

IIT Hyderabad develops device to diagnose infectious diseases



New Delhi, November 21:

A team of researchers from Indian Institute of Technology, Hyderabad, has developed a new device that promises to help detect infectious diseases at low costs and very early.

The device uses a biochip and a nanomaterial based on Zinc Oxide. As a proof of concept it has been demonstrated in rapid detection of malaria.

The biochip comprises of a sensing platform integrated with a three-electrode system. The sensing electrode consists of antibody conjugated nanofibers. In the case of the device which has been tested, nanofibres were conjugated with histidine-rich protein II antibodies, which are specific to malarial antigen. Upon recognizing the presence of even a trace of malaria's biomarkers in blood serum, the device registered a signal. It is calibrated to assess the quantitative level of infectious biomarker present in the sample. Samples obtained from a hospital were tested using the device.

The device can also quantify the extent of infection and does not require a trained technician to use it. "It can be used as a point of care device. It will be particularly useful in rural areas where diagnostic facilities are not available readily. People in endemic areas can keep the device at home and when someone in the house falls sick, they test if there is infection," Shiv Govind Singh, leader of the team, said while speaking to India Science Wire.

The device is highly sensitive. It can detect malaria parasite at a concentration of even as low as a trillionth of a gram in a millilitre. This means it can detect minutest presence of a parasite, and help detect the infection on day one itself.

Dr. Singh said he and his team members were working on taking the device to the next level wherein the diagnosis could be transmitted to a medical professional via a smart phone. In addition, they are working on a device through which several diseases could be detected in one go.

The research team included Brince Paul and Asisa Kumar Panigrahi (IIT Hyderabad) and Dr. Vikrant Singh from School of Medicine, University of California. The study results have been published in journal ACS Applied Materials and Interfaces. (India Science Wire)

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