

Novel Targets for the Anti-cancer properties of Phytochemicals

Patrikios I.,¹ Yiallouris A.,¹ Fedosova NV,² De Ford C.,³ Graier W.,⁴ & Stephanou A.¹

¹School of Medicine, European University Cyprus; ²Dept. of Biomedicine, Aarhus University, Denmark. ³Dept Pharmaceutical Biology, University of Freiburg, Germany, ⁴Medical University of Graz.

Tripterygium wilfordii Hook F, amygdalin and graviola phyto-compounds have been reported to have anti-cancer activity. However, the precise target of action for these plant-based anti-cancer agents has not been well characterized. Importantly, no studies have yet been reported on whether these anti-cancer plant-based agents have death-promoting effects on normal non-transformed cells. Therefore, in order to determine the direct effects of the three phyto-compounds we investigated their death-promoting ability in several cancer cell lines as well as in normal non-transformed cells. All three phyto-compounds showed morphological changes of apoptotic cell death in all cancer cell lines. In contrast, treatment with Tripterygium wilfordii, amygdalin and graviola had no effect in normal non-transformed cells. *In silico* studies on the most abundant molecules found in Tripterygium wilfordii and graviola but not amygdalin indicated for the first time a possible association with the Na⁺/K⁺ ATPase and SERCA ATPase channel activity. Importantly experiments were performed that were able to validate our *in silico* findings. These results strongly indicated that the above phyto-chemicals have death promoting activity in cancer cells but not in normal cells. The present data indicates that these natural phyto-compounds may have distinct targets with reduced drug toxicity for the treatment and prevention of cancers.

