

The effect of ionizing gas plasma as apoptosis promoter in some cancer cell lines

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Résumé

The low-temperature atmospheric plasmas have provided a cheaper and more convenient alternative to low-pressure plasma technology.

In order to be used for biological materials, they must generate non-thermal plasmas (below 40°C), should be operated at atmospheric pressure and should not cause electrical or chemical damage to the biological materials.

The incidence of melanoma has significantly increased in many parts of the world and it is one of the main causes of death and morbidity from cancer. Treatment of a melanoma has relied on chemotherapeutic agents, which induces apoptosis in cancer cells. However, once melanoma spread beyond the skin, it is frequently incurable by available chemotherapeutic agents. This is mainly due to the development of resistance to apoptosis.

In the present work human melanoma SkMel63 cell line shown to be killed immediately by high doses of plasma treatment, moreover, low doses shown to promote apoptotic behavior as detected by flow cytometry. It is shown that plasma acts on the cells directly and not by “poisoning” the solution surrounding the cells, even through a layer of such solution. Potential mechanisms of interaction of plasma with cells are discussed and further steps are proposed to develop an understanding of such systems.

