World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:9, No:07, 2015

Nanoscale Metal-Organic Framework Coated Carbon Nitride Nanosheet for Combination Cancer Therapy

Authors : Rui Chen, Jinfeng Zhang, Chun-Sing Lee

Abstract : In the past couple of decades, nanoscale metal-organic frameworks (NMOFs) have been highlighted as promising delivery platforms for biomedical applications, which combine many potent features such as high loading capacity, progressive biodegradability and low cytotoxicity. While NMOF has been extensively used as carriers for drugs of different modalities, so far there is no report on exploiting the advantages of NMOF for combination therapy. Herein, we prepared core-shell nanoparticles, where each nanoparticle contains a single graphitic-phase carbon nitride (g-C3N4) nanosheet encapsulated by a zeolitic-imidazolate frameworks-8 (ZIF-8) shell. The g-C3N4 nanosheets are effective visible-light photosensitizer for photodynamic therapy (PDT). When hosting DOX (doxorubicin), the as-synthesized core-shell nanoparticles could realize combinational photo-chemo therapy and provide dual-color fluorescence imaging. Therefore, we expect NMOFs-based core-shell nanoparticles could provide a new way to achieve much-enhanced cancer therapy.

Keywords : carbon nitride, combination therapy, drug delivery, nanoscale metal-organic frameworks
Conference Title : ICNN 2015 : International Conference on Nanotechnology and Nanomedicine
Conference Location : Prague, Czechia
Conference Dates : July 09-10, 2015