Tech. Code AB35NABTD
Microplate based Biosensor for detection of Methyl parathion Pesticide

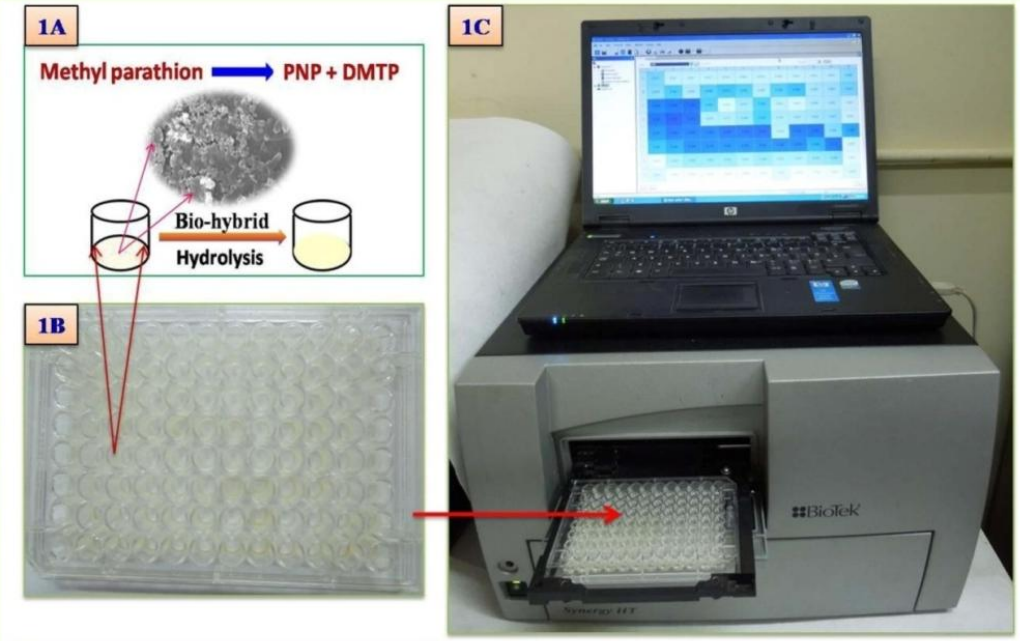

Figure 1: Microplate based Biosensor for Methyl parathion pesticide
1A. Hydrolysis reaction of Methyl parathion pesticide with immobilized Bio-hybrid
1B . Bio-hybrid immobilized on wells of Microplate (96 wells) and
1C. Microplate reader with optical transducer)

- Methyl parathion is an organophosphate pesticide used to control insect pest in agriculture
- Highly toxic in nature and harmful for human being

- Detection Range: 0.1 – 1.0 ppm Methyl Parathion (MP) pesticide
- More sensitive and detect MP upto MRL (Maximum Residue Level): 0.1 -1.0 ppm
- Analyze multiple samples (96 samples) continuously in lab in 5min

- Cost of sample analysis: Rs. 30/per sample

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This is an upgradation of our previous technology, handheld colorimetric biosensor.

EU/USDA/FSSAI (Food Safety and Standard Authority of India) had set the Maximum Residual Limit (MRL) of methyl parathion MP between 0.1 to 1.0 ppm depending on types of food commodities. Therefore, there is need to develop a method that is more sensitive and able to monitor a large number of samples simultaneously in its MRL range.

Present prototype is software controlled microplate based optical biosensor which is able to detect methyl parathion pesticide in the range of 0.1-1.0ppm (MRL value).

This prototype can be utilized for monitoring large numbers of sample (up to 96). It has two components: first is the biocomponent consisting of bio-hybrid immobilized on wells of microplate (96 wells) (Figure 1B) which hydrolyzes methyl parathion (transparent) into an optically detectable product (Figure 1A). Second is the microplate reader (optical transducer) which is completely controlled via software for all operations including data reduction, monitoring and analysis of each well of 96 wells microplate (Figure 1C).

A 200 µL volume of methyl parathion sample is added into the wells where the bio-hybrid had been immobilized and readings are acquired. This microplate based optical biosensor is initially calibrated with PNP, followed by methyl parathion in association with immobilized biocomponent. This biosensor specifically detects methyl parathion pesticide in sample in 5-10 min.