

**OMICS** Group **3<sup>rd</sup> International Conference and Exhibition on**  
**Conferences** **Pharmaceutics & Novel Drug Delivery Systems**  
Accelerating Scientific Discovery

April 08-10, 2013 Hilton Chicago/Northbrook, USA

## Engineering drug nanocarriers for delivery of chemotherapeutic drugs

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Nanocarriers have seen a growing interest in drug delivery technologies and the success of the carrier depends on the size, shape and the surface structure and chemistry of the carrier in the context of the delivery pathway. This article develops a map of guidelines for design of nanoparticle based chemotherapy. It reviews the mechanism of delivery in different pathways, physiology and chemistries involved and barriers to transport and delivery of nanocarrier based drugs, specifically for chemotherapeutic drugs. The microenvironment and physiology of a tumor site and its chemical environment is also reviewed, focusing on the impact on delivery. For each of these primary pathways including transdermal, parenteral, mucosal, and oral, nanoparticle size, method of formation and functional characteristics are defined based on the hurdles to transport and mechanisms that aid delivery. Targeting and release mechanisms with these different kinds of nanocarriers are also reviewed. Successful lab and commercially available solutions are compared to these design parameters and a map of nano-carrier design guidelines are developed and presented.

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