

Human Vaginal-Ectocervical Tissue Model For Vaginal Irritation Studies. Ayehunie, S., Kubilus, J., Cannon, C., Klausner, M., MatTek Corporation, Ashland, MA 01721.

ABSTRACT:

Purpose: To develop a human in vitro tissue model for vaginal irritation studies

Methods: Normal, human ectocervical-vaginal (ECV) epithelial cells were harvested from hysterectomy tissue free of pathology. Dendritic cells were harvested from human umbilical cord blood. Both cells types were expanded in culture and cryopreserved. Three-dimensional tissues were reconstructed using these cells and specially formulated serum free medium. The tissue was exposed to exogenous stimuli and to potential vaginal irritants. Changes in gene expression were determined using RT-PCR and tissue viability was monitored using the MTT tissue viability assay and histology.

Results: A three-dimensional in vitro engineered ECV tissue has been produced whose histological and ultrastructural features mimic those of native tissue including the presence of basal, parabasal, glycogenated intermediate, and the superficial cell layers. RT-PCR experiments using multiplex primers showed that upregulation of genes for IL-6, TNF- α , IL-1 β , and GM-CSF in response to external stimuli such as LPS and PMA. Different concentrations of vaginal spermicides or microbicides such as Nonoxynol-9 (N9), carrageenin-1 (C1), and methyl cellulose (MC) affected tissue viability to varying degrees in the order N9 > C1 > MC. Structural damage as observed in histological cross-sections followed a similar order.

Conclusions: The ECV tissue model appears to be a useful tool to screen new or existing spermicides, microbicides and other feminine hygiene products for potential vaginal irritation.

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