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Editorial

Seventh International Nanomedicine and Drug Delivery Symposium (NanoDDS'09)

The ability to fabricate, manipulate, and characterize nanometer-scale materials have opened up a number of exciting new strategies to solve problems that previously seemed intractable. The nanoscale materials include those in low micrometer scale. Several new and novel approaches have progressed significantly and have demonstrated promising pre-clinical outcomes in recent years. These were highlighted at the 7th international NanoDDS meeting held in Indianapolis, Indiana (USA) on October 5–6, 2009. Building on the advances of nanomedicines and drug delivery presented in previous years at this conference, we elected to focus this meeting on the challenges that must be met to turn those promising laboratory results into clinical reality.

Nanomedicines will require both standard and unique development efforts to establish the data package required for investigational new drug status. The talks presented in Indianapolis highlighted these points. The keynote address by Scott McNeil (Director of the Nanotechnology Characterization Laboratory for the National Cancer Institute) provided an introduction to some of these issues and highlighted the capabilities at the National Institutes of Health that can be accessed to address some of these development questions. The fact that nanomedicines may not be inert bystanders was highlighted by a series of talks by S. Moein Moghimi (Copenhagen University), Samir Mitrogotri (University of California, Santa Barbara), Claus-Michael Lehr (Saarland University), Vinod Labhasetwar (Cleveland Clinic) and Scott McNeil. While safety is clearly the first concern of clinical testing, the ability to reproducibly manufacture within defined specifications at a reasonable scale is essential. Efforts to produce nanomedicines were highlighted in talks given by Elaine Merisko-Liversidge (Elan Drug Technologies) and Kinam Park (Purdue University). Following these talks Susan Clare (Indiana University School of Medicine), Ick Chan Kwon (Korea Institute of Science and Technology) and Gershon Golomb (The Hebrew University of Jerusalem), Soon Hong Yuk (Hannam University), and M. Laird Forrest (University of Kansas) focused on strategies to translate nanomaterials to clinical applications, comparing *in vitro* and *in vivo* performance of these materials, as well as toxicological issues. All talks were followed by extended discussions. It was especially gratifying to see the extensive number of high quality poster presentations that vividly demonstrated the promise of the next generation of scientists who are poised to take nanomedicines forward in the future.

Nine of the presentations from the meeting have now been distilled into manuscripts that are being published in this special issue of the *Journal Controlled Release*. While these papers cannot adequately reflect the energy and enthusiasm of the meeting in Indianapolis, they do provide a flavor of the meeting and the topics discussed. Dr. Scott McNeil's group provides an outline of regulatory issues for consideration regarding nanomedicine development. The potential for poly(ethylene glycol)-phospholipid as elements of nanomaterials to incite complement activation is discussed in an article from Professor Moghimi's group. Work from Professor Golomb's group defines cellular responses to 60–800 nm liposomal bisphosphonate preparations and the implications these might have to optimizing therapeutic applications. A technique to nanofabricate a wide range of polymer structures is outlined in a paper from Professor Mitrogotri and colleagues. A paper from Professor Park's group describes a new way to use hydrogel-based templates for the nano/micro fabrication of polymer-based systems of homogeneous sizes. Professor Yuk's group presents their studies on growth factor-loaded nanoparticles could be used to correct tissue damage in an *in vivo* model of heart attack. A promising application using a hyaluronan–drug nanoconjugate for the targeting and treatment of early-stage solid tumors is presented by a paper from Professor Forrest's group. Dr. Kwon and colleagues present an exciting approach to use nanoparticles for simultaneous detection and treatment of early-stage cancers. Professor Lehr's contribution to this issue focused on the challenges for the successful targeting and delivery of telomerase inhibitors to suppress cancer cell growth. Together, this group of papers reflects the spectrum and promise of presentations given at the meeting in Indianapolis. This special issue also presents a review article on the issues associated with long-term delivery of protein drugs using biodegradable microparticles.

The 8th international NanoDDS meeting will be held in Omaha, Nebraska (USA) on October 3–5, 2010. The main focus of the 8th meeting will be nanomedicines in cancer, clinical translations, and novel nanoformulation technologies. We eagerly await this meeting and the opportunity to see not only how much progress has been made on making nanomedicines a clinical reality but also to learn about new and novel advances in the application of nanomaterials for benefiting human health.

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