

Paper-Based Colorimetric Sensor Utilizing Peroxidase-Mimicking Magnetic Nanoparticles Conjugated with Aptamers

Authors : Min-Ah Woo, Min-Cheol Lim, Hyun-Joo Chang, Sung-Wook Choi

Abstract : We developed a paper-based colorimetric sensor utilizing magnetic nanoparticles conjugated with aptamers (MNP-Apts) against *E. coli* O157:H7. The MNP-Apts were applied to a test sample solution containing the target cells, and the solution was simply dropped onto PVDF (polyvinylidene difluoride) membrane. The membrane moves the sample radially to form the sample spots of different compounds as concentric rings, thus the MNP-Apts on the membrane enabled specific recognition of the target cells through a color ring generation by MNP-promoted colorimetric reaction of TMB (3,3',5,5'-tetramethylbenzidine) and H_2O_2 . This method could be applied to rapidly and visually detect various bacterial pathogens in less than 1 h without cell culturing.

Keywords : aptamer, colorimetric sensor, *E. coli* O157:H7, magnetic nanoparticle, polyvinylidene difluoride

Conference Title : ICBN 2016 : International Conference on Biotechnology and Nanotechnology

Conference Location : Bali, Indonesia

Conference Dates : October 13-14, 2016