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ABSTRACTS

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Preparation of uterine epithelium for trophoblast attachment: changes in apical plasma membrane-bound enzymes

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This study was performed in order to look for cell membrane changes which may prepare the uterine epithelium of the rabbit for attachment of the invasive trophoblast at implantation initiation at 7 d post coitum (p.c.).
Implantation chamber, interblastocyst endometrium as well as uterine epithelium at hCG-induced pseudopregnancy (p. hCG) were compared to distinguish between membrane changes regulated by maternal plasma steroid hormones and those which might be induced locally by blastocyst-derived signals.
Membrane characteristics were evidenced by marker enzymes of the apical plasmalemma of the uterine epithelium. All marker enzymes which could be detected with high activity in the apical plasma membrane were so-called brush-border enzymes: alkaline Phosphatase (aP), Aminopeptidase M (AM), γ-Glutamyltransferase (γ-GT) and Dipeptidylpeptidase IV (DPP IV).
The enzymes tested showed their main activity at 5 d p.c./d p. hCG. The weakest reaction in this series of stages is generally found at 8 d p.c./p. hCG. In interblastocyst segments and in the uterine epithelium of pseudopregnant rabbits there is a continuous decline from 5 d to 8 d p.c./p. hCG which varies in extent and the day of first decline. In the implantation chamber there was a difference between the epithelium surrounding the blastocyst and the epithelium of interblastocyst segments. In contrast to the rest of the epithelium the activity of DPP IV remained high in the cavum epithelium of the para- and obplacental folds and the activity of aP even raised again from 7 to 8 d p.c. indicating a direct local influence of the blastocyst itself on the luminal epithelium. The different stage-specific patterns of enzyme activity indicate a drastic change in the composition of the apical uterine membrane in preparation for adhesion and implantation of the blastocyst. (Supported by DFG grant De 181/9-6)

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