

# ANALYTICAL MICROSYSTEMS FOR BIOMEDICAL AND ENVIRONMENTAL APPLICATIONS

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## **Abstract**

Two types of analytical microsystems for the detection of species of interest in biomedical diagnosis and in environmental monitoring are specifically described in this paper.

We describe a novel device that will measure whole blood concentration of D-dimer, a recognized biomarker of increased blood clotting activity and that will then offer opportunity to use the test in the point of care setting. The device combines innovation in antibody bio-engineering for high specificity immunoassay-based diagnostics and nano/micro engineered impedimetric analysis electrodes incorporating a biocompatible polymer substrate with development of a disposable microfluidic manifold, enabling diagnostics at the point-of-first-contact.

The feasibility of a generic microsystem integrating a microfluidic system of concentration and a module of electrochemical detection is demonstrated for the four metals of the European directive (OCE 2000/GO/EC) for the quality of water resource: cadmium, mercury, lead and nickel.

**Keywords:** analytical microsystems, fluidic microsystems, Electrochemical Impedance Spectroscopy, Deep Venous Thrombosis, water resource, heavy metals, diamond like carbon