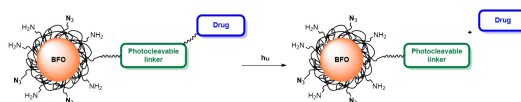


## Functionalization of second harmonic generation nanoparticles for theranostic applications

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Nowadays, cancer is the leading cause of death in developed countries. The emergence of new multimodal nanodevices for *in vivo* imaging offers the perspective of cancer detection at a very early stage.[1] The recent progress in nanotechnologies has generated high expectation that nanomaterials could provide unprecedented contrast agents in imaging set-ups and multifunctional platforms for drug delivery.[2] In this context, harmonic nanoparticles (HNPs), which are composed by non-centrosymmetric materials, can be easily imaged by their second harmonic generation signal in multiphoton imaging platforms.[3]



We recently disclosed efficient protocols for the biocompatible coating [4] and post-functionalization of bismuth ferrite (BiFeO<sub>3</sub>, BFO) and LiNbO<sub>3</sub> HNPs as well as their favorable properties for targeted imaging of human cancer cells and tissue.[5] We report therein the conjugation of BFO HNPs to caged molecular cargos through a photocleavable linker based on coumarinyl and *o*-nitrobenzyl derivatives. Excitation of these functionalized HNPs in the visible or near IR region generated second harmonic UV emission [6] and subsequent selective release of the conjugated drug models.

These multifunctional HNPs offer the possibility for decoupled imaging modality and photo-activation process by tuning the wavelength of the excitation beam.

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