An AACR Special Conference on

Nano in Cancer: Linking Chemistry, Biology, and Clinical Applications In Vivo

January 12-15, 2011
InterContinental Miami Hotel
Miami, Florida

Wednesday, January 12

7:00 p.m.-8:00 p.m. **Opening Session**
Keynote Address

New targeting mechanisms and contrast agents for molecular imaging and therapy
Roger Y. Tsien, University of California, San Diego, La Jolla, CA

8:00 p.m.-9:30 p.m. **Reception**

Thursday, January 13

7:00 a.m.-8:00 a.m. **Continental Breakfast**

8:00 a.m.-9:30 a.m. **Session 1**
Chemistry: Multifunctional Nano Platforms
Chairperson: Karen L. Wooley, Texas A&M University, College Station, TX

Nanoscopic polymer objects of unique shapes and morphologies and well-defined structures and dimensions as controlled drug delivery devices
Karen L. Wooley

Polyvalent DNA nanostructures: New modalities in cancer diagnostics and therapeutics
Chad A. Mirkin, Northwestern University, Evanston, IL

Co-opting Moore's Law: Vaccines, medicines, and biological particles made on a wafer
Joseph M. DeSimone, University of North Carolina, Chapel Hill, NC

9:30 a.m.-10:00 a.m. **Break**

10:00 a.m.-11:30 a.m. **Session 2**

Nanomolecular Imaging

Chairperson: David Piwnica-Worms, Washington University School of Medicine, St. Louis, MO

Magnetic resonance nanoprobes for in vivo cellular fate mapping
Thomas J. Meade, Northwestern University, Evanston, IL

Cerenkov radiation energy transfer (CRET): A new strategy for optical imaging of PET isotopes with fluorescent nanoparticles
David Piwnica-Worms

Multifunctional nanoparticles for optical imaging of tumors
Samuel Achilefu, Washington University School of Medicine, St. Louis, MO

11:30 a.m.-2:30 p.m. **Poster Session A / Lunch**

2:30 p.m.-4:00 p.m. **Session 3**

Biomarkers and Diagnostics

Chairperson: Ralph Weissleder, Massachusetts General Hospital, Boston, MA

DMR for molecular analysis of human cancer cells
Ralph Weissleder

Strategies for sensitive detection of nanoparticles in deep tissue
Louis S. Bouchard, University of California, Los Angeles, CA

Ligand-directed therapy and molecular imaging based on in vivo phage display technology: Translational updates in nanomedicine applications
Renata Pasqualini, University of Texas MD Anderson Cancer Center, Houston, TX

4:00 p.m.-4:30 p.m. **Break**

4:30 p.m.-6:00 p.m. **Session 4**

Nanotargeting Overcoming In Vivo Barriers

Chairperson: Jan E. Schnitzer, Proteogenomics Research Institute for Systems Medicine, San Diego, CA

Proteomic mapping and targeting of the transvascular pumping space in caveolae in vivo
Jan E. Schnitzer

Mucus penetrating nanoparticles for lung, cervical, and ovarian cancers
Justin Hanes, Johns Hopkins University, Baltimore, MD

Engineering cooperative nanosystems for cancer diagnosis and therapy
Sangeeta N. Bhatia, Massachusetts Institute of Technology, Cambridge, MA

6:00 p.m. **Dinner On Own / Evening Off**

Friday, January 14

7:00 a.m.-8:00 a.m. **Continental Breakfast**

8:00 a.m.-10:00 a.m. **Session 5**

Clinical Prospects and Cancer Applications

Chairperson: Lihong Wang, Washington University, St. Louis, MO

Photoacoustic tomography: Ultrasonically breaking through the optical diffusion limit
Lihong Wang

Beyond the NP+ targeting molecule paradigm
Mauro Ferrari, University of Texas Health Science Center, Houston, TX

A multifunctional nanodelivery platform on trial
Esther H. Chang, Georgetown Lombardi Comprehensive Cancer Center, Washington, DC

Cancer nanotechnology—Opportunities and challenges: View from the NCI Alliance for Nanotechnology in Cancer
Piotr Grodzinski, National Cancer Institute, Bethesda, MD

10:00 a.m.-10:30 a.m. **Break**

10:30 a.m.-12:00 p.m. Proffered Papers Session

Investigation of ligand surface density and its implications on the active targeting of nanoparticles*
Andrew Elias, University of Pennsylvania, Philadelphia, PA

Development of multifunctional nanoparticle-based imaging agents at the Imaging Probe Development Center at the National Institutes of Health*
Haitao Wu, National Heart, Lung, and Blood Institute, Rockville, MD

The sensitive detection of RNA in single living cells using a newly developed ratiometric bimolecular beacon*
Xuemei Zhang, University of Pennsylvania, Philadelphia, PA

Ligand-directed targeting of tumors with self-assembled nanoparticles allows for multimodal imaging and triggered release of therapeutics*
Wouter Driessen, University of Texas MD Anderson Cancer Center, Houston, TX

A synthetic enzyme inhibitor of legumain is a novel targeting ligand for nanotherapeutic drug delivery, inhibiting primary tumor growth without systemic toxicity*
Debbie Liao, Scripps Research Institute, La Jolla, CA

Delivery of siRNA to the mouse lung*
Kevin Polach, Egen, Inc., Huntsville, AL

Nanodendrons for imaging and drug delivery targeted to the tumor microenvironment*
Lynn Samuelson, Vanderbilt University, Nashville, TN

Renally excreted multimodal silica nanoparticles as melanoma-selective therapeutic platforms for nanomedicine*
Michelle Bradbury, Memorial Sloan-Kettering Cancer Center, New York, NY

PEG on nanocarriers induces anti PEG IgM production as a result of activation of immune system*
Hashiguchi Yuki, University of Tokushima, Tokushima, Japan

12:00 p.m.-2:00 p.m. Lunch On Own

*Indicates proffered presentations from selected abstracts.

2:00 p.m.-3:30 p.m. **Session 6**
Therapeutic Nanoparticles and Nanogene Delivery
Chairperson: Shuming Nie, Emory University, Atlanta, GA

Multifunctional nanoparticles for tumor targeting and penetration
Shuming Nie

Laser-induced explosion of nanoparticles ("nano-bombs") for selective cancer nanophotothermolysis
Renat Letfullin, Rose-Hulman Institute of Technology, Terre Haute, IN

Noninvasive radiofrequency (RF) field heating of metallic and semiconducting nanoparticles
Steven A. Curley, University of Texas MD Anderson Cancer Center, Houston, TX

3:30 p.m.-6:00 p.m. **Poster Session B / Reception**

6:00 p.m. **Dinner On Own / Evening Off**

Saturday, January 15

7:00 a.m.-8:00 a.m. **Continental Breakfast**

8:00 a.m.-9:30 a.m. **Session 7**
Thematic Translational Potential

Magnetic labeling of cells: Will we ever get to the clinic?
Joseph A. Frank, National Institutes of Health, Bethesda, MD

Controlling drug resistance by physical forces delivered by nanoparticles
Robert H. Getzenberg, Johns Hopkins University School of Medicine, Baltimore, MD

Bilamellar cationic liposomes: From clinic to lab to clinic
Neil Senzer, Mary Crowley Cancer Research Center, Dallas, TX

9:30 a.m.-10:00 a.m. **Break**

10:00 a.m.-11:45 a.m. **Session 8**

Controversies: Safety, Toxicity, and Environment

Chairperson: Larry A. Nagahara, National Cancer Institute, Bethesda, MD

Impact of the biological environment on nanoparticle coating and cytotoxicity
Laura K. Braydich-Stole, Air Force Research Laboratory, Wright-Patterson AFB, OH

Cancer nanotechnology: Addressing toxicity for better translation
Scott E. McNeil, Nanotechnology Characterization Laboratory, NCI-Frederick, Frederick, MD

Panel Discussion

David Piwnica-Worms
Washington University School of Medicine, St. Louis, MO

Jan E. Schnitzer
Proteogenomics Research Institute for Systems Medicine, San Diego, CA

Karen L. Wooley
Texas A&M University, College Station, TX

Scott E. McNeil
Nanotechnology Characterization Laboratory, NCI-Frederick, Frederick, MD

11:45 a.m.-12:00 p.m. **Closing Remarks**

David Piwnica-Worms
Washington University School of Medicine, St. Louis, MO

Jan E. Schnitzer
Proteogenomics Research Institute for Systems Medicine, San Diego, CA

Karen L. Wooley
Texas A&M University, College Station, TX

12:00 p.m. **Departure**