

Nanoscale Science and Engineering Forum

Presentations at the 2008 AIChE Annual Meeting

**Philadelphia, Pennsylvania
16 - 21 November 2008**

ISBN: 978-1-61567-234-9

Printed from e-media with permission by:

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

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

Copyright© (2008) by AIChE
All rights reserved.

Printed by Curran Associates, Inc. (2009)

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

TABLE OF CONTENTS

o5β1-Targeted Stealth Liposomes for Delivery of DNA to Cancer Cells	1
<i>Alison W. Tisdale, Alice Hsu, R. Scott McIvor, Efrosini Kokkoli</i>	
ABC Triblock Copolymer Micelleplexes for Potent Gene Silencing and In Vivo Tumor Targeting.....	2
<i>Dana J. Gary, Rahul Sharma, You-Yeon Won</i>	
Rgd-Targeting of PAMAM Dendrimers for Efficient Delivery of siRNA to Malignant Glioblastoma Cells	3
<i>Carolyn L. Waite, Sarah M. Sparks, Kathryn E. Uhrich, Charles M. Roth</i>	
Drug Release Kinetics from Dendritic Nanodevices for Sustained Delivery	5
<i>Yunus Emre Kurtoglu, Rangaramanujam M. Kannan</i>	
Design of a Multivalent Binding Platform for Enhanced Non-Viral Gene Transfer to αvβ3 Expressing Cells	6
<i>Quinn Ng, Tatiana Segura</i>	
Preparation and Stabilization of Biodegradable Cationic Polyelectrolyte Complexes for Targeted Drug Delivery	7
<i>Sameer Davé, Anagha Bhakay, Rajesh Dave, Habibe Karacay</i>	
Prodrug Conjugates to Improve the Delivery Capacity of Nanoparticles for Protein Therapeutics.....	8
<i>Marian E. Gindy, Robert K. Prud'homme</i>	
The Design of Functional Nanostructured Materials	9
<i>Ravi S. Kane</i>	
Getting around the Innate Immune Response - Nanoscale Insights into Shape, Flexibility, and the 'marker of Self' System	10
<i>Dennis E. Discher</i>	
Drug Delivery and Imaging Using Nanoparticles Produced by Block-Copolymer Directed Flash Nanoprecipitation	11
<i>Robert K. Prud'homme</i>	
Synthesis of Aligned Carbon Nanotubes on Double-Sided Metallic Substrate by ChEmical Vapor Deposition	12
<i>Huan Wang, Ji Yun Feng, Xi Jun Hu, Ka M. Ng</i>	
Vapor Grown Carbon Fiber - Microfibrous Matrix Composites	34
<i>Amogh N. Karwa, Bruce Tatarchuk, Virginia A. Davis</i>	
Catalyzed Growth of Nascent Caps of Single-Wall Carbon Nanotubes of Various Chiralities	35
<i>Diego Armando Gomez-Gualdrón, Perla B Balbuena</i>	
Single-Walled Carbon Nanotube (SWNT) Diameter Tuning Using C10 Co-Mcm-41	36
<i>Nan Li, Xiaoming Wang, Gary L. Haller, Lisa D. Pfefferle</i>	
Ostwald Ripening-Induced Termination of Carbon Nanotube Growth	37
<i>Placidus B. Amama, Cary L. Pint, Laura McJilton, Terry P. Murray, Robert H. Hauge, Benji Maruyama</i>	
A Mechanochemical Model of Growth Termination In Vertical Carbon Nanotube Forests and Experimental Approaches toward Infinite Film Synthesis	38
<i>Jae-Hee Han, Charles Robert Welch, Charles P. Marsh, Thomas A. Carlson, Michael S. Strano</i>	
Targeting Single-Walled Carbon Nanotubes for the Treatment of Breast Cancer	39
<i>Roger G. Harrison, Luis F. F. Neves, Yahya A. Lazrak, David E. Martyn, Peter S. McFetridge, Daniel E. Resasco, Kenneth E. Bartels</i>	
Polymersomes as Carriers for Genetic and Protein Therapeutics.....	40
<i>David A. Christian, Shenshen Cai, Diana M. Bowen, Younghoon Kim, J. David Pajerowski, Dennis E. Discher</i>	
Immune-Evasion of Viruses and Nanoparticles as a Result of 'Self' Mimicry.....	41
<i>Richard Tsai, Dennis E. Discher</i>	
Novel Architecture for Dendritic Cell-Targeted Vaccines.....	42
<i>Jordi Mata-Fink, K. Dane Wittrup</i>	
Remotely Triggered Liposome Release by near Infrared Light Absorption Via Hollow Gold Nanoshells	43
<i>Guohui Wu, Alexander Mikhailovsky, Hiet Khant, Wah Chiu, Joesph A. Zasadzinski</i>	
Surface Modification of Hydrophobic Nanoparticles and Its Biological Application	44
<i>Rui Shen, Hong Yang</i>	
Synthesis and Evaluation of Cationic Beta-Cyclodextrin Nanogels for Drug Delivery across the Blood Brain Barrier	45
<i>Linfeng Wu, Tao L. Lowe</i>	
Biomolecules Versus Plain Adhesion Molecules for Larger-Scale Targeting: An Unconventional Perspective	46
<i>Maria M. Santore</i>	
Polymersomes for Delivery, Release and Cell Tracking	47
<i>Daniel A. Hammer</i>	
Optical Modulation of Single Walled Carbon Nanotubes for Life Science and Biomedical Applications.....	48
<i>Michael S. Strano</i>	

Characterization of Length Fractionated Single Walled Carbon Nanotubes	49
<i>Jeffrey A. Fagan, Matthew L. Becker, Jeffrey R. Simpson, Jaehun Chun, Barry J. Bauer, Angela R. Hight Walker, Erik K. Hobbie</i>	
Solution Phase Processing of Carbon Nanotubes with Optoelectronic Tweezers	50
<i>Peter Pauzauskis, Arash Jamshidi, Joe Zaug, Justin Valley, Joe Satcher Jr., Ming Wu</i>	
Improving the Effectiveness of Interfacial Trapping	51
<i>Randy K. Wang, Wei-Chiang ChEn, Kirk J. Ziegler</i>	
Viscoelasticity and Stability of Single Walled Carbon Nanotube – Unsaturated Polyester Resin Dispersions	52
<i>Matthew J. Kayatin, Virginia A. Davis</i>	
Covalent Functionalization of Single Walled Carbon Nanotubes Alters Their Densities Allowing Electronic and Other Types of Separation.....	53
<i>Woo-Jae Kim, Nitish Nair, Chang Young Lee, Michael S. Strano</i>	
Antenna Chemistry with Metallic Single-Walled Carbon Nanotubes.....	54
<i>Juan G. Duque, Matteo Pasquali, Howard K. Schmidt</i>	
Synthesis of High Mechanical Strength Silica Films In Supercritical CO₂, Utilizing Blends of POSS-Paa Copolymers and PEO-B-PPO-B-PEO Triblock Copolymers as Templates	55
<i>Alvin H. Romang, James J. Watkins</i>	
Three Dimensional Inorganic Nanoarrays Created by Electrodeposition through a Crystalline Protein Monolayer	56
<i>Daniel B. Allred, Anchi ChEng, Mehmet Sarakaya, Francois Baneyx, Daniel T. Schwartz</i>	
Peptide-Mediated Deposition of Nanostructured TiO₂ into the Periodic Structure of Diatom Biosilica	58
<i>Clayton Jeffryes, Timothy Gutu, Jun Jiao, Gregory L. Rorrer</i>	
Tud-C: A Tunable, Hierarchically Structured Mesoporous Zeolite Composite	59
<i>Jia Wang, Marc-Olivier Coppens</i>	
Confined Synthesis of Silicalite-1 Nanocrystals In Threedimensionally Ordered Mesoporous Carbon	60
<i>Wei Fan, Sandeep Kumar, Yoo Won Choel, Andreas Stein, R. Lee Penn, Michael Tsapatsis</i>	
Microporous Silicate Nucleation and Growth: Mechanistic Investigations toward Rational Design of Nanocrystalline Materials.....	61
<i>Jeffrey D. Rimer, Alexandra Navrotsky, Dion Vlachos, Raul F. Lobo</i>	
Investigation of the Effect of Synthesis Sol Composition on Silicalite-1 Crystallization Using ATR / FTIR Spectroscopy.....	63
<i>Vladimiro Nikolakis, Agnelos Patis, Vassiliou Dracopoulos</i>	
Molecular Interactions Between Structure-Directing Organic Molecules, Fluoride Species, and Siliceous Zeolite Frameworks Established by Two-Dimensional NMR	65
<i>Ramzy M. Shayib, Sylvian Cadars, Stacey I. Zones, Allen Burton, Bradley F. Chmelka</i>	
Dissolution-Rate Enhancement of Fenofibrate by Adsorption Onto Silica Using Supercritical Carbon Dioxide	66
<i>Ganesh Sangwanwar, Ram B. Gupta</i>	
Mathematical Modeling of Delivery of ChEmotherapy Drugs to Human Tissues: An Analytical Approach.....	67
<i>Dwaipayan Mukherjee, Saikat Chakraborty</i>	
Modeling Skin Permeation with Quantitative Structure-Property Relationships	74
<i>B. J. Neely, S. Golla, E. a. Whitebay, S. V. Madihally, R. L. Robinson Jr., K. a. M. Gasem</i>	
Modeling Local Pharmacokinetics in Drug-Eluting Stents: The Coupling Effects of Luminal Flow, Transmural Flow and Drug Binding.....	75
<i>Jahid Ferdous, Chuh Khiun Chong</i>	
Assessment of the Time Required for Controlled-Release Devices to Reach Steady State	76
<i>Laurent Simon</i>	
A Study of the Release of Doxorubicin in Porous Alumina	77
<i>Bradley R. Gordon, Charles E. Luckett, Douglas S. English, Sheryl H. Ehrman, Daniel D. Lim</i>	
Controlling and Manipulating Supported Phospholipid Monolayers as Soft Resist Layers for Fabricating ChEmically Micropatterned Surfaces	78
<i>Chang-Ying Xue, Kun-Lin Yang</i>	
Scalable Meniscus-Directed Fabrication of Assemblies from Microspheres and Nanoparticles on Hydrophobic and Superhydrophobic Surfaces	79
<i>Vinayak Rastogi, Daniel M Kuncicky, Lindsey B Jerrim, Orlin D. Velev</i>	
Centerline Placement and Alignment of Carbon Nanotubes In Cylindrical Droplets of Nanometer Diameter	80
<i>Richa Sharma, Michael S. Strano</i>	
Large-Scale Fabrication of Sub-100 Nm Periodic Nanostructures by Spin-Coating	81
<i>Chih-Hung Sun, Wei-Lun Min, Peng Jiang</i>	
Fabrication of Polymeric Nanochannel/microwell Arrays by DNA Combing and Imprinting	82
<i>Jingjiao Guan, Ly James Lee</i>	
Attachment of Single Bacterium Cell, DNA and Single Molecules on ChEmically Modified Graphene Sheets: Avenue to Build Smart Electrochemical Circuitry.....	83
<i>Nihar Mohanty, Vikas Berry</i>	

Dispersion of Nanoclay in Linear Low-Density Polyethylene (LLDPE) and Maleated Linear Low-Density Polyethylene (LLDPE-g-MA) in Supercritical Carbon Dioxide	84
<i>Matthew Factor, Sunggyu Lee</i>	
Biodistribution of Dendrimer-Based Nanodevices for Brain Delivery of Therapeutics	92
<i>Rangaramanujam M. Kannan, Hui Dai, Sujatha Kannan, Roberto Romero</i>	
Nanoscale Reversible Loading and Unloading In Layer-by-Layer “Exponential” Polymer Films	94
<i>Sudhanshu Srivastava, Vincent Ball, Paul Podsiadlo, Peter Ho, Nicholas Kotov</i>	
Glassy Worms: From Rheology to Solvent Tuned Flexibility and Nano-Molded Rods	95
<i>Kandaswamy Vijayan, Andre E. Brown, Karthikan Rajagopal, Dennis E. Discher</i>	
Molecular Dynamics In Amorphous Polymers and Self-Assembling Molecular Glasses	96
<i>Daniel B. Knorr Jr., Jason P. Killgore, Rene M. Overney</i>	
Reorientational Dynamics of Pegylated Dendrimers.....	97
<i>Sanja Ristic, Jovan Mijovic</i>	
Nano-Sized Bioactive Glass In a Biodegradable Polymer: How Advantageous Is Nano-Size?	98
<i>Dirk Mohn, Tobias J. Brunner, Superb K. Misra, Aldo R. Boccaccini, Wendelin J. Stark</i>	
Nanorods Modulate Cell Adhesion and Survival.....	100
<i>Jiyeon Lee, Byung Hwan Chu, Fan Ren, Benjamin Keselowsky, Tanmay Lele</i>	
Assessment of Cell-Material Interactions on 3D Nanostructured Titania-Polymer Surfaces towards the Improvement of Osseointegration of Orthopedic and Dental Implants.....	101
<i>Jason Howard, Shraddha Patel, Jeffery Fontenot, Stephen McMullen, Austin Thompson, Jillann Walker, David K. Mills, Scott A. Gold</i>	
Optimization of Preosteoblast Proliferation Rate on Whey Protein Gels for Bone Tissue Regeneration	106
<i>Mia Dvora, James E. Henry</i>	
Enhanced Osteoblast Adhesion, Proliferation and Differentiation on Nanocrystalline Diamond Coatings.....	107
<i>Lei Yang, Thomas J. Webster, Brian W. Sheldon</i>	
Self-Assembled, Nanometer-Rough Cartilage Sealants for Orthopaedic Applications.....	114
<i>Yupeng ChEn, Rajesh A. Pareta, Hicham Fenniri, Thomas J. Webster</i>	
Control of Nanoscale Flow in Thin Wetting Films by Electric Field.....	122
<i>Jairus Kleinert, Sejong Kim, Orlin D. Velev</i>	
Electric Field-Assisted Convective Assembly of Large-Domain Colloidal Crystals	123
<i>Jairus Kleinert, Sejong Kim, Orlin D. Velev</i>	
Design of An Efficient Quartz Crystal Nanobalance: a Finite Element Study.....	124
<i>Reetu Singh, Venkat Bhethanabotla</i>	
The Electrical Conductivity Properties of Polythiophene/TiO₂ Nanocomposites Prepared In the Presence of Surfactants	131
<i>Ayse Gul Yavuz, Aysegul Uygun, Songul Sen</i>	
A Mechano-ChEmical Model of Growth Termination In Vertical Carbon Nanotube Forests	132
<i>Jae-Hee Han, Charles Robert Welch, Charles P. Marsh, Thomas A. Carlson, Michael S. Strano</i>	
Electronically Homogeneous Semiconducting Single-Walled Carbon Nanotubes Solid Bundles	133
<i>Jae-Hee Han, Ryutichiro Maruyama, Woo-Jae Kim, Chang Young Lee, Jong Hyun Choi, Daniel A. Heller, Michael S. Strano</i>	
Dynamics of Surfactant-Suspended Single Walled Carbon Nanotubes In a Centrifugal Field	134
<i>Nitish Nair, Woo-Jae Kim, Richard D. Braatz, Michael S. Strano</i>	
Annealing Studies on Functionalized Metallic Single-Walled Carbon Nanotube Thin Film	135
<i>Woo-Jae Kim, Michael S. Strano</i>	
Modeling Sustained Chain Reactions In Carbon Nanotubes	136
<i>Nitish Nair, Michael S. Strano</i>	
A Quantitative Description of Absolute Endocytosis and Exocytosis Rates of Nanoparticles	137
<i>Hong Jin, Daniel A. Heller, Richa Sharma, Michael S. Strano</i>	
Synthesis and Surface ChEmistry of Oligonucleotide-Templated Nanocrystals	138
<i>Jong Hyun Choi, Kok Hao ChEn, Jae-Hee Han, Amanda Chaffee, Alice Chang, Michael S. Strano</i>	
Nanotherapeutic Design Using Predictions of Nanoparticle-Protein Interactions	139
<i>Esther S. Jeng, Michael S. Strano</i>	
Thermal Anisotropy In Carbon Nanotubes Measured by Transient Thermotransmittance and Anisotropic Effects on Reaction Rates In Composites	140
<i>Joel T. Abrahamson, Nitish Nair, Michael S. Strano</i>	
Centerline Placement and Alignment of Single Carbon Nanotubes In Cylindrical Droplets of Nanometer Diameter	141
<i>Richa Sharma, Michael S. Strano</i>	
Complexity In Nanocrystal Self-Assembly: Size Mixing, Rods, Disks, Triangles, and Multiple Length Scales.....	142
<i>Brian A. Korgel</i>	
Physiological Cellular Reaction Detection on Biosensor Surfaces. A Fractal Analysis	143
<i>P. Archer Davis, Ifejesu A. Eni-olorunda, Ajit Sadana</i>	
Nanocomposites from An Amorphous Polyamide: Effect of Organoclay Structure on Morphology and Properties	144
<i>Youngjae Yoo, D. R. Paul</i>	

Degradable Nanoparticles as Alternative Ultraviolet Radiation Filters for Sunscreens	145
<i>Samuel C. Halim, Ludwig K. Limbach, Tobias J. Brunner, Stefan Loher, Evangelos K. Athanassiou, Robert N. Grass, Neil Osterwalder, Norman A. Luechinger, Fabian Koehler, Wendelin J. Stark</i>	
Static and Dynamic Properties of Molecularly Thin Perfluoropolyether Films	146
<i>Pil Seung Chung, Myung S. Jhon</i>	
Rheology and Tribology of the Nano-Scale Confined Polymeric Thin Films Using Molecular Dynamics	147
<i>Pil Seung Chung, Myung S. Jhon</i>	
A Novel Heat Transfer Model for Ultrashort Laser Heating on Metals	148
<i>Dehee Kim, Sartaj S. Ghai, Myung S. Jhon</i>	
Fluorescent Gold Nanoparticle for Bio-Imaging	150
<i>Chang-won Lee, Agnes E. Ostafin</i>	
A Simple Methodology for Producing Super-Hydrophobic Composite Films on Various Substrates	153
<i>Panagiotis Manoudis, Ioannis Karapanagiotis, Andreas Tsakalof, Ioannis Zuburtikidis, Costas Panayiotou</i>	
Enhanced Thermal Stability of Biodegradable Poly(3-hydroxybutyrate)/Layered Silicate Nanocomposites	160
<i>Ioannis Zuburtikidis, Sotirios I. Marras, Kyriaki Tornikidou, Athanasia Tsimpliaraki, Elpiniki Panayiotidou, Georgia Christofidou</i>	
Synthesis and Characterization of Protogenic Liquid Crystals	167
<i>Supacharee Roddecha, Mitchell Anthamatten</i>	
Self Assembly of Biomolecules at Nano Scales-Structure and Kinetics	168
<i>Weixian Shi, Ronald G. Larson</i>	
Surface Coated Iron Particles for Magnetorheological Grease (MRGr)	169
<i>Alan Fuchs, Joko Sutrisno, Faramarz Gordaninejad, Husein Sahin</i>	
Disperse Barium Oxide Nanoislands Synthesized on Aluminum Oxide by Successive Ionic Layer Deposition	170
<i>Thomas I. Gilbert, Johannes W. Schwank</i>	
Effect of Crystallization Growth Inhibitors in the Synthesis of Sapo-34	171
<i>Surendar Reddy Venna, Moises A Carreon</i>	
Formation of Fractal Structures from Self-Assembling Dipeptide Derivatives	172
<i>Weiping Wang, Siamrut Patanavanich, Ying Chau</i>	
Monolithic Tunnel Junctions for Single Molecule Detection	173
<i>Rahul Gupta, Brian G. Willis</i>	
Confined Nanoparticle Solutions for Nanotribological Applications	174
<i>Ramesh ChEmbeti, Jee-Ching Wang</i>	
Comparing Mixing Quality of Nanosized Particles by Environmentally Benign Mixing Techniques	178
<i>James V. Scicolone, Rajesh Dave</i>	
Permeability Control of Nanoparticle-Assembled Capsules	179
<i>Hitesh G. Bagaria, Michael S. Wong</i>	
Nanoscale Sensors for Multi-Modal Detection of Genotoxic Agents	180
<i>Daniel A. Heller, Hong Jin, Michael S. Strano</i>	
Integrated Plasmonic Lens Photodetector	181
<i>James A. Shackleford, Richard Grote, Mark Currie, Jonathan Spanier, Bahram Nabet</i>	
Preparation of Anodic Aluminum Oxide Membrane for the Template Synthesis of Semiconductor Nanowires	182
<i>Chang Hyun Ko, Sung-Youl Park, Kwang Bok Yi, Jong-Ho Park, Jong-Nam Kim</i>	
Ligand Exchange Using Alkosilanes on Oleic Acid-Cobalt Ferrite Nanoparticles	183
<i>Victoria L. Calero-DiazdelCastillo, Carlos Rinaldi</i>	
Smart Micro- and Nanostructured Hydrogels for Biomedical Applications Synthesized Via Pcapc	184
<i>Hariharasudhan D. Chirra, J. Zach Hilt, Dipti Biswal</i>	
Optical Tracking of Monodisperse Magnetite Nanoparticles	185
<i>Arjun Prakash, Michail Stamatakis, Christopher J. Jones, J.T Mayo, Matteo Pasquali, Vicki L. Colvin</i>	
The Influence of Electric and Electromagnetic Fields on Water Self-Diffusion within Carbon Nanotubes Implanted In Lipid Membranes	186
<i>J.M.Don MacElroy, Jose-Antonio Garate, Niall J. English</i>	
Mass Transport through Carbon Nanotube Membranes In Three Different Regimes: Ionic, Liquid and Gas	187
<i>Mainak Majumder, Bruce J. Hinds</i>	
Crossover from Fickian to Single-File Diffusion of Fluids Confined In Carbon Nanotubes	188
<i>Ying-Chun Liu, Joshua D. Moore, Thomas R. Roussel, Qu ChEn, Qi Wang, Keith E. Gubbins</i>	
Pressure Gap In Carbon Nanomaterials? Effect of Temperature and Pressure on the Binding of Simple Molecules to Carbon Nanotubes	190
<i>Dmitry V. Kazachkin, Yoshifumi Nishimura, Stephan Irle, Keiji Morokuma, Radisav Vidic, Eric Borguet</i>	
Atomic-Scale Analysis of the Interactions Between Atomic Hydrogen and Multi-Walled Carbon Nanotubes	191
<i>Andre R. Muniz, Tejinder Singh, Michael J. Behr, Eray S. Aydil, Dimitrios Maroudas</i>	
Characterization of Alkali Metal Doped Carbon Nanotubes	192
<i>Li Xiao, J. Karl Johnson, Michael Buettner, John T. Yates</i>	

Facilitating Density-Based Electronic-Type Separation of Carbon Nanotubes Via ChEMical Reactions: A Modeling Study	193
<i>Niitish Nair, Woo-Jae Kim, Monica Usrey, Michael S. Strano</i>	
Effects of Nanoparticle Size Polydispersity on Stability of the Double Gyroid Phase In a Tethered Nanoparticle System	194
<i>Carolyn L. Phillips, Christopher R. Iacovella, Sharon C. Glotzer</i>	
Ordering of Nanoparticles Mediated by End-Functionalized Triblock Copolymers	195
<i>Rastko Sknepnek, Joshua A. Anderson, Monica H. Lamm, Joerg Schmalian, Alex Travesset</i>	
Two-Dimensional Assembly of Aqueous Colloidal Metallic Nanowires at Surfaces	196
<i>Derek A. Triplett, Lisa M. Dillenback, Benjamin D. Smith, Christine D. Keating, Kristen A. Fichthorn</i>	
Effect of Confinement and Internanoparticle Forces on the Nanoparticle Structuring and Ordering	197
<i>Younjin Min, Mustafa Akbulut, Yuval Golan, Joseph A. Zasadzinski, Jacob N. Israelachvili</i>	
The Role of Alpha-Helix Formation In the Self-Assembly of Protein-Analogous Micelles	198
<i>Mark Kastantin, Matthew Tirrell</i>	
The Significance of Sphere-to-Rod Transition Kinetics of Tri-Block Copolymer Micelles for the Synthesis of Mesoporous Silica Materials	199
<i>Antonia G. Denkova, Eduardo Mendes, Marc-Olivier Coppens</i>	
Liposomal Nanoparticles Prepared by Nanoscale Directed Assembly for Delivery of Oligonucleotide Therapeutics	200
<i>Jingjiao Guan, Megan Lynn Cavanaugh, Weibin Zha, Ly James Lee</i>	
Forum Award Lecture - One Dimensional Nanomaterials and Their Applications	201
<i>M. Meyyappan</i>	
Nanomaterials for Drug Delivery	202
<i>Samir Mitragotri</i>	
Colloidal Nanoparticles: Synthesis and Applications	203
<i>Darrell Velegol</i>	
Controlled Aggregation of Iron Oxide Nanocrystals for Preparation of Magnetic Resonance Imaging Contrast Agents	204
<i>Marian E. Gindy, Theodore Wolfson, Carlos R. N. Pacheco, Victoria Calero, Carlos Rinaldi, Robert K. Prudhomme</i>	
In Vitro Toxicity and Intracellular Uptake of Flame Synthesized Iron Oxide Nanoparticles: An Alternative to Wet Synthesis Methods	205
<i>Kivilcim Buyukhatipoglu, Tiffany A. Miller, Alisa Morss Clyne</i>	
Synthesis and Characterization of Functionalized Magnetic Iron Oxide Nanoparticles	211
<i>Reynolds A. Frimpong, J. Zach Hilt</i>	
Colloidal Stability of Polyether-Stabilized Magnetite Nanoparticles In Aqueous Media	212
<i>Richey M. Davis, William C. Miles, Judy S. Riffle</i>	
Are Carbon Coated Metal Nanoparticles a High Magnetization Alternative to Oxide Based Beads?	213
<i>Robert N. Grass, Wendelin J. Stark</i>	
Preparation of Biocompatible MAGNETIC COLLOIDS from Supercritical Fluid Extraction of Emulsion	214
<i>Marco Furlan, Johannes Kluge, Marco Lattuada, Francesco Fusaro, Marco Mazzotti, Massimo Morbidelli</i>	
Self-Assembled Polyelectrolyte Films for Nonlinear Optics: Study of Film Structure, Composition and Kinetics of Film Formation	215
<i>Akhilesh Garg, Richey M. Davis</i>	
Analyzing Photoresponsive Side Chain Dendritic Polyesters (SCDPE) Using Atomic Force Microscopy (AFM)	216
<i>Joshua J. Galgano, David G. Rethwisch, Alexei V. Tsvanski</i>	
Theory of Polyelectrolyte Adsorption Onto Surfaces Patterned with Charge and Topography	217
<i>Nazish Hoda, Satish Kumar</i>	
Engineering Robust Omnipiphobic Surfaces with Fluoro-POSS	218
<i>Anish Tuteja, Wonjae Choi, Joseph M. Mabry, Gareth H. McKinley, Robert E. Cohen</i>	
Patchy and Striped Phase Separation In Surfactant-Coated Surfaces	220
<i>ChEtana Singh, Sharon C. Glotzer</i>	
Self-Organized Pattern Formation In Dewetting of Elastically Confined Thin Polymer Layer	221
<i>Danish Faruqui, Ashutosh Sharma</i>	
Nanosculpting of Electrodeposited Multilayered Nanowires and Nanotubes	223
<i>Maoshi Guan, Elizabeth J. Podlaha</i>	
Templated Directed Electrodeposition of SnO₂-Nanotubes	230
<i>Min Lai, Syed Mubeen, Jae-Hong Lim, Ashok Mulchandani, Marc A. Deshusses, Nosang V. Myung</i>	
Gold and Palladium Deposition on the Genetically Engineered Tobacco Mosaic Virus with Controlled Metal Ion Loading	231
<i>Jung-Sun Lim, Sang-Yup Lee, James N. Culver, Michael T. Harris</i>	
Epitaxial Growth of InP Nanowires on Silicon	232
<i>Li Gao, R. L. Woo, R. F. Hicks</i>	
Self-Catalysis Schemes for Group III-Antimonide Nanowires: Antimony Versus Group III Metal	233
<i>Chandrashekhar Pendyala, Mahendra K. Sunkara</i>	

Synthesis of Metallic Nanostructures Using Mesoporous Templates and Supercritical CO₂ as Reaction Medium	234
<i>Candy S. Lin, Frank Leung-Yuk Lam, Xijun Hu, Wing Yim Tam, Ka M. Ng</i>	
The Assembly of Microwires from Monomeric Solution of Nanoparticles Using Dielectrophoresis.....	235
<i>Ryan P. Slopek, James F. Gilchrist</i>	
Combined Electric and Magnetic Field-Driven Assembly of Magnetic Janus Particles.....	236
<i>Stoyan K. Smoukov, Sumit Gangwal, Orlin Velev</i>	
Self-Assembly of Ditetethered Nanospheres and Comparison with Triblock Copolymer Mesophases	237
<i>Christopher R. Iacovella, Sharon C. Glotzer</i>	
Theoretical Prediction of Branched-Tail Surfactant Micellization In Dilute Aqueous Solutions Using Computer Simulations and Molecular Thermodynamics	238
<i>Shangchao Lin, Jonathan D. Mendenhall, Daniel Blankschtein</i>	
Molecular Modeling of the Self-Assembly of Amphiphilic Molecules Using Interfacial Statistical Associating Fluid Theory (iSAFT) Density Functional Theory	239
<i>Chris Emborsky, Kenneth R Cox, Shekhar Jain, Adam Bymaster, Zhengzheng Feng, Walter G Chapman</i>	
Elasticity of Chains of Paramagnetic Colloidal Particles.....	240
<i>Dichuan Li, Sibani Lisa Biswal</i>	
Mechanical Properties and Microstructure of Triblock Copolymer Network: DPD Simulation Study	241
<i>Yelena Sliozberg, Jan Andzelm, Mark VanLandingham, John K. Brennan, Victor Pryamitsyn, Venkat Ganeshan</i>	
Young Investigator Award Lecture - the Design of Nanoscale Polyvalent Therapeutics.....	242
<i>Ravi S. Kane</i>	
Nanoporous Membranes: Fabrication, Analysis, and Applications	243
<i>Sankar Nair</i>	
Microplasma Techniques for Nanoparticle Synthesis.....	244
<i>R. Mohan Sankaran</i>	
Characterization Methods for Magnetic Nanoparticle Systems	245
<i>Cindi Dennis</i>	
On the Design of Stents for Implant Assisted Magnetic Drug Targeting.....	246
<i>Jan O. Mangual, Armin D. Ebner, James A. Ritter</i>	
Hybrid Nanomaterials for Molecular Imaging and Cellular Engineering	248
<i>Gang Ruan, Shuang Deng, Dhananjay Thakur, Ning Han, Jessica O. Winter</i>	
Quantification of Non-Specific Binding of Magnetic Nanoparticles: Implication for Detection and Magnetic Cell Separation.....	249
<i>Jeffrey Chalmers, Ying Xiong, Mei Shao, Xiaodong Tong, Sherif Farag, Maciej Zborowski</i>	
Magnetite Nanoparticle-Linked Immunosorbent Assay	250
<i>Lizeng Gao, Jianmin Wu, Liangliang Cao, Di Gao</i>	
In Situ Magnetic Separation and Immobilization of Rhodococcus Erythropolis LSSE8-1 for Dibenzothiophene Biodesulfurization.....	251
<i>Yuguang Li, Jianmin Xing, Huizhou Liu</i>	
Characterizing Interfacial Thermal Transitions In Polymer Nanocomposites	252
<i>Jason P. Killgore, Rene M. Overney</i>	
Application of Interfacial Statistical Associating Fluid Theory (iSAFT) to Tethered Polymers.....	253
<i>Shekhar Jain, Adam Bymaster, Walter G Chapman</i>	
Forces Between Nanorods with End-Adsorbed Chains In Polymer Melts	254
<i>Amalie L. Frischknecht</i>	
Fluids DFT Studies of Polymer Nanoparticle Thin Films.....	255
<i>Erin S. McGarry, Amalie L. Frischknecht, Michael E. Mackay</i>	
Effects of High Concentration of Polymeric Stabilizers for Poorly Water-Soluble Drug Suspensions.....	256
<i>Kapil V. Deshpande, Eric Jaycock, Frank Romanski, Fernando J. Muzzio</i>	
Lipid Bilayer Curvature and Pore Formation Induced by Charged Linear Polymers and Dendrimers: The Effects of Charge Density, Concentration, Molecular Size and Shape	257
<i>Hwankyu Lee, Ronald G. Larson</i>	
Underlying Mechanisms of Gold Catalyzed Silicon Nanowire Growth: First Principles-Based Atomistic Modeling	258
<i>Soohwan Lee, Gyeong S. Hwang</i>	
Dependence of Sensing Properties upon Metal Oxide Nanostructure.....	259
<i>Randy L. Vander Wal, Gordon M. Berger, Gary W. Hunter, Jennifer C. Xu</i>	
Exploration of Lead-Free Nanosolders for Nanowire Assembly	261
<i>Fan Gao, Subhadeep Mukherjee, Zhiyong Gu</i>	
Maskless Electrodeposited Contact to Organic Nanowires	262
<i>Carlos Hangarter, Youngwoo Rheem, Ashok Mulchandani, Wilfred ChEn, Marc A. Deshusses, Nosang V. Myung</i>	
Molecular Dynamics Simulations on the Elongation Properties of Gold Nanowires in Benzendithiol	263
<i>Qing Pu, Yongsheng Leng, Xiongce Zhao, Peter T. Cummings</i>	
Multifunctional Polymer Structures: Enabling Technology for Miniaturized Devices.....	264
<i>Joseph L. Lenhart</i>	

Biomolecular Sensing with Polyaniline-Poly(2-acrylamidomethylpropane sulfonic acid) Nanosystems	265
<i>Carolyn L. Bayer, Alper A. Konuk, Nicholas A. Peppas</i>	
Iontophoretic Transdermal Drug Delivery System Using a Conducting Polymeric Membrane	267
<i>Qiuxi Fan, Kamalesh K. Sirkar, Bozena Michniak</i>	
Delivery of Antibiotics and BMP-2 from Biodegradable Polyurethane Scaffolds	268
<i>Andrea E. Hafeman, Bing Li, K. L. Zienkiewicz, S. A. Guelcher</i>	
Purification of CD45+ Hematopoietic Cells Directly from Human Bone Marrow and Peripheral Blood Using a Flow-Based P-Selectin-Coated Microtube	269
<i>Srinivas Narasipura, Joel Wojciechowski, Brian Duffy, Jane L. Liesveld, Michael King</i>	
Supported Biomembranes at Micro- and Nanoscale Interfaces	270
<i>Bin He, M. Lane Gilchrist</i>	
Carbon Nanotube Electrochemical Photocathodes with Optical Rectenna Behavior	271
<i>Juan G. Duque, Howard K. Schmidt, Matteo Pasquali</i>	
Effect of Pore Size and Rope Size on the Mechanical Properties of Vapor Grown Carbon Nanofiber – Unsaturated Polyester Resin Nanocomposites	272
<i>Vinod K. Radhakrishnan, Matthew J. Kayatin, Robert L. Yuan, Virginia A. Davis</i>	
Electrochemical Double Layer Behavior on Vertically Oriented Cnt Electrodes	273
<i>Mainak Majumder, Bruce J. Hinds</i>	
Connecting Single Molecule Electrical Measurements to Ensemble Spectroscopic Properties for Quantification of Single-Walled Carbon Nanotube Separation	274
<i>Woo-Jae Kim, Chang Young Lee, Michael S. Strano</i>	
Electrically Homogeneous, Photonic Semiconducting Single-Walled Carbon Nanotubes Bundles In Solid Phase	275
<i>Jae-Hee Han, Ryuichiro Maruyama, Woo-Jae Kim, Chang Young Lee, Jong Hyun Choi, Daniel A. Heller, Michael S. Strano</i>	
Selective Enrichment of (n,m) Single-Walled Carbon Nanotubes Via Cosurfactant Extraction	276
<i>Yuan CheEn, Li Wei, Bo Wang</i>	
Kinetic Control of Self-Catalyzed Indium Phosphide Nano - Wires, Cones, and Pillars	277
<i>R. L. Woo, L. Gao, Suneel Kodambaka, Kang L. Wang, Niti Goel, Mantu K. Hudait, Robert F. Hicks</i>	
A Theoretical Study of Atomic Wires and Atomic Junctions Created on a Molybdenum Disulfide Surface	278
<i>Diana M. Otalvaro, Kian Soon Yong, Ravi K Tiwari, Mark Saeyns, Christian Joachim</i>	
Atomic-Scale Analysis of the Effects of Thermal Treatment and Loading Conditions on the Mechanical Properties of Ultra-Low-Dielectric-Constant Mesoporous Amorphous Silica Films	284
<i>M. Rauf Gungor, James J. Watkins, Dimitrios Maroudas</i>	
Optimization of New Ultralow-K Materials for Vlsi Multilevel Interconnection	285
<i>Xuan Li, James Economy</i>	
Characterization and Processing/Property Relationships of Semiconducting Polythiophene Nanotubes by Template Wetting Nanofabrication	286
<i>Steven D. Bearden Jr., Joseph Cannon, Scott A. Gold</i>	
Ultra-High Strength Due to Dislocation Depletion In Small-Volume Structures of Face-Centered Cubic Metals	290
<i>Kedarnath Kolluri, M. Rauf Gungor, Dimitrios Maroudas</i>	
Surface Effects on Oxygen Defects In TiO₂ for Nanoelectronic Materials	291
<i>Alice G. Hollister, Edmund G. Seebauer</i>	
Supramolecular Templating of Nanoporous Catalysts	292
<i>Jackie Y. Ying</i>	
Peptide Assembled Nanoparticles with Enzyme-Like Activity	293
<i>Joseph M. Slocik</i>	
Development of Functional Nano-Biocatalysts through Novel Nanostructured Materials	294
<i>Jinwoo Lee</i>	
Lipase Nanogel for Nonaqueous Biocatalysis	295
<i>Ge Jun, Lu Diannan, Wang Jun, Liu Zheng</i>	
Immobilization of <i>Candida Antarctica</i> Lipase B on Fumed Silica Nanoparticles	296
<i>Juan C. Cruz, Peter H. Pfromm, Mary E. Rezac</i>	
Modeling the Effect of a Crowding Agent on the Activity of Enzyme-Au Bioconjugates	297
<i>Francisco G. Vital-Lopez, Jacqueline Keighron, Christine D. Keating, Costas D. Maranas, Antonios Armaou</i>	
Self-Interaction Nanoparticle Spectroscopy: A Nanoparticle-Based Protein Interaction Assay	298
<i>Aditya Bengali, Moumita Bhattacharya, Peter M. Tessier</i>	
Silver-Copper Alloy Nanoparticles for Metal Enhanced Luminescence	299
<i>Sanchari Chowdhury, Venkat Bhethanabotla, Rajan Sen</i>	
Molecular Simulation Studies on Trapping Ions by a Nanoscale Paul Trap	304
<i>Xiongce Zhao, Predrag S. Krstic</i>	
Probing Nanoscopic Origins of Adsorbate-Driven Liquid Crystal Ordering Transitions Using Localized Surface Plasmon Resonance of Gold Nanodots	305
<i>Gary M. Koenig Jr., Nicholas L. Abbott</i>	

DNA Hybridization Detection Using Zinc Selenide Nanocrystals as Active Sensors.....	306
<i>Jun Wang, Tracy Heckler, Bing C. Mei, Pedro Lei, Stelios T. Andreadis, T. J. Mountzaris</i>	
Award Submission: Engineering Mucus Penetrating Particles for Transmucosal Delivery	308
<i>Samuel K. Lai, Ying-Ying Wang, Ming Yang, Amanda Pace, Benjamin C. Tang, Richard Cone, Justin Hanes</i>	
Award Session: Single-Walled Carbon Nanotube Optical Biosensors for Multi-Modal and Single Molecule Detection of Genotoxic Agents	309
<i>Daniel A. Heller, Hong Jin, Michael S. Strano</i>	
Award Submission: Targeting Colon Cancer Cells Using Pegylated Liposomes Modified with a Fibronectin-Mimetic Peptide	310
<i>Ashish Garg, Alison W. Tisdale, Efrosini Kokkoli</i>	
Award Submission: Morphology and Size-Controlled Self-Assembling of Enzyme-Responsive Peptides	311
<i>Weiping Wang, Ying Chau</i>	
Design Considerations for CdTe Nanotetrapods as Electronic Devices	312
<i>Stephanie L. Teich-McGoldrick, Mathieu Bellanger, Matthieu Caussanel, Leonidas Tsetseris, Sokrates Pantelides, Sharon C. Glotzer, Ron. D. Schrimpf</i>	
Synthesis of Boron Nanotube and Magnesium Boride Nanostructure	313
<i>Fang Fang, Eswaramoorthy Iyamperumal, Mathieu Pinault, Dragos Ciuparu, Codruta Zoican, Lisa Pfefferle</i>	
Synthesis of Short Chain Thiol Capped Au Nanoparticles and Their Stabilization Inside Functionalized Polymers for Organic Memory Applications.....	314
<i>Raju Kumar Gupta, MP Srinivasan, Jianyong Ouyang</i>	
Synthesis of Thiol Capped Gold Nanoparticles and Their Immobilization on a Substrate	315
<i>Raju Kumar Gupta, MP Srinivasan</i>	
'Spring-Like' and Photomechanical Junctions Between Nanoparticles: An Avenue to Power Molecular-Machines by Compression Energy	316
<i>Kabeer Jasuja, Vikas Berry</i>	
Polymer Collars in All-Copper Chip-to-Substrate Connections	317
<i>Tyler Osborn, Charles Lightsey, Paul A. Kohl</i>	
Ultraviolet-Wavelength Franz-Keldysh Oscillations in Single-Walled Carbon Nanotubes	318
<i>Moon-Ho Ham, Byung-Seon Kong, Woo-Jae Kim, Hee-Tae Jung, Michael S. Strano</i>	
Directed Assembly of Functional Nanoscale Biomolecular Catalytic Architectures	319
<i>Jonathan S. Dordick</i>	
Micellar Immobilization for Bioelectrocatalysis	320
<i>Shelley D. Minteer</i>	
Nanoscale Catalysts In Cell-Like Microcapsules	321
<i>Guanghui Ma</i>	
Development of Cell Surface Engineered Whole Cell Biocatalysts for Biomass Conversion	322
<i>Akihiko Kondo</i>	
A Nanostructured Molecular Assembly in Ionic Liquids as a Novel Medium for Biocatalysis Reactions.....	323
<i>Masahiro Goto</i>	
Fast on-Line Digestion System for High-Throughput Proteomics	324
<i>Daniel López-Ferrer</i>	
Studying Single Molecule Receptor-Ligand Interactions on Self-Assembled Monolayer Platforms.....	325
<i>Xiaojuan Zhang, Vamsi K. Yadavalli</i>	
Single Conducting Polymer Nanowire Protein Biosensor.....	326
<i>Mangesh Ashok Bangar, Dhammanand Shirale, Carlos Hangarter, Wilfred ChEn, Nosang V. Myung, Ashok Mulchandani</i>	
A Novel Glucose Biosensor Based on Electrochemically Synthesized Chitosan- Conductive Poly(N-Methylaniline) Composite	327
<i>Ayse Gul Yavuz, Aysegul Uygun, Venkat Bhethanabotla</i>	
Antibody Functionalization of Nanostructured Diatom Biosilica for Selective Detection of Biomolecules by Enhanced Photoluminescence	333
<i>Debra K. Gale, Timothy Gutu, Jun Jiao, Chih-hung Chang, Gregory L. Rorrer</i>	
Solution-Phase ELISA Enabled by Magnetic Nanoparticles and Vc-Containing Chitosan Nanocapsules.....	334
<i>Lizeng Gao, Jiamin Wu, Di Gao</i>	
Single-Walled Carbon Nanotube Optical Biosensors for Multi-Modal and Single Molecule Detection of Genotoxic Agents.....	335
<i>Daniel A. Heller, Hong Jin, Michael S. Strano</i>	
Concentration-Specific Hydrogen Sensing Behaviour In Monosized Pd Nanoparticle-Based Thin Films	336
<i>Einar Kruis, Manika Khanuja, Shubhra Kala, Bodh Raj Mehta</i>	
Volatile Organic Compound Sensor Based on Conducting Polymer-Metal Nanoparticle Composites	337
<i>Sreeram Vaddiraju, Karen K. Gleason</i>	
Development of Peptide and Protein Assays Based on Enzyme-Multiplied Assay Technique	338
<i>May L. Chiu, Harold G. Monbouquette</i>	

Rapid Screening of DNA Due to Differences In the Viscoelastic Properties	339
<i>Ashish S. Yeri, Lizeng Gao, Di Gao</i>	
Calibration of the Charge-Coupled Device Camera Based Microscopic Particle Tracking and Microrheology.....	340
<i>Pei-Hsun Wu, Yiider Tseng</i>	
Adjuvant Characterization for Virus-Like Particle-Based Influenza Vaccines.....	341
<i>Harvinder S. Gill, Fu-Shi Quan, Sang-Moo Kang, Richard W. Compans</i>	
Biodegradable Polyanhydride Nanosphere Interactions with Antigen Presenting Cells	342
<i>Bret D. Ulery, S. Avanti Sarkar, Maria Torres, Yashdeep Phanse, Jenny Wilson, Bryan Bellaire, Michael J. Wannemuehler, Balaji Narasimhan</i>	
High-Throughput and High-Content Screening of Antibody Responses from Single Cells	343
<i>J. Christopher Love, Adebola Ogunniyi, Eliseo Papa, Eduardo Guillen, Jae H. Choi, Craig M. Story</i>	
Anionic Nano-Polymerosomes for Enhanced Circulation Kinetics In Vivo	344
<i>David A. Christian, Diana M. Bowen, Ryan J. Dunn, Dennis E. Discher</i>	
A Trojan Horse Approach for the Non-Invasive Delivery of Nanotherapeutics to and through the Lungs.....	345
<i>Balaji Bharatwaj, Libo Wu, Judith A. Whittum-Hudson, Sandro R. P. da Rocha</i>	
Selective Control of Mucus Mesh Size and Nanorheology for Prevention of Infectious Diseases.....	346
<i>Samuel K. Lai, Ying-Ying Wang, Kaoru Hida, Richard Cone, Denis Wirtz, Justin Hanes</i>	
Liquid Crystalline Assemblies of Inorganic Nanorods	347
<i>Shanthi Murali, Khristine Pizarro, Kyle Taylor, Virginia A. Davis</i>	
Parallel Patterning of Single Inorganic Nanowires with Arbitrary Composition Using Optoelectronic Tweezers.....	348
<i>Peter Pauzauskis, Arash Jamshidi, Aaron T. Ohta, Justin Valley, Peidong Yang, Ming Wu</i>	
Gas Phase Production of Metal Oxide Nanowires and Nanoparticles Using a Microwave Plasma Reactor	349
<i>Vivekanand Kumar, Jeong H. Kim, Mahendra K. Sunkara</i>	
Length and Tortuosity Control of Te Nanowires.....	350
<i>G. Daniel Lilly, Nicholas A. Kotov</i>	
Fabrication of High Aspect Ratio Gold-Polypyrrole Bilayer Nanobelts as Nanoscale Actuators.....	351
<i>Nicha Chartuprayoon, Youngwoo Rheem, Bong Young Yoo, Nosang V. Myung</i>	
Molecularly Guided Assembly of Silver into 1 Dimensional Structures	352
<i>Miguel Castro, Roberto Irizarry, Madeline Leon</i>	
The Nanolab: An Interdisciplinary Undergraduate Science and Engineering Laboratory at the University of Texas at Austin.....	353
<i>Brian A. Korgel, John G. Ekerdt, Andrew Heitsch</i>	
The Ethics of "Nanoethics"	354
<i>Michael Bennett</i>	
Nue: Active Learning Experiences for Undergraduates	355
<i>Miguel Castro, Edmy Ferrer, Madeline Leon, Eunice Mercado</i>	
Nanotech Innovations: Nanotechnology Enterprise at Michigan Technological University	356
<i>John A. Jaszcak, Mary Raber, Michael Bennett, Nasser Alaraje, Paul L. Bergstrom</i>	
Teaching Nanoscale Science and Engineering to Chemical Engineers at Georgia Tech.....	362
<i>Sankar Nair</i>	
Learnings from Teaching An Interdisciplinary Class on Nanotechnology.....	363
<i>David H. Gracias</i>	
Nanomaterials Education for City College of New York Science and Engineering Undergraduates	364
<i>Ilona Kretschmar</i>	
A Resource Sharing Approach to Nanotechnology Education: The PA Nanotechnology Partnership.....	365
<i>Amy Brunner, Jamie Houseknecht, William Mahoney, Terry Kuzma, Robert Ehrmann, Stephen Fonash</i>	
Incorporation of Nanotechnology into the ChE Curriculum at Oregon State University	366
<i>Milo D. Koretsky, Alex Yokochi, Sho Kimura, Sarah Herzog</i>	
Targeted Block Copolymers for the Prevention of Post-Surgical Adhesions	372
<i>John M. Medley, Thomas D. Dziubla, Eugene Kaplan, Eric J. Beane</i>	
Low Temperature Tetherless Grippers for Medicine	374
<i>Timothy Leong, Christina Randall, Bryan Benson, David H. Gracias</i>	
Engineering Mucus Penetrating Particles for Transmucosal Delivery	375
<i>Samuel K. Lai, Ying-Ying Wang, Ming Yang, Amanda Pace, Benjamin C. Tang, Richard Cone, Justin Hanes</i>	
Targeting Colon Cancer Cells Using Pegylated Liposomes Modified with a Fibronectin-Mimetic Peptide	376
<i>Ashish Garg, Alison W. Tisdale, Efrosini Kokkoli</i>	
Designing Nanotherapeutics Via Prediction of Nanoparticle-Protein Binding Interactions	377
<i>Esther S. Jeng, Michael S. Strano</i>	
Gold Nanorod Architectures for Targeted Delivery of Combination Treatments to Cancer Cells	378
<i>Huang-Chiao Huang, Jared Burdick, Joseph Wang, Kaushal Rege</i>	
Nanoparticle-Aptamers: An Effective Growth Inhibitor for Human Cancer Cells	379
<i>Jong Hyun Choi, Kok Hao ChEn, Amanda Chaffee, Michael S. Strano</i>	

Microfluidic Blood Cleansing Device for Sepsis Therapy.....	380
<i>Chong Wing Yung, Jason Fiering, Donald E. Ingber</i>	
Nanoscale Engineering for Cytochrome P450 System	381
<i>Teruyuki Nagamune</i>	
Structure and Transport in High-Rate Biocatalytic Electrodes.....	382
<i>Scott Calabrese Barton, Ramanujam Kothandaraman, Hao Wen</i>	
New Possibility: Biofuel Cells with Stabilized Enzyme Activity	383
<i>Su Ha</i>	
Structure, Function, and Stability of Enzymes Covalently Attached to Oxidized Carbon Nanotubes	384
<i>Prashanth Asuri, Sandeep S. Karajanagi, Ravindra C. Pangule, Dhiraj A. Shah, Shyam Sundar Bale, Ravi S. Kane, Jonathan S. Dordick</i>	
Highly Enhanced Fluorescence Detection of Biomolecular Microarray on Large-Area Metal Nanopatterned Substrate.....	385
<i>Hee-Tae Jung</i>	
Protein Patterning through Microcontact Printing with Sortase	386
<i>Ranganath Parthasarathy, Scott Retterer, Mitchel J Doktycz, Eric T. Boder</i>	
Supercritical Carbon Dioxide Processing of Nano-Clays and Polymer/clay Nanocomposites	387
<i>Mihai Manitu, Robert Bellair, Steven E. Horsch, Esin Gulari, Rangaramanujam M. Kannan</i>	
Exponential Growth of Lbl Films with Incorporated Inorganic Sheets.....	389
<i>Paul Podsiadlo, Marc Michel, Jungwoo Lee, Eric Verploegen, Nadine Wong Shi Kam, Jaebeom Lee, Vincent Ball, Ying Qi, Anastasios J. Hart, Paula T. Hammond, Nicholas Kotov</i>	
Influence of the Functional Group, Type of Filler and Processing on the Mechanical Properties of Swcnt/nylon and Graphene Sheet/nylon Composites.....	390
<i>Arun K. Kota, Mohammad Moniruzzaman, Arnab Mukherjee, Jayanta Chattopadhyay, W. Edward Billups, Karen I. Winey</i>	
Deconvoluting Nanofiller Reinforcement and Polymer Morphology Via Model Polymer Nanocomposites	391
<i>Gowri Dorairaju, Saurabh Toshniwal, Kunal Tulsyan, Daniel F. Schmidt, Emmanuelle Reynaud</i>	
Influence of Nanoparticle Filler on the Dynamic Relaxation Characteristics of Polymer Nanocomposites.....	392
<i>Anthony C. Comer, Victor A. Kusuma, Benny D. Freeman, Douglass S. Kalika</i>	
Nanoparticle Incorporation and Aggregation In Block Copolymer Worm-Like Micelles	394
<i>David A. Christian, Karthikan Rajagopal, Goundla Srinivas, Michael L. Klein, Dennis E. Discher</i>	
Designing All-Organic MRI Contrast Particles Which Produce Contrast through ChEmical Exchange Saturation Transfer	396
<i>Michael T. McMahon, Yah-el Har-el, Guanshu Liu, Christopher Long, Assaf A. Gilad, Marco A. Deliso, George Sgouros, Jeff W.M. Bulte, Peter C.M. van Zijl</i>	
Properties of Protein Polymer-Based MRI Contrast Agents and Their Use for Tracking Biomaterial Degradation In Vivo.....	397
<i>Lindsay Karfeld-Sulzer, Hermann Kissler, Nicolynn Davis, Dixon B. Kaufman, Thomas Meade, Annelise Barron</i>	
Imaging of Single Nanoparticles In Live Cell Cytoplasm	399
<i>Gang Ruan, Amit Agrawal, Shuming Nie</i>	
Quantum Dots-Capped Viruses for Antiviral Drug Screening	400
<i>Ching-An Peng, Morris Hsu, Chung-Hao Wang</i>	
Cytotoxicity of Luminescent Silicon Quantum Dots Engineered for Biological Applications	401
<i>Folarin Erogbolegbo, Ken-Tye Yong, Hong Ding, Paras N. Prasad, Mark Swihart</i>	
Gold Nanoroses for Optical Biomedical Imaging and Photothermal Therapy In Atherosclerosis and Cancer.....	402
<i>Li Ma, Kiran ChErku, Amit Paranjape, Vidia Paramita, Timothy A. Larson, Jignesh Shah, Marc D. Feldman, Thomas E. Milner, Bysani Chandrasekar, Konstantin Sokolov, Stanislav Emelianov, Keith P. Johnston</i>	
Multi-Stage Delivery of Gold Nanoparticles for Detection of Early Stage Oral Cancer Using Optical Coherence Tomography	403
<i>Chang Soo Kim, Yeh-Chan Ahn, Lih-Huei Liaw, Hilari Kawakami-Wong, Petra Wilder-Smith, Matthew Brenner, Zhongping ChEn, Young Jik Kwon</i>	
Biosensors Involved in Drug Discovery.....	404
<i>P. Archer Davis, Ifejesu A. Eni-olorunda, Ajit Sadana</i>	
Controlled Assembly and Disassembly of Biotinylated Au Nanoparticles on Metallic Nanowires for Nanobiosensing	405
<i>Ramazan Kizil</i>	
Development of a New Generation of Bone Cement Using Nanotechnology	406
<i>Zahangir Khaled, Amin S. Rizkalla, Paul A. Charpentier</i>	
Self-Assembly of Polymer Grafted Nanoparticles In Polymer Melts	414
<i>Pinar Akcora, Sanat Kumar, Brian C. Benicewicz Sr., Yu Li, Linda S. Schadler</i>	
Biodegradable Polymer /Clay Nanocomposites Based on Poly(Butylene Adipate-co-Terephthalate) and Poly(Lactic Acid).....	415
<i>Mahin Shahlari, Sunggyu Lee</i>	

Hybrid System Consisting of Polyaniline/poly(acrylic acid) Doped with Au Nanoparticles for Biofuel Cell Electrode Platform	.....421
<i>Sunmook Lee, Bokkyu Choi, Chihiro Fushimi, Atsushi Tsutsumi</i>	
Synthesis and Characterization of Cadmium Telluride Nanowire	.....422
<i>Maxwell C. Kum, Bongyoung Yoo, Youngwoo Rheem, Krassimir N. Bozhilov, Wilfred ChEn, Ashok Mulchandani, Nosang V. Myung</i>	
Growth of ZnO Nanowires for Dye-Sensitized Solar Cells	.....423
<i>Janice Boercker, Yasuhide Nakamura, Spencer Schaber, Jillian Schmidt, Eray S. Aydil</i>	
High Yield Solution Synthesis of ZnO Nanowire Arrays Using a Novel Reactor Design	.....426
<i>K.M. McPeak, J.B. Baxter</i>	
Oriented Single Crystalline Titanium Dioxide Nanowires for Dye-Sensitized Solar Cells	.....427
<i>Bin Liu, Janice E. Boercker, Eray S. Aydil</i>	
Effect of Surface Structure on Interfacial Charge Transfer In Photoelectrochemical Cells	.....428
<i>Sudhira Pasupuleti, Gerold A. Willing</i>	
Atomistic Design of Thermoelectric Properties of Si Nanowires	.....429
<i>Trinh Vo, Andrew Williamson, Vincenzo Lordi, Giulia Galli</i>	
pH Sensitive Fluorescent-Magnetic Nanocomposites for Intracellular Detection and Manipulation	.....430
<i>Dhananjay Thakur, Lee Siers, Thierno Baldet, Jessica O. Winter</i>	
A Quantitative Description of Absolute Endocytosis and Exocytosis Rates for Nanoparticles	.....431
<i>Hong Jin, Daniel A. Heller, Richa Sharma, Michael S. Strano</i>	
Tracking the Intracellular Transport of Nanoparticles by Quantum Dots	.....432
<i>Gang Ruan, Amit Agrawal, Shuming Nie</i>	
Rare-Earth Doped and Co-Doped Y₂O₃ Nanomaterials as Potential Bio-Imaging Probe	.....433
<i>Gautam Kumar Das, Tan That Yang Timothy</i>	
Dynamic Fluorescent Nanoparticle Assemblies for Biosensing Applications	.....434
<i>G. Daniel Lilly, Nicholas A. Kotov</i>	
Fluorescence Emission Control by Nanometal Particle	.....435
<i>Jianting Wang, Samuel Achilefu, Kyung A. Kang</i>	
Phase Behavior and Rheology of Biopolymers Stabilized Carbon Nanotubes	.....436
<i>Dhriti Nepal, Virginia A. Davis</i>	
Conical Carbon Nanotube Arrays: Large Area Synthesis, Electrochemical and Field Emission Characteristics	.....437
<i>Santoshrupa Dimpala, David Mudd, Gamini U. Sumanasekera, Mahendra K. Sunkara</i>	
Anisotropic Thermal Properties of Carbon Nanotubes: Reaction Rate Enhancements and Effects of Covalent Functionalization	.....438
<i>Joel T. Abrahamson, Nitish Nair, Michael S. Strano</i>	
Voltage-Controlled Purification of DNA-Wrapped Carbon Nanotubes	.....439
<i>Steve R. Lustig, Rick Rajter, Yet-Ming Chiang</i>	
Photothermal Ablation of Neuroblastoma Using Carbon Nanotube Bound with GD2 Monoclonal Antibody	.....440
<i>Chung-Hao Wang, Yao-Jhang Huang, Chia-Wei Chang, Ching-An Peng</i>	
Aggregation Kinetics of Carbon Nanotubes In the Presence of Biomacromolecules	.....441
<i>Navid Saleh, Lisa D. Pfefferle, Menachem Elimelech</i>	
Nanotechnology for Regenerating Tissues: Hype or Reality ?	.....442
<i>Thomas J. Webster</i>	
Production of Virus-Mimetic Mucus-Penetrating Particles for Drug and Gene Delivery In Mucosal Tissues	.....443
<i>Ming Yang, Samuel K. Lai, Ying-Ying Wang, Christina Happe, Michael Zhang, Justin Hanes</i>	
Influenza Virus-Like Particles as a Platform for Novel Bionanomaterials	.....444
<i>Harvinder S. Gill, Fu-Shi Quan, Sang-Moo Kang, Richard W. Compans</i>	
Design of Caged Protein Scaffold for Molecular Encapsulation	.....445
<i>Mercè Dalmau, Sierin Lim, Helen C. ChEn, Szu-Wen Wang</i>	
Self-Assembly of Biomimetic Peptide Nanocages with Enzymatic Control	.....446
<i>Ying Chau, Weiping Wang</i>	
Formation and Characterization of Virus-Nanoparticle Clusters	.....447
<i>Leonard F. Pease III, De-Hao Tsai, Michael Zachariah, Michael J. Tarlov</i>	
Molecular Assemblies of Nanoparticles: Surprising Analogy with Proteins and New Optical Properties	.....448
<i>Nicholas A. Kotov</i>	
An Imaging Nanoprobe Predicts the Outcome of ChEmotherapy	.....449
<i>Efstathios Karathanasis, Ioannis Sechopoulos, Ananth Annabragada, Ravi Bellamkonda</i>	
Targeted Radionuclide Therapy of Metastatic Ovarian Cancer	.....450
<i>Yah-el Har-el, George Sgouros</i>	
Composite Nanoparticles (CNP_s) Containing Upconverting Nanophosphors for Photodynamic Therapy	.....451
<i>Stephanie J. Budijono, Robert K. Prud'homme, Yiguang Ju, Jingning Shan, Robert Austin, Baris Üngun, Josh Collins, Joseph Friedberg</i>	

Catalase Polymer Nanofilaments of Tunable Stiffness and Morphology.....	452
<i>Eric A. Simone, Thomas D. Dziubla, Vladimir Muzykantov</i>	
Effect of Solvent Properties on Antioxidant Enzyme Polymer Nanocarriers Formed with a Modified Double Emulsion.....	453
<i>Elizabeth Hood, Eric A. Simone, Vladimir Muzykantov</i>	
Formation of Magnetite-Containing Nanoparticles Using a Confined Impinging Jet Mixer.....	454
<i>Raquel Mejia-Ariza, Jonathan Goff, John S. Boyd, Judy S. Riffle, Richey M. Davis</i>	
Nanowire ChEm-Bio Sensors.....	455
<i>Stergios Papadakis, David H. Gracias</i>	
Sensing ChEmical and Biological Substances with CdS Nanowires.....	456
<i>Shih-Yuan Lu, Yi-Feng Lin, Yung-Jung Hsu</i>	
Probing the “Quality” of Intrinsic Semiconducting –O–Ti–O–Ti– Chains In Titanosilicate ETS-10.....	457
<i>Zhaoxia Ji, Morag Murdoch, Dennis M. Callahan Jr., Juliusz Warzywoda, Russell F. Howe, Albert Sacco Jr.</i>	
Nanowire Based Hybrid Materials as Anodes for Lithium Ion Batteries.....	459
<i>Praveen Meduri, Chandrashekhar Pendyala, Vivekanand Kumar, Gamini U. Sumanasekera, Mahendra K. Sunkara</i>	
Interface Thermal Transport Measurements across Nano-Junctions.....	460
<i>Monalisa Mazumder, Theodorian Borca-Tasciuc</i>	
Materials, Electrical, and Sensing Properties of ZnO Nanowires.....	461
<i>Sandra Catalina Hernández, Min Lai, Ashok Mulchandani, Marc A. Deshusses, Nosang V. Myung</i>	
Self-Assembling Bifunctional Proteins for Bioelectrocatalytic Hydrogels: A Protein Engineering Approach to Advanced Materials Design.....	462
<i>Ian R. Wheeldon, Joshua Gallaway, Scott Calabrese Barton, Scott Banta</i>	
Morphology and Size-Controlled Self-Assembling of Enzyme-Responsive Peptides	463
<i>Weiping Wang, Ying Chau</i>	
A DNA-Programmed Protein Nanoassembly Capable of Sensing Single Nucleotide Polymorphisms.....	464
<i>Cho-Ah Im, Jandi Kim, Jongshik Shin</i>	
Biological Fabrication of Photoluminescent Nanocomb Structures by Metabolic Incorporation of Germanium into the Biosilica of the Diatom <i>Nitzschia Frustulum</i>.....	465
<i>Tian Qin, Timothy Gutu, Chih-hung Chang, Jun Jiao, Gregory L. Rorrer</i>	
Biodegradable Nanoparticles Conjugated with ává3 Integrin-Binding Ligand for Targeted Tumor Delivery	466
<i>Angel Mercado, Xuezhong He, Esmaiel Jabbari</i>	
Inulin Surfactants for Colon-Specific Drug Delivery	467
<i>Julio C. Arboleda, G. Toriz, S. Beltran, V. Zúñiga, E. Delgado</i>	
Aluminum and Copper Nanostructures for Metal-Enhanced Luminescence	468
<i>Sanchari Chowdhury, Venkat Bhethanabotla, Rajan Sen</i>	
Enhanced Cellular Activation with Single Walled Carbon Nanotube Bundles Presenting Antibody Stimuli	473
<i>Tarek Fadel, Tarek Fahmy, Gary Haller, Lisa Pfefferle</i>	
Multiplex Analysis of Raman Nanoparticle Signatures for Protein Imaging In Tissues	474
<i>Barry R. Lutz, Claire Dentinger, LiENCHI Nguyen, Lei Sun, Jingwu Zhang, April Allen, Selena Chan, Beatrice Knudsen</i>	
Multifunctional Surface Ligands for Improved Stability of Quantum Dots and Gold Nanoparticles for Biological Applications.....	475
<i>Bing C. Mei, Kimihiro Susumu, Igor L. Medintz, T. J. Mountzaris, Hedi Mattoussi</i>	
Decontamination and Safety Applications and Products Based on Nanomaterials.....	476
<i>David A. Jones, Olga B. Koper, Kyle Knappenberger, Megan J. Winter</i>	
Report on the Nist Cross-Industry Issues in Nanomanufacturing Workshop	483
<i>Anne M. Chaka, John Cowie, Gerard Closset, C. Michael Garner, Michael Postek, Dianne Poster</i>	
Author Index	