

Abstract Submitted
for the NWS07 Meeting of
The American Physical Society

Biocompatible magnetic nanoparticles with high magnetic moment for cancer treatment¹ AMIT SHARMA, YOU QIANG, University of Idaho, LESLIE MULDOON, Oregon Health and Science University, DANIEL MEYER, JAMIE HASS, University of Idaho, OREGON HEALTH AND SCIENCE UNIVERSITY COLLABORATION — Non-toxic iron oxide nanoparticles have extended the boundary in medical world; with size range from 2 to 400 nm they can be compared with most of the small cells and tissues in living body. We have prepared monodisperse iron-iron oxide core-shell nanoparticles in our novel cluster deposition system. The nanoparticles have very high magnetic moment up to 200 emu/g. To test the nontoxicity and uptake we incubated the nanoparticles coated with dextrin and non-coated iron nanoparticles with LXI SCLC lung cancer cells found in rats. Results indicate that both coated and noncoated cells were successfully taken up by the cells indicating that the core-shell nanoparticles are not toxic. Due to the high magnetic moment offered by the nanoparticles we propose that even in low applied external alternating field desired temperature can be reached for hyperthermia treatment in comparison to the commercially available iron oxide nanoparticles (magnetic moment less than 20 emu/g). We also found that our ferromagnetic nanoparticles were taken up by the cancer cells without adding protamine sulfate, which is normally needed to prevent the coagulation of cells for the commercial nanoparticles.

¹DOE

Amit Sharma
University of Idaho

Date submitted: 17 Apr 2007

Electronic form version 1.4