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Novel herbal drugs enhanced radiotoxicity of breast cancer lines with relevance to improving cancer radiotherapy

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Cancer incidence and mortality have been rapidly increasing in the industrialized world. Breast cancer in women is one of the major diseases in both developed and developing countries. Apart from surgery and chemotherapy, radiotherapy is a most prevalent treatment modality but frequently observed problems of general toxicity, exorbitant cost and non-specific action pose profound limitations in treatment of cancer patients. While considerable technical improvement has been made in delivering the radiation to the target tissue but technical limitations yet pose many daunting challenges. The search for new drugs for cancer treatment has been a challenging task for pharmaceutical companies. A predicament is faced in the clinic because anticancer drug as well as radiation kills equally both cancer and normal cells of the patients producing undesirable side effects compelling discontinuation of the treatment. Research is, therefore, warranted to develop non-toxic and affordable drugs for effective treatment of cancer patients. To meet these objectives, our laboratory has actively been investigating to develop novel drugs from plant kingdom and targeted approaches to selectively kill the cancer cells while sparing the normal cells. The results of our studies on MCF 7 and T40D breast cancer lines have shown great promise of enhancing radio sensitivity of these cell lines to gamma radiation in vitro. A developing strategy that holds promise in treatment of cancer patients consists in searching for natural compounds which can selectively enhance tumor cell toxicity to radiation but spare normal cells as desired in

clinical settings. Recent research from screening studies has found some potent phytochemicals from plant kingdom which display unique ability to cause no or minimal toxicity to normal cells but remarkably sensitize tumor cells to ionizing radiation. The mechanism involves the radiation generated reactive oxygen species (ROS) which trigger induction of apoptosis (cellular suicide) in tumor cells because of the high oxidative stress status in these cells. This talk is designed to present a brief highlight of developing plant based herbal drugs for improving chemo and radiotherapy of cancer patients. This talk is based on the recent research results from our laboratory. A few examples of notable herbs such as triphala, ellagic acid and silibinin will be given for the observed increased tumor cytotoxicity in tumor cells by compounds from plant sources which hold promise of improving cancer radiotherapy.

Speaker Biography

K P Mishra has completed his BSc from University of Allahabad in 1966 and MSc from University of Allahabad in 1968. He did his PhD from the University of Gujarat in 1979. He became Vice Chancellor at Nehru Gram Bharati University (Deemed-to-be University), Allahabad from January 2010 onwards. He served as Ex Head & Senior Scientist at Radiation Biology and Health Sciences Division, Bhabha Atomic Research Center, Mumbai and retired as scientific officer H+ and Head of RB & HS Division, BARC in 2006. He worked as Adjunct Professor at Institute of Technology, Manipal Academy of Higher Education from 2002-2006. He also worked as Adjunct Professor at Dept. of Life Sciences, Mumbai University, Mumbai from 2006-2009. He also worked as Visiting Professor in many universities.

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