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Technology bulletin

CSIR-Indian Institute of Chemical Biology

An easy-to-use point-of-care system for RNA-based detection of dengue directly from serum samples using a fluorometer

INTRODUCTION: In the present world, after COVID-19, dengue is the largest pandemic affecting more than 400 million people worldwide, annually. Early dengue diagnosis is a challenge. NS1 antigen detection by ELISA is about 70% sensitive. In the post-COVID era, antibody-based dengue diagnosis is also anticipated o be problematic as there are reports of serological cross-reactivity between SARS-CoV-2 and dengue virus.

CHALLENGE/APPLICATION DOMAIN: Our methodology **does not involve any time-consuming RNA extraction or nucleic acid amplification step**. It is a **rapid method of detection** of dengue virus directly from patient's serum. It gives **results in about two hours**. It is also advantageous over other methods as it gives a **semi-quantitative estimation of dengue virus load in patient's serum** by comparison with known standards (in addition to dengue detection/diagnosis). Present invention has higher **specificity for dengue detection** as it does not carry the risk of non-specific amplification often associated with NASBA-based diagnosis. It is an **easy-to-use method** and **does not need much expertise** to perform the experiments.

Opportunity : This method can supplement current methods of early dengue detection. Our method is more flexible and can be easily modified based on emerging dengue serotypes, compared to updating currently available ELISAs. Changing the probe sequence to match a given target sequence is easier and more economic and so our method can be adapted for rapid diagnosis of any target pathogen, in body fluids.

STAGE OF TECHNOLOGY DEVELOPMENT: Proof of concept is established. Clinical validation with large sample size is required.

REFERENCES/ PATENTS: 1. International application published under PCT.

2. Soumi Sukla, Prasenjit Mondal, Subhajit Biswas, and Surajit Ghosh. 2021. "**A Rapid and Easy-to-Perform Method of Nucleic-Acid Based Dengue Virus Diagnosis Using Fluorescence-Based Molecular Beacons**" ***Biosensors*** 11, no. 12: 479. https://doi.org/10.3390/bios11120479

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