

Mesoporous silica-coated luminescent Eu^{3+} doped GdVO_4 nanoparticles for multimodal imaging and drug delivery

_____,^{1,*}
 ;¹
 (tkyu@khu.ac.kr^{*})

We describe a simple route for synthesizing mesoporous silica-coated luminescent europium-doped gadolinium vanadate ($\text{GdVO}_4:\text{Eu}^{3+}@\text{mSiO}_2$) nanoparticles. Their biomedical applications as a potential imaging nanoprobe for both fluorescence imaging and magnetic resonance imaging (MRI) and as a simultaneous anti-cancer drug delivery vehicle are also discussed. Eu^{3+} doped GdVO_4 nanoparticles exhibit strong red photoluminescence and the Gd^{3+} in GdVO_4 can be used as a T_1 contrast agent for MRI. The mesoporous silica layer on the nanoparticles enables the simultaneous capabilities of T_1 -weighted MR contrast enhancement and sustained intracellular drug delivery. $\text{GdVO}_4:\text{Eu}^{3+}@\text{mSiO}_2$ nanoparticles can provide new opportunities in cancer treatment as a new type of theragnostic (imaging and treatment) agents.