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ABSTRACTS

Attachment and invasion of rabbit blastocysts confronted with endometrium in organ culture

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Embryo implantation in the uterus involves attachment of the apical side of the trophoblast to the apex of uterine epithelial cells, and it starts when the invasive phase of the trophoblast coincides with a "receptive state" of endometrium, the latter being controlled by estrogens and progesterone. The molecular basis for implantation is largely unknown so far. To study these mechanisms it is attempted to develop an in vitro culture model for embryo implantation. In a previous communication (Eur. J. Cell Biol. 33, Suppl. 5, 17, 1984) we have reported on a method of maintaining rabbit endometrium in organ culture, including the induction to transformation as typical for pregnancy. In a subsequent series of experiments this tissue is confronted with rabbit blastocysts.

An essential element of the experiments is that the endometrial fragments are obtained in early pseudopregnancy and are precultured for 2 days so that a complete, well-polarized epithelial covering is regenerated and is appropriately conditioned under progesterone influence.

Blastocysts show a remarkable degree of differentiation (embryo proper as well as the trophoblast) during co-culture with the precultured endometrial fragments. Attachment of blastocysts to endometrial fragments seems to be possible only if both are kept constantly in close contact as they are in the uterus. Random collision during flotation in simple culture systems with gyration is not sufficient. Better contact is provided by co-culture in plastic tubes closed with dialysis membranes, or in dialysis tubings. Attachment of trophoblast to and invasion into the endometrium as seen in these latter types of experiments is in many respects similar to the cytological details of implantation in utero.

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