

## Supperparamagnetic iron oxide nanoparticles for biomedical application

Nguyen Minh Phuong, 김덕준<sup>1,†</sup>

성균관대학교; <sup>1</sup>성균관대학교 화학공학과

(djkim@skku.edu<sup>†</sup>)

In this study, we prepared iron oxide nanoparticles (IONs) capping oleic acid by thermal decomposition method. The synthesized IONs were coated with the grafted polymers which are biocompatible and hydrophilic. The backbone of polymer is polysuccinimide (PSI), a polymer biocompatible. Multifunctional polymers were grafted on PSI, including hydrophilic O-(2-aminoethyl) polyethylene glycol (PEG) and hydrophobic octadecylamine (C18) for amphiphilic structure, pH-sensitive - hydrazine hydrate to release drugs, and biotin to interacts with receptors on cancer cell surfaces. The coated IONs were applied for MRI contrast agents and target drug delivery. The structure of the polymers was confirmed by <sup>1</sup>H NMR. The size and distribution size of nanoparticles were defined by TEM and DLS. Magnetism property of IONs was measured by SQUID and Relaxometry measurement appreciated the ability of nanoparticles for MRI contrast agent. Effective toxicity cells were analyzed by MTT assay in MCF7 cells.

Keywords: iron oxide nanoparticles (IONs), biomedical applications, super-paramagnetic, amphiphilic polymer