Advances in Personalized Nanotherapeutics

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Editors

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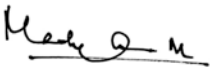
The Society for Personalized NanoMedicine (SPNM) aims to tailor medical intervention to patient- and disease-specific needs. The SPNM's mission is to promote research, serve as a source of information on current applications of nanotechnology, and foster the exchange of information and ideas on personalized nanomedicine. Our vision and goals are to merge interdisciplinary research in order to increase our understanding of current applications of nanotechnology. These applications include reconstructive surgery; targeted therapy; the latest research on nanodevices, drug development, and drug delivery; and the use of microelectronics and high-precision lithography for the production of nanocomposites for personalized medical use. The SPNM also promotes translational research that focuses on the interactions between the human immune system, substance abuse, HIV, and cancer, in order to create a solid ground for the development and application of groundbreaking medical devices and systems for superior diagnosis and treatment.



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Preface

Personalized health care management and optimization of the treatment of disease is crucial for improving the quality of health. Significant efforts have been made to design and develop novel nanotherapeutics strategies for the proficient monitoring and treatment of disease in a personalized manner. As per the state of the art, there are various strategies that involve the development of novel nanomaterials; novel drug delivery systems; the discovering of novel therapeutic agents; the integration of devices for better biosensing technology; and new therapeutic agents for the development of personalized nanomedicine to combat targeted diseases with no side effects. Besides nano-drug delivery, attention has also been focused on describing nano-enabled sensors, miniaturizing sensing systems, the interfacing of sensing components, and developing smart portable systems for point-of-care (POC) applications to detect biomarkers at very low levels in order to monitor the progression of targeted diseases. Such systems have also been used to assess the therapeutic efficacy of medicines that are specifically prescribed for the targeted diseases.

This book describes the fundamentals of nanomedicine; personalized therapeutics; novel nanomaterials for drug delivery; the role of nanotechnology in investigating therapeutic approaches; targeted CNS drug delivery; stimuli-responsive drug release; nano-enabled sensing systems for health care; and disease management. The future prospects of personalized nanotherapeutics and related challenges – with possible solutions – are also discussed. The book can be the source for new ideas to design and develop novel biomaterials, novel nano-formulations, targeted delivery, translational medicine, the scaling up of nanomedicine to a clinical phase, POC-sensing systems for rapid diagnostics, and the promotion of nano-pharmacology for next-generation personalized medicine.

This book will also be very useful for helping young scholars understand the exploration of state-of-the-art nanotechnology for personalized health care; it will also help researchers design their future investigations towards developing effective personalized nanomedicine and diagnostic healthcare systems. Numerous studies have reported on the design and development of nanomedicines with higher efficacy, but unfortunately such products are in the laboratory research phase only and need to be thoroughly tested, using pre-clinical or human models. Our book

can be a call for experts to explore multidisciplinary research for developing novel and effective approaches to exploring smart, efficient nanocarriers for site-specific, on-demand controlled drug delivery to combat targeted diseases, and smart sensing systems to detect targeted biomarkers at the fM level, for complete personalized healthcare.

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