

Hyperthermia Efficacy of Nanoparticles for Cancer Therapy

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Optical activation of gold-nanoshell particles with laser radiation in the near-infrared spectrum provides a means to induce hyperthermia in a tumor while leaving the surrounding healthy tissue intact. The procedure entails two processes: (i) heating of the nanoshells via a plasmon resonance phenomenon and (ii) diffusion of the heat from the particles into the surrounding tissue. Tumor-scale finite-element modeling of thermal ablation efficacy requires effective properties of tissue containing nanoparticles. Little is known about these effective properties. Mesoscale simulations are used to computationally measure effective system properties and responses of nanoshell particle ensembles.