Antarctic Alga *Prasiola crispa* Induces Apoptosis in K562 Cells and Activates Nrf2 Antioxidant Pathway

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**Introduction:** There is a wide interest in the identification of medicinal plants and derived natural products for developing cancer therapeutics. Here we investigated the antiproliferative properties of *Prasiola crispa* (Pc), a terrestrial eukaryotic green alga collected in Antarctica. Plants have evolved and adapted to different environmental conditions and their secondary metabolites appear to play essential role in this process. It has been recognized that organisms living in Polar Regions, are subject to extreme environmental conditions. This fact has lead to the development of unique strategies enabling these organisms to survive under the most extreme environmental conditions on Earth. This fact emphasizes the importance of studies concerning the biological effects of these organisms, which may present in its constitution a combination of chemical compounds potentially not found in other organisms. **Material and Methods:** To evaluate the antiproliferative activities of the fraction 1 (ethanol), fraction 2 (methanol) and fraction 3 (ethyl acetate) extract of Pc, K562 leukemic cancer cells were maintained in standard culture conditions and exposed for 24h to different concentrations of Pc fractions. After treatments were finished, cell viability (resazurin), PARP cleavage, cell cycle and apoptosis (PI staining; flow cytometric analysis) and the expression of Nrf2, HO-1 and HSP70 were determined. Statistical analysis was done by One Way ANOVA followed by Duncan’s post hoc test (n=3-6). **Results and Discussion:** The fraction 3 showed greater cytotoxic activity in leukemic cells when compared to fraction 1 and 2, inhibited cell proliferation and caused accumulation of cells in G2 phase. This was accompanied by a marked increase in Nrf2, HO-1 and HSP70 protein levels indicating oxidative stress signals. **Conclusions:** The results indicate the potential antitumoral of *Prasiola crispa*. Studies are ongoing to elucidate the chemical constitution of fraction 3 and additional mechanisms involved in the cytotoxicity of Pc fractions in leukemic cancer cells.

Key words: Prasiola crispa, Antarctica, apoptosis, oxidative stress, K562 cells

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