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INCREASED EXPRESSION OF HUMAN BETA-DEFENSIN 2 IN HIV- INFECTED HUMAN COLONIC MUCOSA

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INTRODUCTION: Human beta-defensins (HBD) are antimicrobial peptides produced by the gastrointestinal epithelium that contribute to the mucosal innate immune system. Up-regulation of Human Beta-Defensin 2 (HBD-2) has been previously demonstrated in gastrointestinal bacterial infections and inflammatory bowel disease. To better define the role of HBD-2 in HIV infection, we compared mRNA expression of HBD-2 in endoscopic biopsies of colonic mucosa from healthy controls, active ulcerative colitis patients, and patients with HIV infection.

METHODS: The relative expression level of mucosal HBD-2 mRNA and HIV-1 was measured by real-time RT-PCR in colonic biopsies from 34 patients (6 healthy controls, 5 patients with ulcerative colitis, and 23 patients with HIV infection). The HIV-infected patients were further subdivided into 2 groups depending on their mucosal HIV viral load (MVL). Twelve patients had MVL <10 copies and 11 patients had MVL >5000 copies.

RESULTS: None of the control biopsies had detectable expression of HBD-2 mRNA. In contrast, 60% of the ulcerative colitis, 33% of the HIV-infected (with MVL <10 copies), and 100% of the HIV-infected (with MVL >5000 copies) biopsies, demonstrated positive expression of HBD-2 mRNA.

CONCLUSIONS: The up-regulation of HBD-2 expression in HIV infection seen in this study may be a response to the mucosal inflammation that has been previously described in intestinal tissue from patients with HIV infection. In addition, the increased expression of HBD-2 in tissue with high versus low HIV MVL suggests a virological threshold before up-regulation of HBD-2 expression occurs. HBD-2 expression and regulation appears to play a role in controlling mucosal HIV infection. Further work is required to

characterize the relationship between HBD-2 and HIV infection but HBD-2 may be considered as a potential candidate microbicide for HIV prevention.

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