

## **Development of an optical sensor based on surface plasmon resonance phenomenon for diagnosis of dengue virus E-protein**

### **ABSTRACT**

Application of surface plasmon resonance (SPR) optical sensor in the diagnosis of dengue virus (DENV) emerged over recent years. Immobilized monoclonal antibody (IgM) on gold/Fe-MPA-NCC-CTAB/EDC-NHS thin film was prepared using a spin coating technique. DENV *E*-protein can be detected by measuring the SPR signal when IgM immobilized gold/Fe-MPA-NCC-CTAB/EDC-NHS thin film is exposed to the DENV *E*-protein solution, by varying the concentration ranging from 0.0001 nM to 10 nM. A linear relationship between the shift of SPR angle and concentration of DENV *E*-protein up to 0.01 nM, with sensitivity of  $39.96^\circ \text{ nM}^{-1}$  has been observed. The surface morphology of sensor chip was also recorded using atomic force microscopy to confirm the presence of bound DENV *E*-protein into IgM surface.

**Keyword:** Optical sensor; Surface plasmon resonance; Sensing; Dengue virus