Inhibitory effect of berberine on human skin squamous cell carcinoma A431 cells

D.X. Li[1]*, J. Zhang[1]*, Y. Zhang[2], P.W. Zhao[3] and L.M. Yang[3]

[1]Department of Dermatology,
The Affiliated Hospital of Inner Mongolia Medical University, Hohhot,
Inner Mongolia, China
[2]Medical College of Shandong University, Jinan, Shandong, China
[3]Pathogenic Organisms and Immunology Lab, Inner Mongolia Medical University,
Hohhot, Inner Mongolia, China

*These authors contributed equally to this study.
Corresponding author: D.X. Li
E-mail: lidongxianmg@163.com

Genet. Mol. Res. 14 (3): 10553-10568 (2015)
Received February 19, 2015
Accepted July 10, 2015
Published September 8, 2015
DOI http://dx.doi.org/10.4238/2015.September.8.17

ABSTRACT. Berberine (BBR) is a natural alkaloid with significant anti-tumor activity against many types of cancer cells. In this study, we investigated the molecular mechanisms employed by BBR to repress the proliferation and growth of skin squamous cell carcinoma A431 cells. Berberine was reported to inhibit the proliferation of A431 cells in a dose- and time-dependent manner and was observed to induce a series of biochemical events, including the loss of mitochondrial membrane potential, release of cytochrome-c to cytosol, induction of proteins of the Bcl-2 family and caspases, and the cleavage of poly(ADP)-ribose polymerase. This suggested its ability to induce apoptosis. The results of a wound healing test revealed that berberine inhibited the migration of A431 cells. Ezrin was transfected into A431 cells by RNA interference. The level of expression of Ezrin in the transfected A431 cells was observed to decrease with berberine treatment, which suggested that berberine might inhibit the invasion of A431 cells through Ezrin. The results of this study

demonstrated that berberine could potentially inhibit proliferation, induce apoptosis, and inhibit the invasion of A431 cells.

Key words: Berberine; Squamous cell carcinoma; A431 cells; Bcl-2; Proliferation; Apoptosis

