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## Discovery of potential biomarkers from Chronic Hepatitis B to cirrhosis by cytokine profiling analysis

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**Background:** Liver cirrhosis is a critical state in the natural course of hepatocellular carcinoma (HCC). Chronic hepatitis B (CHB) is a major cause of liver cirrhosis in China. To find biomarkers for the diagnosis of CHB caused cirrhosis (HBC), we examined the cytokines profiling of CHB and HBC.

**Methods:** Serum samples of 15 health controls (HC) and 15 CHB patients and 15 HBC patients were collected to detect the profiles of 48 cytokines by multiplex biometric ELISA-based immunoassay. Partial least squares discriminant analysis (PLS-DA) was used to analyze the significant cytokines, and they were validated using independent cohort of 60 CHB patients, 60 HBC patients and 35 HC samples.

**Results:** There were 22 differential expressed cytokines of CHB and HBC. Three differential expression cytokines including interleukin (IL)-9, IL-2 receptor subunit alpha (IL2R $\alpha$ ) and Granulocyte-macrophage colony-stimulating factor (GM-CSF) were found by PLS-DA, and their significant changes of serum levels were further validated. The Receiver-operator characteristic (ROC) analysis demonstrated that three cytokines and their logistic regression panel potentially to be the potential biomarkers for CHB and HBC differentiation ( $P < 0.001$ ,  $AUC = 0.876$ ). Furthermore, a functional pathway analysis showed that differential regulation of cytokine production in macrophages, T Helper Cells and intestinal epithelial cells by IL-17A and IL-17F were enriched in the 22 differentially expressed cytokines. They were also enriched in pathway of hepatic fibrosis / hepatic stellate cell activation.

**Conclusions:** There were particular cytokines profiles of CHB and HBC. Besides, IL-9, IL2R $\alpha$  and GM-CSF may be involved in the differentiation of CHB and HBC. These findings may give further insight into the pathobiology of HBC.

### Biography

Shi-Bing Su, Medicine Doctor (PhD-medicine), is an Professor of Integrative Medicine and Traditional Chinese Medicine (TCM), director of the center for complex systems, Shanghai University of TCM, leading scientist of TCM System Science Discipline, distinguished researcher of Shanghai TCM internal Medicine E-institute, visiting professor of Nanjing University of TCM, guest professor of Henan college of TCM, academic Journal editor for *Integrative Medicine International*, *Journal of Integrative Medicine*, *Journal of TCM Science*, etc. He got his BSc in TCM at Nanjing University of TCM, MSc in Pharmacy and Medicine Doctor's degree in Gastroenterology at Cancer Institute, Kanazawa University, and Docent at China Pharmaceutical University. Currently his researches focus on TCM syndrome classification-based treatment in clinical and basic studies applied by system biology. His studies are also involved in biomarker discovery in chronic liver disease. He has published 160 papers and 10 books in academic Journals and presses.

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