Detection of dengue using PAMAM dendrimer integrated tapered optical fiber sensor

ABSTRACT

The exponential escalation of dengue cases has indeed become a global health crisis. This work elaborates on the development of a biofunctionalized tapered optical fber (TOF) based sensor with the integration of polyamidoamine (PAMAM) dendrimer for the detection of dengue E protein. The dimension of the TOF generated an evanescent feld that was sensitive to any changes in the external medium while the integration of PAMAM promoted more adhesion of bio-recognition molecules; antiDENV II E protein antibodies; that were complementary to the targeted protein. This in return created more active sites for the absorption of DENV II E proteins onto the tapered region. The resolution and detection limit of the sensor are 19.53nm/nM and 1 pM, respectively with Kd=1.02×10−10M.