

The World's First Alpha Thalassemia Immuno-chromatographic Strip Test

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Better blood test

A three-year effort by a group of researchers at the Faculty of Associated Medical Science at Chiang Mai University has recently produced the world's first test strip to detect thalassaemia carriers within a few minutes.

The test strip was developed to allow doctors to easily detect whether people carry the alpha thalassemia trait, said the project's group leader Watchara Kasinrer.

As the process of detecting thalassemia carriers through blood tests takes at least three hours, he said the team had the idea of developing a technology to perform the test in just three minutes.

A blood test to check for thalassemia is important, especially for couples planning to have children. If doctors find that either parent is a carrier, they will recommend the couple avoid pregnancy and this helps early screening of children who would be prone to thalassemia.

Around 1 per cent of the Thai population suffers from thalassaemia, while around 40 per cent are carriers of the thalassemia trait.

To reduce the rate of new-born children who are prone to thalassemia, Watchara said the development would help the country control the expansion of the disease.

The project's researcher Chatchai Tayapiwatana said the development would downsize the blood testing process for thalassemia in laboratories to just a test strip.

Instead of sending blood samples to a laboratory, which requires a high-technology testing process, he said doctors could now conduct the test themselves.

"Testing for thalassaemia will become much easier since doctors can put a blood sample on the strip and read the result within a few minutes. The process is something like the way people test for pregnancy," he added.

Even though the test strips are very easy to use, Chatchai said their development was not that easy. The team spent three years searching for a method to make the strips.

The idea was to use an antigen-antibody technique to develop the test strip. Antibodies are a key element when it comes to the testing process as they indicate antigens, the molecules that stimulate an immune response in red blood cells. If the antibody finds Haemoglobin Barts, an abnormal haemoglobin molecule, it gives a positive result on the strip and that means the patient is a carrier of thalassemia.

Chatchai said the team put a great effort into finding an antibody that would help detect the traits of a thalassemia carrier and finally they found one in the cells of a mouse. "We reproduced the antibody from the mouse cells and then used it to develop the test strip," he said.

During the development, the team conducted trials with 100 samples at the Thalassaemia Research Centre at Mahidol University and found the strip has 100-per-cent sensitivity, 98.5-per-cent specificity and 99.07-per-cent accuracy.

The technology has recently been licensed by a private company, I+Med Laboratories, for mass production and the product is now available for commercial use at Bt100 per set.

The new strip, Chatchai said, was intended to not only make the blood test for thalassemia quicker and easier but also to reduce the cost of testing.

"Normally the laboratory blood test costs around Bt1,000 to Bt1,200 but with the new strip, people will pay only Bt100," he said.

As thalassemia is common not only in Thailand but also in Southeast Asia, China, India, the Middle East and in the Mediterranean region, the development of the test strip will help many places to better control of the disease. Apart from the Thai market, the test strip will also be exported, Chatchai said.

The research team also plans to conduct more trials on the thalassemia test strip with an other 1,000 samples to make the product more reliable when it comes to commercial use.

The development of the test strip is another research project which has received funding support from the National Centre of Genetic Engineering and Biotechnology.

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