PARTNERS

CNR ISMN · plasmore · csem · Istituto Superiore di Sanità · parmalat · Fraunhofer · VTT · beWarrant TINEXTA GROUP · Wageningen University & Research · nébih · QCL · Milkline

PROJECT DETAILS

START/END: Jan 2018 – Mar 2022
EU CONTRIBUTION: 5,479,159 €
TOPIC: ICT-30-2017 Photonics KET 2017
PROJECT COORDINATOR: CNR (Italy)

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PHOTONICS21
PHOTONICS PUBLIC PRIVATE PARTNERSHIP

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MOLOKO

Multiplex phOtonic sensor for pLasmonic-based Online detection of contaminants in milK

PROJECT RESULTS

MOLOKO project aims to develop a **miniaturized integrated photonic sensor**, specifically designed to be used during the whole milk supply chain, from production to distribution.

The device will enable and guarantee self-monitoring safety and quality standards by the use of a reliable, highly sensitive and specific, low-cost innovative self-screening photonic technology.

MOLOKO SENSOR PERFORMANCE

SELF-TESTING AND CALIBRATION

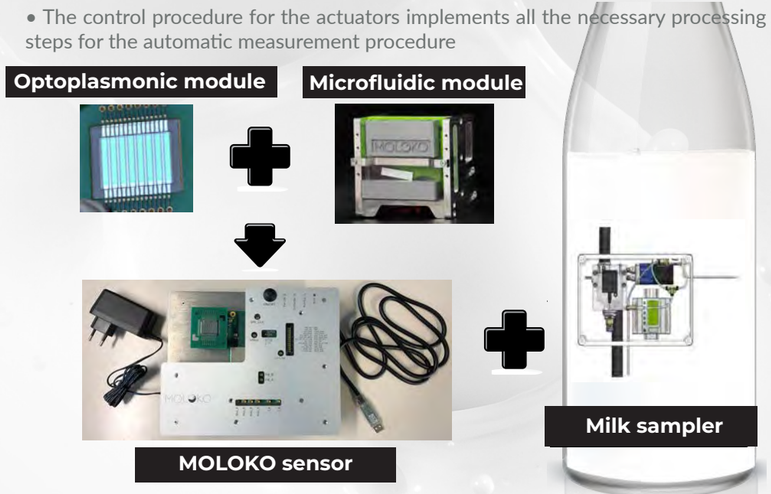
- Linear dependence of the measured signal with respect to different concentrations of reference solutions (ethanol, sucrose).
- Sensitivity limit down to the scale of 100 RU
- Channel-specific correction factor is extrapolated to be used for the quantitative assay analysis.

OPERATIONAL USE OF THE SENSOR:

1. THE AUTOMATIZATION

Engineering and manufacturing of an innovative miniaturized and monolithic-integrated optical biosensor on OLEDs and OPDs: 1 square-inch transparent optoelectronic chip comprised by 7 independent channels.

- Exchangeable microfluidic cartridge for the integration with the OptoPlasmonic Module (OPM)
- The microfluidic cartridge includes a block for the reagent storage
- The re-usable microfluidic module for the integration into the readout device includes robust actuators
- The control procedure for the actuators implements all the necessary processing steps for the automatic measurement procedure



2. THE LIST OF ANALYTES

FOOD SAFETY

- *Antibiotics*
- *Staphylococcal enterotoxins*
- *Mycotoxin*

FOOD QUALITY

- *Lactoferrin*
- *k-Casein B*
- *β-Casein A2A2*

3. AUTOMATIZED ANALYSIS

14-min long protocol of use comprising an automatized analysis of the output signal for not skilled end-users.

- ANALYTICAL PERFORMANCE -

Multiplexing detection of lactoferrin (quality parameter), streptomycin and quinolone (safety parameters) in buffer medium simultaneously on the same chip.

- INTEGRATION IN MILKING PARLOURS -

Automated prototype analyser installed in a milking parlour (farm) and demonstrated on-line operation.

- PATENTS ON NOVEL RECOMBINANT ANTIBODIES -

Specific for Staphylococcus aureus enterotoxins A and B (SEA and SEB) and cephalosporin antibiotics.