Sorg, Brian

Biomedical Engineering *2009 Program*
University of Florida *New Investigator (3-year project)*

Project Title: Light-Triggered Carrier Drug Release for Treatment of Disseminated Cancer

Project Summary: Chemotherapy is standard treatment for metastatic cancer; however, drug toxicity limits the dosage that can safely be used thus reducing treatment efficacy. Drug carrier particles can help reduce toxicity by shielding normal tissue from drug and selectively depositing drug in tumors. Most drug carriers release drug passively by slow leakage, but this uncontrolled, passive drug release can limit treatment efficacy as it can be difficult to achieve therapeutic concentrations of drug at tumor sites even with tumor accumulation of the carriers. Controlled rapid drug release can be more effective due to higher achievable peak drug concentrations. The long-term objective this research is to harness a photochemical technique called delayed photolysis as a new light-based method for rapid controlled drug release from carriers to improve the treatment of metastatic cancer. The objective of this grant is the first demonstration of delayed photolysis in an animal model. This project represents the first attempt to demonstrate delayed photolysis in a live animal and the first attempt to harness this technique for therapeutic benefit. The results of this project will provide a basis for further development of the technique for targeting tumors to improve treatment of metastatic cancer lesions. This technology will have potential positive impacts in chemotherapy of advanced metastatic cancer.