

## **ORT.13 - Establishment of 3D culture of mammary tumor cells for *in vitro* therapeutic response studies targeting personalized anticancer therapy**

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**Introduction:** Breast cancer is the second most common type of cancer in the world. Personalized therapy is an option in the fight for the cure of cancer, since tumor variability is a great challenge in the elaboration of therapeutic protocols. Only 5% of the compounds tested *in vitro* in 2D systems present *in vivo* antitumor activity. Otherwise, the three-dimensional (3D) cell culture systems, which better mimic the architecture and tumor behavior observed *in vivo*, respond to *in vitro* treatment in a similar way to tumors in patients when treated with the same chemotherapeutic agents, showing great potential for evaluation of specific tumor therapy.

**Objective:** The aim of this study is to evaluate the similarity of tumor spheroids produced *in vitro* with their original tumors, as regards the morphological, molecular and functional characteristics for therapeutic response studies, aiming at personalized anticancer therapy.

**Methodology:** First, we established the 3D culture with the MCF7 human breast cancer cell line and analyzed spheroid growth, death (7-AAD) and migration during doxorubicin or beta-lapachone treatment. At this point, we started to standardize the 3D culture with breast cancer cells from patients. Then we will perform molecular and functional analyzes. The molecular characterization will be done by analyzing the gene expression of mammary tumor biomarkers. Functional analyzes of the spheroids will be done through evaluation of proliferation, death and cell viability to compare with the pathological response after neoadjuvant therapy.

**Results:** Our preclinical results demonstrate that it is possible to produce tumor spheroids both from cell lines and tumors isolated from mouse. The treatment of spheroids with doxorubicin or beta-lapachone were able to inhibit spheroid growth, induce apoptosis and inhibit metastasis *in vitro*.

**Conclusion:** We established our 3D cell culture using cell lines and tumors isolated from mouse. Our next step will be perform the assays with tumor spheroids produced from tumor cells of patients and, once we keep the tumor identity *in vitro*, we will begin the therapeutic tests with different drugs already used in the clinic, aiming the production of a prototype of a kit for personalized therapy (“tumor antibiogram” or “chemogram”).

**Keywords:** breast cancer; three-dimensional cell culture; personalized therapy