Pharmacognosy-2013
International Conference and Exhibition on
Pharmacognosy, Phytochemistry & Natural Products
October 21-23, 2013 Radisson Blu Plaza Hotel, Hyderabad, India

Apoptotic mechanism of a synthetic triterpenoid cyano enone of methyl boswellate in cancer cell lines

Palaniyandi Ravanan

Vellore Institute of Technology University

Abstract

Triterpenoids are pentacyclic compounds that are synthesized as secondary metabolites in many plants. Extracts of some of these plant parts have been widely used in traditional medicine. Natural triterpenoids have been shown to have anti-inflammatory and anticarcinogenic properties. Cyano Enone of Methyl Boswellate (CEMB) is a novel synthetic triterpenoid compound, derived from boswellic acid. In this work, we explored the effect of a CEMB on various prostate cancer and glioma cancer cell lines. CEMB displayed concentration-dependent cytotoxic activity with sub micromolar lethal dose 50% (LD50) values in 10 of 10 tumor cell lines tested. CEMB induced cytotoxicity is accompanied by activation of downstream effector caspases (caspases 3 and 7) and by upstream initiator caspases involved in both the extrinsic (caspase 8) and intrinsic (caspase 9) apoptotic pathways. By using short interfering RNAs (siRNA), we show evidence that knockdown of caspase 8, DR4, Apaf-1, and Bid impairs CEMB-induced cell death. Similar to other pro-apoptotic synthetic triterpenoid compounds, CEMB induced apoptosis involved endoplasmic reticulum stress, as shown by partial rescue of tumor cells by siRNA-mediated knockdown of expression of genes involved in the unfolded protein response such as IRE1a, PERK, and ATF6. Altogether, our results suggest that CEMB stimulates several apoptotic pathways in cancer cells, suggesting that this compound should be evaluated further as a potential agent for cancer therapy.

Biography

Palaniyandi Ravanan has completed his Ph.D at the age of 28 years from University of La Reunion, France and postdoctoral studies from Sanford-Burnham Medical Research Institute, USA. Since 2010, he is serving as Assistant Professor (Senior) in School of Biosciences and Technology, Vellore Institute of Technology (VIT) University, Vellore, Tamil Nadu. He has published more than 10 research articles in reputed international journals in the area of Cancer, Obesity and Inflammation. He has been awarded under Fast track scheme for young scientists from Department of Science and Technology and Research award from VIT University, 2012.