Review of microbial transformations of human bile acids

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Video Byte

Keywords: bile acid, cholic acid, conjugation, Microbiome, metabolism, microbiology, gut health, Clostridium scindens, Enterocloster bolteae, bile acid transformation, bile salt hydrolase, microbially conjugated bile acid, glycine, taurine, microbiota, microbial transformation, deconjugation, dehydroxylation, dehydrogenation, epimerization, symbiosis

Posted Date: October 13th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-967275/v1>

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Abstract

Bile acids play key roles in gut metabolism, cell signaling, and microbiome composition regulation in mammals. Primary bile acids are produced from cholesterol in the liver but are modified by microbes in the gut to form numerous secondary and tertiary bile acids with diverse functions. For decades, gut microbes have been known to transform bile acids through several mechanisms, including deconjugation of the amino acids glycine and taurine by bile salt hydrolases, dehydroxylation of the cholesterol core, and dehydrogenation and epimerization of the cholesterol core. Notably, alterations in the chemistry of the resulting secondary bile acids are linked to several diseases, including cirrhosis, inflammatory bowel disease, and cancer. Recently, an additional transformation mechanism was uncovered in which gut microbes conjugate amino acids to bile acids. The discovery of the resulting microbially conjugated bile acids expands the known diversity of bile acids in the mammalian gut. However, the effects of these bile acids on mammalian physiology and gut microbe dynamics remain to be clarified.