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LABORATORY: Micro fabrication Facility Lab

AREA OF RESEARCH: Biosensors and Biomedical Engineering

TITLE/TOPIC: Development of point-of-care test (POCT) based on DNA Aptasensor for rapid detection and diagnosis of rotavirus antigen in children's fecal specimen.

SUMMARY: Biosensors are analytical devices that convert biological reactions into measurable signals. Biosensors such as DNA based Aptasensors have the promising potential in diagnosis of many infectious disease caused by many microorganism including viruses. Aptamers that recognize viral proteins have been successfully employed in the rapid detection of viruses such as Influenza virus, Zika virus, Dengue virus, SARS-CoV and SARS-CoV-2. Rotavirus is a very contagious virus that causes diarrhea in children below five-year age. There is high burden of rotavirus gastroenteritis among Indian children hospitalized for acute diarrhea thereby highlighting the need for continued monitoring of circulating genotypes across the states of India. Therefore, In this proposed work we are interested to develop POCT for rapid detection of rotavirus antigen based on colorimetric DNA aptasensor. Colorimetric methods are user-friendly due to its simplicity, portability, low cost and widely applied in aptasensors. Briefly, we will outsource biotinylated DNA aptamer that are selected based on SELEX and performed ELAA. Based on the performance in ELAA, we will be designed colorimetric-based DNA aptasensor to decide the presence or absence of rotavirus antigen in stool specimens solely on chemiluminescence development. Target beneficiary of the outcome of this project includes rural health care facilities, academic and research institutions, medical colleges and hospital.