

MOLOKO

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



THE PROJECT

The main objective of MOLOKO project is the **manufacturing, implementation and validation** of a self-managing and automatic **miniaturized integrated photonic sensor** to be used as process analytical instrumentation for fastresponse **on-site monitoring** of interest analytes for security and quality within **milk supply chain**. In particular, the project aims at realizing multiplexing quantitative detection of **up to 10 analytes** among which food safety parameters, e.g. antibiotics (i.e. penicillin, ampicillin, cephalonium) and toxins (i.e. mycotoxins and bacterial toxins) and food quality parameters e.g. lactoferrin and caseins by implementing a highly-integrated optoplasmonic-microfluidic sensor in the strategic checkpoints along the entire supply and value chain of milk.

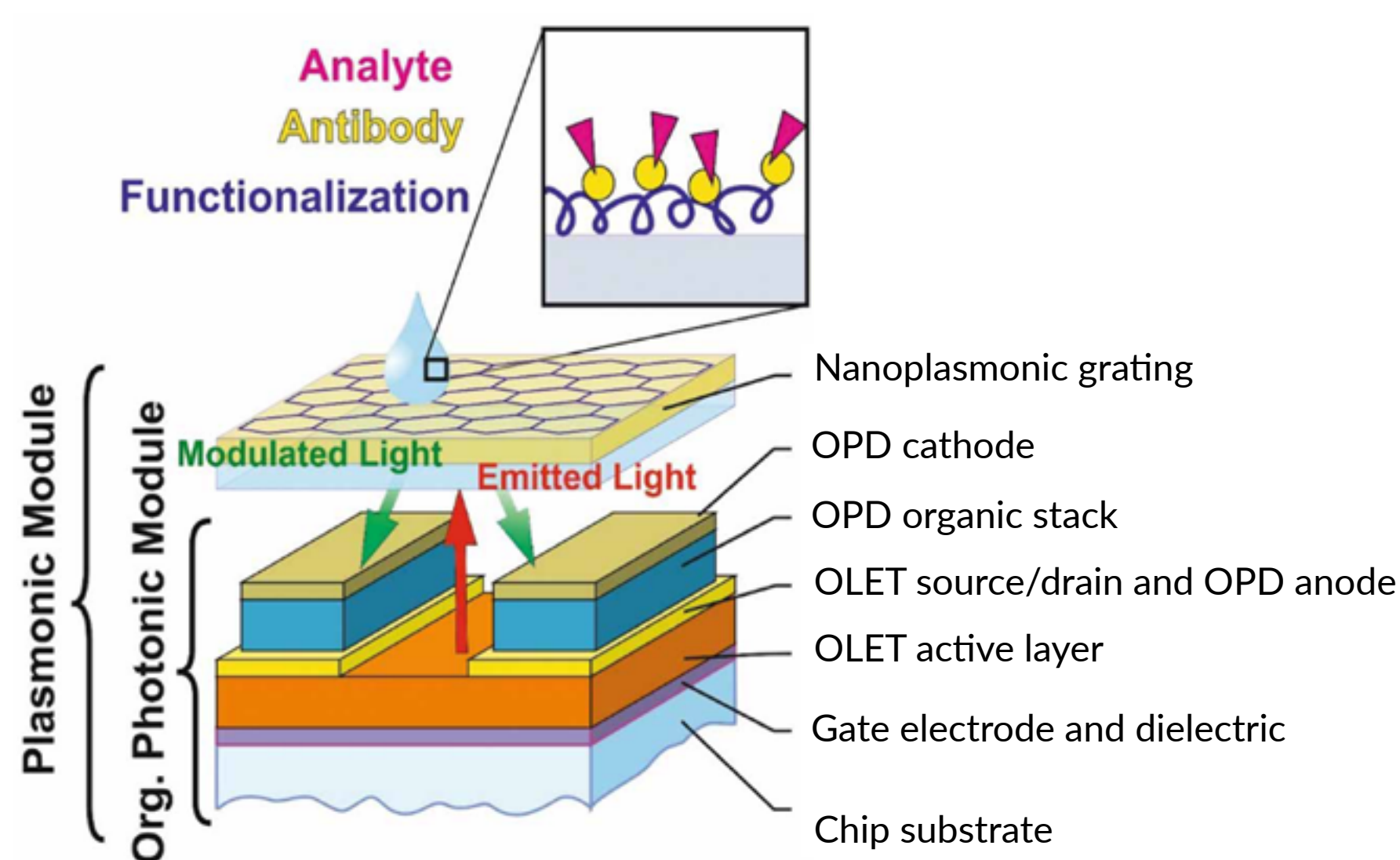
The MOLOKO miniaturized integrated photonic sensor is specifically designed according to milk primary production, processing and distribution end-users in order to **enable and guarantee self-monitoring safety and quality standards** by the use of a reliable, highly sensitive and specific, low-cost innovative self-screening photonic technology. The effectiveness and market-placement of the engineered functional prototype is quantitatively evaluated by direct comparison with respect to standard analytical methods and commercially available optical biosensors.

OBJECTIVES

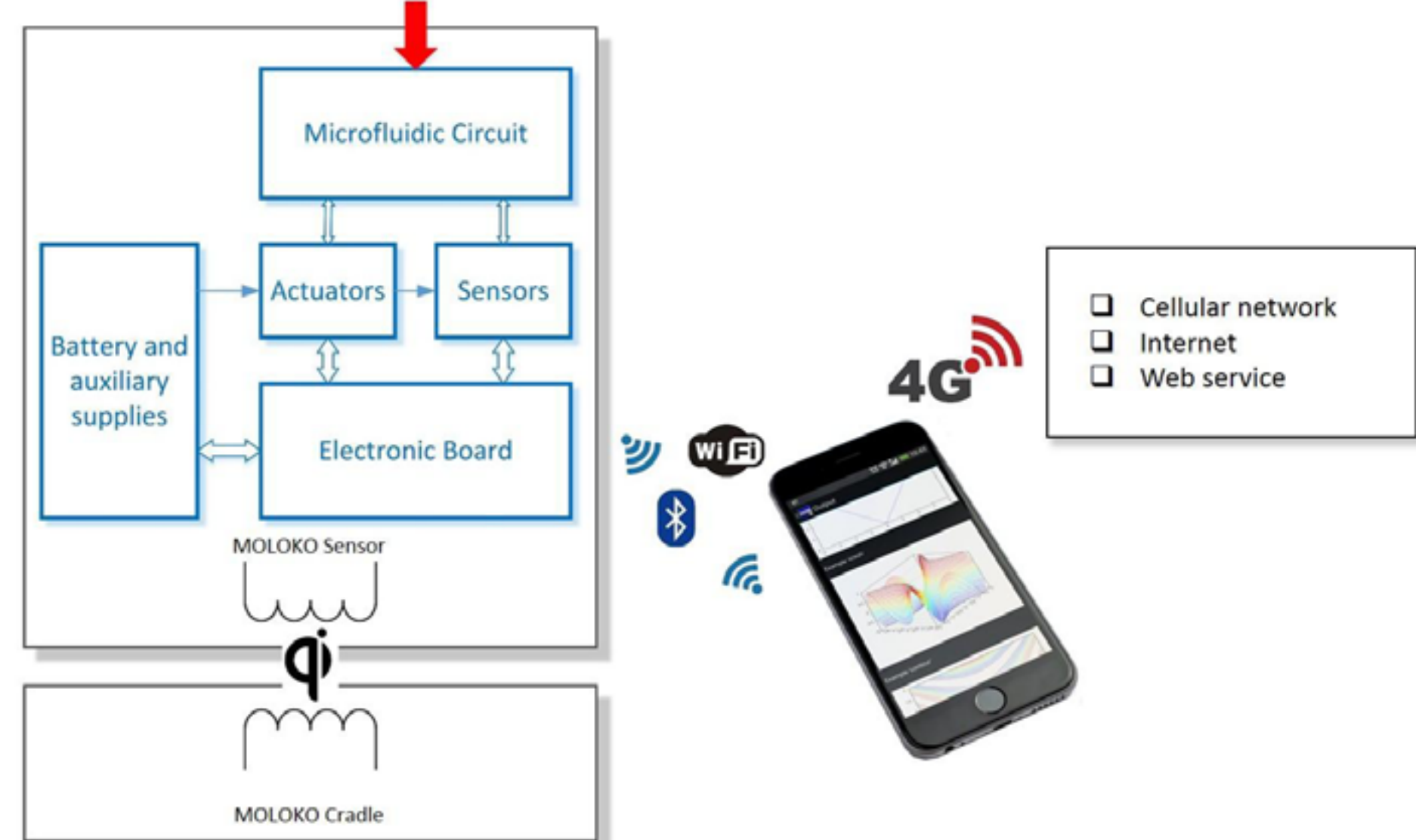
- Manufacturing, implementation and validation of a self-managing and automatic miniaturized integrated photonic sensor
- Fast-response on-site monitoring of interest analytes for security and quality within milk supply chain
- Multiplexing quantitative detection of up to 10 analytes
- User-friendly, reusable and highly-integrated opto-microfluidic chip
- Market-placement by direct comparison with respect to commercially-available standard analytical methods and optical biosensors
- Self-monitoring the safety and quality standards in the value-chain of milk production and distribution
- Implementing the device as in on-line analyser for the monitoring of the whole milk chain
- Cloud-based traceability

CONCEPT

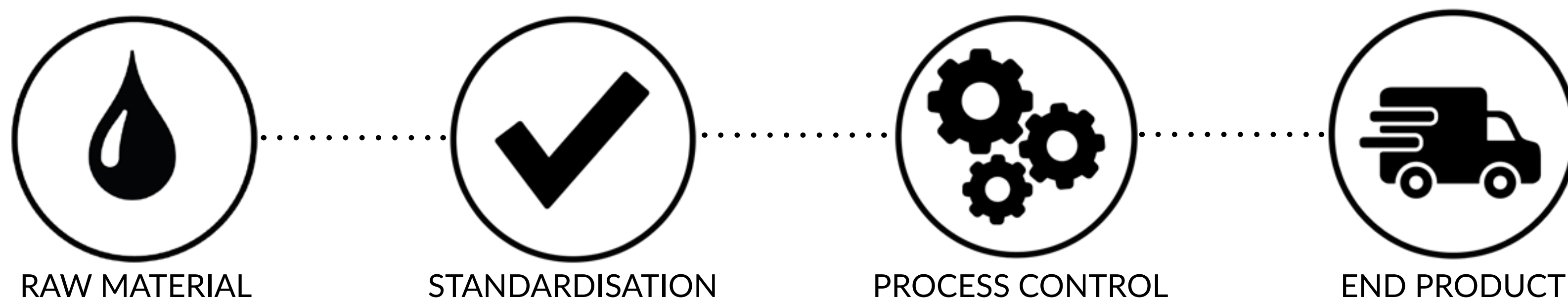
Optoplasmonic module



Technology



ONLINE CONTROL IN MILK SUPPLY CHAIN



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PHOTONICS²¹
PHOTONICS PUBLIC PRIVATE PARTNERSHIP