



photonic system for Adaptable muLtipLe-analyte Monitoring of fOod quality



THE PROJECT

The EU-funded research and innovation project h-ALO aims to develop a cutting-edge **bio-chemical photonic-based sensor** enabling the on-site early detection of microbiological and chemical contaminants **in the farm-to-fork local food chains**.

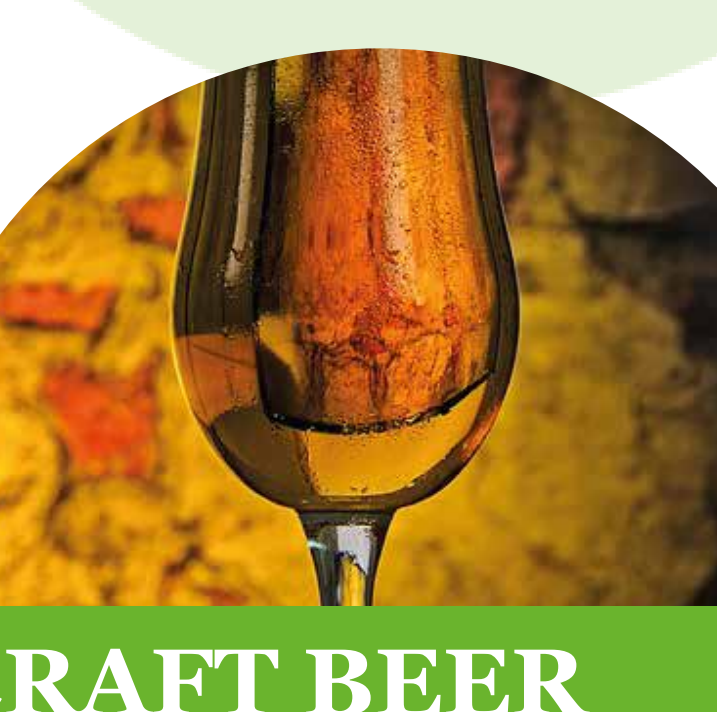
h-ALO combines micro-nanotechnologies for optical sensing based on **nanoplasmonics, advanced biorecognition, micro-engineered surfaces and microfluidics** for the realization of an **ICT monitoring analytical instrumentation** that aims at outperforming current commercially available portable tools for contamination detection.

The h-ALO sensor will offer unique advantages in terms of **sensitivity, portability, and multiplex capabilities** and its adoption will help local food producers and small retailers to assess quality and safety of their products in a **fast, reliable, and cost-effective way**.

h-ALO FOOD VALUE CHAINS

The use of the sensor will be demonstrated in real-setting applications focusing on short selected local and organic food chains such as **aquaponics, organic honey, craft-beer, and raw milk**.

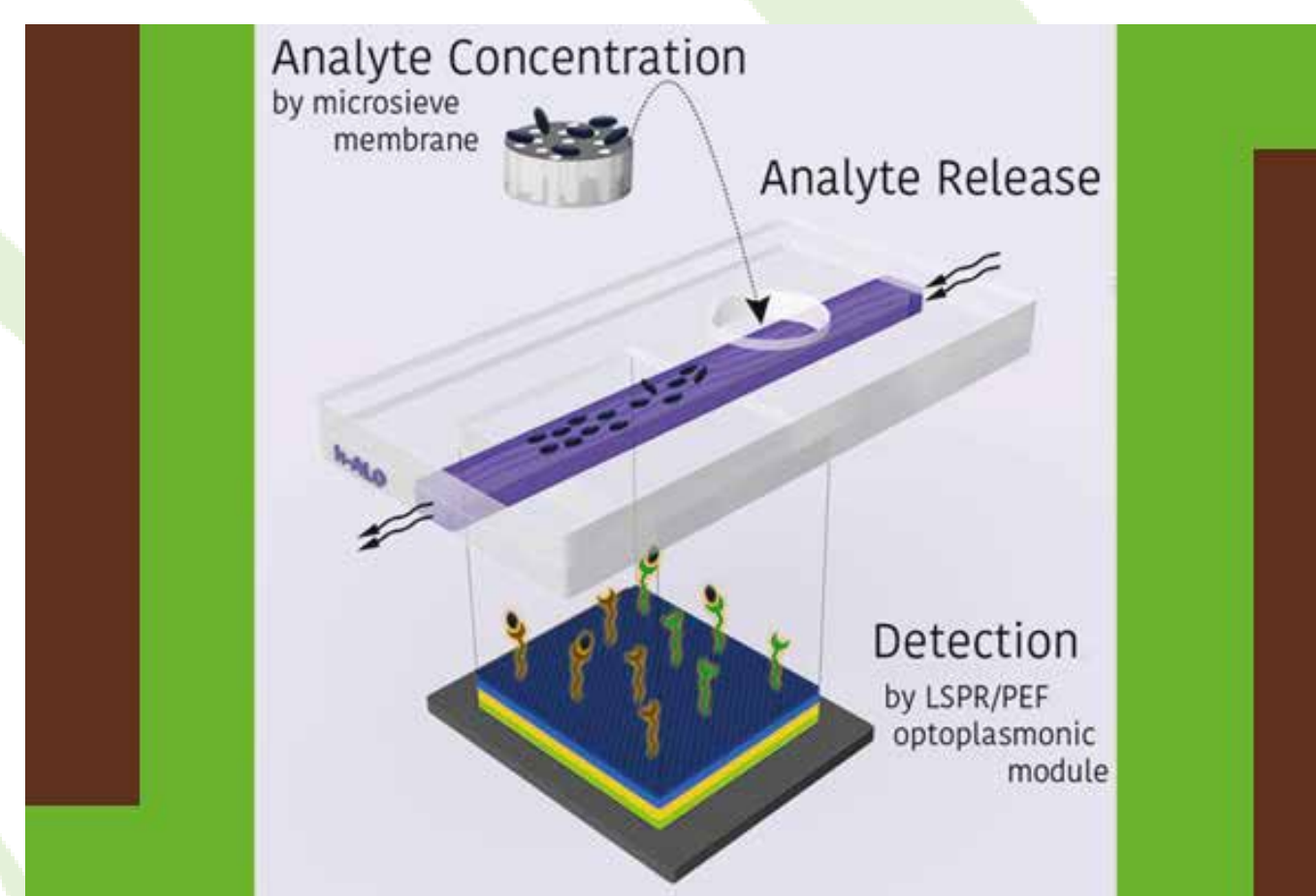
End-Users such as owners of small/medium sized farms, local producers of organic and craft food, and on-site food vendors will be **consulted** by project partners **to co-create** the list of target analytes and to support the validation of the h-ALO prototype.



THE h-ALO SENSOR

Photonic sensor:

The h-ALO sensor is a tool to bridge the gap between local food production chains and food safety/quality monitoring.



Integrative sensor system:

- a disposable cartridge including a **microsieve membrane for analyte pre-selection**, concentration and treatment;
- a reusable cartridge for the **multimodal photonic detection through reusable nanoplasmonic biofunctionalized sensing surface**;
- a static part devoted to electronics, readout and containing the data-management unit.

KEY INNOVATIONS

- Multiplex-analyte recognition**: Simultaneous detection of both microbiological and chemical contaminants
- High sensitivity and low limit-of-detection**: Through the combination of an analyte pre-concentration and a multi-modal detection scheme
- Miniaturization and integration**: On-site analysis and flexible use
- Preparation protocols**: Adaptable for a wide range of agri-food chains
- Measurement automation**: Reliable for on-site use by non-expert food operators
- Advanced data management**: Mobile-phone connectivity and cloud-based sharing capability

BENEFITS

- To ensure high quality and safety standards at lower costs
- To meet consumers demand
- To store data in a cloud-based system
- To strengthen local farm-to-fork food production chains

PROJECT DETAILS

PROJECT TITLE: photonic system for Adaptable muLtipLe-analyse Monitoring of fOod quality
ACRONYM: h-ALO
START DATE: 01/01/2021
DURATION: 36 Months
TOPIC: ICT-37-2020 | Advancing photonics technologies and application driven photonics components and the innovation ecosystem
EU CONTRIBUTION: 4,239,432 Euro

CONTACTS

PROJECT COORDINATOR

Stefano Toffanin
 E-mail: stefano.toffanin@cnr.it

DISSEMINATION MANAGER

Isella Vicini
 E-mail: isella.vicini@warrantHub.it



"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101016706".

Powered by Warrant Hub spa | (Illustration:@Simona Duci)



PHOTONICS PUBLIC PRIVATE PARTNERSHIP