

## **Regulatory effects of deoxycholic acid, a component of the anti-inflammatory traditional Chinese medicine Niu Huang, on human leukocyte response to chemoattractants.**

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Niu Huang is a commonly used Chinese traditional medicine with immunoregulatory and anti-inflammatory properties. Deoxycholic acid (DCA) is a major active constituent of Niu Huang. The reaction of human leukocytes to chemoattractants is an important part of the host immune response and also plays a crucial role in the development of inflammation. We, therefore, investigated the *in vitro* effects of DCA on human monocyte and neutrophil responses to classic chemoattractants [fMet-Leu-Phe (fMLP), complement fraction 5a (C5a)], CC chemokine [monocyte chemoattractant protein-1 (MCP-1/CCL2)], and/or CXC chemokines [stromal cell-derived factor-1 (SDF-1 $\alpha$ /CXCL12), interleukin-8 (IL-8/CXCL8)]. The results showed that DCA significantly inhibited fMLP-induced monocyte and neutrophil chemotaxis and calcium mobilization, and also blocked the binding of [<sup>3</sup>H]fMLP and anti-formyl peptide receptor (FPR) monoclonal antibodies (mAb) to the cells. The inhibitory effects of DCA on calcium mobilization and anti-FPR-mAb binding to the receptor could be abrogated by washing DCA out of the cell suspension, suggesting that DCA blocked fMLP receptors via a steric hindrance mechanism, not via receptor internalization. DCA had no significant inhibitory effects on MCP-1-, SDF-1 $\alpha$ -, or C5a-induced monocyte function, or C5a- or IL-8-induced neutrophil function. Taken together, our experimental results suggest that blockade of fMLP receptors may contribute to the anti-inflammatory effects of traditional medicine containing DCA.

### **SCHISANDRA CHINENSIS**

#### **A summary of publications**

The dried berries of *Schisandra chinensis* Baill. or *S. sphenanthera* have been used in the traditional Chinese medicine as tonic and sedative since more than 2000 years. *Schisandra* (the spelling *Schizandra* is common but actually not correct) is a vine belonging to the Magnoliaceae which is being cultivated in recent years also in Europe. Dried *Schisandra* berries are administered in dosages from 2 to 5 g (KEYS 1976, TANG & EISENBRAND 1992). As *Schisandrae Fructus* they are described in the Chinese Pharmacopoeia. *Schisandra* has been subject of extensive chemical analytical and pharmacological investigations. As active components lignanes were identified, e.g. the groups of Schizanterines, Gomisins and Schizandroles. The percentage of the Lignanes varies from 7.2% to 19.2% in dependence of the variety and geographical provenance. Pharmacological studies have been carried out with the original drug, with extracts as well as with isolated lignanes. (TANG & EISENBRAND 1992).

OHTAKI (1996) investigated the protective effect of Gomisin A, a principal lignane of *S. sinensis*, against experimentally induced neoplasms of the liver. The substance has apparently an anti-promotor effect which is presumably based on an enhanced gallic acid metabolism. A further investigation of the hepatoprotective properties of *S. sinensis* has been done by IP (1996). The effect of Schisandra lignanes is assumed to be partly caused by quenching of free radicals. LIU (1989) showed a protective effect of ethanolic Schisandra extract in cases of tetrachloro carbon poisoning. The liver toxicity of tetrachloro carbon poisoning is caused by the generation of trichloromethyl radicals formed in presence of Cytochrom P450. The trichloro methyl radicals react with oxygen to peroxy trichloromethyl radicals which initiate a rapid lipid peroxidation. The radical formation by tetrachloro carbon may therefore serve as a model reaction for damages caused by free radicals in general. LU and LIU (1992) determined the antioxidative properties of various *S. sinensis* lignanes in comparison with vitamin E. The majority of the investigated lignanes were in in-vitro assays clearly more effective than vitamin E. A triterpene isolated from *S. sphaerandra* was described by SUN et al. (1996) as inhibitor of the reverse transcriptase of HIV and can therefore be considered a potential anti AIDS agent. NISHIYAMA and coworker (1995) have tested a combined phytotherapeutic preparation of *S. sinensis*, *Biota orientalis* and *P. ginseng* on mice whose learning capability had been affected by administration of alcohol and scopolamine. An improvement of the memory was observed. Comparable tests (NISHIYAMA et al., 1996) carried out on senescence accelerated mice showed a similarly memory enhancing effect which demonstrates a potential usefulness in cases of age related memory deterioration.

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