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Alternative Splicing Transcripts of IGF-I in preimplantation mouse embryos

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Growth factors are potent mitogen for many kinds of cells. The insulin-like growth factor I(IGF-I) is known to play important roles during preimplantation embryonic development. Gene expression of IGF-I as a multiple transcript species has been found in different tissues of various animals. Alternative splicing, which produces different IGF-I transcripts having the sequence from either Exon 4(IGF-IB) or Exon 5(IGF-IA), has been reported in rat and human, but not in preimplantation mouse embryos. Using the reverse transcription polymerase chain reaction(RT-PCR), we detected the mRNA encoding IGF-I in preimplantation mouse embryos. The temporal pattern of different IGF-I transcripts revealed that the IGF-IA and IGF-IB were co-expressed during pre- and postimplantation mouse embryos. From above results, IGF-I transcripts were alternatively spliced through pre- and postimplantation embryonic development in mouse.

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Effects of Concanavalin A and Prostaglandins on Development and Hatching of Mouse Embryos

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It is well known that concanavalin A(Con A) induces activation and mitosis of immune cells, and prostaglandins(PGs) play a certain role in implantation. So, we examined the effects of Con A and PGs on develompent and hatching of preimplantation mouse embyos. The embryos(day 4, 96h post hCG injection) were cultivated in the medium containing Con A for 30 min, 60 min, 40 hr, respectively. Embryos were treated with PGs after Con A treatment for 60 min. Also, the concentration of Ca^{2+} was measured with confocal laser microscope during Con A treatment period. The blastocoel formation occured normally in all groups of Con A treatment. However, the hatching rate decreased and the rates of expanded and shrinked embryos increased siginficantly compared with control. These results suggest that Con A stimulates expansion but not hatching. By the treatment of PGs followed by ConA, the hatching rate overcame up to the value of control. But PGs inhibited hatching at the concentration of 10μM PGE_2 and $PGF_{2\alpha}$, respectively. So we suggest that post-treatment of PGs induces hatching. In the treatment of the Con A at day 4, intracellular calcium concentration in trophoectoderm increased and showed peak at specific sites of trophoectoderm. It is suggested that Con A increases the intracellular calcium concentration, and then enhances the blastocoel formation and expansion, but doesn't activate the hatching-related signal system. These results suggest that the treatment of ConA followed by that of PGs activates the expansion and hatching through some signal systems.