

Dysregulation of the Barrier Function in T84 Intestinal Epithelial Cell Monolayers Through the Modulation of Tight Junction Localization by Lipopolysaccharide

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Abstract : Background & Aims: Bacterial lipopolysaccharide (LPS) has been reported to be an important factor involved in experimental enteropathy and IBD. Our aim was to investigate the functional, as well as the morphological, changes of the tight junction (TJ) in response to LPS in T84 intestinal epithelial monolayers. **Methods:** LPS (10, 100 or 300 µg/ml) was added to the cultured T84 cells. The barrier function of the TJ was evaluated by measuring transepithelial electrical resistance (TER). The expression and localization of TJ-associated proteins (ZO-1 and occludin) were examined by Western blotting and confocal laser scanning microscopy, respectively. **Results:** LPS induced a significant decrease in TER in a dose-dependent manner in T84 cells. Western blotting demonstrated no significant changes in the expression of either ZO-1 or occludin. Confocal laser scanning microscopy and densitometric analyses showed significantly altered localization of ZO-1 and occludin at a higher concentration of LPS (300 µg/ml) ($P < 0.001$). **Conclusions:** These results suggest that LPS induces a disruption of the TJ in T84 cells due to an altered localization of ZO-1 and occludin, thus leading to barrier dysfunction. The dysregulation of TJ by LPS may therefore play a crucial role in the pathogenesis of IBD.

Key words : Tight junction, Lipopolysaccharide, T84 cell monolayer, ZO-1, Occludin