UNIVERSITY OF SOUTH ALABAMA

Department of Chemistry Presents Seminar Series Speaker

Dr. Eden E. L. Tanner

University of Mississippi
Oxford, Mississippi

Ionic Liquids as Antifouling Polymeric Nanoparticle Coatings

One of the major challenges facing intravenous nanoparticle administration is the formation of protein coronae on the surface of injected nanoparticles, which prevents them from reaching the target tissue. Biocompatible ionic liquids (ILs) have been shown to have tunable interactions with biomolecules including proteins and are prone to rearrangement on charged surfaces. We show that this can be exploited to use designer protein avoidant-ionic liquids as polymeric coatings, which can protect the nanoparticle from being fouled by serum proteins in the blood. When the IL coated poly (lactic-co-glycolic acid) (PLGA) particles are injected into mice, they show reduced clearance compared to control poly(ethylene glycol) or bare PLGA particles. Instead of lung, kidney or splenic deposition, the IL-particles accumulate in the lung tissue after hitching a ride on red blood cells post-injection. This talk will discuss the development of ionic liquids for efficacious nanoparticle drug delivery, elucidate the lessons learnt thus far, describe the many challenges to come, and highlight the opportunities that arise at the intersection of physical chemistry and bioengineering.

Friday, January 29, 2021, 12:20 pm

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