Acanthopanax senticosus Harms extract causes G0/G1 cell cycle arrest and autophagy via inhibition of Rubicon in human liver cancer cells

Object of research:

Acanthopanax senticosus (Rupr. et Maxim) Harms (ASH), also known as Siberian ginseng or eleuthero, is a hardy shrub native to China, Korea, Russia and the northern region of Japan. ASH is used for the treatment of several diseases such as heart disease, hypertension, rheumatoid arthritis, allergies, chronic bronchitis, diabetes and cancer. In the present study, the inhibitory effect of the root extract of ASH (ASHE) on HuH-7 and HepG2 liver cancer cells was examined. ASHE suppressed liver cancer cell proliferation by inducing cell cycle arrest at the G0/G1 phase, as well as apoptosis, as indicated by the increased number of Annexin V and 7-AAD-positive cells. Furthermore, the expression of LC3-II, an autophagy marker, in these cells also increased post treatment with ASHE. LC3-II induction was further enhanced by co-treatment with chloroquine. Fluorescence and transmission electron micrographs of ASHE-treated liver cancer cells showed the presence of an increased number of autophagic vesicles. A decreased protein expression level of run domain Beclin-1-interacting and cysteine-rich domain-containing, an autophagy inhibitor, with no change in RUBCN mRNA expression was observed, indicating activation of the autophagosome-lysosome fusion step of autophagy. In conclusion, ASHE exerts cytostatic activity on liver cancer cells via both apoptosis and autophagy, and may serve as a potential therapeutic agent for management of liver cancer and autophagy-related diseases.

- Published online on: January 22, 2021 https://doi.org/10.3892/or.2021.7948
- Pages: 1193-1201