



NanoBiotech World Congress

16-17 Nov 2006
Boston
MA, USA

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Keynote Speakers

John Frangioni
Harvard Medical School

Edward Goldberg
Tufts University Medical School

K.K. Jain
Jain PharmaBiotech

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Session Topics

Nanodiagnostics

Nanotechnology in Life Sciences Research

Nanobiosensors

Nanotechnology for Biodefense

Nanobiopharmaceuticals

Nanomedicine

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Provisional Speaker List

Protein Tomography™ a Novel Tool for Nanobiology - **Anders Aberg** [Sidec](#)

Nanoparticle Cancer Treatments - **Steven Barry Alnis** [Biosciences Inc.](#)

Electrochemically Switchable DNA Biosensors - **John Beattie** [University of Edinburgh](#)

Compacted Nucleic Acid Nanoparticles for Therapeutic Applications - **Mark Cooper** [Copernicus](#)

A Novel Approach to Tackle Viral Diseases - **Anil Diwan**, [NanoViricides Inc](#)

Near-infrared Fluorescent Quantum Dots for Intraoperative Imaging - **John Frangioni** [Harvard Medical School](#)

Nanoparticle Arrays - **Edward Goldberg** [Tufts University Medical School](#)

Application of RNA Nanotechnology in Gene Delivery and Therapy - **Peixuan Guo** [Purdue University](#)

Advances in Nanomedicine - **K.K. Jain** [Jain PharmaBiotech](#)

Nanobiotechnology for Drug Discovery - **AI Kolb** [Key Tech Solutions](#)

An Overview of the Properties and Bio-applications of NanoActive Materials® - **Olga Koper**, [NanoScale Materials Inc](#)

Stabilized Sporicidal Surfaces by Molecular Self-assembly - **Sang Beom Lee** [NanoDynamics Life Sciences Inc](#)

3D Dielectrophoresis-based Manipulation of Individual Bioparticles - **Qu Yan Li** [Chinese Academy of Sciences](#)

Production of Hyaluronic Acid-derived Polymer Nanoparticles Loaded with Growth Factors by High-pressure Gas Antisolvent Precipitation - **Camilla Luni** [University of Padua](#)

Label Free Detection of DNA - **David Macdonald** [Nanomix](#)

Nanostructural Porous Silicon for Electrical Biosensing - **Raul Martin-Palma** [Universidad Autonoma de Madrid](#)

Single Molecule Fluorescence Control for Nanotechnology - **Nils Walter** [University of Michigan](#)

Development of Nanotechnology BioDefense Vaccines - **Sandy Weinberg** [GE Healthcare](#)

Novel Optical Sensors - **Christian Wolfrum** [Identif GmbH](#)

Electrically Controlled Nano-drug Delivery Systems - **Mohammed Zourob** [University of Cambridge](#)

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Agenda - Day One

- 07:30 *Registration*
- 08:30 **Nanodiagnosics**
*Chaired by Edward Goldberg,
Tufts University Medical School*
- 08:35 **Keynote Speaker - Nanoparticle Arrays**
Edward Goldberg, Tufts University Medical School
Summary TK
- 09:05 **Single Molecule Fluorescence Control for Nanotechnology**
Nils Walter, University of Michigan

Cybernetically moving nanoassemblies called "Spiders" suitable for drug delivery are being imaged at high spatial resolution within the framework of NSF's Center for Molecular Cybernetics. Our latest results on how to gain single molecule fluorescence control in nanotechnology will be presented.
- 09:35 **Label-free Detection of DNA Hybridization Using Carbon Nanotube**
David Macdonald, Nanomix
Summary TK
- 10:05 *Coffee and Networking in Exhibition*
- 10:50 **Keynote Speaker - Near-Infrared Fluorescent Quantum Dots for Intraoperative Imaging**
John Frangioni, Harvard Medical School
This talk will focus on the application of nanotechnology, including near-infrared fluorescent quantum dots, to important problems in human surgery. Basic physiology, including biodistribution and clearance of quantum dots as a function of organic coating and hydrodynamic diameter will be reviewed. Data from the pre-clinical validation of quantum dots in small and large animal model systems will be presented, including sentinel lymph node mapping of the skin, stomach, esophagus, stomach, colon, and pleural space. Newer formulations of ultra-small NIR fluorescent quantum dots will also be presented.
- 11:20 **Nanotechnology in Life Sciences Research**
*Chaired by John Frangioni,
Harvard Medical School*
- 11:25 **Protein Tomography™ a Novel Tool for Nanobiology**
Anders Aberg, Sidec
Protein Tomography™ visualizes disease events at the molecular level in virtually any environment thereby bridging the current gap between the test tube and human biology. Here we will present examples to illustrate how Protein Tomography is used in understanding biological mechanisms.
- 11:55 **3D Dielectrophoresis-based Manipulation of Individual Bioparticles**
Qu Yan Li, Shenyang Institute of Automation, Chinese Academy of Sciences
This presentation will show the need for massively parallel manipulation of individual bioparticles. State-of-the-Art DEP-based micro and nano particles manipulation techniques.
- 12:25 *Lunch and Poster Viewing*

Agenda - Day One

- 13:55 **Nanobiosensors**
*Chaired by Nils Walter
University of Michigan*
- 14:00 **Novel Optical Sensors**
Christian Wolfrum, Identif GmbH
Sensors for a huge variety of parameters that show a strong change in color can be produced by using a multi-layer setup. The color is generated through interference and is enhanced through an effect called surface-enhanced absorption.
- 14:30 **Nanostructured Porous Silicon for Electrical Biosensing**
Raul Martin-Palma, Universidad Autonoma de Madrid
Nanostructured porous silicon based devices were developed for their use as optical and electrical biosensors. Those devices take advantage of the particular structure and physico-chemical behavior of this material which favors surface biomolecule immobilization.
- 15:00 **Electrochemically Switchable DNA Biosensors**
John Beattie, University of Edinburgh
This work presents a novel application of nano-scale molecular machines as biosensors, with potential benefits in improving assay performance in research, drug development and diagnostics.
- 15:30 *Coffee and Networking in Exhibition*
- 16:15 **Nanotechnology for Biodefense**
*Chaired by Nils Walter
University of Michigan*
- 16:20 **Development of Nanotechnology BioDefense Vaccines**
Sandy Weinberg, GE Healthcare
The development of vaccines to prevent or control a bioterrorism attack depends on one of two strategies. The first, in current adoption by BioShield, calls for advance anticipation of possible threats; mass production of vaccines based upon those predictions; and stockpiling of the resulting products. The alternative is the use of nanotechnologies to very rapidly –potentially within days – produce mass quantities of a specific and effective vaccine for a realized threat.
- 16:40 **An Overview of the Properties and Bio-applications of NanoActive Materials®**
Olga Koper, NanoScale Materials, Inc
This presentation will focus on products based on nanocrystalline metal oxides and their applications, including protection from and treatment of biological and chemical hazards, acid neutralization, odor control, and antimicrobial plastic packaging.
- 17:20 *End of Day - Drinks Reception in the Exhibit Hall*



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Agenda - Day Two

- 08:30 **Nanopharmaceuticals**
Chaired by Al Kolb, Key Tech Solutions
- 08:35 **Keynote Speaker - Nanobiotechnology for Drug Discovery**
Al Kolb, Key Tech Solutions
Nanotechnology has the potential to revolutionize drug discovery from target identification and drug development to biomarkers for clinical validation and targeted drug delivery methods. Some current and potential technologies to accomplish these goals will be presented.
- 09:05 **Production of Hyaluronic Acid-derived Polymer Nanoparticles Loaded with Growth Factors by High-pressure Gas Antisolvent Precipitation**
Camilla Luni, University of Padua
Hyaluronic acid-derived polymer nanoparticles were produced by high-pressure CO₂ GAS technique under controlled operative conditions. The particles show a high drug-loading efficiency when impregnated with two growth factors which play an important role in cell growth and in wound healing processes.
- 09:35 **Electrically Controlled Nano-drug Delivery Systems**
Mohammed Zourob, University of Cambridge
Summary TK
- 10:05 *Coffee and Networking in Exhibition*
- 10:50 **Application of RNA Nanotechnology in Gene Delivery and Therapy**
Peixuan Guo, Purdue University
RNA is a versatile molecule that can be redesigned to form a variety of structures and shapes that can act as specific delivery systems for therapeutic molecules for long term administration of treatment as demonstrated by pRNA of bacteriophage phi29 motor.
- 11:20 **Compacted Nucleic Acid Nanoparticles for Therapeutic Applications**
Mark Cooper, Copernicus
We have developed a microarray containing novel content and probe design to detect alternatively spliced variants which can determine the protein species expressed, important to the phenotype under study.
- 11:50 *Lunch and Poster Viewing*

Agenda - Day Two

- 13:20 **Nanomedicine**
Chaired by K.K. Jain, Jain PharmaBiotech
- 13:25 **Keynote Speaker - Advances in Nanomedicine**
K.K. Jain, Jain Pharmabiotech
Summary TK
- 13:55 **Stabilized Sporocidal Surfaces by Molecular Self-Assembly**
Sang Beom Lee, NanoDynamics Life Sciences, Inc.
We describe here the stabilization of functional nanoparticles in porous substrates by molecular self-assembly to develop sporocidal surfaces. The novel process consists of a UV stabilization of nanoparticles embedded in substrates. Potential applications include health care, defense, and shielding materials.
- 14:25 **A Novel Approach to Tackle Viral Diseases**
Anil Diwan, NanoViricides, Inc.
Nanoviricides™ are nanomedicines that specifically attack and destroy virus particles. Applications to bird flu and influenza will be discussed.
- 14:55 **Nanoparticle Cancer Treatments**
Stephen Barry, Alnis BioSciences, Inc.
Nanoparticles with magnetic cores and chemotherapeutic payloads can be efficiently delivered to tumors through precise engineering of size, structure and ligand selection. Verification of tumor localization can be determined using MRI and chemotherapeutic payloads can be activated using magnetic fields.
- 15:20 *Coffee and End of Conference*

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