

2nd International Conference and Exhibition on

MARINE DRUGS AND NATURAL PRODUCTS

June 15-17, 2017 London, UK

Thuja modulates redox status to induce apoptosis in functional p53, expressing mammary epithelial carcinoma cells

Tanya Das

Bose Institute, India

The adverse side-effects associated with chemotherapy during cancer treatment have shifted considerable focus towards therapies that are targeted but devoid of toxic side-effects. In the present study, the anti-tumorigenic activity of *Thuja*, the bioactive derivative of the medicinal plant *Thuja occidentalis*, was evaluated, and the molecular mechanisms underlying *Thuja*-induced apoptosis of functional p53-expressing mammary epithelial carcinoma cells were elucidated. Our results showed that *Thuja* successfully induced apoptosis in functional p53-expressing mammary epithelial carcinoma cells. Abrogation of intracellular Reactive Oxygen Species (ROS), prevention of p53-activation, knockdown of p53 or inhibition of its functional activity significantly abridged ROS generation. Notably, under these conditions, *Thuja*-induced breast cancer cell apoptosis was reduced, thereby validating the existence of an ROS-p53 feedback loop. Elucidating this feedback loop revealed bi-phasic ROS generation as a key mediator of *Thuja*-induced apoptosis. *Thuja*-induced generation of ROS at the first phase was instrumental in ensuring activation of p53 via p38MAPK and its nuclear translocation for transactivation of Bax, which induced a second phase of mitochondrial ROS to construct the ROS-p53 feedback loop. Such molecular crosstalk induced mitochondrial changes 1) to maintain and amplify the *Thuja* signal in a positive self-regulatory feedback manner; and 2) to promote the mitochondrial death cascade through cytochrome c release and caspase-driven apoptosis. These results open the horizon for developing a targeted therapy by modulating the redox status of functional p53-expressing mammary epithelial carcinoma cells by *Thuja*.

Biography

Tanya Das completed her PhD at University of Calcutta, India. Currently she is working at the Division of Molecular Medicine as a Senior Professor. She has been a Post-doctoral Fellow and Research Associate, at Calcutta University, Kolkata from 1990-1996, and Research Scientist at Bose Institute, Kolkata. She has published more than 50 papers in reputed journals.

tanya@jcbose.ac.in

Notes: