

Colloidal Integration of Fluorophore and Gold Nanoparticle into Single Liposome

장정우, 이영재, 신용희, 강태욱[†]

서강대학교

(twkang@sogang.ac.kr[†])

Fluorophore-metal hybrid nanoparticle is a promising candidate in bioimaging due to its ability to produce multiple images at the same location. These particles typically require additional 'spacers' such as DNA or polymers to prevent fluorescence quenching. However, the spacer often limits endocytosis for biological applications. Here we propose the synthesis of fluorophore-gold hybrid nanoparticles by using liposome to simultaneously deliver hydrophobic or (and) hydrophilic fluorophores. Hydrophobic fluorophores (e.g. Nile Red) are embedded in a lipid bilayer by hydrophobic interaction. During hydration to form a liposome, hydrophilic fluorophores (e.g. Fluorescein) are encapsulated in the liposome with ascorbic acid. Then, ascorbic acid and fluorescein outside the liposome are removed by centrifugation. We confirmed that both hydrophobic and hydrophilic fluorophores coexist in the same liposome using fluorescence microscope. After the addition of gold ions, gold nanoparticle is selectively grown by the diffusion and reduction of the gold ions into the liposome. The synthesized hybrid nanoparticles are characterized by TEM, UV-vis spectrophotometer and dark-field microscope.