation ( $6.0 \pm 0.4$  vs.  $10.5 \pm 0.2$ ) indices compared to control group. Therefore, our study suggests that PHA improves the blastocyst yield and quality by enhancing blastocyst expansion, hatching and total cell number and decreasing the apoptosis by positively modulating the expression of embryo survival related genes.

Key words) *Phytohemagglutinin, Apoptosis, Gene expression, SCNT, Pig embryo*

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