Photonic sensing of food allergens

Food allergens

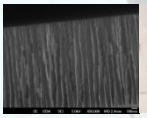
Food allergies can provoke clinical reactions whose most severe is anaphylaxis, with respiratory and/or cardiovascular problems that might result in death. They are common in 1-2% of adults and up to 8% of children, corresponding to a serious public health problem that affects over **15 million people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

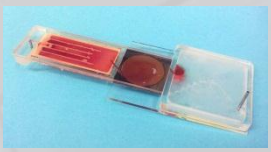
Lab on a chip

POSITIVE is developing 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, <100µl. A final prototype consisting of a packaged biochip and reader will 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 completed its second year and it has made some great advances against very difficult challenges, proof of that coming recently in the form of successful bio-sensing experiments. In working towards the readiness of technologies necessary for realizing the Positive instrument we have developed technologies that not only offer functionality that the machine requires but will also have numerous applications across many areas of life. Such advances include:





- Development of a reliable and reproducible process to obtain porous membrane with highly tailored structural properties (thickness, porosity and pore size) and that shows a fluidic-friendly behavior.
- The development of OSTE materials. OSTE is the first polymeric material developed specifically for the needs of microfluidic devices. We envision that OSTEs will be a very strong alternative for rapid prototyping of microfluidic devices thanks to rapid turnaround, high yield and properties very close to those found in the final commercial products.
- A module developed for blood filtering that enables several 100 ul 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.

The POSITIVE Consortium

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