

## 2<sup>nd</sup> International Conference and Exhibition on Pharmacognosy, Phytochemistry & Natural Products

August 25-27, 2014 DoubleTree by Hilton Beijing, China

### Mechanism of protective effects of *Salvia miltiorrhiza* (Danshen) against acute and chronic liver injury induced by iron overload

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*Salvia miltiorrhiza* (SM) is a well-known Chinese medicinal herb, which has shown hepatoprotective effects with anti-fibrotic, anti-oxidative, anti-inflammatory and anti-apoptotic properties. Iron is essential for normal biological functioning, yet it is toxic when present in excess. As a central role in regulating iron homeostasis, liver is the most susceptible organ of injury by iron-overload. Patients with iron-overload conditions are at risk for developing acute liver injury, chronic hepatic fibrosis and ultimately cirrhosis. In acute experiment, SM demonstrated protective effects in short-term iron-overloaded liver. Treatment of iron-overloaded liver with either low or high doses of SM significantly attenuated the hepatic dysfunction, decreased the reaction of oxidative stress, and suppressed hepatocytes apoptosis. Histopathological examination showed that treatment with SM reduced iron deposition and ameliorated pathological changes. Meanwhile, the chronic experiment clarified the anti-fibrotic activity of SM in iron-overloaded liver. Besides the results consistent with acute experimental data, treatment of chronic iron-overloaded mice with SM dose-dependently reduced iron deposition and collagen accumulation (type I and III collagens), regulated overexpression of fibrosis-related molecules (TGF- $\beta$  and MMP-9), and reduced expression of pro-inflammatory cytokines (TNF- $\alpha$  and IL-1 $\alpha$ ) and apoptotic factor (caspase-3). In summary, SM displayed protective effects against acute and chronic liver injury induced by iron overload, which may be attributed to multi-targeted inhibition of iron deposition and collagen accumulation, as well as oxidative stress, apoptosis and inflammation.

#### Biography

Ying Zhang got her Master's degree from Hebei Medical University in 2005, and she is a PhD student and working as Associate Professor at the same university. Her current research interests focus on the effects of Traditional Chinese Medicine with efficacy of promoting blood circulation against iron-overload disorders. She recently found that treatment with *Salvia miltiorrhiza* (Danshen) reduced iron deposition and ameliorated pathological changes in mice with acute and chronic iron-overload.

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