

## **Worried about if your fruit juice is contaminated? Here is the 5 minute detection test**

By Dr Bilqeesa Bhat

A team of scientists at the Department of Biotechnology's institute, the Translational Health Science and Technology Institute (THSTI), Faridabad have developed an Aptamer-NanoZyme-based assay for detection of fruit juice contamination by pathogenic bacteria *Escherichia coli* O157. Widely known as *E. coli* to the scientific community, this microorganism is responsible for the most common and lethal contamination of food and water.

A low- and middle-income country like India requires a rapid and affordable test to check the contamination in food products like fruit juices. Aptamer-based assay meets the criteria and can cater to the huge needs of common masses. The Aptamer-NanoZyme - based assay is simple to handle and detects *E. coli* contamination in fruit juice with 5 minutes without any requirement of sophisticated instruments. It costs roughly two dollars.

The assay is based on the peroxidase like activity (enzyme activity) of gold nanoparticles (NanoZyme) and high affinity and selectivity of an aptamer. When the aptamer binds with pathogenic *E. coli*, it produces a colourful product that can be viewed by naked eye, making the test result easy to read. Aptamer based *E. coli* detection approach can serve as a valuable tool for food industry to ensure bacterial contamination absence in packaged food stuffs.

Pathogenic strains of *E. coli* have emerged as a threat to public health as it contaminates both food and water. Therefore, its early detection is of fundamental importance to avoid any severe medical situations associated with its infection. The conventional methods of *E. coli* detection are time consuming and require technical expertise. Advance medical diagnostics based on principle of Enzyme Linked Immunosorbent Assay (ELISA) and Polymerase Chain Reaction (PCR), are accurate and relatively quick, however, they are expensive and require well trained manpower and complex instrumentation facilities.

In 2015, the World Health Organization (WHO) reported that 1 in 10 people fall ill due to food contamination which results in death of about 420,000 people every year. According to another report published in 2016, diarrhea caused by water contamination leads to 829,000 deaths globally.

The work was published in the journal *Sensing and Bio-sensing Research*.

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