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Down regulation of CD98 receptors via siRNA loaded nanoparticles attenuate NAFLD signs in mice liver

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Nonalcoholic fatty liver disease is highly correlated to obesity and thus commonly found in developed countries. It is defined as excessive lipid accumulation in the liver, i.e., hepatosteatosis. Nanotechnology, including nanoparticles (NPs), for drug delivery system is an alternative solution to prevent cytotoxicity of drugs. As the main cells concerned with liver inflammation overexpressed CD98 during NAFLD, the aim here is to investigate how a reduction/knock down of CD98 expression via CD98 siRNA loaded into NPs can ameliorate the overall liver inflammation. After accessing *in vitro* on mice macrophages and human hepatic cells that CD98 siRNA NPs significantly reduced CD98 expression, the study in mice model of fatty liver disease was translated. Age and gender matched wild type (WT) mice were used for *in vivo* experiments to induce fatty liver by providing to mice 70% fat diet for 8 weeks. Liver, spleen, colon and main organs were collected to respectively analyze overexpression of cytokines and fatty liver markers, mRNA level, and perform histology (H&E and Oil red to stain cytosolic lipid vacuoles inclusions). Mice receiving NPs loaded with CD98siRNA have significantly reduced signs of liver inflammation and lipid accumulation. In addition, evidence of hepatic injury such as hepatocyte ballooning, increased blood levels of ALT, hepatic inflammation, oxidative stress was all attenuated in significant proportion when mice received CD98 siRNA loaded NPs. Together, the data show that diminution of expression of CD98 in hepatic cells strongly correlated with a diminution of NAFLD signs thereby CD98 seems to act like as a steatosis actor/inducer in NAFLD.

Biography

Hamed Laroui has completed his PhD in 2007 from Henri Poincare and Polytechnics University (France) and Postdoctoral studies from Emory University School of Medicine (Gastroenterology division). He is now Assistant Professor at Georgia State University serving as Director of the Biophysical Group. He has published more than 29 papers in reputed journals and serving as reviewer for reputed journals such as *Gastroenterology, Molecular therapy, JBC.*

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Light weight complex hydrides for high-capacity hydrogen storage

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Development of safe, efficient and economic hydrogen storage technology is a major challenge for widespread use of hydrogen energy. Complex hydrides with light weigh elements possessing gravimetric densities higher than 5 mass% and volumetric densities higher than 70 kg/m^3, have been investigated for a decade as potential candidates of on-board hydrogen storage materials for fuel cell vehicles. In this presentation, the most investigated metal borohydrides $M(BH_4)_n$ (n is the valence of metal M) will be taken as an example to explain the dehydrogenation and rehydrogenation mechanism of complex hydrides. Furthermore, the material designing guidance of complex hydrides from a thermodynamic point of view and the promoting effect of nanotechnology on kinetics, based on the systematic summary of the recent significant progresses will be discussed.

Biography

Hai-Wen Li received his PhD degree in 2005 from Kitami Institute of Technology (Japan), under the supervision of Prof. Kiyoshi Aoki. He works as an Associate Professor at International Research Center for Hydrogen Energy and International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University. His research interests focus on investigating fundamental, physical and chemical properties of metal and complex hydrides, aiming at developing advanced materials for hydrogen storage and secondary batteries.

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