

Nanomedicine—prospects and challenges

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Published online: 27 March 2013
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This special issue of *Drug Development and Translational Research* is a fall out of the INDO US joint Symposium on Nanomedicine—Prospects and Challenges, organized at the Institute of Chemical Technology, Mumbai, India, jointly with Dr. Labhasetwar, Cleveland Clinic, Ohio, USA, and supported by the INDO US Science and Technology Forum.

The last two decades have seen an explosion in nanotechnology applications in science and technology. One such area is nanomedicine, which has touched the lives of many by enabling efficient therapy and which has helped overcome various impediments in medical science. Nanomedicine has helped medical science grow in leaps and bounds in the areas of treatment, diagnosis, and drug safety. These welcome advances have brought hope to the treatment of many incurable diseases.

Nanomedicine, the exploration of medical applications of nanotechnology, is evolving from laboratory research to clinical application, particularly in the areas of drug delivery, imaging, diagnostics, and monitoring. Nanotechnology and nanoparticles are expected to dramatically change the way disease is detected and treated, with implications for personalizing management strategies in clinical practice, patient–physician communication, and outcomes measurement. Over the past few decades, collaborative and multidisciplinary research has matured the field of nanomedicine. Polymer and material scientists, physicists and engineers, biologists and clinicians,

and pharmaceutical scientists have all contributed to the progression of nanomedicine. The rapid progress in the field is evident from the wide range of different nanotechnologies that have been designed and investigated, and are now at different stages of preclinical and clinical development. As these applications of nanotechnology are being explored, the critical issue of their safety to the patient is also being debated and investigated.

This special issue is a compilation of research papers relating to various aspects of nanomedicine. The issue is a blend of reviews and research manuscripts which cover diverse aspects of nanomedicine. The issue addresses on one hand design and in vivo evaluation of nanocarriers for administration by oral, nasal, and parenteral routes; in vitro evaluation with a special focus on dissolution techniques; and nanomedicine for gene delivery and specific infections like HIV, including multifunctional nanomedicines for varied applications. Toxicity aspects have also been covered in the issue.

Acknowledgments Financial support for this conference was provided by the Indo US Science and Technology Forum and the University Grants Commission, Government of India. The editors express their gratitude to Prof. Vladimir Torchilin Center for Pharmaceutical Biotechnology and Nanomedicine, Northeastern University, Boston, for contributing the preface to the issue.

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