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Basic Study

Sieving characteristics of cytokine- and peroxide-induced epithelial barrier leak: inhibition by berberine

Katherine M DiGuilio, Christina M Mercogliano, Jillian Born, Brendan Ferraro, Julie To, Brittany Mixson, Allison Smith, Mary Carmen Valenzano, James M Mullin

Abstract

AIM: The IBD colon exhibits varying severity and cytokine levels across its mucosa. Does this create varying types of transepithelial leak?

METHODS: We examined the effects of Tumor Necrosis Factor- α (TNF), Interferon- γ (IFN), Interleukin-1- β (IL1 β) and hydrogen peroxide (H₂O₂) – singly and in combinations – on barrier function of CACO-2 cell layers. Our focus was on the type (not simply the magnitude) of transepithelial leak generated by these agents as measured by transepithelial electrical resistance (TER) and transepithelial flux of ¹⁴C-D-mannitol, ³H-Lactulose and ¹⁴C-Polyethylene glycol as radiolabeled probe molecules. The isoquinoline alkaloid, berberine, was then examined for its ability to reduce specific types of transepithelial leak.

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