

Nanomedicine: A New Frontier in Precision Medicine

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Today, healthcare is harnessing the power of genomics, gene editing, and nanotechnology to build a solid foundation for a more patient-centric and individualized approach to healthcare and improving clinical outcomes. The emergence of the “precision medicine” paradigm is helping with the discovery of novel drug targets, drug repurposing, and drug repositioning. Developments in nanotechnology are introducing responsive entities for controlled delivery of therapeutic and diagnostic agents across difficult biological barriers for the treatment of immunological, cardiovascular, and neurological diseases and disorders. Technological breakthroughs in targeted drug delivery together with advances in biomarker discovery are becoming the driving force of precision medicine. However, an effective treatment planning must not only consider disease heterogeneity, but also the broader aspects of disease microenvironment as therapy progresses. These include the dynamics of immune system microenvironment, rate-limiting biological barriers and transport processes. This presentation will address these challenges through systems approaches and introduces work in progress towards development of biomarker detection technologies, more effective and safer vehicles and therapeutic nanoplatforms than lipid nanoparticles for the delivery of nucleic acid therapeutics across the biological barriers, and global solutions to nanoparticle-mediated adverse reactions.

References:

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