SERS-based biosensor for bacterial detection using aptamer-functionalized Raman probe

곽철환[†], A.T. Ezhil Vilian[1], 유태경[2], 한영규[1], 허윤석
인하대학교; [1]동국대학교; [2]경희대학교
(skymcity@gmail.com[†])

A surface-enhanced Raman scattering (SERS) has been used as a biosensor due to the sensitive and rapid detection of a trace amount of pathogens. The selectivity is also important factor of biosensor for the detection of pathogenic bacteria because they form heterogeneous population in natural environments. Thus it is necessary to fabricate a target-specific substrate in SERS-based biosensor. Herein, the SERS-based biosensor using aptamer-modified Ag@Au core-shell nanoparticles has been developed for the rapid detection of Salmonella typhimurium with high selectivity. The high selectivity and sensitivity was achieved by the modification of target-specific sequenced aptamer and the enhancement of weak Raman scattering due to Ag@Au core-shell nanoparticle. It was possible to quantify S. typhimurium by the correlation between SERS intensity and concentration of S. typhimurium.