

## AbstractID: 11894 Title: Immunoliposomes for Targeted Radionuclide Therapy

Liposomes are the prototypical nanodevices for delivery of therapeutics. These nanovesicles are structures comprising a phospholipid membrane, an encapsulated aqueous phase (usually) containing the therapeutic agent and surface grafted polymer chains. Typical diameters are in the hundred nanometer range. The extended structure provides a platform that can increase circulation time, protect the therapeutic from enzymes in the circulation and reduce the interaction of toxic therapeutics with normal organs. Several liposomal drug delivery formulations are now FDA approved. Immunoliposomes or “targeted” liposomes are engineered with surface grafted antibodies or antibody fragments reactive against tumor or other target cell antigens or receptors. Studies have demonstrated that targeted liposomes do not provide a tumor-targeting advantage in terms of gross localization to the tumor site. For both targeted and untargeted liposomes, tumor localization is accomplished by the enhanced permeability effect that arises because tumor vasculature is “leakier” than normal organ vasculature. Targeted liposomes provide a delivery advantage because of increased interaction with the target cell population once localized to the tumor site. The increased interaction can take on the form of fusion with the cellular membrane or internalization by endocytosis. We have developed immunoliposomes for the targeted delivery of alpha-particle emitting radionuclides. Pre-clinical studies evaluating the efficacy of such constructs will be presented.

### Learning Objectives:

1. Provide an overview of liposomes as therapeutics
2. Explain how liposomes target
3. Understand the distinction between targeted and untargeted liposomes
4. Understand the possible advantages of using liposomes to target alpha-particle emitters