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***In-vitro* Depth-Dependent Photo thermal Ablation of Human Adenocarcinoma by Polystyrene Stabilized Fe₃O₄**

Nanoparticle mediated photo thermal ablation of cancerous tissue shows promising results as an efficacious treatment method. However it is important to understand the effects of greater laser attenuation on photothermal efficacy mediated by changes in the scattering and absorption profiles of soft tissue. Photothermal efficacy using a near infrared (NIR) 785 nm laser irradiating polystyrene (PS) stabilized magnetite (Fe₃O₄) nanoparticles (PS-Fe₃O₄) is examined on MDA-MB-231 human mammary gland adenocarcinoma *in-vitro*. Agarose gel columns of various depths were created to simulate soft tissue and subsequently used for NIR laser attenuation. PS was found to significantly improve magnetite nanoparticle stability in modified Hank's Balanced Salt Solution, serum containing media, reduces innate toxicity over 48 hours compared to uncoated magnetite, and allows for effective hyperthermic ablation. Agar gel layers provided similar optical attenuation in the NIR region to soft tissue and provided a convenient base gel material for advanced soft tissue modeling. The NIR laser power used did not solely affect cellular viability, but allowed for photothermal ablation through all examined agar gel depths.

Biography

Donglu Shi received his Ph. D. in Materials Science and Engineering in 1986 from the University of Massachusetts at Amherst. In 1995, Donglu Shi joined the faculty as an Associate Professor in the Department of Materials Science and Engineering at University of Cincinnati. He was promoted to the full professor position, with tenure, in 2001 at University of Cincinnati. He is currently the Chair of the Materials Science and Engineering Program at the University of Cincinnati. Donglu Shi has so far published 250 refereed SCI journal publications including *Physical Review Letters*, *Nature*, *ACS Nano*, and *Advanced Materials*.

shid@ucmail.uc.edu**Notes:**