



OPTOFLUIDIC DEVICES FOR MICROANALYSIS

HYBRID MICROFLUIDIC CHIP
FOR SINGLE CELL DIAGNOSIS



INESCTEC
TECHNOLOGY & SCIENCE

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Miniaturisation and portability, increased automation, minimum reagent consumption, high throughput and reduced manufacturing costs are some of the strong motivations to develop microfluidic sensing platforms.

In this project, partners with complementary expertise (INESCTEC – Optoelectronics, CENIMAT – Material Science, ITQB – Biomolecular diagnosis) joined to develop a new optofluidic chip capable of performing optical and electrical characterisation of biological fluids and single cells.

The technology currently being developed makes it possible to perform multiple simultaneous measurements with extremely reduced sample volumes. As a result, this project guarantees an improved analytical diagnostic tool. In this particular project, the goal is to analyse red blood cells (RBC) simultaneously using impedance spectroscopy and refractive index measurements. The aim is to provide a way to differentiate infected and healthy cells more accurately. Nevertheless, the technology is versatile and will allow a diversity of analytical applications.

POTENTIAL APPLICATIONS

- **Security and defence:** high sensitivity detection of multiple chemical and biological threats using minimal sample amounts.
- **Biomolecular diagnosis:** single cell manipulation and diagnosis (infectious states, cancer).
- **Point of care analysis:** fast and sensitive multiparameter analysis of biological fluids (blood, urine).
- **Quality control:** spectroscopic and refractive index analysis of dye solutions and other fluids (chemical industry, food industry).

PARTNERS

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