

Quick food allergy test - just a drop of blood

Over 15 million people in Europe – including eight percent of all children - suffer from food allergies, and this number is growing steadily. Currently, children who portray mild symptoms may undergo a skin prick test that is not only lengthy but particularly painful and usually very traumatic. Researchers from the Positive consortium are about to change all that by putting a food allergy machine on every pediatrician's desk, a machine that produces test results in 15 minutes from a miniscule drop of blood.

Today's food allergy tests can be very expensive, take a long time, as well as being both difficult to administer and quite painful. This is especially true for the common skin prick test on young children whose arms are not large enough to take the regular test made on adults. Instead they have to be held face down for long periods of time while the pediatrician scratches food extracts into different marked patches on the skin of the child's back.



Daniel Hill, Project Coordinator of Positive and researcher at UMDO in the University of Valencia

"For a one-year-old child this could be a very traumatic experience, and even more so for the parents. They are held face down and typically cry throughout the whole frightening experience. What if the pediatrician suspects a severe allergy to certain foods? Then they have to undergo blood tests which require a sizeable extraction which is not only difficult to undertake is also very traumatic. Then, the tests can take several days at considerable cost." says Daniel Hill, Project Coordinator of Positive and senior researcher at the Unit of Optoelectronic Materials and Devices (UMDO) in the University of Valencia, Spain.

The Positive consortium is opening the door to a new scenario. Together with industrial partners, researchers from six universities and research institutes, and with a SEK 29 million grant from the EU, they are aiming to put a diagnostic platform, using a biosensor, on every pediatrician's desk. This machine will be able to test for multiple food allergies very quickly, safely and painlessly from a tiny drop of blood.

"This will be a convenient test, made right there in your pediatrician's office, that will give test results within 15 minutes at low cost levels as no samples have to be sent to a laboratory. The doctor places the tiny drop of blood on a cartridge containing several sensors containing food extracts, and places the cartridge inside a machine the size of a shoe box on the desk," explains Daniel.

So far, alternatives to the skin prick and blood-based lab tests have not been able to satisfy all three desired parameters: to test all food allergies at the same time, to do it quickly and to do it painlessly. Current alternatives that can cover hundreds of food allergies are very expensive and take more than five hours to produce the test results necessitating another scheduled visit to the pediatrician with all the inconvenience, additional cost and cramming of the busy practitioners' agenda this entails. Even then the test only says whether there is an allergy or not without saying how severe it might be.

"We have tested the material the sensors will be made of and we have determined that it will be able to get up to ten different measurements of food allergies at a time in our eventual prototype, which will tell us to what degree the person is allergic. The first step afterwards will be to scale it up for hundreds of food allergies in order to be able to test all the food allergies at the same time."

With time Daniel Hill is hoping for a change of attitude towards the routine testing of food allergies in children.

"Today at birth all children immediately undergo several tests including Apgar and the heel test and as they grow parents take them to be weighed, measured and vaccinated. Instead of only testing children when they are showing symptoms, sometimes of life-threatening reactions, the screening of food allergies might be included within these general checkups. This way not only will all children be able to avoid potentially fatal reactions to certain foods but also not have to undergo the slow, painful, difficult, somewhat limited and sometimes costly current diagnostic tests – potentially substantial socio-economic savings! Ultimately of course this is dependent on the willingness of countries' public health systems and authorities to include this in their general battery of tests."

The consortium is pushing to present a commercial product within two years of project conclusion. Innovative and commercially relevant research is ensured by the consortium's two technological companies' clear vision of what the market is and what is needed of the product if it is to be successful.

"Our vision is that all pediatricians should have this machine on their desk, whether they work in a hospital or in general practice. The companies' knowledge of the market really provides us with an excellent road map for innovation, making sure that we will be able to exploit our results fully."

- [Read more about the project on Positive's homepage](#)

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