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### Cell Death Pathways on Cancer Therapy

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#### ABSTRACT

**Introduction:** Cancer is a disease characterized by uncontrolled cell proliferation. The development of new drugs effective in the cancer treatment seeks the selectivity in inducing cell death. Different cell death pathways are known to date, the main ones are apoptosis, necrosis and autophagy. **Objective:** To describe the main cell death regulatory pathways and the possible targets of new anticancer drugs. **Methodology:** A bibliographic review of the scientific literature published in international journals was carried out. **Results and Discussion:** Apoptosis is a programmed cell death that controls the balance between death and tissue proliferation, and cancer cells are able to evade this mechanism. It can be induced by the extrinsic pathway, where receptors of the TNF- or CD95 family are activated on the cell surface, which subsequently activate cytosolic proteases, the caspases; or by the intrinsic pathway, where apoptosis is induced by the release of apoptogenic factors by mitochondria. Bcl-2 family proteins are highly involved in this pathway. Autophagy is a type of death in which the cell eliminates unhealthy cytoplasmic components by lysosomal degradation. The autophagic process is highly controlled, among others, by components of the PI3K-Akt-mTOR pathway, becoming key targets in anticancer therapy via autophagy induction. Finally, necrosis is a passive cell death that generally does not depend on a specific signaling pathway. It usually occurs as a final step of apoptosis or necrosis or by other factors which affect cellular homeostasis, such as physical damage and mechanical stresses, leading to cell volume augmentation and membrane disruption, resulting in loss of cell integrity. **Conclusion:** Thus, the search or development of new molecules that act against one or more of the cell death activation pathways may reveal new and promising therapeutic agents against cancer.

**Keywords:** Apoptosis; Autophagy; Cancer; Necrosis

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