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Metabolomics approach on therapeutic effects and mechanisms of natural products on diabetes and non-alcoholic fatty liver miceLi-Heng Pao¹, Jung Chao² and Ming-Ling Chang³¹Chang Gung University of Science and Technology, Taiwan²China Medical University, Taiwan³Chang Gung Memorial Hospital, Taiwan

Gallic Acid (GA), a naturally abundant plant phenolic compound has been shown to have potent anti-oxidative and anti-obesity activity. However, the effects and mechanisms of GA on diabetes and Non-Alcoholic Fatty Liver Disease (NAFLD) are not well understood. In this study, we investigated the beneficial effects of GA administration on NAFLD and diabetes mice induced by High Fat Diet (HFD) followed by Streptozotocin (STZ) injections. A holistic view approach, namely 1H NMR-based metabolomics, was adopted to examine the metabolites changes in mouse serum, urine, liver and muscle tissues in order to obtain information that might lead to a better understanding of the mechanisms of GA in mitigating diabetes and NAFLD. The results showed that severe metabolic disturbance was observed in the diabetes and NAFLD mice induced by HFD and STZ. The metabolic disorders under the disease model included glucose, amino acids, lipids, purines and pyrimidines. Interestingly, metabolites changes related to intestinal microbiota also observed. GA oral administration slow down the progression of NAFLD, alleviated the high blood glucose and partially reversed the disturbance of metabolic pathways in the diabetes mice. Further liver lipid metabolite gene expressions studies indicated that mechanism in alleviating lipid accumulation was related to the upregulation of β -oxidation and ketogenesis. Taken together, this study suggested that metabolomics approach is a useful platform for natural product functional evaluation. The selected metabolites are potentially useful as preventive action biomarkers and could also be used to help our further identifying new mechanisms of GA in alleviating metabolic diseases.

Biography

Li-Heng Pao is working as a Professor of Graduate Institute of Health Industry Technology at Chang Gung University of Science and Technology, Taiwan. He is also the Director of Research Center of Food and Cosmetic Safety at the same University. He has completed his Doctorate in Pharmaceutical at the University of Michigan (USA) in 1997. He has Directed one of his researches to bioanalysis of drug with mass spectrometry that applied mainly to pharmaco-kinetics as well as herbal-drug interactions in human and animal study. His current research is on applying the mass spectrometry and NMR in metabolomics study on the effects of herbal drug in metabolic diseases.

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