

# Colcemid-treated heifer cytoplasts improved *in vitro* and *in vivo* cloned embryo development

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Two elements of the somatic cell nuclear transfer (SCNT) process likely have an effect on reprogramming efficiency: the state of the donor cell/nucleus and a suitable recipient cytoplast. Maternal transcripts are responsible for the events of early embryonic development, therefore, the recipient cytoplast likely has a more profound impact on the success of NT than the donor cell simply because it makes a more significant contribution to the reprogramming process. The present study was designed to examine the effects of colcemid, a microtubule assembly inhibitor, on the development of bovine NT embryos. At 19-20 h after the beginning of maturation, the recipient oocytes derived from heifer ovaries were denuded and exposed to colcemid for 3 to 4 h. Significantly higher blastocyst development (over 40%) was observed than the non-treated control oocytes. More cell number of the yielded blastocysts from the colcemid-treated oocytes was obtained than the control group. Colcemid concentrations and treatment times of oocytes did not affect their ability to support NT embryo developed to blastocyst and hatching blastocyst stages. Further investigation showed that colcemid-treated oocytes might tolerate high oxygen (20%) tension. The ratio of inner cell mass (ICM) : total cells was no difference among experimental groups and similar to the control groups. After embryo transfer higher ( $P<0.05$ ) pregnant rates were obtained from colcemid treated oocytes than non-treated. Six of 40 recipients (15%) received cloned embryos from colcemid treated oocytes delivered healthy calves, significantly higher than those recipients (3.3%) received embryos from non-treated oocytes.

**Keywords:** nuclear transfer, colcemid, chromosomal composition, bovine, oxygen tension

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