

Development of Fe-aminoclay conjugated with carbon dot for potent cancer therapy with bio-imaging capability

강경숙, 이영철<sup>1</sup>, 이현옥<sup>2</sup>, 박현규<sup>†</sup>

한국과학기술원; <sup>1</sup>가천대학교; <sup>2</sup>한국기초과학연구소

(hgpark@kaist.ac.kr<sup>†</sup>)

Nanomaterials are emerging in the development of cancer therapy due to their advantageous characteristics such as tunable size and morphology, multifunctional modification of surface with anti-cancer drugs, and improved therapeutic efficacy by reducing non-specific toxicity. In this study, Fe-aminoclay conjugated with fluorescent carbon dot were developed as new bio-imaging nanomaterials and applied to HeLa cells to demonstrate the cytotoxicity by using MTT assay and NR assay. When Fe-aminoclay conjugated with carbon dot were incubated with HeLa cells, the nanomaterials entered the cells yielding specific fluorescence of conjugated carbon dot. On the other hand, only carbon dot without any aminoclay did not enter the cells. Moreover, carbon dot, Fe-aminoclay and Fe-aminoclay conjugated with carbon dot did not show any toxicity to HeLa cells up to the concentration of 1.0 mg/mL. Additionally, the nanomaterials developed in this work should have enormous potentials for developing new drug delivery system based on their unique cytotoxicity and bio-imaging capability.