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IMEC launches cancer lab-on-chip project

Peter Clarke
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LONDON – European research institute IMEC (Leuven, Belgium) and its project partners have launched a European collaborative research project to build a lab-on-a-chip for the detection of tumor cells in blood.

The Miracle project (Magnetic Isolation and molecular Analysis of single Circulating and disseminated tumor cElls on chip) is due to run for four years from Sept. 1 2010 and the partners are set to receive €7 million (about \$9 million) towards a total budget of €9.18 million (about \$11.8 million)

The creation of a microfluidic device able to isolate and detect circulating and disseminated tumor cells (CTCs and DTCs) in blood is a step towards faster and more cost-efficient diagnosis of cancer. The Miracle project aims at developing a fully automated and integrated microsystem to provide the genotype of CTCs and DTCs starting from clinical samples.

In a preceding joint project called Mascot, individual microfluidic modules for cell isolation, cell counting, DNA amplification and detection were developed. Based on this expertise and strengthened by additional partners, the development of a fully automated, lab-on-chip platform to isolate, count and genotype CTCs is envisaged within the framework of the Miracle project.

For genotyping, genetic material, such a mitochondrial RNA, will be extracted from the cells and multiple cancer related markers will be amplified based on multiplex ligation-dependent probe amplification followed by their detection using an array of electrochemical sensors.

IMEC is project coordinator and is collaborating with the Universitat Rovira I Virgili (Spain), the Institut für Mikrotechnik Mainz, AdnaGen, ThinXXs and Consulatech (Germany), MRC Holland (The Netherlands), the Oslo University Hospital (Norway), the KTH Royal Institute of Technology, Multi-D and Fujirebio Diagnostics (Sweden), the European Cancer Organisation and ICsense (Belgium) and Labman (UK).

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