

Metastases are the leading cause of death in breast cancer patients. During the metastatic process, in order to migrate from the primary tumour to the distant metastatic sites, the tumour cells must undergo fundamental molecular adaptations. Thus, the cancer cells circulating in blood (circulating tumour cells - CTCs) - the intermediate stadium of cancer progression, are likely to differ from tumour cells from the primary and metastatic tumours. Recently, isolation of CTCs from blood samples (so-called liquid biopsy) have gained much recognition as potential alternatives to standard core biopsies in cancer patients. However, before implementing this new method in clinic, it must be scrupulously examined whether CTCs are good, biologic representatives of the primary and metastatic tumours in context of standard factors that decide about patients' prognosis. In breast cancer, there has been no comparison between CTCs, primary and metastatic cells with respect to widely recognized both biologically and clinically significant markers. The aim of this project is to carry out such a comparison and to analyse it in context of well-known and important prognostic features of breast cancer. The methodology of the project will cover the novel method for isolation of CTCs from whole blood samples.

It is foreseen that the study will thoroughly characterise the molecular profile of circulating tumour cells in breast cancer patients and thus may help to justify the use of CTCs as a reliable diagnostic tool in clinic.