

Controllable self-assembly of gold nanoparticles on *E. coli* by electrostatic interaction

김유연, 정광영, 이영재, 장지한, 강태욱[†]
서강대학교
(twkang@sogang.ac.kr[†])

Plasmonic microorganism would be one of ideal candidates for energy harvesting and nanomedicine. For example, gold nanoparticles (GNPs), when being assembled on microalgae, have been reported to enhance growth rate of the microalgae. In order to assemble GNPs on microorganism, antibody conjugation has been widely used. However, it requires multiple surface modifications of GNPs, which might lead to unexpected precipitation. Here, we propose one-step, self-assembly of GNPs onto the surface of *E. coli* by electrostatic interaction. Positively charged hydroxylamine hydrochloride-capped GNPs are attached on the negatively charged *E. coli*. The surface density of the attached GNPs can be tuned by controlling the concentration of colloidal nanoparticles. The effect of surface charge on the assembly is systematically investigated by changing surface ligands of GNPs. The assembly is characterized by using scanning electron microscope and dark-field microscope.