

## Metabolomics-based investigation of the lipid-lowering mechanism of Schisandrin B in nonalcoholic steatohepatitis

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**Background:** Before the advent of advanced MS instrumentation and metabolomics study, delineating the metabolic effects of herbal drugs has been a difficulty, tedious and time-consuming task. Metabolites are the end products of cellular regulatory processes and they represent the ultimate responses of our biological systems to drug treatments. Study on the metabolic effects of herbal drugs not only helps to evaluate efficacy of the drugs, but also paves a new way to explain its mechanism of action. Non-alcoholic steatohepatitis (NASH) is considered the hepatic manifestation of metabolic syndrome. Fatty infiltration of the liver is the hallmark feature of non-alcoholic steatohepatitis (NASH). NASH patients will progress to cirrhosis, end-stage liver disease and hepatocellular carcinoma. Drug that could reduce hepatic lipid accumulation is desperately needed. A Chinese herb *Semen Schizandrae* (seeds of *Schisandra Chinensis*) possesses hepatic lipid lowering effect.

**Hypothesis:** Schisandrin B (Sch B), the most abundant and active dibenzocyclooctadiene derivative isolated from *Schizandrae Chinensis* which could reduce lipid accumulation in the mice hepatic steatosis model. We postulate that changes in metabolic profiles in livers after Sch B treatment could reveal the underlying mechanism of Sch B.

**Objective:** In this project, we aim to identify metabolites that might help to elucidate the lipid lowering mechanism of Sch B in hepatic steatosis by LC/MS metabolomics approach.

**Results:** In our study, the principle component analysis of mice liver metabolites revealed distinct profiles by Sch B treatment. After searching against database, we have suggested a number of metabolites which contribute to the distinct clustering that might help to elucidate the lipid-lowering mechanism of Sch B. Identification of these metabolites and investigation of the relevant lipid-lowering pathways with molecular techniques could help to understand the mechanism of action of Sch B.

**Long-term significance:** The results in this study could provide crucial new information and strengthen scientific basis for the therapeutic use of Sch B in treating NASH.