Biao Nie, J Diabetes Metab, 2:8
doi: http://dx.doi.org/10.4172/2155-6156.S1.02

OMICS Group Conferences
Accelerating Scientific Discovery

2nd World Congress on
Diabetes & Metabolism

6-8 December 2011 Philadelphia Airport Marriott, USA

TITLE

Secondary bile acids inhibit hepatic fatty acid uptake

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Bile acids are known to play important roles as detergents in the absorption of hydrophobic nutrients, and as signaling molecules, in the regulation of metabolism. Here we tested the novel hypothesis that naturally occurring bile acids interfere with protein-mediated hepatic fatty acid uptake. Stable cell lines expressing fatty acid transporters as well as primary hepatocytes from mouse and human liver were incubated with primary and secondary bile acids to determine their effect on fatty acid uptake rates. Mice were treated with secondary bile acids in vivo to assess their ability to inhibit diet-induced hepatic triglyceride accumulation. Ursodeoxycholic acid (UDCA) and deoxycholic acid (DCA) were identified as potent inhibitors of the liver-specific fatty acid transport protein 5 (FATP5). Both UDCA and DCA were able to inhibit fatty acid uptake by primary hepatocytes in a FATP5-dependent manner. When given to mice in vivo, UDCA and DCA inhibited by more than 50% the accumulation of hepatic triglyceride in response to a high-fat diet. The data demonstrate a novel role for specific secondary bile acids in the regulation of hepatic fatty acid uptake. They illuminate a previously unappreciated means by which secondary bile acids can impact liver metabolism, and highlight a unique hepatoprotective function of UDCA that could inform its future clinical use.

Biography

Biao Nie has completed his M.D. and Ph.D at the First Military Medical University and Southern Medical University of China. Now he studies as postdoctoral scholarship in the department of Nutritional Science and Toxicology, University of California at Berkeley. He is also an attending doctor in Nanfang (Southern) Hospital, Guangzhou, China.