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Coordinator: INTRASOFT International

[www.phasmafood.eu](http://www.phasmafood.eu)



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PhasmaFOOD Project Community on Sensing Technologies for Food Quality & Safety

## WELCOME TO THE FIRST PHASMAFOOD E-BULLETIN!

PhasmaFOOD is an EU collaborative R&D project funded by the Horizon 2020 Programme. It aims at delivering a miniaturized multi-sensor optical sensing device for the detection of food safety threats such as food spoilage, adulteration and aflatoxins. The system is based on heterogeneous visible and near infrared spectroscopy technologies and is supported by a software architecture that delivers fast characterisation of foods, encompassing an extendable framework for the deployment of smart chemometric algorithms, data fusion strategies and reference laboratory measurements. The built-in algorithms

address data mining and data analysis methods from non-destructive, non-invasive instruments and are independent of the food type and food-tech application.

The market for food quality detectors is developing rapidly, and PhasmaFOOD is tapping into this strong potential, proposing a new paradigm for smarter microsystems with high compactness, low cost, multifunctionality and portability. PhasmaFOOD started in January 2017 and will be completed in December 2019. The project is a Research and Innovation Action funded from the European Union's Horizon 2020 research and innovation programme.

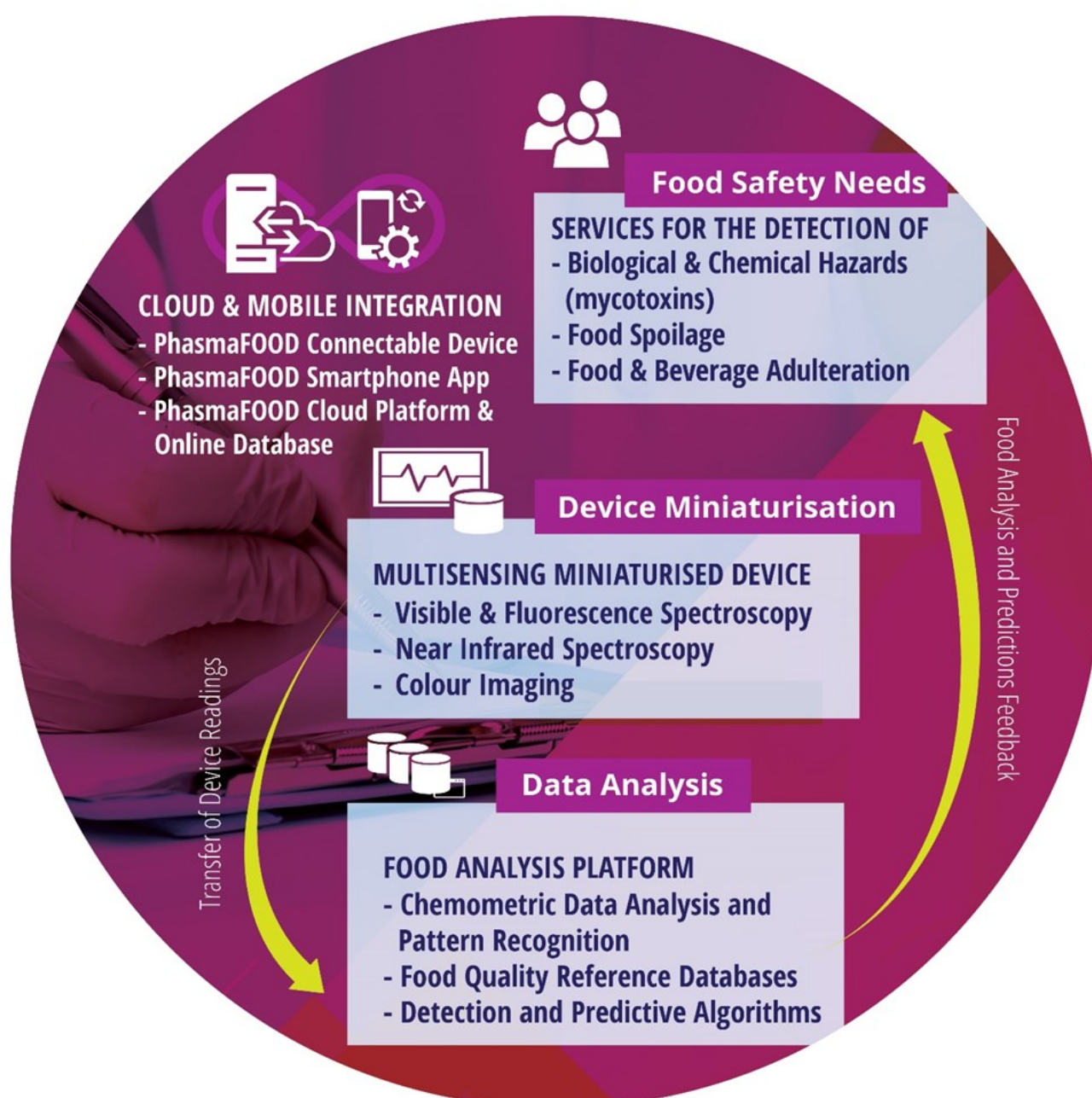




## WHY AN OPEN SOFTWARE ARCHITECTURE?

As is presented in the presented Conceptual Architecture, PhasmaFOOD opts for an open model where:

- The PhasmaFOOD cloud platform aggregates sensory and contextual data from the smart sensor device.
- Food analytics are performed on the collected data using a variety of methods
  - ◊ Depending on the food/beverage
  - ◊ Depending on the evaluation requirements
- Cloud infrastructure and Food Analytics loosely coupled, i.e. minimum dependence, therefore:
  - ◊ New types of food and beverages can be added in the future
  - ◊ New types of food safety services can be readily prototyped
  - ◊ New business models can be easily prototyped





## PHASMAFOOD MINI-PORTABLE SMART SYSTEM - FROM THE IDEA TO PROTOTYPE! SHOWCASING OUR FIRST RESULTS IN THE MAJOR INTERNATIONAL EVENT ON RECENT ADVANCES IN FOOD ANALYSIS - RAFA 2017 - IN PRAGUE!



The 8<sup>th</sup> International Symposium on Recent Advances in Food Analysis (RAFA) is an international meeting bringing together food scientists from academia and industry, national and international agencies, control authori-



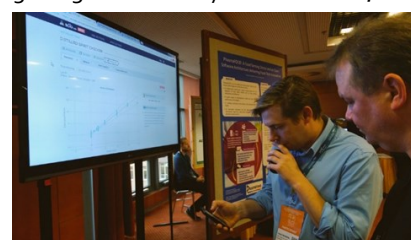
ties and governmental and commercial laboratories. Having taken place in Prague on November 7-10, 2017, RAFA provided opportunities for participants to network with hundreds of food scientists and practitioners from all over the globe that convened for this exciting event.

PhasmaFOOD in cooperation with another Horizon 2020 project [FoodSmartphone](#) organised a **special session on "Smart portable and personalized food analysis systems"**. The session was particularly successful attracting around 200 attendees. The main PhasmaFOOD presentation has been prepared by INTRASOFT International

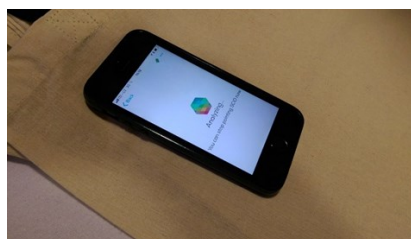
with RIKILT and was presented by Yannick Weesepoel (RIKILT), sketching the goals of the project and its technological potential. The first results of NIR spectroscopy and casing design for the PhasmaFOOD prototype was shown by Susanne Hintschich (Fraunhofer), while Lemonia Fengou (AUA) showcased the first results on the evaluation of spectroscopy- and imaging- based sensors for the use case of food spoilage.

RAFA puts specific emphasis on introducing the EU-projects to the wider scientific community, and the **"Smart Lab"** demonstration sessions provided a great opportunity for discussion and small demonstrations of the developed ideas and prototypes. PhasmaFOOD, together with FoodSmartPhone and [FoodIntegrity](#) EU projects **organised the two-day Smart Lab Sessions** providing small demonstrations\* on measuring alcohol content in beverages and collecting invaluable feedback on the project idea, vision, soft/hardware issues and use cases from the industry representatives, regulators, academia and hardware producers. Visitors of the Smart Lab were invited to subscribe as PhasmaFOOD followers to be regularly informed on the progress and activities of the project and become involved in our work supplying the PhasmaFOOD consortium with their feedback.

The RAFA Symposium was co-organised by the University of Chemistry and Technology, Prague and RIKILT – Wageningen University and Research, the



Netherlands. Over 750 representatives attended the symposium from about 50 countries, leading to a wide variety of



expertise in the field of food analysis, regulation and hardware development.



*\* PhasmaFOOD demonstrations were performed using a SCiO device*

## OTHER EVENTS

### PhasmaFOOD presence in the events:

- IAFP's European symposium – 29-31 March 2017 – Brussels, Belgium
- 7th Annual Food Sure Safety & Quality Summit – 22-24 May 2017 – Amsterdam, the Netherlands
- International Conference on Near Infrared Spectroscopy (ICNIRS) – 12-15 June 2017 – Copenhagen, Denmark
- 1st Summer School on Smartphone-based Food Analysis – 26-30 June 2017 - Wageningen, the Netherlands
- 2nd CAPS Community Workshop – 10-14 July 2017 – Volos, Greece
- First MycoKey International Conference (in cooperation with MYTOOLBOX project) – 11-14 September 2017 - Ghent, Belgium
- 43rd International Conference on Micro and Nanoengineering (MNE2017) – 18-22 September 2017 – Braga, Portugal
- 10th International Conference of Predictive Modelling in Food (ICPMF10) – 26-29 September 2017 – Cordoba, Spain



- IDC 2017 – 11-13 October 2017 – Belgrade, Serbia
- Athens Innovation Festival – 20-22 November 2017 – Athens, Greece
- Annual MNBS Workshop 2017 (hosted by the Micro-Nano Conference 2017) – 12-13 December 2017 - Amsterdam, the Netherlands

## PHASMAFOOD ON THE NEWS



### FOOD ANALYSIS AT YOUR FINGERTIPS - PHASMAFOOD INTERVIEWED FOR THE ANALYTICAL SCIENTIST

PhasmaFOOD researcher Yannick Weesepeel (Wageningen University & Research, the Netherlands) was interviewed by [the Analytical Scientist](#) to tell the story of PhasmaFOOD.

The article profiles two innovative Horizon 2020 food projects, PhasmaFOOD and FoodSmartPhone, that combine analytical technology with smartphone portability to put food analysis into the hands of consumers. The future is (almost) here – and it knows what's in your food!

Download the article [here](#) or read it online at <http://bit.ly/2g6YhI8>

### PHASMAFOOD: ON-THE-SPOT DETECTION OF FOOD FRAUD IN GREECE

The Greek newspaper Υπαίθρος Χώρα ([www.ypaithros.gr](http://www.ypaithros.gr)) interviewed professor George-John Nychas, the Head of the Laboratory of Microbiology and Biotechnology of Foods of the Agricultural University of Athens and partner of PhasmaFOOD, to explain the main aspects and targets of PhasmaFOOD.

An excerpt from this article is translated in English below.

In the coming years an innovative mini-portable sensor shall be able to verify quickly and easily the freshness of sold or transported foods as well as detect undisclosed food substitutes and additives. Consumers, businesses in the food industry, government authorities and regulators are all poised to benefit from these capabilities.

It works simply by placing the device near the food item and depending on the food type it shall provide valuable information to the user, such as its freshness state or whether there has occurred any kind of fraud. For example, it shall detect the case where the food is sold as fresh, but was once frozen. The information can be obtained by placing the sensor near the food item. In a similar manner, it has the ability to detect illegal meat sources in mince products as in the case of burgers, for example horse meat acting as substitute to veal meat, or the presence of pork.

The project is still in its initial stage and it has already attempted to examine fish, fruits, green salads and meats. The ultimate goal is to make the technology work for as many food categories as possible. The sensor is being developed by the Laboratory of Microbiology and Biotechnology of Foods of the Agricultural University of Athens under the leadership of George-John Nychas.

The whole article is available [here \[in Greek\]](#).



## COLLABORATION WITH OTHER PROJECTS

In this section we provide information on the pertinent ongoing activities of the coordination team to build actionable bonds with related ongoing research projects. Further information on our achievements will be updated in the coming issues.



The Horizon 2020 Marie-Curie FoodSmartphone project coordinated by Prof. Dr. Michel Nielen, RIKILT Wageningen University & Research, proposes the development of smartphone-based (bio)analytical sensing and diagnostics tools for simplified on-site rapid pre-screening of food quality and safety parameters and wireless data transfer to servers of relevant stakeholders. FoodSmartphone comprises of 7 Training Sites plus 2 Partner Organisations. The consortium has been built upon complementary disciplines: (bio) analytical chemists, biologists, physicists, micro-engineers, mathematicians and food chemists will work together on the joint supra-disciplinary goal. PhasmaFOOD and FoodSmartPhone created strong collaboration taking the lead in organising a session about smart sensing as well as a dedicated "smart lab" during the RAFA 2017 (also see the related article in this issue).

Website: [www.foodsmartphone.eu](http://www.foodsmartphone.eu)



PhasmaFOOD has signed a Memorandum of Understanding for cooperation with Horizon 2020 project Project "Integrated and innovative key actions for mycotoxin management in the food and feed chain (MycoKey)". The areas of cooperation cover mutual dissemination projects activities, collaboration for the measurement of mycotoxin levels in food samples, but also for potential exchange of data between apps and databases.

MycoKey project has focused on the issues of biological contamination of crops and the food chain and aims to deliver in 2019 the first integrated ICT based solutions to address mycotoxin contamination along the food and feed chain, using a holistic and sustainable approach.

Website: [www.mycoketkey.eu](http://www.mycoketkey.eu)



DataBio (Data-driven Bioeconomy) is a H2020 lighthouse project focusing on utilizing Big Data components and datasets to improve Bioeconomy. It deploys over 90 state-of-the-art Big Data, Earth Observation, ICT technologies and existing partners' infrastructure and solutions, linked together through the DataBio Platform. It is driven by the development, use and evaluation of 26 pilots aiming to contribute to the production of the best possible raw materials from the 3 sectors to improve the output of food, energy and biomaterials. DataBio organizes a series of trainings and hackathons to support its take-up and to enable developers outside the consortium to develop new components based on and for the DataBio Platform. DataBio vision includes the enhancement and support of the Agrifood market chains in Europe, by facilitating the collection, flow and analysis of relevant Big Data, for a more efficient and optimal use in the Agrifood industry, especially at the food production stage, which enable more sophisticated food safety procedures.

Website: [www.databio.eu](http://www.databio.eu)

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If you are interested in the PhasmaFOOD project, or if you have questions, please contact us at [info@phasmafood.eu](mailto:info@phasmafood.eu)

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