Comparing effects of urolithin A and urolithin B on the viability of B16F10 and L929 cells

Shervin Qatran [a], Shahin Gharedaghi [a], Fatemeh Mohammadi [a], Farhang Haddad [a], Milad Iranshahi [c], Fatemeh B. Rassouli [d*]

[a] Department of Biology, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran
[b] Department of Medical Biotechnology and Nanotechnology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
[c] Biotechnology Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran.
[d] Novel Diagnostics and Therapeutics Research Group, Institute of Biotechnology, Ferdowsi University of Mashhad, Mashhad, Iran

Corresponding authors' E-mail: behnam3260@um.ac.ir

Introduction: Urolithins are dibenzopyran-6-one derivatives produced by gut microbiota upon digestion of ellagitannin-containing fruits and nuts. Due to their high bioavailability, urolithins can be absorbed and reach different tissues, and induce health beneficial effects including chemopreventive, anti-inflammatory, anti-oxidative and anti-cancer activities. Melanoma is the most serious type of skin cancer with rising incidence and mortality in developing countries. The present study was designed to assess and compare toxicity of urolithin A (UA) and urolithin B (UB) on melanoma cells and fibroblasts.

Methods: Synthesis of UA was carried out using 2-bromo-5-methoxy benzoic acid and resorcinol in basic condition, while 2-bromo benzoic acid and resorcinol were used for UB. To assess cytotoxicity of UA and UB, B16F10 cells (a mouse melanoma cell line) and L929 cells (mouse fibroblasts) were treated with 10, 20, 40 and 80 µM of each agent, while 0.4% DMSO was used as solvent control. After 24 and 48 h, cell viability was determined by alamarBlue assay as a colorimetric method.

Results: Calculating viability of B16F10 cells upon treatment with different concentrations of UA and UB revealed that both agents induced toxicity in a dose-dependent manner. For UA, cell viability was determined as 85% and 84.3% after 24 and 48 h treatment with 80 µM, respectively. Likewise, 80 µM UB decreased viability of B16F10 cells down to 86.9% and 74% during the same time periods. In addition, UA and UB induced toxic effects on normal cells; 83.2% and 94.1% of L929 cells were alive upon 48 h treatment with 80 µM UA and UB, respectively.

Discussion: Taken together, our findings indicated toxic effects of UA and UB on melanoma cells and fibroblasts. More research must be done to unravel mechanism of UA and UB action, and also determine cytotoxicity of both agents on other cell lines.

Key word: Urolithin A, Urolithin B, Cytotoxicity, Melanoma cells.