Gut microbiota-mediated P-glycoprotein regulation in the intestinal epithelium

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Video Byte

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Abstract

P-glycoprotein (P-gp) plays a critical role in gut health by transporting foreign substances and aiding communication between the innate immune system and the gut mucus barrier. However, the exact P-gp regulation mechanisms and the influence of the microbiome remain unclear. To learn more, a recent study investigated how the microbiome drives P-gp expression and function. In mice, specific vancomycin-sensitive gut bacteria were found to be necessary for normal P-gp expression, and recolonizing germ-free mice with these bacteria from donor mice restored gut P-gp levels. Certain metabolites produced by these bacteria synergistically increased P-gp expression and function in mice and a human cell line. In samples from humans with ulcerative colitis (UC), P-gp expression was reduced, particularly in lesion (involved) samples, and the levels of the anti-inflammatory P-gp substrate AEA 20:2, an endocannabinoid (eCB), were decreased. Finally, soluble stool fractions from patients with UC were not able to induce P-gp expression in a cell line. Although further research in humans is needed, the findings suggest that microbes and their metabolites are important modulators of P-gp and support a new crosstalk mechanism that regulates intestinal inflammation.