DEVELOPMENTAL POTENTIAL OF MOUSE EMBRYOS CULTURED IN VITRO: A MORPHOLOGICAL ANALYSIS

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The long term stationary culture of postimplantation embryos without extraembryonic membranes is a method to assess their development in vitro (1). When gastrulating rat embryos are cultivated, epidermis, cartilage, gut and respiratory epithelium, neuroblasts and myotubes develop and reach a high degree of differentiation (2, 3).

In order to determine the degree of tissue differentiation in cultivated mouse embryos, electron microscopy was used to analyse their ultrastructural characteristics. Gastrulating CD1 mouse embryos were cultivated in Dulbeco’s Modified Eagle Medium with 20% fetal bovine serum for 14 days and compared with cultivated gastrulating Fisher rat embryos.

After 14 days in vitro culture, various tissues developed: different epithelia, neuroblasts, connective tissue, cartilage, blood vessels and myotubes (Fig. 1). Electron microscopy showed a high extent of ultrastructural differentiation of obtained tissues (Fig. 2). It can be concluded that mouse embryos after long term culture can reach a high degree of differentiation which was comparable to that observed in rats.

References:
Figure 1. Cartilage (a) and blood vessel (b) in mouse embryo cultivated for 14 days. 400 x.

Figure 2. Myotubes containing myofibrils and Z-lines (→) in mouse embryo cultivated for 14 days. Bar = 1 μm.