

## A rapid test to diagnose Zika and dengue

An international team, including researchers from India, has developed a low-cost, rapid diagnostic test for diagnosing Zika and dengue viruses and differentiating the four serotypes of dengue virus. None of the rapid tests available is capable of differentiating the four dengue virus serotypes.

While many diagnostic tests cannot strictly distinguish between Zika and dengue infections, the test has nearly 100% ability to distinguish between the two virus infections. *Science Translational Medicine* published the results.

The diagnostic test has nearly 76-100% sensitivity and specificity in the case of dengue, while the sensitivity is 81% and specificity 86% in the case of Zika. "Since the antigens specific to dengue and Zika viruses are identified, there will be no cross-reactivity leading to wrong diagnosis," says Dr. Guruprasad Medigeshi from the Translational Health Science and Technology Institute in Faridabad and one of the authors of the paper.

The researchers injected specific flavivirus nonstructural 1 (NS1) proteins produced by Zika and dengue viruses into mice to generate monoclonal antibodies. They identified pairs of antibodies that can specifically detect and distinguish each of the four dengue serotype NS1 proteins as well as the Zika NS1 protein. They took the antibody pairs and coated each antibody on a strip of chromatography paper at two different spots. One of these antibodies was attached to gold nanoparticles.

"When a serum sample from a patient is added on the chromatography paper where the antibody is spotted, the antigen present in the serum binds to the first antibody. Since it is paper, the antigen bound to the antibody diffuses and comes in contact with the second antibody. The second antibody too binds to the antigen leading to the formation of colloidal aggregates, which then forms a pink spot," says Dr. Medigeshi. A pink spot appears on the strip within 20-30 minutes after the second antibody binds to the captured antigen.

The appearance of the pink spot indicates positivity to either Zika virus or dengue virus. And in the case of a serotype test, it indicates the respective dengue virus serotype.

"Since each pair recognises a particular serotype, we need four strips for dengue serotyping and one strip for Zika for testing each sample," he says.

The team has also developed a pan-dengue strip which indicates positivity to dengue virus without cross-reacting with Zika NS1 unlike the current kits. The strip cannot differentiate between the four serotypes.

The new U.S. Fed Chairman is unlikely to opt for policies that might upset the President's plan

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