



## 6 - NEW APPROACH IN THE TREATMENT OF OVARIAN CANCER THROUGH SODIUM IODIDE SYMPORTER (NIS)

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### Resumen

**Introduction:** The sodium iodide symporter (NIS) is an integral plasma membrane glycoprotein expressed in thyroid gland, where mediates active transport of iodide into the gland. Radioiodide therapy (RAI) through NIS is the most effective therapy in thyroid cancer. Ovarian cancer is the most lethal gynecological malignancy, more than 70% of cases are diagnosed when the cancer has already metastasized. Our group has demonstrated that NIS is expressed in ovarian surface epithelium and is overexpressed in human epithelial ovarian cancer. The aim of this study is to determine whether overexpression of NIS in ovarian cancer can be use as therapeutic tool using RAI in ovarian tumors.

**Methods:** Serous ovarian cancer cell line (SKOV3) was transfected with exogenous NIS and characterized by different techniques. NIS transfected cells were injected into the flanks of nude mice. The expression of NIS in tumors was analyzed by different molecular biology techniques and NIS functionality in animal models was measured by SPECT-CT. <sup>131</sup>I therapeutic approach was analyzed in the animal model.

**Results:** PCR and western-blot show NIS expression. Immunofluorescence and immunohistochemistry show that NIS expression occurs in plasma membrane, and iodide uptake assays show that the expression of NIS in plasma membrane is functional in vitro and in SPECT-CT assay in vivo. Tumor growth was much lower in those tumors derived from ovarian cancer cells that express NIS after a therapeutic dose with <sup>131</sup>I.

**Conclusions:** NIS expression in human ovarian cancer cell lines is functional in vitro and in vivo. Even though the levels of NIS expression are not very high, the uptake and accumulation of iodine is very high. A single therapeutic dose of <sup>131</sup>I reduced tumor growth in ovarian cancer NIS expressing cells, which leads us to pointing NIS as a therapeutic approach in treatment of ovarian cancer.

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