Pt-Decorated Magnetic Nanozymes for Facile and Sensitive Point-of- Care Bioassay

이준상, 이진우†
포항공과대학교
(jinwoo03@postech.ac.kr†)

Developing accurate and sensitive bioassays for various point-of-care applications are important issues. In this work, Fe_3O_4-Pt/core-shell nanoparticles (MPt/CS NPs) were synthesized for fulfilling such demands and the bioassay based on unique property of the newly synthesized nanozymes. Fe_3O_4 has its own catalytic activity superior to that of natural enzymes, but incorporating Pt to its outer layer of the Fe_3O_4 can improve the catalytic activity while building heterogeneous nanostructures. Catalytic properties of MPt/CS NPs allow signal amplification by enzyme-like reactions. Furthermore, magnetic properties of MPt/CS NPs enable magnetic enrichment of liquid samples. By integrating MPt/CS NPs in lateral flow immunoassay strips, one of the widely used point-of-care bioassay devices, and harnessing magnetic and enzyme-like properties of MPt/CS NPs, an increase in sensitivity of two orders of magnitude was achieved compared to the sensitivity of conventional lateral flow immunoassay based on Au nanoparticles.