

Establishment of mouse fertilized tetraploid embryos and characteristics of preimplantation development

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Abstract

Tetraploid embryos are commonly used to avoid embryonic lethality due to the tetraploid complementation assay by introducing ES cells into tetraploid embryos which can develop to conceptuses. Numerous effective methods were performed to produce tetraploid embryos in vitro. However, electrofusion is one of the most accurate, measurable, repeatable, less toxic and well defined procedure which can be performed with the embryos having the zona pellucida. Efficiency of electrofusion depends on numerous factors, such as fusion medium, electrical parameters, characteristics of the cells, pulse number, alignment of embryos between electrodes, and exposure time. Attention in this study has been focused on choosing the optimal parameters of electric field with the aim of improving efficiency of cell fusion after electrofusion of 2-cell stage. The results showed that the compaction of 4-cell tetraploid embryos and 8-cell diploid embryos after 88 hr hCG injection occurred concurrently. Therefore, the timing of tetraploid embryo development and the first change in embryo morphology were dependent on the timing of fertilization, not on the number of completed cell cycles. Beside that, the immunofluorescence staining with CDX2 clarified that tetraploid embryos contributed only to trophectoderm due to lower numbers of TE cells and ICM cells in tetraploid blastocysts compared with diploid blastocysts.

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Speaker Publications:

1. Using Risk Factor Weighting to Target and Create Effective Public Health Policy for Campylobacteriosis Prevention in Ontario, Canada; American Journal of Public Health Research. 2013