Technology for a better diagnosis of food allergies

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Allergy skin test.

Researchers at the Institute of Materials Science of the Universitat de València, in consortium with various European companies and institutions, are developing a system based on photonic biosensors for rapid diagnosis of food allergies. The EU-funded project aims to make a low-cost instrument that in fifteen minutes, and from a single drop of blood, will perform effective allergy tests potentially for hundreds of foods simultaneously and without risk to patients.

Undiagnosed food allergies and unsuitable diets are, according to the experts, factors that can significantly reduce people's quality of life, and even cause death. More than 15 million people in Europe suffer from food allergies, including 6% of children, and this number grows progressively with great social and economic costs.

"Currently, the most common allergy tests are expensive tests and especially traumatic for children, as well as pose a risk of adverse reactions," says Daniel Hill, coordinator of POSITIVE- as the project is called - and researcher at the Universitat de València. "Beyond the project, the idea is to be able to put a food allergy diagnostic instrument that is fast, effective and safe in the surgery of every paediatrician, so that they can test during the first few years of life. The incorporated technology will on one hand allow the analysis from just one drop of blood, overcoming the frequently troublesome blood sampling issue, and on the other provide much greater information for a more precise diagnosis.

POSITIVE is a multidisciplinary project focused on the development of a system of high-tech biosensors oriented to the recognition of biomolecules symptomatic of allergic reactions to food from patients. The system combines different technology components, some of which are reported in various scientific journals (such as *IEEE Photonics*, 4, 3, 986, Lab on Chip:2012,12, 3032-3035), that demonstrate multiple applications in different fields such as, for example, analysis of blood markers or filter laboratories.

The system will be finished by February and will include elements such as a fluidically compatible porous membrane with biosensor functions, the first polymeric material developed especially for microfluidic devices, a new module for filtering blood that solves certain problems and improves on previous systems, a more stable measuring instrument, and a disposable cartridge for the detection of biomolecules responsible

for allergic reactions.

According to Daniel Hill, the instrument will be ready to begin clinical trials with patients from June, and testing will take place at the Hospital of the Universitaetsmedizin Berlin (Germany). "According to our calculations, from the bioassays using non-human molecule samples, the final prototype will be able to detect up to ten different food allergy measurements," says Hill. "The objective, once the project has ended, is to build a commercial instrument capable of detecting all food allergies at the same time, quickly, safely and at a very low cost."

More information: www.uv.es/positive

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