

# SAPHER project

A Fast Track to Innovation project funded by the European Commission

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NEWSLETTER #2



## SAPHER PROJECT UPDATES

Cristina Romero. Eurofins Ingenasa

The main objective of the **SaPher project** is the development of a innovative technology for supporting the food allergen assessment market, thanks to the industrialization and commercial deployment of a full automatic SaPher nano-photonics biosensing allergen test platform. SaPher systems will simultaneously assess up to 6 different allergens in food matrices, reducing times and cost by over 70% in comparison with current golden standards.

After 12 months from the project start out, many tasks and achievements have been accomplished, thanks to the smooth progress of the project activities; and leading to a suitable position to reach the foreseeable Allergen market.

1. Study of standardization needs for allergen contamination assessment has been done.
2. Setting-up SaPher cartridges product line and antibody production, including the development of antibodies of interest not commercially available
3. Industrialization and optimization of the technology for mass production.
4. Demonstration in different customer sites and conditions

## NEWS

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# CARTRIDGE DEVELOPMENT

Alejandro Hernández. Lumensia S.L.

One year after SAPHER project started, assays from whole allergenic foods from SAPHER C01 cartridge, and soya from cartridge SAPHER C02 have been developed and fully characterized in terms of analytical performance. Assays for celery and peanut detection are still on going. Additionally, Lumensia Sensors is ready with SAPHER C03 cartridge targets detection at laboratory level. Final implementation at SAPHER platform for cartridges C01 and C02 were tested and developed successfully. In Figure 3 there is a list of available detected targets from the complete SAPHER project list. In a nutshell,

- ✓ Antibodies against selected allergens have been successfully immobilised on top of photonic ring resonator structures.
- ✓ Preliminary calibration curves were thereafter developed for the detection of all the allergenic food involved in SAPHER C01 cartridge, and for soya detection in cartridge SAPHER C02 (Fig1).

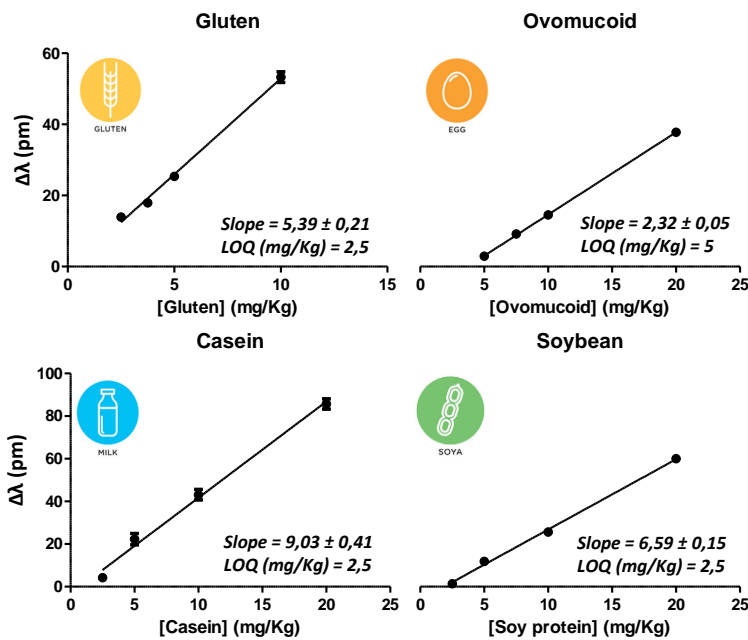


Figure 1. Preliminary calibration curves developed for different allergen detection and quantification. Each calibration was done by triplicate, 3 different days.

- ✓ Compatibility studies still in process to explore multiplexed combinations in each cartridge.

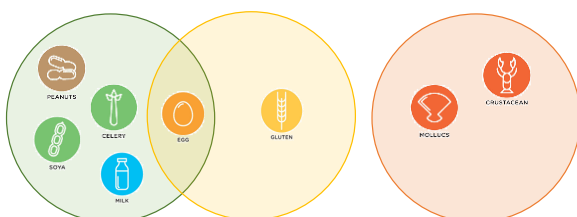


Figure 2. Compatible targets in terms of common fluidic channel sharing

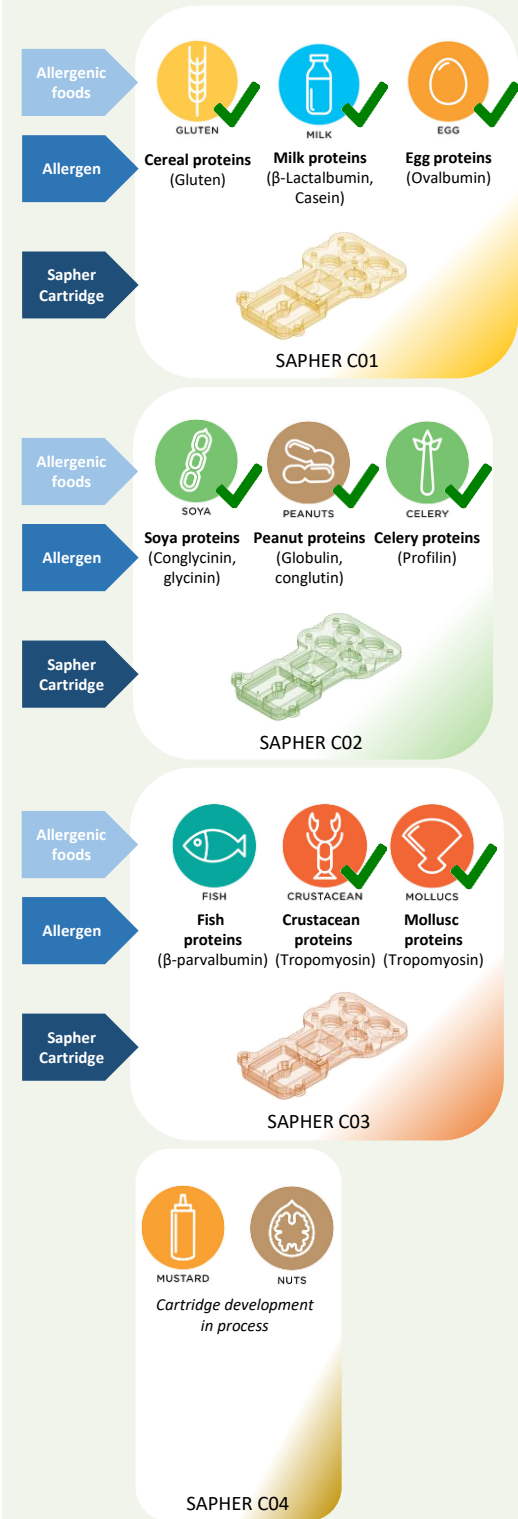


Figure 3. SAPHER project set of combined allergens separated by cartridges. An indication has been made for the available detected targets.

## SAPHER Kits Approaches

Sapher kits' design is being carried out, with the main attention focused on the differences in the kit composition depending on the analysis they are designed to perform, whether they are surfaces and rinse waters or final product.



Figure 5. Prototype of Sapher kit for food allergen detection

## Towards Industrialization and Mass Production Scenario

Alejandro Hernández. Lumensia S.L.

Lumensia is awaiting the arrival of different set of equipment that will shift the entire process of manufacturing and preparing optical biosensors to an optimal level in terms of production volume. In addition, the incorporation of these technologies will improve parameters such as precision and accuracy, as well as the sensitivity of the detection method.



Figure 4. Picture of the current cartridge design, with the waste reservoirs containing corresponding waste after running an assay.

With this aim, part of the work is focused on the definition of protocols that will allow all the procedures to be followed up to date to an industrial execution level.

Cartridge design has been optimised in terms of reducing sample volume required, and material composition, avoiding fluidic issues due to the buffer composition.



# SAPHER DEMONSTRATED IN INDUSTRIAL FACILITIES

Santiago Simón. Lumensia SL

The current version of Sapher biosensing platform has been demonstrated to almost 20 different food industry stakeholders, envisioning them as possible Early Adopters of the new allergen assessment methodology. These companies belong to meat, dairy, bakery, infant food, cleaning products or laboratories subsectors.

During the recent demonstrations, some samples of each company's products were extracted and analysed by Sapher, which ended up delivering very good and reliable results in terms of stability against different matrices.

LUMENSIA has also replicated the full product quality plan and has compared Sapher's results with those given by accredited laboratories in three of the companies participating in our test demonstrations. The test has given an excellent correlation between Sapher's and laboratories' results.

Moreover, a one-week on-site test was recently carried out in one of these companies to face a real in-line allergen assessment situation.

As an outcome of these extensive testings, Lumensia has decided to split Sapher into two product ranges: kits for rinsing water and swab surface inspection on the one hand and, on the other, the laboratory high precision kits. As a matter of fact, both kits will use the same biosensing platform.

Given that the Sapher Project is inching closer to TRL7, our main goal is to eye for TRL8, with which we would be able to perform "System prototype demonstration in an operational environment".

## Sapher Project shall be introduced in Bilbao Foodtech Summit

Santiago Simón. Lumensia SL

LUMENSIA and Sapher project have been invited by a Spanish company Cleanity to share its stand in the event Foodtech World Summit that will take place 15-17 June in Bilbao, Spain.

Sapher project's Operations Manager will be present at the event with a small booth showcasing the present and future capabilities of Sapher and also collecting market insights about Sapher concept on a wider coverage compared to that done up to now.

Cleanity is a chemical company offering cleaning products and services to the Food Industry, guaranteeing the microbiological and allergenic cleanliness of industrial equipment. They at Cleanity are interested in using Sapher as a verification tool after the use of their cleaning products and services.

Bilbao is expected to host Food 4 Future - ExpoFoodTech, running from June the 15th all through to the 17th, which, among other exhibitors, shall bring together the most innovative business experiences, the latest scientific advances and development of food and beverage products trends that will transform the sector in the coming years.

More info: <https://www.expofoodtech.com/>

# A new study has found out that the European photonics industry growing at more than double global GDP rate

ETP Photonics21

New research findings published today shows European photonics is growing at more than double the rate of global GDP - outperforming EU GDP and EU industrial production by three and five times, respectively.



Present in many high-end, next-generation products, photonics technologies have proved to be long-term drivers of growth through their indispensable role in future markets.

Photonics - the technology and science of light - is one of the most resilient and fast-growing industries in Europe, outperforming many other market segments according to the new 'Market Research Study - Photonics 2020' by deep technology research group Thematic. Key to several mega markets - including Industry 4.0, Digitisation, Quantum, AI, IoT - European photonics have enabled many market segments and applications to flourish ranging from Space, Healthcare, Environment, and Defence to Security Telecoms.

The study shows that photonics technologies are participating directly in future societal challenges across the world, such as digitalisation of production and society, Health and well-being, Sustainable development and Environment, Photonics for Consumers IT, Medicine & Biology, Environment, Lighting & Energy Industry 4.0.

The study delivered a glowing report on European photonics from 2015 to 2019: the industry grew at a CAGR of 7% per year and was worth €103 billion at the latest count in 2019.

More information <https://www.photonics21.org/>

SaPher project will disrupt the food allergen assessment market thanks to the development of an allergen assessment procedure supported by the industrialization and commercial deployment of our full automatic SaPher nano-photonics biosensing allergen test platform



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