

## Natural and synthetic compounds as anti-cancer therapies for breast and prostate cancer

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### Abstract

Breast Cancer (BCa) and Prostate Cancer (PCa) are the most prevalent tumors in females and males, respectively, being the main causes of cancer morbidity and mortality, worldwide. Currently, there is no available curative treatment for the hormone-resistant tumors, being the development of new therapeutic strategies using innovative anticancer agents imperative. Thus, the main goal of this work was to evaluate the anticancer properties of natural and synthetic compounds through *in vitro* assays.

BCa, PCa and non-tumor cell lines were treated with natural compounds, extracts of *Taraxacum hispanicum*, and synthetic compounds, ionic liquids and quinoxalines. Phenotypic assays were performed for evaluation of cell viability, cytotoxicity, apoptosis and colony formation. Only the ionic liquid ([C16Pyr][Amp]) and the alcoholic extract of *Taraxacum hispanicum* (EAL) are associated with significant decreased cell viability, with a high index of selectivity. Hence, the additional functional assays were performed only for these two compounds. When characterizing the mechanism of cell death, treatments with both compounds proved to sensitize cancer cells to apoptosis, while rarely induced cell death by necrosis. Moreover, the ability of colony formation was reduced in cell treated with both compounds, although a more pronounced effect has been observed in PCa cell lines.

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Overall, functional assays revealed that both [C16Pyr][Amp] and EAL have a significant antitumor activity. Nevertheless, these observations must be molecularly analyzed to allow the identification of the major cellular pathways affected by these compounds.

**Keywords**

Breast cancer, Prostate cancer, Natural compounds, Synthetic compounds

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