

Scientist develops disposable devices to identify allergies

February 9 2015



Gabriel Caballero Robledo from the Center for Research and Advanced Studies (CINVESTAV) at Monterrey, Mexico, is working on the design of a small medical device capable of detecting allergies or diseases

quickly and at a low cost.

During his stay in the Netherlands to pursue postdoctoral studies, Caballero Robledo met French colleagues who worked with medical microfluidic devices; as a specialist in granular matter, which is any material shaped like [sand grains](#), he decided to design and improve these devices.

When he started working at Cinvestav, located within the Park of Research and Technological Innovation (PIIT), he was interested in following this line of work with the idea of combining the knowledge of the [granular material](#) with medical [microfluidic devices](#) because he is familiar with how these small grains behave.

"We want to design disposable devices, which could be purchased at the pharmacy, can be used and discarded, and aren't expensive. The device would be similar to a bar of 2x1 centimeters, and be made of plastic with an input that processes blood or saliva."

According to the specialist, the device will detect allergies. However, he discovered that the devices are very sensitive to the density of the package of the iron particles within the microfluidic channels, which had not been previously considered for blood tests.

"What I will do is optimize the device and see how densely compacted the grains of iron are, as well as the amount of nanoparticles that can be caught (with grains of iron), because the more it catches, the more sensitivity it will have to detect allergies or various conditions ".

Microfluidic devices can be applied to medicine through miniaturizing processes that are common in conventional large laboratory appliances. The idea is to integrate them in a small device, conferring the advantages of portability and disposability.

The researcher explains that when the nanoparticles are mixed with blood to perform clinical analysis, they move inward because of the temperature, and when they find an antibody, they catch it to determine and identify an [allergy](#) or illness.

Caballero Robledo adds that at the moment, they are in the stage of controlling the packing density and irregular particles. Next is understanding how the captured nanoparticles change to find the optimal size for maximum sensitivity and allergy or pathology identifying.

"In the lab at Cinvestav we developed a preparation protocol for the fluids canal that allows fine control over how the grains are arranged in the device."

Currently, the team is working in how nanoparticles are trapped together, to understand the optimal particle size and arrangement. Today, allergies are detected using an ELISA test with the analysis taking up to three hours.

Provided by Investigación y Desarrollo

Citation: Scientist develops disposable devices to identify allergies (2015, February 9) retrieved 25 April 2024 from <https://phys.org/news/2015-02-scientist-disposable-devices-allergies.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--