Cost effective point of care Plasmonic Portable Sensor with Disposable Semiconductor based Chips that can detect presence of anti-bodies due to the presence of COVID-19 virus in blood

Centre for Materials for Electronics Technology (C-MET), Thrissur &

Rajiv Gandhi Centre for Biotechnology, (RGCB) Thiruvananthapuram)

C-MET Thrissur is currently developing a cost-effective portable biosensor based on semiconductor chips for detecting causative agents for food poison (such as campylobacter, rubella etc), jointly with RGCB (under DBT). This project is being funded by the Biomedical Device & Technology Development (BDTD] Program of DST. This biosensor will play a pivotal role in the detection of food borne pathogens as it will be more convenient, accurate, portable, efficient, with high sensitivity & selectivity. RGCB is carrying out the functionalization of the semiconductor films developed at C-MET and the docking efficiency analysis of the designed bio receptors with different pathogenic strains. The first version of this biosensor is ready; the validation of the same is being carried out at RGCB. Conventional biosensors use gold layers for such purposes; and hence not a disposable chip. However, the C-MET technology uses cost-effective semiconductor based disposable chips in the portable device.

Regarding the Covid 19 pandemic, antibody/antigen test is considered a strong tool to monitor the spread of the virus. The immune system of infected person produces antibodies, which are specific to the pathogen. In addition, antigens can be detected from the swab collected from infected persons. Hence swab or blood test using the portable sensor based on the antibody-antigen reaction will accurately tell whether the person is infected; such portable devices are extremely useful for random testing, as that is the need of the hour in India. With the expertise available, C-MET, Thrissur is planning to develop a portable plasmonic device for random testing of corona virus at community level, with the collaborations of RGCB, Thiruvananthapuram and Govt. Medical College, Thrissur, Kerala.

Expected deliverable: **Cost-effective point of care plasmonic portable sensor with disposable semiconductor based chips that can detect antigen in throat swab and circulating antibodies in blood due to the presence of covid 19 virus.**

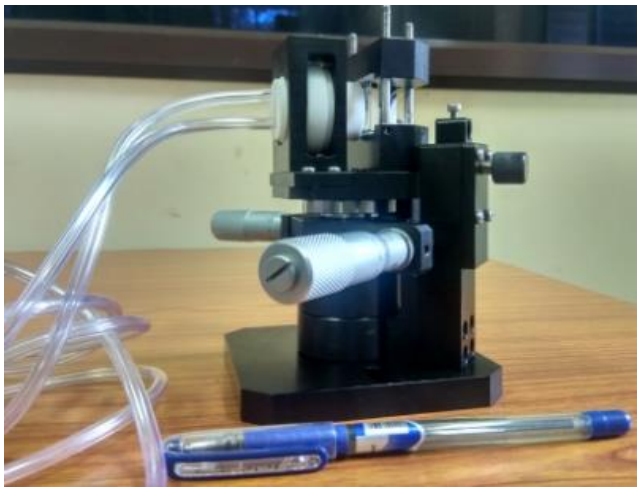
Deliverables: Portable Sensors: 5 Nos. Disposable chips: 100 Nos.
Clinical trials planned in the project period: 250 patients consisting of 50 confirmed cases

Participating Institutions & Role

1. ***C-MET Thrissur*** : Development of plasmonic based disposable chips using semiconductor film; Fabrication of point of care plasmonic portable sensor with disposable chip.

2. ***RGCB, Thiruananthapuram***: Development of immobilization strategies to coat antibodies/antigens of novel corona virus on semiconductor film surface developed by C-MET.

3. ***Govt. Medical College, Thrissur***: Clinical trials using the biosensor jointly developed by C-MET & RGCB



First version of the portable biosensor developed