

Design of Ball-and-stick Particles with Enhanced Cellular Uptake for Photothermal Therapy

강혜림^{1,2}, 박지호¹, 양승만^{1,2,*}
¹한국과학기술원; ²광자유체집적소자연구단
(smyang@kaist.ac.kr*)

Biomaterials have been developed to enhance the functionality in medical application by adjusting surface chemistry, size, shape, and composition. These chemical and physical designs of biomaterials could be affect the interaction from the cells. Here, we have described a fabrication strategy for ball-and-stick particles, which had inorganic sphere and organic stick parts, using combination of colloidal lithography, reactive ion etching and metal deposition process. The aspect ratio of stick part could be tuned by changing the thickness of deposited polymeric film under the ordered colloidal particles. Furthermore, ball-and-stick particles were more cellular internalized in the cells as increasing aspect ratio of stick part. These effectively internalized ball-and-stick particles, which had plasmonic hemisphere cap onto the sphere, could kill the cells using photothermal conversion by irradiation of NIR laser as a therapeutic agent.