

Annual meeting of the

# Deutsche Gesellschaft für Zellbiologie

## Symposia

Evolution of the cell — Cell surface molecules for cellular interactions during development — Cell cycle control — Intracellular calcium pools and calcium binding proteins — Regulation of intracellular membrane fusion

## Workshops

The polarized epithelial cell — Signal transduction in sensory cells — Fluorescence digital imaging and confocal microscopy — Satellite cells and muscle regeneration — Parasite-host cell interaction — Cell-cell interaction via gap junctions — Interaction of pathogenic bacteria with mammalian cells — DNA methylation in cellular differentiation and ageing

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### 34 Uvomorulin, Actin and the Shift in Uterine Epithelial Polarity at Embryo Implantation

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Embryo implantation requires the adhesion of two epithelia, the trophoblast and the endometrium, via their apical membranes. This is very remarkable insofar as apical membranes of polarized epithelia are usually not adhesive for other cells. Therefore we investigated immunohistochemically the distribution of uvomorulin (E-cadherin), a cell adhesion molecule, and of actin, a major constituent of the cytoskeleton, in the uterine epithelium of pregnant rabbits in the pre- and periimplantation phase. Both proteins are possibly involved in the establishment and maintenance of epithelial polarity.

In non-pregnant uteri uvomorulin is located only at the lateral membranes with a subapical maximum in the junctional complex while actin is diffusely distributed throughout the cytoplasm with a subapical maximum in the terminal web. This distribution is typical for polarized epithelia.

In early pregnancy uvomorulin loses its subapical maximum and is more evenly distributed along the lateral membranes while actin remains relatively unaltered. On day 8 p. c. when implantation has just started there is a marked change in the distribution of uvomorulin in the uterine epithelium in certain distinct areas of the implantation chamber: Large amounts of the protein are now located at the basal cell surface of the epithelial cells. Immuno-gold electron microscopy of these areas show numerous cell projections which contact with each other via uvomorulin. In the same region there is a striking enrichment of filamentous actin in the basal cytoplasm of the cells as shown by TRITC labeled phalloidin.

We suggest a trapping mechanism for uvomorulin that leads to local enrichment of this molecule through the process of establishment of cell-cell-contacts between the basal projections. As uvomorulin is indirectly linked to actin, this cytoskeletal protein becomes enriched in the same basal part of the cell. This shift in the distribution of actin could influence the overall polarity of the cells including the composition of the apical membrane compartment as a prerequisite for successful embryo implantation.

## ABSTRACTS

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