ADME of Pulmonary-Administered Polystyrene Nanoparticles and Development of a PBPK Model

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Polymeric nanoparticles have been widely investigated for the controlled local delivery of therapeutics through the pulmonary route. There has also been a growing interest in utilizing polymeric nanoparticles for systemic delivery since numerous groups have shown internalization and systemic distribution from the alveolar space. Our research group is interested in understanding the relationship of nanoparticle properties (size, surface charge, hydrophilicity, etc.) on the absorption, distribution, metabolism and elimination (ADME) characteristics. The parameter-ADME relationship as a function of size following pulmonary administration will be presented. Further, we have begun development of a physiologically-based pharmacokinetic (PBPK) model describing the ADME properties of nanoparticles for various administration routes and particle parameters. An example of this model will be presented along with some applications of the model.

Dr. Joshua Reineke is assistant professor in the Department of Pharmaceutical Sciences in the Eugene Applebaum College of Pharmacy and Health Sciences at Wayne State University. More information on the Reineke lab can be found at http://reinekelab.org.

All students, faculty, and anyone interested are welcome.