

Developmental Potential of Interspecies Nuclear Transferred Embryos using Mouse Embryonic Fibroblast *In Vitro*

B.S.Koo¹, J.I.Yoon¹, H.Y.Son¹, M.G.Kim¹, C.H.Park¹, S.G.Lee¹,
Y.I.Lee¹, C.K.Lee^{1,2}

¹College of Agriculture and Life Science, ²Xenotransplantation Research Center, Seoul National University

Even though success in birth of live offspring from nuclear transfer(NT) using somatic cells in many species, detailed information on processes or mechanisms of development are not well known. Cytoplasm of bovine oocyte has been known to support the development of nuclear transferred embryos using nuclear donor cells from different species. Therefore, interspecies NT might be used to find answers of some questions in basic aspect of nuclear transfer. In this study, we examined the developmental potential of reconstructed embryos when bovine oocyte as a cytoplasm recipient and mouse embryonic fibroblast as a nuclear donor were used. The nuclear transfer units were allocated in Group 1. (murine block media and normal media) and Group 2. (bovine block media and normal media). NT units were not blocked at 2-cell stage regardless of types of medium. In mouse media, poor development of interspecies NT units was observed compared to bovine media. However, as NT units cultured in bovine normal medium, embryos developed over 8-cell stage. Further studies performed to increase the developmental rate in condition of antioxidant treatment. Despite low development, bovine-murine interspecies nuclear transferred embryos could develop to blastocysts and they showed that blastocysts rate of antioxidant group was superior to those of non-antioxidant group. Next, we investigated gene expression pattern which is carried out for zygotic activation. The Xist gene is expressed in female mouse embryo after zygotic activation of 4-cell stage. But interspecies nuclear transferred embryos do not express Xist gene at 4-cell stage. As a result, it is suggested that the bovine cytoplasm controls the early preimplantation development in interspecies NT. However, the development of later stages might require genomic control from transferred donor nucleus. Therefore, even though the involvement of several other factors such as mitochondrial incompatibility, effective development of embryos produced by interspecies NT requires proper genomic activation of donor nucleus after overcoming the cytoplasmic control of recipient oocytes.

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