



## Efficacy of *Artemisia annua* polysaccharides as an adjuvant to hepatitis C vaccination

L.D. Bao<sup>1</sup>, X.H. Ren<sup>1</sup>, R.L. Ma<sup>1</sup>, Y. Wang<sup>1</sup>, H.W. Yuan<sup>2</sup> and H.J. Lv<sup>3</sup>

<sup>1</sup>Department of Pharmacy,  
Affiliated Hospital of Inner Mongolia Medical University, Hohhot, China

<sup>2</sup>Department of Pathology,  
Affiliated Hospital of Inner Mongolia Medical University, Hohhot, China

<sup>3</sup>Department of Scientific Research,  
Affiliated Hospital of Inner Mongolia Medical University, Hohhot, China

Corresponding authors: H.J. Lv/ H.W. Yuan  
E-mail: lvhaijundsr@163.com

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**ABSTRACT.** The traditional Chinese medicine *Artemisia annua* can prevent and treat hepatitis following an unclear mechanism. The aim of this study was to evaluate the effects of *A. annua* polysaccharides (AAP) on hepatitis C virus (HCV). A pcDNA3.1/NS3 expression vector was constructed. Ninety female BALB/c mice were randomly divided into six groups: high-dose AAP (1 mg/mL) + HCV/NS3 plasmid; middle-dose AAP (0.5 mg/mL) + HCV/NS3 plasmid; low-dose AAP (0.1 mg/mL) + HCV/NS3 plasmid; HCV/NS3 plasmid; high-dose AAP (1 mg/mL); normal saline control (N = 15). Except the control group and the high-dose AAP group, other groups were inoculated with 50 µg pcDNA3.1-HCV/NS3 plasmid. Serum antigenic-specific antibody was detected after the last immunization, and the levels of secreted IFN-γ and IL-4 were measured. pcDNA3.1/NS3 plasmid was successfully constructed, and the extracted product contained HCV/NS3 sequence. Compared with single inoculation with HCV/NS3 DNA vaccine, the specific antibody levels induced

by middle-dose AAP plus HCV/NS3 DNA vaccine were significantly different in weeks 1, 3 and 5 ( $P < 0.05$ ). However, there were no significant differences in the antibody levels induced by high-dose and low-dose AAP as adjuvant compared with those of single inoculation with DNA vaccine ( $P > 0.05$ ). The level of serum IFN- $\gamma$  secretion was significantly higher than that of IL-4 secretion. Compared with the single HCV/NS3 DNA vaccine group, AAP plus HCV/NS3 DNA vaccine groups had significant increased IFN- $\gamma$  levels ( $P < 0.05$ ), but the IL-4 levels were not significantly different among these groups ( $P > 0.05$ ). AAP, as the adjuvant of HCV/NS3 DNA vaccine, can widely regulate the humoral immunity and cellular immune function of normal and cyclophosphamide-induced immunocompromised mice. AAP can promote IFN- $\gamma$  secretion probably by inducing Th1-type cellular immune response.

**Key words:** Hepatitis C virus; *Artemisia annua* polysaccharide; Nonstructural protein