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Development of new anticancer agents

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Cancer continues to be a major health concern and a number of deaths are caused by cancer that is second only to cardiovascular diseases. The development of compounds that target genes involved in cancer pathogenesis is a potential area of cancer drug discovery. A number of anticancer drugs employed clinically exert their effect by inhibiting nucleic acid (DNA or RNA) or protein synthesis. It is evident that DNA is an important cellular target for many anticancer agents. Pyrrolo[2,1-c][1,4]benzodiazepines (PBDs) are naturally occurring compounds isolated from various *Streptomyces* species. The PBDs exert their biological activity through covalent binding within the minor groove of DNA. Several PBD conjugates have been synthesized to investigate the detailed biological aspects relating to the mechanism of action. Some of the potent molecules like PBD-quinazolinones and PBD-diaryloxadiazoles have been evaluated for their *in vivo* efficacy studies. These studies suggest that such PBD conjugates have promising anticancer activity. Some of the PBD conjugates act as activators of p53 and suppressors of NF-κB and thereby they could be considered as promising anticancer agents with improved potential for the suppression of tumours. To improve the selectivity as well as stability, some new β-galactoside prodrugs of PBDs have been synthesized and evaluated for their potential use in selective therapy of solid tumors by ADEPT and PMT protocols. Another important property of these molecules is their enhanced water solubility and stability, which are essential for a molecule to be an effective drug.

Biography

Ahmed Kamal graduated from Osmania University, Hyderabad (India) and did his Ph.D. research in the area of Medicinal Chemistry. He later joined as a Scientist at the Indian Institute of Chemical Technology (IICT), Hyderabad. For the last 25 years, he has pursued his research career at IICT, Hyderabad and is presently working as an Outstanding Scientist. He also holds an additional charge of Project Director of NIPER, Hyderabad. He has over 290 publications, 12 review papers and 7 book chapters and has filed over 75 patents. He is serving as an editorial advisory board member for the journals of repute.

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Tanshinone IIA could inhibit human hepatocellular carcinoma Hep-G2 cells through inducing ER stress in vitro

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Tanshinone IIA (Tan-IIA) is one of the diterpene quinone in Salviae miltiorrhizae Radix. Tan-IIA could inhibit many human cancer cells in vitro and in vivo through different molecular mechanisms. But the molecular mechanisms for Tan-IIA to inhibit hepatocellular carcinoma (H.C.C) were not well evaluated. In the present study, the cytotoxicity of Tan-IIA in H.C.C Hep-G2 cells was measured by M.T.T assay. The ER stress related protein expressions were evaluated by western blotter. For in vivo study, the Hep-G2 cells were implanted directly into SCID mice and then mice with Hep-G2 cells xerograft tumours were treated with Tan-IIA (I.P) every other day for 4 weeks. These mice were sacrificed with CO2 inhalation. The xerograft tumours were dissected and extracted the total protein for western blot. These results showed that Tan-IIA could inhibit H.C.C Hep-G2 cells with time and dose dependent in vitro. Tan-IIA could inhibit the growth of Hep-G2 cells xenograft tumor when compared with the control group. The ER stress related protein expressions ATF6, Caspase 12 and CHOP were up regulated when compared with the control group. These finding indicate that Tan-IIA could inhibit Hep-G2 through inducing ER stress in vitro.

Biography

Chin Cheng Su has completed his Ph.D at the age of 42 years from Graduate Institute of Chinese Medical Science (2003-2006) from China Medical University, Taiwan. He is the director of tumor research center of integrative medicine and Co-Chair of the Comprehensive Breast cancer center and the Department of Surgery, Changhua Christian Hospital. He has published more than 36 papers in reputed journals and serving as a reviewer of reputed journals.

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