

COLONIC EPITHELIAL BRUSH BORDER ALTERATIONS IN MICROSCOPIC COLITIS: AN INTEGRATED MULTI-OMIC ANALYSIS

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Poster

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Multi-omic analysis with electron microscopy reveals dysregulated brush border molecular pathways and structural microvilli defects in microscopic colitis, particularly collagenous colitis, compared to healthy controls and IBS-D patients.

KEY POINTS

- RNA-Seq analysis identified three microvilli-related pathways significantly enriched in collagenous colitis compared to lymphocytic colitis, IBS-D, and healthy controls, with integrated analysis revealing 28 genes showing significant RNA-protein expression correlation.
- Collagenous colitis showed reduced expression of microvilli proteins and actin-binding proteins compared to all other groups, while both collagenous and lymphocytic colitis showed altered protein expression in the actin-membrane junction.
- Electron microscopy demonstrated that microvilli in microscopic colitis were more scattered, irregular, and shorter than in healthy controls and IBS-D, with microvilli density reduced in collagenous colitis (3.7 per μm) and lymphocytic colitis (5.2 per μm) versus healthy controls (7.5 per μm).
- Microvilli length was significantly reduced in both collagenous colitis (0.5 μm) and lymphocytic colitis (0.6 μm) compared to healthy controls (1.1 μm), with no differences observed between IBS-D and healthy controls.
- This study provides previously undescribed molecular and ultrastructural characterization of brush border dysfunction in microscopic colitis that may inform future pathophysiological understanding and potential diagnostic or therapeutic approaches.

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