

## $\mu$ -ELISA System for the Diagnosis of Hepatitis B Using Anodic Aluminum Oxide in a Microfluidic System

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An efficient system for diagnosis of disease marker molecules in microfluidic device was developed by employing the anodic aluminum oxide (AAO). AAO was integrated into poly (dimethylsiloxane) (PDMS) microchannel structure. Aluminum layer was anodized by variation of electrolyte composition, applied voltage and time for specific pore sizes and depth. For the enhancement of antibody immobilization and adhesion with PDMS, surface activation of AAO was performed by TMOS-sol spin-coating and calcinations to form SiO<sub>2</sub> layer. The demonstration of diagnosis of bio-marker protein was performed by employing conventional ELISA assay for hepatitis B virus. The anti-HBV surface antigen (anti-HBsAg) was immobilized and coupled with HBsAg and sheep anti-HBs/horse radish peroxidase (HRP) conjugate. The identification was cleared by colorimetric assay in conformity with the result using commercial ELISA kit, with high efficiency using microfluidic channels. The AAO inside microfluidic channel allows specific immobilization of proteins by accessible size. Furthermore, this study can be carried out in high-throughput system for bio-marker.