Diagnostic & Therapy
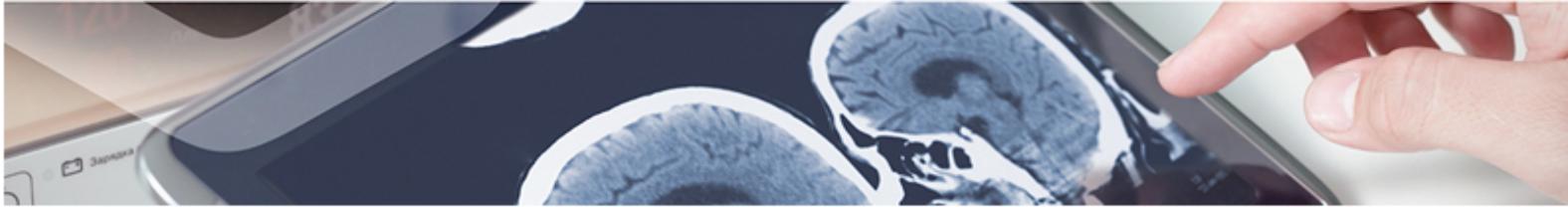
Biomarker for Triple Negative Breast Cancer diagnosis, prognosis, follow-up & drug screening and development

A research group of the Public Health System of Andalusia has identified activating transcription factor 4 (ATF4) as a valuable prognostic biomarker and therapeutic target in patients with TNBC.

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TRANSFERENCIA DE TECNOLOGÍA
Sistema Sanitario Público de Andalucía

Description

Breast cancer is the most common cancer in women; among all kinds of breast cancer, triple-negative breast cancer (TNBC) accounts for about 10-15% of all diagnosed cases. Tumor heterogeneity, metastasis and drug resistance define the aggressiveness and poor survival rates of this kind of cancer.

Different responses to the same treatment among patients suggest that novel biomarkers and therapeutic targets are required for a personalized therapeutic approach to improve clinical success rates.

In line of this, the activating transcription factor 4 (ATF4) is overexpressed in breast cancer and TNBC. Researchers have demonstrated both *in vitro* and *in vivo* that ATF4 depletion leads to a reduction of the metastasis rate, cancer stemness and tumor cell survival through the modulation of TGFβ/SMAD and PI3K/mTOR pathways. In addition, they have identified a pathway-guided gene signature with prognostic potential.

ATF4 expression inhibition reduced migration, invasiveness, mammosphere-forming efficiency, proliferation, epithelial-mesenchymal transition, and antiapoptotic and stemness marker levels.

The identification of the relevant signaling pathway may facilitate the design of combinatorial targeted therapies and provide a gene signature that may improve personalized medicine in breast cancer.

The inventors propose the use of ATF4 as a prognostic biomarker and therapeutic target in patients with TNBC.

Advantages

- *In vitro* method for the diagnosis, prognosis and follow-up of triple-negative breast cancer patients.
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- *In vitro* and *in vivo* (patient-derived xenografts) models useful in the screening and development of new therapeutic compounds for the treatment of TNBC patients.

Aims

This research group is seeking to establish a public-private partnership agreement for the development of the technology.

Classification

Area: Biotech and pharma.
Technology: Prognostic and therapeutic agent.
Pathology: Oncology. Triple Negative Breast Cancer