

The consortium

Interuniversitair Micro-Electronica Centrum VZW, Belgium
Universitat Rovira i Virgili, Spain
Institut für Mikrotechnik Mainz GmbH, Germany
Adnagen AG, Germany
MRC Holland B.V., Netherland
Oslo Universitetssykehus HK, Norway
THINXXS Microtechnology AG, Germany
ConsulTech GmbH, Germany
Kungliga Tekniska Hoegskolan, Sweden
MultiD Analyses AB, Sweden
Fujirebio Diagnostics AB, Sweden
European CanCer Organisation, Belgium
Labman Automation Ltd., United Kingdom
ICsense, Belgium



Magnetic Isolation and moleculaR Analysis of single CircuLating and disseminated tumor cElls on chip (MIRACLE project)



WWW.MIRACLE-FP7.EU



WWW.MIRACLE-FP7.EU



LABMAN



This flyer describes work undertaken in the context of EC FP7-ICT project 257743. It is funded by the European Commission. It does not necessarily reflect its views and in no way anticipates the Commission's future policy in this area.



About

MIRACLE is a large-scale integrating project between 14 partners from universities, research institutions and companies from all over Europe. The project is funded by European Commission within the 7th Framework Programme (ICT-Information and Communication Technologies Priority) and commenced on the 1st September 2010.

The quest

Occult tumor cells (OTCs), i.e. circulating tumor cells (CTCs) in peripheral blood and disseminated tumor cells (DTC) in bone marrow, have been attracting increasing attention due to their important role in cancer metastasis. The isolation of OTCs, however, poses significant technical challenging because of the

low abundance (down to a few cells per mL in peripheral blood or bone marrow), compared to the background of millions of leukocytes and more red blood cells. Moreover, the variation of cell size and imperfect surface marker specificity further increases the difficulty for OTC identification and analyses.

The objective

MIRACLE aims to develop a low-cost, fully automated, integrated lab-on-a-chip (LOC) system for the isolation, counting and characterization of CTCs and DTCs starting directly from clinical samples.

The approach

The overall strategy of MIRACLE is to immunocapture tumor cells followed by counting and characterization of OTCs on an active sieve with integrated transistors. After cell lysis, multiple genes are amplified by RT-PCR and multiplex ligand-dependent probe amplification (MLPA) and then quantitatively detected by an electrochemical sensor array, ending in a highly sensitive and specific, multiplexed result.

