



## Nanotechnology for Targeting Bloodborne Cancer Metastasis

Metastasis through the bloodstream contributes to poor prognosis in many types of cancer. Mounting evidence implicates selectin-based adhesive interactions between circulating tumor cells (CTCs) and the blood vessel wall as facilitating this process, in a manner similar to leukocyte trafficking during inflammation. In this talk, I will present our novel platform technology for therapeutic targeting of CTCs *in vivo*, as means to interfere with the spread of metastasis. We have focused on the delivery of the TNF-related apoptosis inducing ligand (TRAIL) to CTCs, which preferentially induces apoptosis in tumor cells while leaving normal blood cells unharmed.

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## Break and enter: new concepts for intracellular delivery of macromolecules

Intracellular delivery is a long-standing challenge in research and therapeutic applications. Limitations of current technologies motivate research on universal delivery systems that can deliver a wider variety of cargo to diverse cell types, particularly sensitive primary cells. In this talk I present an overview of the two main approaches for intracellular delivery with a focus on mechanism, challenges and opportunities. First, I will discuss the latest knowledge on carrier-based delivery, with an overview of the different types of carriers, their speculated modes of entry, cargo release dynamics, putative pathways of vesicular transport, and sites of endosomal escape. In the second part of my talk, I will discuss membrane disruption-based approaches, which facilitate universal cytoplasmic delivery of a wide range of molecular cargoes to diverse cell types.

**Martin P. Stewart, Ph.D.**

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