

Program

Nanotechnology for the Study of Cellular and Molecular Interactions

June 14-18, 2009
Il Ciocco Hotel and Conference Center
Barga (Tuscany), Italy

Conference Chairs

Professor Kathleen J. Stebe
University of Pennsylvania, USA

Professor Denis Wirtz
Johns Hopkins University, USA

Conference Co-Chair

Professor Shouheng Sun
Brown University, USA



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The organizers would like to thank the following for their support of this conference:

Brown University

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Sunday, June 14, 2009

14:00	Bus to Il Ciocco leaves Pisa Airport
16:30 - 18:00	Conference check-in
18:00 – 18:15	Welcome and conference overview
18:15 – 19:45	Opening Plenary: Shuming Nie (Emory University) Nanomedicine: Designing infrastructures for <i>in-vivo</i> molecular imaging and targeted therapy
19:45 – 20:15	Welcome drink on patio/veranda
20:15	Dinner followed by social hour

NOTES

- Audiotaping, videotaping and photography of presentations are strictly prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Tuesday's excursion to Lucca is optional. Information will be at the registration desk. Please sign up by Monday noon.
- Be sure to make any corrections to your name/contact information on the Master Participant List or confirm that the listing is correct. A corrected copy will be sent to all participants after the conference.

Monday, June 15, 2009

- 07:30 – 08:30 Breakfast buffet
- 08:30 – 12:30 **Session I: *Nanoscale/Nanopatterned Structures for Cell Adhesion, Growth, and Motility***
Session Chairs: Kate Stebe and Denis Wirtz
- 08:30 - 09:30 **Keynote:** Joachim Spatz (Max Planck Institute for Metals Research)
Molecular engineering of cellular environments
- 09:30 - 10:00 Cherie Kagan (University of Pennsylvania)
Molecular interactions at the surfaces of organic and nanowire devices
- 10:00 – 10:30 Coffee break
- 10:30 – 11:00 Muhammad Zaman (University of Texas)
Cellular interactions with soluble and tethered nano-ligands: The role of size, shape, concentration, and mechanics of nanoparticles
- 11:00 – 11:30 Sharon Gerech (Johns Hopkins University)
Engineering in the microenvironment for vascular differentiation
- 11:30 – 12:00 Manuel Théry (Grenoble)
Where does the primary cilium stand?
- 12:00 – 12:30 Denis Wirtz (Johns Hopkins University)
Nano-biophysical basis of progeria
- 12:30 – 15:00 Buffet Lunch and Break
- 15:00 – 18:00 **Session II: *Nanostructures for Molecular and Cellular Diagnostics and Therapeutics I***
Session Chairs: Kate Stebe and Denis Wirtz
- 15:00 - 16:00 **Keynote:** Nick Abbott (University of Wisconsin)
Using liquid crystals to amplify nanoscopic events in biological systems
- 16:00 – 16:30 Justin Cooper-White (Australian Institute for Bioengineering and Nanotechnology, University of Queensland)
Self-assembled biomaterial surfaces and scaffolds for control of stem cell behavior and phenotype
- 16:30 - 17:00 Coffee break
- 17:00 – 17:30 Shouheng Sun (Brown University)
Developing multifunctional magnetic nanoparticles for imaging and delivery applications
- 17:30 – 18:00 Paul Janmey (University of Pennsylvania)
Nonlinear elastic materials to direct cell growth
- 18:00 – 18:30 Poster soundbites
- 18:30 – 19:30 Poster session/social hour
- 20:00 – 21:30 Dinner followed by poster session/social hour

Tuesday, June 16, 2009

- 07:30 – 08:30 Breakfast buffet
- 08:30 – 09:30 **Keynote:** Jeffrey Hubbell (Ecole Polytechnique Fédérale de Lausanne)
Engineering polymer nanoparticles for modulating immune and regeneration function
- 09:30 – 10:00 Coffee break
- 10:00 – 12:30 **Session III: *Commercialization of Bio-nanotechnology***
Session Chairs: Misti Ushio and Laura Sepp-Lorenzino
- 10:00 - 10:25 Misti Ushio, Harris & Harris Group, Inc.
Nanotech for Healthcare™: A venture capital perspective
- 10:25 - 10:50 Bernhard Sabel (University of Magdeburg)
Technology transfer and commercializing nanobiotechnology
- 10:50 – 11:15 Liesbet Lagae (IMEC)
Where nano-electronics and biology meet: a biomedical industrial affiliation program
- 11:15 – 11:40 Laura Sepp-Lorenzino (Merck Research Laboratories)
RNA delivery challenges: How Merck is approaching the problem
- 11:40 – 12:05 Jason Rolland (Liquidia)
Engineered drug therapies: Nanoparticles of controlled size, shape, deformability and Chemistry
- 12:05 – 12:30 Discussion
- 12:30 – 14:00 Buffet lunch for those not on excursion/Boxed lunches for those on excursion
- 12:45 Buses leave for optional excursion to Lucca
- 13:45 – 16:45 Lucca excursion
- 16:45 Board buses to return to Il Ciocco
- 17:45 Buses return to Il Ciocco
- 18:00 – 19:30 **Session IV: *Nanostructures for Molecular and Cellular Diagnostics and Therapeutics II***
Session Chairs: Shouheng Sun and Liesbet Lagae
- 18:00 - 18:30 Robert Hurt (Brown University)
Design of carbon nanotubes for bio- and neuro-compatibility
- 18:30 - 19:00 Thomas Webster (Brown University)
Better tissue engineering through nanotechnology: Decreasing biofilm formation through the use of magnetic nanoparticles
- 19:00 – 19:30 David Gracias (Johns Hopkins University)
Lithographically micro-nanostructured tools and devices for medicine
- 20:00 – 21:00 Dinner followed by social hour

Wednesday, June 17, 2009

- 07:30 – 08:30 Breakfast buffet
- 08:30 – 12:30 **Session V: Nanoscience for Neuroscience**
Session Chairs: Barclay Morrison, III and Stephanie Lacour
- 08:30 – 09:30 **Keynote:** Ravi Bellamkonda (Georgia Institute of Technology)
Nanofiber-based topographical cues to enhance peripheral nerve regeneration
- 9:30 – 10:00 Barclay Morrison, III (Columbia University)
Vertically-aligned carbon nanofiber arrays for electrophysiological and electrochemical recordings from brain slices
- 10:00 - 10:30 Coffee Break
- 10:30 – 11:00 Stephanie P. Lacour (Cambridge University)
Soft neural electrodes: Design, properties, and applications
- 11:00 – 11:30 Brahim Lounis (Université Bordeaux)
Single molecule tracking in live neurons
- 11:30 – 12:00 Nicholas Kotov (University of Michigan)
Nanostructured materials for neuron interface and neural medicine
- 12:00 – 12:30 Elias Greenbaum (Oak Ridge National Laboratory)
Nanoscience for the optical control of cellular activity
- 12:30 – 16:30 Buffet lunch and break
- 16:30 – 19:00 **Session VI: DNA-directed Nanoparticle Assembly**
Session Chair: John Crocker
- 16:30 – 17:00 **Keynote:** Oleg Gang (Brookhaven National Laboratory)
Manmade nanosystems with nature-developed components
- 17:00 – 17:30 John Crocker (University of Pennsylvania)
How to build crystals of colloids and nanoparticles using DNA
- 17:30 – 18:00 Coffee break
- 18:00 – 18:30 Alexei Tkachenko (University of Michigan)
Nanoparticles with key-lock interactions: From self-assembly to drug delivery
- 18:30 – 19:00 Shan Wang (Stanford University)
Functional synthetic antiferromagnetic nanoparticles for magnetic manipulation and biomolecule detection
- 19:00 – 20:00 Social hour
- 20:00 – 21:30 Banquet or Mountainside Feast

Thursday, June 18, 2009

07:30 – 08:30	Breakfast buffet
08:30 – 10:00	Closing Plenary: Chris Murray (University of Pennsylvania) Tailoring monodisperse nanocrystals for bio-imaging, sensing, and therapeutics
10:00 – 10:30	Coffee Break
10:30 – 11:00	Poster Award Winner Presentation I
11:00 – 11:30	Poster Award Winner Presentation II
11:30 – 12:00	Closing Remarks: Denis Wirtz (Johns Hopkins University) Closing Remarks: Kate Stebe (University of Pennsylvania)
12:30 – 13:30	Buffet lunch and departure
13:30	Bus to Pisa will depart Il Ciocco

LIST OF POSTERS

- SERS-CODED GOLD NANORODS AS A MULTIFUNCTIONAL PLATFORM FOR DENSELY-MULTIPLYED NEAR-INFRARED IMAGING AND PHOTOTHERMAL CANCER ABLATION**
Andrea Centrone, Massachusetts Institute of Technology
Geoffrey von Maltzahn, Renuka Ramanathan, Massachusetts Institute of Technology
Ji-Ho Park, Michael J. Sailor, University of California, San Diego
Sangeeta N. Bhatia, Massachusetts Institute of Technology
T. Alan Hatton, Massachusetts Institute of Technology
- NON-CYTOTOXIC SILVER NANOPARTICLE-POLYSACCHARIDE NANOCOMPOSITES WITH ANTIMICROBIAL ACTIVITY**
Andrea Travan, University of Trieste
Ivan Donati, Eleonora Marsich, Chiara Pelillo, Monica Benincasa, Tommaso Scarpa, Sabrina Semeraro, Gianluca Turco, Renato Gennaro, Sergio Paoletti, University of Trieste
- MECHANICAL ANALYSIS OF FIBROBLAST CELL LINE USING MEMS TECHNOLOGY**
Raffaella Fior, University of Trieste
Stefano Maggiolino, Department of Materials and Natural Resources
Orfeo Sbaizero, Department of Materials and Natural Resources
- POROUS NANO-HYDROXYAPATITE/ALGINATE SCAFFOLDS FOR BONE REGENERATION**
Gianluca Turco, University of Trieste
Francesca Bellomo, Department of Life Sciences, University of Trieste
Eleonora Marsich, Department of Life Sciences, University of Trieste
Sabrina Semeraro, Department of Life Sciences, University of Trieste
Paoletti Sergio, Department of Life Sciences, University of Trieste
- MAGNETIC NANOPARTICLE FOR GENE DELIVERY: CELLULAR UPTAKE, GENE EXPRESSION, AND CYTOTOXICITY STUDY**
Maria Arsianti, The University of New South Wales
Dr. May Lim, The University of New South Wales
Dr. Christopher Marquis, The University of New South Wales
Professor Rose Amal, The University of New South Wales
- FUNCTIONAL HYALURONIC ACID SURFACES FOR THE IN VITRO STUDY OF CANCER CELLS**
Laura Beasman, Johns Hopkins University
Michelle Ho, Johns Hopkins University
Geoffrey Wang, Johns Hopkins University
- A MULTIPLEXED MICRO/NANO PARTICLE ASSAY CHARACTERIZES THE CELLULAR ENVIRONMENT BY PROBING PORE SIZE, INTRACELLULAR AND EXTRACELLULAR RHEOLOGY SIMULTANEOUSLY**
Stephanie Fraley, Johns Hopkins University
Ranjini Krishnamurthy, Johns Hopkins University
Denis Wirtz, Johns Hopkins University
- ACTIN CIRCULARIZATION UNDER 2D CONFINEMENT AND PHOTO-INDUCED SUPERCOILING TRANSITION**
Tim Sanchez, Brandeis University
Zvonimir Dogic, Brandeis University
Igor Kulich, Centre national de la recherche scientifique

9. **PATCHY SURFACES IN CELLULAR ADHESION EVENTS**

ZiQiu Tong, Johns Hopkins University

Moniraj Ghosh, University of Pennsylvania

Christina Alves, Johns Hopkins University

Konstantinos Konstantopoulos, Johns Hopkins University

Kathleen J. Stebe, University of Pennsylvania

10. **RARE EARTH NANOPARTICLES: FROM PREPARATION TO BIOAPPLICATIONS**

Ling-Dong Sun, State Key Lab of Rare Earth Materials Chemistry and Applications

PKU-HKU Joint Lab in Rare Earth Materials Bioinorganic Chemistry, Peking University

Jie Shen, State Key Lab of Rare Earth Materials Chemistry and Applications

Jian-Qin Gu, State Key Lab of Rare Earth Materials Chemistry and Applications

Wei Feng, State Key Lab of Rare Earth Materials Chemistry and Applications

Chun-Hua Yan, State Key Lab of Rare Earth Materials Chemistry and Applications