

Hairy Root Extract of *Angelica gigas* Exerts Anticancer Activity towards Human Ovarian Cancer

Aihua LIU ^{1#}, Mengna LIU ^{2#}, Xiaoyan MENG ^{3#}, Meirong LU ⁴ & Jiangqiong HAN ^{5*}

¹ Department of Obstetrics, Penglai People's Hospital, Penglai City, Shandong Province, Yantai, Shandong, 265600, China.

² Department of Obstetrics and Gynecology, Xuzhou Central Hospital, Xuzhou, Jiangsu, 221000, China

³ Department of Obstetrics and Gynecology, Wuzhong People's Hospital of Suzhou City, Jiangsu Suzhou, 215128, China

⁴ Gynecology Department of Xi'an International Medical Center Hospital, Xi'an, Shaanxi, 710010, China

⁵ Department of Integrated Traditional Chinese and Western Medicine, Yunnan Cancer Hospital, The Third Affiliated Hospital of Kunming Medical University, Yunnan Cancer Center, Kunming, Yunnan, 650118, China

SUMMARY. In the present study, we wish to evaluate the anticancer properties of hairy root extract of *Angelica gigas* Nakai (hAGE) against ovarian cancer. Initially, the cytotoxicity of hAGE was determined against human ovarian cancer cells (A2780, OVCAR-3 and SKOV-3 cells) and human normal ovarian surface epithelial cell (OSE), where they potently inhibit SKOV-3 cells as compared to other cells, with no toxicity to normal cell. In hAGE also causes significant inhibition of migration and invasion of SKOV-3 cells in dose-dependent manner. It also showed inhibition of apoptosis in SKOV-3 cell in dose-dependent manner in annexin V propidium iodide assay. In western blotting, hAGE cause significant decrease in Bcl-2 levels and increase in Bax levels as compared to the control cells. Collectively, our study demonstrated strong anti-ovarian cancer effect of hAGE by induction of apoptosis and inhibition of migration and invasion of ovarian cancer cells. The present study reveals that hAGE may offer a valuable option for the treatment of ovarian cancer.

RESUMEN. En el presente estudio, deseamos evaluar las propiedades anticancerígenas del extracto de raíz peluda de *Angelica gigas* Nakai (hAGE) contra el cáncer de ovario. Inicialmente, se determinó la citotoxicidad de hAGE contra células de cáncer de ovario humano (A2780, OVCAR-3 y SKOV-3) y células epiteliales de superficie ovárica normal (OSE) humanas, donde inhiben de manera potente las células SKOV-3 en comparación con otras células. sin toxicidad para la célula normal. En hAGE también causa una inhibición significativa de la migración y la invasión de células SKOV-3 de una manera dependiente de la dosis. También mostró inhibición de la apoptosis en células SKOV-3 de manera dependiente de la dosis en el ensayo de yoduro de propidio de anexina V. En western blot, hAGE causa una disminución significativa en los niveles de Bcl-2 y un aumento en los niveles de Bax en comparación con las células de control. En conjunto, nuestro estudio demostró un fuerte efecto anti-cáncer de ovario de hAGE por inducción de apoptosis e inhibición de la migración e invasión de células de cáncer de ovario. El presente estudio revela que hAGE puede ofrecer una opción valiosa para el tratamiento del cáncer de ovario.

KEY WORDS: apoptosis, Bcl2, cytotoxicity, extract, invasion, migration.

* Author to whom correspondence should be addressed. E-mail: hanjiangq2021@sina.com

These authors contributed equally to this study