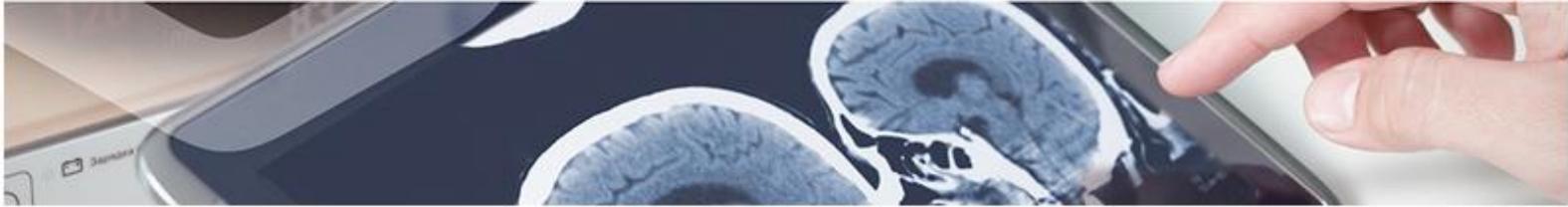


Diagnostics

New Biomarkers and Technologies for Circulating Tumor Cells Identification and Isolation

A research group from the Andalusian Public Health System (APHS) has identified several biomarkers and developed new technology for improving CTCs isolation, detection and characterization.



Description

Metastasis is responsible for the vast majority of cancer-related deaths. During this process, circulating tumor cells (CTC) are generated, spread from the primary tumor, colonize distant organs and lead to overt metastatic disease. In the past decade, a growing interest in CTCs has spread out across the oncology field, especially looking at their capacity as prognostic elements of cancer.

Despite important progresses in understanding and detecting CTCs, most of the assays still have low sensitivity; mainly due to the use of a few epithelial biomarkers to identify and isolate them from whole blood. EpCam and/or cytokeratins (CK) are the two main epithelial biomarkers included in most of the devices used to date.

However, recent evidences have demonstrated that a subset of CTCs may lack EpCAM and cytokeratin expression and instead exhibit epithelial–mesenchymal transition (EMT) features. Accordingly, the development of novel detection platforms should be accompanied by novel and specific CTC biomarkers that enhance their detection and molecular characterization.



Advantages

In this scope, the present research has developed several inventions which improve CTCs isolation, detection and characterization:

1. New chemical compounds that, when mixed with blood samples, allow the concentration of CTCs and other tumor circulation biomarkers (eg. miRNAs). This technology improves the efficiency of the CTCs isolation process.

2. New miRNA biomarker. When this miRNA is present in blood samples, it shows presence of circulating tumor cells, circulating tumor cells of epithelial phenotype or circulating tumor cells of epithelial to mesenchymal transition (EMTs).

3. New group of 4 CTC's epithelial biomarkers for prognosticating cancer, more specifically, colon cancer, lung cancer, breast cancer (non-metastatic breast cancer) and prostate cancer. These biomarkers are also useful to predict the response to EGFR inhibitors like Gefitinib, Erlotinib, Cetuximab, Lapatinib, Pannitumumab and Trastuzumab or Androgen Receptors Agonists (AVR-7 mutation) like Abiraterone.

Stage of development and other relevant data:

1. These technologies have been tested with:
 - a. Around 200 breast cancer patients.
 - b. 78 metastatic colon cancer patients.
 - c. 73 stage I to IV Non-small-cell lung carcinoma patients.
 - d. Around 100 stage I to I-III prostate cancer patients (10 patients treated with Abiraterone (prechemotherapy)). This study is still ongoing.
2. Currently, we have several CTC's research project on going with Janssen Cilag.
3. The APHS is going to set up CTCs based diagnostic protocol for prostate and breast cancer in of its hospitals.



Intellectual Property

The technology is protected by a patent application and know-how with the possibility of international extension.



Aims

The research group is looking for a collaboration agreement for further development or a licence agreement.



Classification

Area: Diagnostics

Pathology: Oncology and Hematology