A Novel Strategy to Realize Ratiometric Detection Using Metallic Nanoparticles

김기훈, 이수승[1], 양영인[1], 정은혜, 이종협[1], 최연호[2], 강태욱*
서강대학교 화공생명공학과; [1]서울대학교 화학생물공학부;
[2]고려대학교 생체의공학과
(twkang@sogang.ac.kr*)

Ratiometric detection that typically measures emission intensities of fluorescent probe at two different wavelengths can provide built-in correction for environmental variations of a sample and probe intrinsic to detection systems, permitting quantitative measurements. Although localized surface plasmon resonance (LSPR) detection using metallic nanoparticles has proven more sensitive than fluorescence, most of LSPR-based detection mechanisms rely on random aggregation of many particles, which has been problematic for quantitative measurements. Here we demonstrate an innovative strategy to design ratiometric detection system using dimeric nanoprobes that gold and polystyrene nanoparticles are attached together. Upon exposure to an analyte, pairs of the nanoprobes can be assembled, resulting in new absorbance peak at longer wavelength. By measuring intensities of two absorbance peaks, ratiometric detection can be accomplished.