

## Novel pharmacologic and phenotypic methods to characterize carrier-mediated and nanoparticle agents as part of preclinical and clinical development

**William C. Zamboni**

The University of North Carolina, USA

Nanoparticle drugs consist of the inactive-drug that remains encapsulated within or conjugated to the nanoparticle carrier and the active-drug that is released from the carrier. The pharmacokinetics and pharmacodynamics of nanoparticle agents is dependent on their recognition and interaction with the mononuclear phagocyte system (MPS) where the encapsulated drug is cleared via the MPS and the drug may be released from the carrier via interactions with the MPS. Thus, it is critically important to evaluate the encapsulated and released forms of nanoparticle agents and how nanoparticle agents interact with the MPS in preclinical models and in patients. The following issues will be discussed: 1) pharmacologic methods to characterize nanoparticle agents *in vivo* and *in vitro*; 2) animal models for pharmacologic and toxicology studies of nanoparticle agents; and the development of phenotypic probes of the MPS to profile nanoparticle agents, animal models and as a method to individualize nanoparticle therapy in patients.

### Biography

William Zamboni received his bachelor of science, doctor of pharmacy and doctor of philosophy from the University of Pittsburgh, School of Pharmacy in Pittsburgh, Pennsylvania. He completed his oncology residency at the Warren G. Magnuson Clinical Center, National Institutes of Health, in Bethesda, MD and his research fellowship at the Department of Pharmaceutical Sciences, St. Jude Children's Research Hospital, in Memphis, Tennessee. Currently, he is an Associate Professor in the UNC Eshelman School of Pharmacy and UNC Lineberger Comprehensive Cancer Center. Zamboni's research program is part of the Division of Pharmacotherapy and Experimental Therapeutics in the UNC Eshelman School of Pharmacy and Molecular Therapeutics in the UNC Lineberger Comprehensive Cancer Center. He is the director of UNC GLP Bioanalytical Facility and the director of the Translational Oncology and Nanoparticle Drug Development Initiative (TOND<sub>2</sub>) Lab at the University of North Carolina in Chapel Hill. He is also the Codirector of the North Carolina Biomedical Innovation Network (NCBIN) for GLP toxicology and pharmacology studies of small molecule and nanoparticle agents.

[zamboni@email.unc.edu](mailto:zamboni@email.unc.edu)