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POSTER

Establishment of parthenogenetic diploid embryonic stem cells in mice

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Abstract

Parthenogenesis is a process in which zygotes are produced without sperm presence. Due to lack of paternal genes, parthenogenetic embryos cannot develop to full-term; however, these embryos show a great potential to generate histocompatible stem cells (parthenogenetic embryonic stem – pES cells) for transplantation. In this research, parthenogenetic activation in the mouse was carried out using strontium chloride ($SrCl_2$) combined with cytochalasin B (CB). The rate of embryo development, blastocyst quality and expression of acetylation of histone H4 lysine 12 ($H_4K_{12}Ac$) were investigated, while parthenogenetic blastocysts were used to establish pES cells. The results showed that rate of in vitro blastulation of parthenogenetic embryos was lower than that of fertilized ones (45.1% vs 98.0%, respectively). In addition, blastocysts developed from parthenogenetic embryos also expressed lower quality, which was demonstrated by lower total cell number. Moreover, $H_4K_{12}Ac$ expression significantly decreased in the inner cell mass (ICM) of parthenogenetic blastocysts compared to fertilized ones, indicating a possible reason for lower blastocyst quality. Following embryo collection and activation, two ES cell lines – fertilized (fES) and pES cell lines have been successfully established and maintained long term in vitro. To sum up, differences in blastocyst quality and $H_4K_{12}Ac$ expression in ICM cells of blastocyst may contribute to aberrant developmental and embryonic stem cell formation in parthenogenetic embryos.

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