

IMMUNOMODULATION OF CLASSICAL AND NON-CLASSICAL HLA MOLECULES BY IONIZING RADIATION*

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Abstract

Radiotherapy has been employed for the treatment of oncological patients for nearly a century, and together with surgery and chemotherapy, radiation oncology constitutes one of the three pillars of cancer therapy. Ionizing radiation has complex effects on neoplastic cells and on tumor microenvironment: beyond its action as a direct cytotoxic agent, tumor irradiation triggers a series of alterations in tumoral cells, which includes the de novo synthesis of particular proteins and the up/down-regulation of cell surface molecules. Additionally, ionizing radiation may induce the release of "danger signals" which may, in turn lead to cellular and molecular responses by the immune system. This immunomodulatory action of ionizing radiation highlights the importance of the combined use (radiotherapy plus immunotherapy) for cancer healing. Major histocompatibility complex antigens (also called Human Leukocyte Antigens, HLA in humans) are one of those molecules whose expression is modulated after irradiation. This review summarizes the modulatory properties of ionizing radiation on the expression of HLA class I (classical and non-classical) and class II molecules, with special emphasis in non-classical HLA-I molecules.

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