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Biological activity of a novel pterostilbene derivative targeting pathways and capable of inhibiting multiple complications related to breast and prostate cancer

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Discovery of novel therapeutic agents for advanced invasive cancers is at the forefront of preclinical and clinical research. A wide range of small molecules belonging to both synthetic and naturally derived molecules targeting various cancer related pathways are under development. Naturally occurring pterostilbene (PTER) and isothiocyanate (ITC) attract great attention due to their wide range of biological properties, including anti-cancer, anti-leukemic, anti-bacterial and anti-inflammatory activities. The study reported that biological activity of a novel class of hybrid compound (PTER-ITC) synthesized by appending an ITC moiety to the PTER backbone, to induce cancer cell death by targeting multiple kinases. Biological studies of the synthesized compounds showed promising antitumor and anti-inflammatory activities both *in vitro* and *in vivo*. The novel hybrid molecule showed significant *in vitro* anti-cancer activity both in MCF-7 cells as well as AR positive (LNCaP) and negative (PC-3) cells. The reduced proliferation of both breast and prostate cancer cells by PTER-ITC was correlated with accumulation of cells in G2/M phase and induction of caspase dependent apoptosis. Both PI3K/Akt and MAPK/ERK pathways played an important role in PTER-ITC induced apoptosis in cancerous cells/tissues. Moreover, the PTER-ITC also inhibited tumor growth in Ehrlich ascitic cell induced tumor bearing mice as observed by reduction in tumor volume. Further investigation suggested that non-toxic doses of PTER-ITC could also inhibit inflammatory responses against LPS-stimulated RAW264.7 cells and carrageenan induced rat paw edema. Collectively, our results suggest that PTER-ITC can be used as a useful therapeutic agent for treatment of both cancer and inflammation.

Biography

Partha Roy has completed his PhD from Visva-Bharati University and Post-doctoral studies from Institute of Reproductive & Developmental Biology, Imperial College London, UK. Currently, he is a Professor in the Department of Biotechnology, Indian Institute of Technology Rookree. He has published more than 70 research papers in reputed journals and having high number of citations. He is serving various scientific and academic bodies in India as Panel Member. He has visited various universities/institutes across the world as a Visiting Faculty.

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