

Near-infrared plasmonic assemblies of AuNPs with multi-function for cancer diagnosis and therapy

이보람, 김현진, 윤철주, 이지원[†]
고려대학교
(leejw@korea.ac.kr[†])

A novel assembly structure of near-infrared plasmonic gold nanoparticles (AuNPs) possesses photoacoustic (PA) and photothermal (PT) properties. The plasmonic AuNP assembly is composed with short double-strand DNA (sh-dsDNA) and human methyl binding domain protein 1 (MBD1). MBD1 binds to methylated cytosine-guanine dinucleotides (mCGs) included in the sequence of sh-dsDNA. Hexahistidine peptides on the MBD1 have a function as a nucleation site for AuNP synthesis, sh-dsDNA-MBD1-AuNPs (named DMAs). By the spacer between two adjacent mCGs and varying the length of sh-dsDNA backbone, we synthesized three DMAs (DMA_5mCG, DMA_9mCG, and DMA_21mCG), DMA_21mCG exhibited a higher photoacoustic signals compared to a plasmonic gold nanorod and a comparable photothermal. In addition, epidermal growth factor receptor I (EGFR)-binding peptides are genetically attached to the MBD1 of DMA_21mCG.