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Nanocolloids for cancer

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Published work by our team has demonstrated that calcium phosphosilicate nanoparticles (CPSNPs) are nontoxic candidates for bioimaging and therapeutic drug delivery applications. The pH-dependent solubility profiles of CPSNPs make this class of nanoparticles especially useful for *in vitro* and *in vivo* delivery of fluoroprobes as well as chemotherapeutics. CPSNPs that encapsulate the near infra-red fluoroprobe, indocyanine green, have both diagnostic imaging and therapeutic efficacy. These “theranostic” attributes can be exploited to enhance photodynamic therapy (PDT), an alternative modality for cancer treatment. ICG-CPSNPs have enhanced optical imaging properties and function as stable photosensitizers for PDT. Data will be presented to demonstrate the theranostic potential of ICG-CPSNPs in multiple models of solid and non-solid tumors. In addition to fluoroprobes and chemotherapeutics, CPSNPs can be formulated to encapsulate molecular-based therapies, such as siRNA. Data will also be presented demonstrating the utility of these non-cationic formulations in *in vivo* models of cancer.

Biography

Mark Kester is a Professor of Pharmacology and the Co-Director of the NanoSTAR Institute of the University of Virginia. He was previously the G. Thomas Passananti Professor of Pharmacology at Penn State Hershey College of Medicine and the inaugural Director of the Penn State Center for NanoMedicine and Materials. His research interests include the design, characterization and validation of nanotechnologies for targeted drug delivery. His laboratory has evaluated nanoliposomes, nanodendrimers and nanocolloids as effective drug delivery vehicles for pharmacological and molecular agents. Recent work focuses on nontoxic nanoscale systemic delivery systems for hydrophobic pro-apoptotic lipids as well as siRNAs that target mutated tumorigenic proteins. He has consulted with, or founded, several companies that have the license to his nano“Solutions”. In addition, he is a co-author of *Integrated Pharmacology*, published by Elsevier, Ltd., which was recognized as a “highly commended textbook” by the British Medical Society.

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