

Nanotechnology in Medicine

Topical Conference at the 2010 AIChE Annual Meeting

**Salt Lake City, Utah, USA
7-12 November 2010**

ISBN: 978-1-61782-144-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2010) by AIChE
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact AIChE
at the address below.

AIChE
3 Park Avenue
New York, NY 10016-5991

Phone: (203) 702-7660
Fax: (203) 775-5177

www.aiche.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

siRNA Liposome by SCF Technology	1
<i>Ranjit Thakur</i>	
Encapsulating Emulsions Inside Liposomes for Drug Delivery	2
<i>Marjan Javadi, William Pitt, Jonathan Hartley, James R. Lattin</i>	
Multimodal Phase-Shift Nanoemulsions for MRI, Ultrasonography, and Catalysis of Image-Guided Drug Delivery	10
<i>Natalya Rapoport, Kwon-Ho Nam, Anne M. Kennedy, Allison H. Payne, Nicolas Todd, Eun-Kee Jeong, Dennis L. Parker, Jill E. Shea, Courtney Scaife</i>	
Charge Reversal Liposomes for Cancer Nuclear Drug Delivery	12
<i>Xinpeng Ma, Zhuxian Zhou, Bo Zhang, Jianbin Tang, Maohong Fan, Huadong Tang, Youqing Shen, Maciej Radosz, Edward Van Kirk, William Murdoch</i>	
Targeted Liposomes with pH-Triggered Leaky Heterogeneities Increase the Therapeutic Potential of Targeted Immunotherapy	13
<i>Amey Bandekar, Shrirang Karve, Stavroula Sofou</i>	
Multicomponent Folate-Targeted Magnetoliposomes: Design, Characterization, and Preliminary in Vitro Hela Cell Studies	14
<i>Geoffrey D. Bothun, Alline Leles, Matthew A. Stoner</i>	
Multifunctional PEG-PLL Drug Conjugate Forming Responsive Nanoparticles for Intracellular Drug Delivery	15
<i>Zhuxian Zhou, Jianbin Tang, Maohong Fan, Huadong Tang, Maciej Radosz, Edward Van Kirk, William J. Murdoch, Youqing Shen Sr.</i>	
Merging 'Micro' with 'Nano': On-Chip High-Throughput Synthesis of Polymeric Nanoparticles for Cancer Therapy	16
<i>Pedro M. Valencia, Minsoung Rhee, Robert Langer, Omid C. Farokhzad, Rohit Karnik</i>	
Fabrication of Highly Uniform Nanoparticles From Recombinant Silk-Elastinlike Protein Polymers for Gene Delivery Applications	18
<i>Rajasekhar Anumolu, Joshua Gustafson, Hamid Ghandehari, Leonard F. Pease III</i>	
Formation and Drug Release From Particles Produced Via Flash Nanoprecipitation	19
<i>Zhengxi Zhu, Han Jing, Adam Wohl, Thomas Hoye, Christopher W. Macosko</i>	
Stabilization of the Nitric Oxide Prodrugs through Incorporation Into PEG-Protected Nanoparticles	20
<i>Varun Kumar, Harinath Chakrapani, Sam Y. Hong, Anna E. Maciag, Joseph E. Saavedra, Larry K. Keefer, Robert K. Prud'homme</i>	
Anti-Cancer Nanoparticle Synthesis and Characterization	21
<i>Fan Mei, Da-Ren Chen, Yin-Nan Lee</i>	
Doxorubicin- Loaded Albumin Nanoparticles: Formulation and Characterization	22
<i>Parvin Golbayani, Soheyla Honary, Mohsen Jahanshahi, Pouneh Ebrahimi</i>	
A New Charge Reversal PCL-Block-Polyhistidine Nanoparticles for Nuclear Targeting Drug Delivery	23
<i>Erlei Jin, Bo Zhang, Jianbin Tang, Maohong Fan, Huadong Tang, Maciej Radosz, Edward A. Van Kirk, William J. Murdoch, Youqing Shen</i>	
Multifunctional Rare-Earth Doped Nanoparticles in Encapsulated Albumin Nanocarriers for Tumor Targeting	24
<i>Dominik J. Naczynski, Tamar Andelman, Richard E. Riman, Charles M. Roth, Prabhas V. Moghe</i>	
Uptake and Clearance of Spherical Gold Nanoparticles in 3D Liver Mimics	25
<i>Christopher J. Detzel, Padma Rajagopalan</i>	
Cellular Viability After Electrostatic Deposition of Electrospayed Nanoparticles	26
<i>Hedieh Saffari, Alexander Malugin, Hamid Ghandehari, Leonard F. Pease III</i>	
Responsive and Targeted Nanoparticles for Intracellular Delivery	27
<i>Weiwei Gao, Robert S. Langer, Omid C. Farokhzad</i>	
Tuning T Cell Responses by Multi-Functional Nanoparticles	28
<i>Hong Shen, Kenny K. Tran, Patrick S. Stayton, Anthony J. Convertine</i>	
Biodegradable Nanoparticles with Sustained Release of Functional siRNA in Skin	29
<i>Gunilla B. Jacobson, Emilio Gonzalez-Gonzalez, Ryan Spitler, Rajesh Shinde, Devin Leake, Roger L. Kaspar, Christopher H. Contag, Richard N. Zare</i>	
Antimicrobial Activity of Zinc Oxide Nanoparticles & Zinc Oxide Powder On Different Gram (-) Ve and Gram (+) Ve Bacteria	30
<i>Shilpa Newati, Sarita Sachdeva, Varsha M. Singh, Riaz A. Khan</i>	

Comparative Evaluation of Transitional Cell Carcinoma Treatments	31
<i>W. T. Godbey, Xiujuan Zhang</i>	
Formulation, Characterization and Evaluation of Curcumin-Loaded γ-Cyclodextrin Liposomal Nanoparticles On Osteosarcoma Cell Lines	32
<i>Santosh Subhashrao Dhule, Patrice Penformis, Trivia P. Frazier, Ryan W. Walker, Grace Tan, Jibao He, Radhika Pochampally, Vijay T. John</i>	
Sustained, Targeted Intraocular Delivery of Therapeutics for the Treatment of Age-Related Macular Degeneration	33
<i>Rangaramanujam M. Kannan, Bharath Raja Guru, Raymond Iezzi, Manoj K. Mishra</i>	
Synthetic Zwitterlation of Enzymatic Proteins for Stability and Retained Enzymatic Kinetics	34
<i>Andrew J. Keefe, Shoayi Jiang</i>	
Functionalized Alumina Particles for pH-Responsive Drug Delivery	35
<i>Brad Gordon, Daniel Lim, Ezinne Achinivu, Charles E. Luckett, Sheryl H. Ehrman, Douglas S. English</i>	
Cell Type-Dependent Uptake of PEGylated Nanoparticles	36
<i>Kenny K. Tran, Alyssa Sheih, Hong Shen</i>	
The Sound of Silence. Multiscale Molecular Simulations and Experiments in Developing Nanocarrier/Nucleic Acid Systems	37
<i>Sabrina Priel, Paola Posocco, Maurizio Ferneglia, Kostantinos Karatasos, Ling Peng, Dave K. Smith</i>	
Functional Magnetic Nanoparticles for Efficient Malaria DNA Vaccine Delivery	38
<i>Fatin M. Nawwab Al-Deen, Jenny Ho, Cordelia Selomulya, Charles Ma, Ross Coppel</i>	
Targeted Virus Nanoparticles for Localized Chemotherapy of Breast Cancer	47
<i>Fang Wei, Kellie I. McConnell, Tse-Kuan Yu, Junghae Suh</i>	
Magnetic Hydrogel Nanocomposites for Synergistic Chemotherapy and Hyperthermia-Based Treatment of Cancer	48
<i>Samantha A. Meenach, J. Zach Hilt, Kimberly W. Anderson</i>	
Method to Synthesize, Optimize and Characterize Smart Multi-Functional Magnetic Nanoparticles for Cancer Targeting	49
<i>Bhushan Shinde, Rachna Rastogi, Veena Koul, Ashok Bhaskarwar</i>	
Nanopolyplexes - Responsive Multipurpose Delivery Vehicles	60
<i>Hitesh G. Bagaria, Michael S. Wong</i>	
Dendrimer-Based Nanodevices for the Treatment of Neuroinflammation in Cerebral Palsy	61
<i>Rangaramanujam M. Kannan, Raghavendra Navath, Hui Dai, Bindu Balakrishnan, Roberto Romero, Sujatha Kannan</i>	
Synthetic Platelets for Biomedical Applications	62
<i>Nishit Doshi, Jennifer Orje, Zaverio Ruggeri, Samir Mitragotri</i>	
Nanobiosensors	64
<i>Ajit Sadana</i>	
Use of Naturally-Occurring Halloysite Nanotubes for Enhanced Capture of Cancer Cells From Blood	65
<i>Andrew D. Hughes, Michael R. King</i>	
Functionalizable and Ultra Stable Nanoparticles Coated with Zwitterionic Poly(carboxybetaine) in Undiluted Blood Serum	66
<i>Wei Yang, Shaoyi Jiang</i>	
Negatively Charged Gold Nanoparticles Can Inhibit the Formation of Alzheimer's Disease Amyloid-B Protein Aggregates in a Mechanism-Specific Fashion	67
<i>Deborah Soto-Ortega, Stephanie Paolini, Alaaldin Alkilany, Rahina Mahtab, Catherine Murphy, Melissa A. Moss</i>	
Production of Robust Virus-Like Particles Via Disulfide-Bond Cross-Linking	69
<i>Bradley C. Bundy, James R. Swartz</i>	
Novel Polyurethane/Carbon Nanofiber Composites for Bladder Cancer Applications	70
<i>Melissa Tsang, Young Wook Chun, Thomas J. Webster</i>	
Guanidylamidated PEI as Ovarian Cancer Gene Therapy Vectors	78
<i>Bo Zhang, Xinpeng Ma, Jianbin Tang, Maohong Fan, Edward Van Kirk, William Murdoch, Youqing Shen</i>	
Fabrication of Nanobiosensors	79
<i>Ajit Sadana</i>	
Size Control for Fluorescent Polymeric Nanosensors	80
<i>Kevin J. Cash, J. Matthew Dubach, Mary K. Balaconis, Heather A. Clark</i>	
Nanobiosensor Applications	81
<i>Ajit Sadana</i>	
Resolving Subdiffraction Limit Distances Using Plasmon Coupling Microscopy	82
<i>Bjoern Reinhard</i>	
Optical Sensing of Acetone in Exhaled Breath Utilizing Acid Catalyst Membranes	83
<i>Adam D. Worrall, Jonathan A. Bernstein, Anastasios Angelopoulos</i>	

Transverse Relaxivities of Polyether-Magnetite Complexes: The Effect of Polymer Loading and Composition	84
<i>Richey M. Davis, Matthew R.J. Carroll, P.P. Huffstetler, William C. Miles, J.D. Goff, J.S. Riffle, Robert C. Woodward, Timothy G. St. Pierre</i>	
Author Index	