ORT_08 - β-lapachone inhibits tumor progression of breast cancer spheroids

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Introduction: Breast cancer is the most prevalent cancer among women. For 2018 -2019 biennium it was estimated almost 20 thousand deaths. The poor prognosis is mainly associated with occurrence of metastasis. β-lapachone (β-lap) is a natural naphthoquinone obtained from the inner bark of the lapacho trees, native of South America. This natural compound has several pharmacological effects, such as antibacterial, antifungal, antiviral, analgesic, anti-inflammatory activities, as well as, antitumor effects. The 3D systems of cell culture better recapitulate cell-cell and cell-matrix interactions, mimetizing the tumor morphology and behavior, responding *in vitro* to treatments in a more similar way to *in vivo* tumors than traditional 2D culture systems.

Objective: Given the lack of studies using 3D culture using β-lap, the aim of this study was to evaluate the effect of β-lap treatment in breast tumor spheroids.

Methodology: First, we produced our scaffold-free 3D model with MCF-7 human breast tumor cell line. Thereafter, we evaluated the cytotoxic and antimetastatic effect of β-lap in spheroids, evaluating spheroid diameter, cell death, migration/metastatic potential of cells and epithelial-mesenchymal markers (E-cadherin and vimentin).

Results: Our results revealed that β-lap reduced spheroid diameter, induced cell death and inhibited the metastatic potential of tumor cells *in vitro* by reducing collective migration and inhibiting the EMT process.

Conclusion: Our results revealed that β-lap reduced spheroid diameter, induced cell death and inhibited the metastatic potential of tumor cells *in vitro* by reducing collective migration and inhibiting the EMT process.

Keywords: Breast cancer; Spheroids; β-lapachone