Opening of Hollow Gold Nanoparticle-Liposome Composites Using Normal Human Body Temperature

Bruns, David

The purpose of this project was to determine if an anti-cancer agent can be released from composites of hollow gold nanoparticles (HGNs) and liposomes using normal body temperature to avoid the side effects of a laser or direct heat. HGNs of approximately 11 nm were synthesized via the methodology of Prevo, et al. Liposomes encapsulating Fast Green FCF dye in phosphate buffered saline (PBS) were created from dry films of DPPC, cholesterol and DSPE-PEG using three sonication and freeze-thaw cycles. Excess dye was removed via repeated centrifugation, decantation, and resuspension of the liposomes prior to combination with HGN. HGN/liposome composites were placed in an incubator at 37 °C and dye release was quantified. The experiments were repeated in the presence of cell media to see if media affects the composite degradation. Results showed that the HGN/liposome composites released the dye at 37 °C. The results of the HGNs in the cell media show potential degrading, but more tests need to be run in order to quantify the results. In conclusion, the HGN/liposome composite represents a potential new drug delivery system that may reduce chemotherapy side effects.

Awards Won: