

POSITIVE

Project Innovation from start to end

Food allergens

Food allergies can provoke clinical reactions whose most severe is anaphylaxis, with respiratory and/or cardiovascular problems that might result in death. They are common in 1-2% of adults and up to 8% of children, corresponding to a serious public health problem that affects over **15 million people in Europe** from infants to the elderly and its prevalence is increasing.

Lab on a chip

POSITIVE aimed to develop a state-of-the-art diagnostics Lab-on-a-Chip platform via an integrated microfluidic sample preparation technique capable of serum preparation from whole blood of volumes, $<100\mu\text{l}$. A final prototype was to consist of a packaged biochip and reader to be used on clinical samples in order to determine sensitization to allergens such as that for hen's eggs, cow's milk, peanuts, wheat, tree nuts, fish, sesame, and shrimp ingestion.

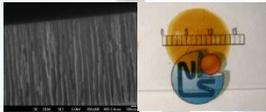
Innovation

The project has just come to completion after 42 months of significant advance towards our initial high risk-high gain target of developing a Lab-on-Chip diagnostic platform for multiple food allergies. On our way we faced to very difficult challenges that led us to develop some very interesting individual component technologies or novel applications of existing technologies including:

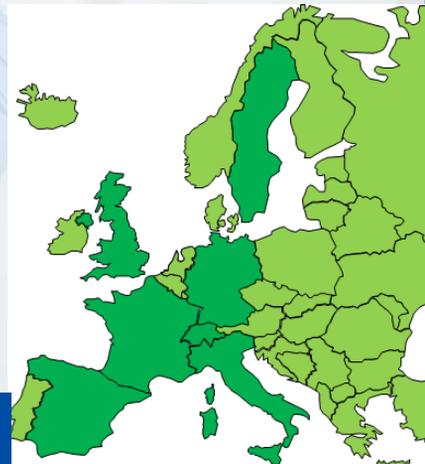
- Combination of OSTE(+)¹ with copolymer. The method aims at improving and simplifying the batch back-end processing of microarrays and create microfluidic cells. The Biosticker is aimed to be a plug-in for existing microarray platforms to enable faster protein assays and DNA hybridizations through mass transport optimization. (KTH, CNR)
- A high performance sensor chip thermal control system that has already been implemented in optical instrumentation in over a dozen international University and industrial research laboratories. (Farfield)
- A module developed for blood filtering that enables several 100 μl of whole blood to be filtered and plasma to be generated for subsequent analysis. This will find uses in lab on chip applications which require alternatives for plasma extraction from whole blood samples which is currently done in dedicated laboratories by centrifugation. (CSEM)
- A module² for sequential actuation of a set of fluids through a microfluidic cartridge, which also enables priming of the cartridge with CO_2 and avoids the introduction of air plugs between the different fluids (CSEM).

(1) Mercene Labs AB is a spin-off Company from KTH commercializing OSTE, which was developed during FP7 InTopSens and FP7 Positive, for device fabrication by customers.

(2) CSEM is working on a demonstrator of a compact, stand-alone pressure driven fluid handling module and it is intended to have this ready for SLAS 2015 in Washington DC to present to the lab automation and instrumentation community. CSEM is also implementing such a module in two currently running projects, one for food quality monitoring and one for 3D cell tissue generation for pharma research.



The POSITIVE Consortium
www.fp7positive.eu



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