Abstract: In 2016 cancer will be diagnosed in approximately 1,700,000 people in the US, and 600,000 people will die of the disease. The overall improvement of efficiency of treatment, while notable, is certainly below the NCI strategic goals of eliminating death and suffering due to cancer by 2015. Among the key treatment modalities, chemotherapy is particularly disappointing, contributing about 2 % to 5-year survival in all types of cancers. New formulations of established chemotherapeutic agents, such as Doxil, a liposomal formulation of doxorubicin, have been introduced to clinical practice to limit systemic exposure to such drugs. Continued improvements are sought through research toward targeted delivery and controlled release of drugs as methods to improve delivery of drugs to diseased sites. Having previously shown that plasmon resonant liposomes release dyes upon laser illumination, we seek to move this finding into a biological setting. To facilitate this, we encapsulate doxorubicin, an FDA approved chemotherapeutic, in gold-coated, plasmon resonant liposomes that are stable at physiological conditions. Stability of encapsulation, imaging methods for monitoring nanocapsules as well as active targeting using the folic acid ligand are addressed. On-demand release of doxorubicin at the target site may decrease the deleterious side effects of chemotherapy by enabling delivery of high doses of drug while minimizing systemic exposure.