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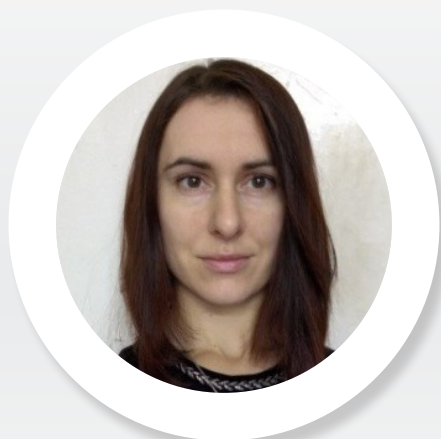
The study of chemotherapeutic activity of the ginsenoside Rh2 from ginseng root and doxorubicin combination treatment

Ginsenoside Rh2 (D-3 β -O-glucopyranoside-20(S)-protopanaxadiol) increased the antitumor efficacy of doxorubicin (DOX) (anthracycline antitumor antibiotic) in the murine model of ascites Ehrlich's adenocarcinoma. DOX-Rh2 co-treatment significantly prolonged the survival of tumor-inoculated animals compared to DOX treatment alone. Average survival of the untreated control group was 21 day, and for DOX and Rh2 alone treated groups were 70 and 65 day respectively. While the survival of the DOX-Rh2 co-treatment group was 95 day and 88% of the animals without symptoms of tumor were alive at the end of the 100 day observation period. In analysis with fluorescent indicator of the intracellular content of reactive oxygen species (ROS) - 2',7'-dichlorofluorescein diacetate, it has been shown that Rh2 is a stronger inducer of intracellular ROS level in the Ehrlich adenocarcinoma and splenocytes primary cells than DOX. Nevertheless, in DOX-Rh2 co-treated cell samples demonstrated no ROS increase in splenocytes. Rh2 was found to be a mild activator in the Neh2-luc reporter assay. Thus, Rh2 can protect of normal cells during oxidative stress by activation of transcription factor Nrf2-driven cytoprotective programs. Hence, Rh2 can minimize DOX side effects associated with oxidative damage of normal cells, but at the same time Rh2 maintains optimal ROS level sufficient for DOX-Rh2 cytotoxicity against cancer cells. It is suggested that trigger of Rh2 antitumor effect is due to its direct interaction with the plasma membrane lipids. Thereby, Rh2 increases membrane permeability for DOX and ROS in cancer cell that probably enhances DOX cytotoxicity and overcome drug resistance caused by efflux of anticancer drugs from the tumor cells.

Biography

Anna Klimovich is Research Assistant in Biotechnology Laboratory at Pacific Institute of Bioorganic Chemistry Far-Eastern Branch of the Russian Academy of Sciences (PIBOC RAS). She has obtained her graduation from PIBOC RAS. She has been working for five years in the research field of the biomedical properties of various natural compounds. She is Author and Co-author for about 10 papers published in reputed journals.

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