

## **GRACED – Next generation sensors as part of a holistic solution for food quality monitoring**

As consumer demand for fresh fruits and vegetables (F&V) continues to increase, so does the risk of microbiological and chemical contamination. Currently, inspections for F&V are carried out at the production site or the food processing facility, based also on regulatory requirements. In most cases these are inspections of random batches using laboratory techniques, which may require up to two or more days before getting results. The time and cost per analysis leads to reduced checks and thus, elevated risks, even in countries with very efficient control mechanisms.

Furthermore, such analysis cannot take place in all parts of the value chain (due to time requirements, but also due to associated cost), including supermarkets or restaurants, which are critical points since this is where the consumer will get the products from. GRACED (EU funded project, entitled “*Ultra-compact, low-cost plasmo-photonic bimodal multiplexing sensor platforms as part of a holistic solution for food quality monitoring*”) considers the aforementioned need and the limitations of current techniques and proposes a **novel solution for contaminants detection in all stages of the F&V industry value chains**.

The heart of the proposed solution is a novel plasmo-photonic sensor capable of simultaneously, cost-efficiently and quickly (<30 minutes) detecting multiple (at least 7) contaminants of interest for the food industry, focusing in particular on the F&V sector needs. The sensor will be part of holistic, modular solution that exploits unique engineering designs, Internet-of-things (IoT) concepts and advanced data analytics, for the early detection of contaminations in the F&V value chains. A portable device will also be developed to allow using the sensors in any point of the F&V value chains (from farm to fork). The possibility to perform quick and accurate controls in all stages of the farm-to-fork value chains is directly linked to the objectives of the European Farm-to-Fork strategy ([https://ec.europa.eu/food/farm2fork\\_en](https://ec.europa.eu/food/farm2fork_en)).

The complete system will be tested and demonstrated in different production & distribution systems: a) a conventional farming system (in Italy) in open-air farms and the follow-up steps of food processing for preparing cooked meals and frozen vegetable packages, b) a novel, urban farming ecosystem (in France), producing F&V locally and using them in in-situ restaurants, c) a short value chain based on agroecology (in France) and direct distribution from farmers to consumers & restaurants, d) a semi-automatic farm producing mushrooms and distributing them to supermarkets & wholesalers (in Hungary).

GRACED is being developed by a multi-disciplinary team, coordinated by CyRIC, Cyprus Research and Innovation Center Ltd, in the framework of EU’s Horizon 2020 Programme. The project has just been launched (1<sup>st</sup> January 2021) and will run for three and a half years, to allow enough time for the development and real-world validation of the technology.

The project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 101007448. The project is an initiative of the Photonics Public Private Partnership. Project partners include: CyRIC - Cyprus Research and Innovation Centre (Cyprus), National Research Council (Italy), Tecnoalimenti S.C.P.A (Italy), Easy Global Market SAS (France), Bialoom Ltd (Cyprus), Mutitel (Belgium), Centre National De La Recherche Scientifique CNRS (France), Sous Les Fraises (France), Aristotle University of Thessalonini (Greece), Pour Une Agriculture Du Vivant (France), AMO GMBH (Germany), Pilze-Nagy Kereskedelmi Es Szolgalatato Kft (Hungary), ISS BioSense S.r.l. (Italy), Lumensia Sensors S.L. (Spain)

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Notes for editors:

1. Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.

2. For media enquiries, please contact CyRIC on +357 22 777200 or e-mail [info@cyric.eu](mailto:info@cyric.eu)

Logos:



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