

ABSTRACTS OF PAPERS PRESENTED AT THE SIXTH ANNUAL
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106. *Blastocyst Enzymes and Implantation in the Rabbit*. H. W. Denker,* Department of Gynecology-Obstetrics and Physiology, Wayne State University School of Medicine, Detroit, Michigan and Max Planck-Institut für Immunbiologie, Freiburg, Germany.

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The dissolution of extracellular coverings of blastocysts and the establishment of contact between trophoblast and uterine epithelium were studied in the rabbit. Animals were autopsied at 6, 7, 7½, and 8 days postcoitum. Paraffin sections (7μ) through the uterus and blastocyst were prepared for histological, and substrate histochemical studies. Unfixed frozen sections (14 μ) were cut in a cryostat for enzyme histochemistry. Implantation involves lytic processes as judged by morphological and histochemical criteria. In the course of weakening and disappearance of the blastocyst coverings, the glycoproteins of these structures were found to undergo biochemical changes, e.g., a decline in sialic acid content. Hydrolytic enzymes, e.g., glycosidases (β-galactosidase, N-acetyl-β-glucosaminidase, β-glucuronidase), and aminopeptidases were localized in the endometrium, uterine secretions and in the trophoblast. The activity of sialidase seemed to be localized only in the endometrium. Protease activity as measured by a modified substrate film technique was very high in the blastocyst coverings and very low in the trophoblast. Dissolution of the blastocyst coverings started always in the abembryonic part of the blastocyst irrespective whether this part of the blastocyst apposed the antimesometrial or the mesometrial part of the endometrium. Abembryonic dissolution of blastocyst coverings seems to be related to the presence of an essential factor in the abembryonic trophoblast which, under appropriate hormonal environment triggers the dissolution of the coverings at this specific place. The rise in protease activity at the time of implantation is progesterone dependent as shown from experiments involving ovariectomy and progesterone replacement therapy. (Supported in part by Ford Foundation Grant. No. 710-0287 and National Institute of Child Health and Human Development Grant No. 06234-02.)