Identification of interacting proteins for a liver-specific butyrate transporter OAT7

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Short chain fatty acids, including acetate, propionate and butyrate, have been shown to regulate various metabolic processes such as energy and lipid metabolism. Of these short chain fatty acids, butyrate has been identified as a ligand for GRP41/43, both of which are known to stimulate GLP-1 production from L cells in the intestine. Thus, the butyrate blood levels would correlate with GLP-1 production and one of the determinants of the butyrate level is its uptake/release by the liver. Human liver-specific organic anion transporter 7 (OAT7), expressed at the hepatic sinusoidal membrane, has been functionally characterized as an exchange transporter of butyrate with sulfate conjugated steroids.

The purpose of this study is to clarify the regulation of butyrate transport function. As a first step we attempted to identify OAT7 interacting proteins by yeast two-hybrid and immunoprecipitation followed by mass spectrometry in human liver cell lines, HepG2 and Huh7. One of the proteins identified by yeast two-hybrid, PDZK1/NHERF3, was likely to regulate OAT7 function. We are currently seeking other regulatory proteins for OAT7 by proteomic analysis of the immunoprecipitant.