

Cryobiological effects on morphology and apoptotic genes expression in ovine immature cumulus oocytes complexes

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Cryopreservation is an important tool for conservation of biological materials. This study reports effects of vitrification on the morphology of ovine immature cumulus oocytes complexes and mRNA content to observe the expression of key apoptotic genes, BAD, BAK, BAX, BID, BOK, BCL2A1, BCL2, MCL1, P53 and GAPDH on immature oocytes. For morphological evaluation using Zoom Stereomicroscope, 853 oocytes were divided into 3 groups for vitrification using 40% Glycerol or 40% DMSO or 20% Glycerol + 20% DMSO. After thawing, a total of 819 oocytes were recovered, resulting in a loss of 34 oocytes during

handling. The morphological examination of the oocytes revealed that the percentage of oocytes recovered in a morphologically normal state was minimum $84.2 \pm 2.3\%$ for Glycerol 40% and maximum $94.09 \pm 1.1\%$ for 20% Glycerol + 20% DMSO. The proportion of oocytes recovered in a morphologically normal state was significantly lower ($P < 0.01$) for 40% Glycerol ($84.2 \pm 2.3\%$) compared to that for these groups. For scanning electron, microscopic studies 451 oocytes were used in this experiment for vitrification using a combination of 20% Glycerol + 20% DMSO and percentage of oocytes recovered in a morphologically normal state was 95.7 ± 2.07 recorded. The real-time PCR results for the comparative expression of the apoptotic gene using mRNA abundance showed the down-regulation BAD, BCL2A1 and MCL1. The expression of BCL 2, BAX and BOK are similar in both the groups. However, BID and BAK were up-regulated. In addition,

P53 was also down-regulated proves vitrification safe for the preservation of immature oocytes in ovine.

Biography

Satish Kumar has expertise in Assisted Reproduction Technology. He is Assistant Professor at Ambala College of Engineering and Applied Research Ambala, Haryana, India. He is actively engaged in research and teaching in the Department of Biotechnology. He has guided eleven MTech students in different research areas of Biotechnology and has been member and coordinator of various committees of college and university level. He has MSc degree in Biotechnology and Molecular Biology, Haryana Agricultural University, Hisar and PhD in Animal Biotechnology from Chaudhary Devi Lal University, Sirsa, Haryana, India and authored one book and three book chapters book and research articles in the journal of international and national repute. He also serves as a member in the scientific advisory board of International Journal of Animal Biotechnology, India. He is a popular speaker who delivered lectures on the role of Biotechnology in human welfare and worked with scientists of International repute from top institutions world and India. He has delivered many lectures in different institutions across the country and at international level via webinar on the topic "Advances in Biocatalysis and its impact on early and late development of small molecules" to 12 PhD scientists and over 20 Research Associates to Merck Research Laboratories USA. His students working as scientist and doing PhD in US, Canada, Australia, etc.

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