

University of Macau

Abstract

**Antiproliferative and Proapoptotic Effects of *Smilax glabra Roxb.*
Extract on Hepatoma cell lines HepG2 and Hep3B**

SA Fei

Supervisor: ZHENG Ying (Assistant professor)

Smilax Glabra Roxb. (SGR) is the root of a traditional Chinese herb named “Tu Fu Ling” in Chinese. It is a cheap and widely used traditional Chinese medicine for cancer therapy. A few studies have indicated that SGR could inhibit tumor cell growth, but the mechanism underlying these activities was unclear and needs to be elucidated. In this study, saponins, flavonoids and methanol extract of SGR were firstly extracted by Accelerate Solvent Extractor. Through the MTT assay, flavonoids of SGR had dramatically cytotoxicity effect towards two human hepatoma cell lines, HepG2 and Hep3B. By UV and LC-MS analysis of SGR, the main components contained in SGR extract are flavonoids (mainly dihydroflavonols), saponin and the flavonoids derived compound. Results showed that flavonoids of SGR could inhibit the growth of HepG2 and Hep3B cells in a dose-dependent manner. Apoptosis was evidenced after treatment of above two hepatoma cells by the flavonoids of SGR, which includes induction of internucleosomal DNA fragmentation and chromatin condensation, termination of the

cell cycle at S/G₂ transition phase, alteration of mitochondrial membrane potential and release of cytochrome C. Flavonoids of SGR could induce poly (ADP-ribose) polymerase (PARP) cleavage, stimulate caspase-3 activity and increase the quantity of active caspase-3 proteins. Furthermore, apoptotic signaling was amplified by cross-talk between the ERK, JNK and p38 apoptotic pathways. All of these results indicate that the cytotoxicity of SGR extract towards selected hepatoma cells is through apoptosis, which is mediated via caspase-3, PARP mitochondrial pathways as well as p38 and JNK apoptotic signaling pathway.

Key words: *Smilax Glabra Roxb.*, HepG2, Hep3B, flavonoids, apoptosis, mitochondria, MAPK.