Extracellular material at the interface between early mammalian embryos and the uterus: dynamic changes in blastocyst coverings in the preimplantation period. H.-W. Denker (Abteilung Anatomie der RWTH, Melatener Straße 211, D-5100 Aachen

Early mammalian embryos are surrounded by extracellular coverings usually referred to as "zona pellucida". The zona is commonly assumed to serve a function in mechanical protection and in the control of metabolic exchange and sperm penetration. Recent data suggest that these coverings are more complex structures than previously thought (at least in a number of mammalian species), that they undergo considerable remodeling during the preimplantation phase, and that their physiological function may be quite different in different developmental stages. The structural and chemical transformation is most obvious in the rabbit but recent observations made in the horse and in carnivores suggest that this may be of more general significance.

In the rabbit, tubal secretion-derived material (mucoprotein layer, MP) is deposited at the outer surface of the zona pellucida (ZP). In the uterus, the ZP dissolves inside the persisting MP and is immediately thereafter replaced by a new innermost layer, the <u>neozona (NZ)</u>. Finally, a uterine secretion-derived layer, the <u>gloiolemma (GL</u>), is deposited at the outer surface of the MP, so that the complex coverings of the mature blastocyst consist of NZ, MP and GL.

A trophoblast-dependent proteinase (blastolemmase) appears to play a key role in the <u>dissolution of</u> the complex blastocyst coverings at implantation initiation. It was characterized as an arginine-specific serine proteinase apparently causing limited proteolysis. A completely different, uterus-derived enzyme for which some first biochemical data are available appears to be responsible for the dissolution of the ZP. Both trophoblast and endometrium participate in the formation of the NZ, of which the biochemical mechanism is under investigation. The continuous deposition and remodeling of material at the interface of both epithelia is considered an interesting new aspect of early mammalian embryology.

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