Projects (Internal/Extramural)

Project 1: Tumor growth inhibition and attenuation of cisplatin induced toxicity without compromising therapeutic potential by a naphthalimide based organoselenium compound 2-(5-selenocyanato-pentyl)-benzo[de]isoquinoline 1,3-dione

Principal Investigator: Dr. Sudin Bhattacharya

Abstract

This study was designed to determine the chemoprotective role of the naphthalimide based organoselenium compound 2-(5-selenocyanato-pentyl)-benzo[de]isoquinoline 1,3-dione against cisplatin induced toxicities and for evaluation of the antitumor efficacy of the compound in mice bearing Ehrlich ascites carcinoma. The test compound was administered orally (3 mg/kg.b.w.) and cisplatin was given intraperitoneally (5 mg/kg.b.w). The protective efficacy of the compound was tested by evaluating several biochemical, hematological, histological and genotoxicity parameters. The antitumor efficacy was determined by evaluating tumor growth response of hosts. Results showed that the test compound significantly attenuated the cisplatin induced oxidative stress as evidenced by the reduced renal ROS level, NO level, LPO level; reduced serum BUN and creatinine levels, enhanced levels of several renal enzymatic and nonenzymatic antioxidants. The test compound also prevented cisplatin induced hematological alterations, renal tissue histopathological changes and genetic damages. The test compound was also found to reduce viable tumor cell count, tumor volume on one hand and increased the MST and %ILS of the tumor bearing host. The results proved the organoselenium compound as an effective chemprotector in cisplatin chemotherapy and most importantly this protection did not come from compromising the therapeutic efficacy of cisplatin, rather the compound effectively augmented the therapeutic effectiveness of cisplatin.

Project 2: Anti-tumoral and toxicological studies with 2-(5-Selenocyanato-Pentyl)-benzo[de]isoquinoline 1,3-dione, a novel naphthalimide based organoselenium compound.

Principal Investigator: Dr. Sudin Bhattacharya

Abstract

The selenium compound was synthesized through multiple steps and characterized by spectral analysis. The compound was evaluated for its therapeutic activity against Ehrlich ascites carcinoma (EAC) cells in Swiss albino mice. Significant inhibition of the growth of the tumour cells was found when the animals bearing EAC cells were treated with the selenium compound. Measurement of tumor volume, packed cell volume and viable tumor cell count revealed the inhibitory effect of the compound. Haemoglobin level of the treated animal improved significantly compared to the EAC control. Results showed that the test compound significantly attenuated the cyclophosphamide induced oxidative stress as evidenced by the reduced hepatic ROS level, NO level, LPO level; reduced serum AST and ALT levels.

Extramural projects/ grants

2-(5-Selenocyanato-Pentyl)-Benzo[De]Isoquinoline 1,3-Dione has the unique properties to enhance the therapeutic efficacy of cisplatin as well as cyclophosphamide at the same time protects normal cells from drug induced toxicity.