



# HerbClip™

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**FILE:** ■ **Western Yew (*Taxus brevifolia*)**  
■ **Korean Ginseng (*Panax ginseng*)**  
■ **Paclitaxel (Taxol®)**  
■ **Antitumor Effects**

**HC 010353-278**

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**RE: Paclitaxel and Korean Ginseng Combined Show Antitumor Effects in Mice**

Shin HJ, Kim YS, Kwak YS, Song YB, Kim YS, Park JD. Enhancement of antitumor effects of paclitaxel (Taxol) in combination with red ginseng acidic polysaccharide (RGAP). *Planta Med.* 2004;70:1033–1038.

Paclitaxel (Taxol®; Bristol-Myers Squibb Co., New York, NY), is an extract from the western yew (*Taxus brevifolia*). It is commonly used in the treatment of breast, ovary, lung, and other cancers; however, it causes significant side effects. Therefore, finding other anti-cancer treatments to combine with Taxol and which can decrease its toxicity is highly desirable. Red ginseng acidic polysaccharide (RGAP), isolated from Korean ginseng (*Panax ginseng*), was combined with Taxol and its effect on the activity and safety profile of Taxol assessed. Previous studies of Korean ginseng have shown its potential as an immunomodulator and anti-cancer agent.<sup>1</sup> The current study evaluated the combination treatment against sarcoma and melanoma in mice.

Efficacy of Taxol and RGAP were based on tumor weight and lifespan of the mice injected with sarcoma and melanoma. Treating the mice with singular Taxol (5 or 15 mg/kg) or just RGAP (25 mg/kg) preparations did not significantly increase the lifespan of mice compared with control mice. However treatment with RGAP (25 mg/kg) combined with Taxol (15 mg/kg) resulted in a 42.8% increase in survival of test animals as compared to treatment with Taxol alone. The combination treatment resulted in complete tumor inhibition in 6 of 14 mice.

Similar results were detected in combined Taxol/RGAP treatment of melanoma in mice. Administration of 10 mg/kg Taxol plus 100 mg/kg RGAP significantly decreased tumor weight by 76.3% compared to control mice ( $P < 0.01$ ). Treatment with 10 mg/kg Taxol alone did not result in a significant decrease in tumor weight.

Immune parameters were also assessed in isolated spleen cells in vitro. The researchers found that RGAP significantly increased IL-6 in a dose-dependent manner ( $P < 0.01$ ). Increased IL-6 levels have been associated with decreased survival time in cancer patients.<sup>2</sup> The toxicity of Taxol apparently causes a decrease in natural killer (NK) cell activity. RGAP (100 mg/kg) significantly decreased the toxicity of Taxol (10 and 20 mg/kg), as evidenced by significantly increasing NK cell activity in vitro ( $P < 0.05$ ). The combination of Taxol (20 mg/kg) plus RGAP increased CD3<sup>+</sup> cells. Low activity of CD3<sup>+</sup> cells has been associated with poor outcomes in some cancers in vitro, notably head and neck cancers.<sup>3</sup>

In this study, Taxol plus RGAP was more effective than Taxol alone in increasing survival time and improving most cancer-related immune system parameters tested. However, the in vitro increase in IL-6 production, which was correlated to decreased survival time in human trials, is of concern. Results of this sarcoma and melanoma trial in mice may not be the same for carcinomas (e.g., colon cancer). Clinical trials are needed to determine the safety and efficacy of Taxol plus RGAP in other cancer types and in humans.

—John Neustadt, ND4

#### References

<sup>1</sup>Helms S. Cancer prevention and therapeutics: Panax ginseng. *Altern Med Rev.* Sep 2004;9(3):259-274.

<sup>2</sup>Martin F, Santolaria F, Batista N, et al. Cytokine levels (IL-6 and IFN-gamma), acute phase response and nutritional status as prognostic factors in lung cancer. *Cytokine.* Jan 1999;11(1):80-86.

<sup>3</sup>Shibuya TY, Nugyen N, McLaren CE, et al. Clinical Significance of Poor CD3 Response in Head and Neck Cancer. *Clin Cancer Res.* March 1, 2002 2002;8(3):745-751.

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