

Magnetic Nanoparticle-Based Colorimetric Detection of Breast Cancer Cells Overexpressing Her-2 antigen

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Magnetic nanoparticles (MNPs) have been widely applied for targeting and imaging the biological molecules such as DNA, protein or cell. Here, a simple, sensitive and specific detection of Her-2 antigen for diagnosis of breast cancer has been developed based on intrinsic peroxidase-like activity of MNPs. A direct detection of breast cancer cells overexpressing Her-2 antigen was performed with antibody-conjugated MNPs, and the presence of the antigen on the cell surface can be monitored by colorimetric change of substrate without complex instruments. In this study, two kinds of MNPs, bare MNPs and mesoporous silica embedding MNPs (MPS-MNPs), were used for detection of the cells. And we have studied the experimental parameters such as cytotoxicity, peroxidase activity and magnetic resonance imaging (MRI) between MNPs and MPS-MNPs. Using this strategy, it was demonstrated that MNPs conjugated with specific antibodies had potential to be utilized as a powerful tool for direct cellular cancer marker detection and imaging.