"DEVELOPMENT OF LIQUID BIOPSY BASED ON CIRCULATING TUMOR CELLS AS THE TOOL FOR MONITORING DISEASE PROGRESSION IN BREAST CANCER PATIENTS"

Product description

Breast cancer is the most frequently diagnosed cancer in women worldwide and second cause of cancer-related deaths. The main culprit of breast cancer deaths are distant metastases. Metastasis formation may already occur at an early disease stage prior to the appearance of clinical manifestations. Tumor cells shed into the circulation, called circulating tumor cells (CTCs), are the direct mediators of distant metastasis. These cells contain markers not normally found in healthy individuals' cells, thus forming the basis for diagnosis and treatment of specific cancers. Hence, the presence of tumor cells in the circulation can be used as prognostic and predictive marker, for choosing optimal therapy and monitoring its efficacy.

Key words

Breast cancer, circulating tumor cells, prognostic marker

Legal status of the product

Polish Patent Office:

Patent granted (2017) – entity solely entitled to the invention – Medical University of Gdansk

The subject of offer

The subject of the offer is the development of a test for detection and molecular profiling of circulating tumor cells from blood of early breast cancer patients in order to provide additional prognostic information.

Foregoing funding of studies on the product

National Centre for Research and Development grant LIDER/13/117/L-1/09/NCBiR/2010 ‚Analysis of selected molecular factors associated with invasion and metastasis in breast cancer patients'
National Science Centre grant SONATA 2016/21/D/NZ3/02629 'Deciphering malignancy of cancer cells outside the primary tumors through molecular characterization of single circulating tumor cells from breast cancer patient'

Analysis of competition on the market

In 2008 Food and Drug Administration approved the CellSearch™ System (Veridex) for identification and enumeration of CTCs from full blood of metastatic breast cancer patient to predict progression-free survival and overall survival. Additionally, AdnaTest (Qiagen) is used for detection of CTCs in breast cancer patients. All these methods however allow for enrichment of CTCs based on epithelial markers, but not accounting for occurrence of CTCs with mesenchymal phenotype, presumably the most malignant subpopulation of CTCs.

Advantages of the product

The approach based on analysis of CTCs from peripheral blood is called 'liquid biopsy' and it allows for non-invasive sampling. Not only number of CTCs carries clinically relevant information. Molecular characterization seems to be incerasingly important. The method allows for isolation and profiling of mesenchymal subpopulations of CTCs (not detected by standard methods), thus it can provide more acurate information on CTCs load and aggressiveness. Profiling of CTCs may allow examination of the molecular evolution of tumor cells during the course of treatment, which may be particularly important in monitoring of the development drug resistance.