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MECHANISM OF ACTION OF THE ANTI-CANCER PREPARATION NSC631570 (UKRAIN)

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NSC631570 (Ukraine) is the very first proton anticancer preparation and due to this, after administration it accumulates in tumours very fast that can be seen under the UV-light because of its the autofluorescence. Besides this, preparation can regenerate the immune system and works as a immunomodulating agent. The selective effect of the NSC631570 has been confirmed by 120 universities and research centers in the world. Until now this preparation has been tested on over 100 cancer cell lines and on 12 normal cell lines. It was shown that NSC631570 down regulates matrix metalloproteinase (MMP)-2 and MMP-9 in pancreatic cancer cells, suggesting that the preparation may decrease cancer cell invasion. Ukraine significantly increased the pro-apoptotic mRNA expression of Bad, Bax, and FasL; decreased the cell survival protein p-Akt and the anti-apoptotic protein Bcl-2; and increased the protein levels of cleaved poly (ADP)-ribose polymerase (PARP) and caspase-10 in cancer cells. Exposure of malignant cells to the drug results in G2/M arrest followed by bimodal programmed cell death. NSC631570 can induce both apoptosis and necrosis of tumour cells in vitro. Apoptotic cells are pre-dominated among dead tumour cells after treatment with the drug. The mechanisms of NSC631570-mediated tumour cell apoptosis have not yet been extensively investigated. Tubulin expression in pancreatic ductal adenocarcinoma (PDAC) cells indicated an antiproliferative effect of NSC631570 on the basis of alterations in mitotic spindle microtubule dynamics, leading to abnormal mitosis. In HeLa cervical cancer cells and some other tumour cells the drug induces apoptosis independently from death receptor signaling via a pathway involving mitochondrial damage, cytochrome c release in the cytoplasm and caspase-activation that is partially sensitive to overexpression of Bcl-2, Bcl-xL and a dominant negative caspase-9. In addition to the direct induction of tumour cell apoptosis, NSC631570 can increase tumour immunogenicity and recovers the role of the tumour as an effective immunogenic hub. The ability of the preparation to induce tumour cell death accompanied by HMGB1 release (immunogenic tumour cell death) can be apply for cancer immunotherapy by using dendritic cells, as a high level of HMGB1 can potentiate the immunotherapeutic effect of the autologous tumour lysate-pulsed dendritic cells vaccine. Therapeutic effect of NSC631570 is always accompanied by immune responses stimulation. Modulation of phagocytes functions is an important component of the therapeutic effect of NSC631570. Ukraine can influence macrophage migration and causes an influx of macrophages into the site of its injection. NSC631570 causes an influx of macrophages into the tumour growth area after intravenous administration, and induces their pro-inflammatory metabolic activation. Moreover, NSC 631570 can restore proinflammatory functions of macrophages, alternatively polarized by hypoxia. Physical activity interferes with immunomodulatory action of NSC631570 and abrogates pro-inflammatory shift of circulating phagocytes.

Biography

Wassil Nowicky, the Director of Nowicky Pharma and President of the Ukrainian Anti-Cancer Institute (Vienna, Austria) has finished his study at the Radiotechnical Faculty of the Technical University of Lviv (Ukraine) by the end of 1955 with graduation. He has completed Diplomingenieur in 1960, whose title was nostrificated in Austria in 1975. He is the Inventor of the anticancer preparation on basis of celandine alkaloids NSC-631570. Author of over 300 scientific articles dedicated to cancer research. He is a real Member of the New York Academy of Sciences, Member of the European Union for Applied Immunology and of the American Association for scientific progress, Honorary Doctor of the Janka Kupala University in Hrodno, doctor 'honoris causa' of the Open international university on complex medicine in Colombo, Honorary Member of the Austrian Society of a name of Albert Schweizer. He has received the award for merits of National guild of pharmacists of America, the award of Austrian Society of sanitary, hygiene and public health services and others.

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