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Search for new potential biomarkers of non-alcoholic fatty liver disease progression in morbid obese patients

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The aim of this study was to uncover new potential biomarkers of Non-Alcoholic Fatty Liver Disease (NAFLD) progression in morbid obese patients ($BMI \geq 36 \text{ kg/m}^2$) referred for bariatric surgery. Liver biopsy and plasma of Non-NAFLD obese, histology-confirmed steatosis obese and histology-confirmed advanced grade of NAFLD: Non-alcoholic steatohepatitis (NASH) obese patients were obtained during bariatric surgery. After randomized, eligible liver sample was examined by HR-MAS ¹H-NMR spectroscopy, eligible plasma of Non-NAFLD obese (n=18), steatosis obese (n=32) and NASH obese (n=21) patients were analyzed by a 500M Hz ¹H-NMR spectroscopy. So far, Orthogonal Projections to Latent Structures Discriminant Analysis (OPLS-DA) shows clear separation between Non-NAFLD obese and NASH obese patients, OPLS-DA and PLS-DA models were evaluated by internal 7-fold cross validation with Cross Validation Area Under Receiver Operating Characteristic (CV-AUROC) > 0.90 for Liver biopsy OPLS-DA model and CV-AUROC > 0.93 for plasma PLS-DA model. Plasma metabolites such as VLDL/LDL, lipid -CH₂CH₂CO, lipid -CH₂CH=CH and lipid -CH₂CO were significantly higher in NASH obese than in Non-NAFLD obese patients, plasma metabolomic profile appears to correlate with HR-MAS ¹H-NMR liver biopsy metabolomic profile. Because of NMR resolution limit, those plasma samples will also analysis by a High-resolution mass spectrometry to get detail information on metabolites such as VLDL/LDLs, triglycerides, non-esterified fatty acids, phosphatidylcholines and ceramides. Furthermore, combing biochemical, genomic and transcriptomic data our study may shed light on mechanisms of mitochondrial dysfunction, hepatic lipid metabolism alterations during NAFLD progression.

Biography

Xiangping LIN has completed his master's thesis "Urinary metabolomic profiling in the French Cohort SU.VI.MAX2 subjects to identify new biomarkers of apple consumption" at the French National Institute for Agricultural Research (INRA). He is doing now a PhD at CSPBAT Laboratory, University of Paris 13, and working on the "Obelix" project, this project aim to search new potential biomarkers of Non-Alcoholic Fatty Liver Disease progression in morbid obese patients referred for bariatric surgery by NMR, MS based metabolomics combined with biochemical, genomics, transcriptomics and statistical approaches.

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