Multi-Stimuli Responsive Functional Hollow Silica Nanoparticles for Hyaluronic acid-guided Delivery

신동훈, 이승기, 장현성[1], 주지봉[1], 최인희†
서울시립대학교; [1]건국대학교
(inheechoi1@uos.ac.kr†)

Stimuli-responsive nanocarriers have been studied for controlling the release kinetics with minimizing undesired leakage of loaded molecules. Mesoporous silica nanoparticle (MSN) has been used as a promising carrier owing to its good biocompatibility, high surface area, and easy in chemical modification. Moreover, introducing targeting moieties onto the MSN enable to achieve targeted delivery to designated sites. Here, we design a multi-responsive MSN capped with diverse molecular weight of hyaluronic acid (HA) for controlling the loading efficiency and enhancing the targeting efficiency. We synthesize dual-responsive MSNs via several surface modified processes. Modified MSNs are further functionalized with HA to provide the targeting properties owing to affinity to CD44 rich cancer cells. Drug release is tested using doxorubicin in presence of external stimuli such as pH and glutathione levels. The targeting ability of HA is examined with cancer cell comparing with the normal cell. We expect that the proposed HA-capped MSN would be a promising carrier to enhance drug delivery efficiency with targeting/stimuli-responsive functionalities.