

CONFERENCE PROGRAM

Saturday, June 25

6:30 p.m.-8:30 p.m.

Welcome and Keynote Lectures

Harbor Ballroom

Session Chairperson: Joan S. Brugge, Harvard Medical School, Boston, MA

6:30 p.m.-6:45 p.m.

Welcome and Opening Remarks

Joan S. Brugge

6:45 p.m.-7:30 p.m.

Reengineering the tumor microenvironment to improve cancer treatment:
Bench to bedside

Rakesh K. Jain, Harvard Medical School and Massachusetts General Hospital, Boston, MA

7:30 p.m.-8:15 p.m.

Advances in drug delivery

Robert S. Langer, Massachusetts Institute of Technology, Cambridge, MA

8:15 p.m.-8:30 p.m.

Discussion

8:30 p.m.-10:00 p.m.

Opening Reception

Galleria Hall

Sunday, June 26

7:30 a.m.-8:30 a.m.

Continental Breakfast

Harbor Foyer

8:30 a.m.-10:30 a.m.

Plenary Session 1: Cancer Modeling/Systems Biology

Harbor Ballroom

Session Chairperson: Joe W. Gray, Oregon Health & Science University, Portland, OR

8:30 a.m.-9:00 a.m.

An integrated omic-multiscale imaging view of breast cancer

Joe W. Gray

9:00 a.m.-9:30 a.m.

Game theory and personalized cancer treatment

Robert H. Austin, Princeton University, Princeton, NJ

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

New methods and better theory for pre-clinical cancer pharmacogenomics

Mario Niepel, Harvard Medical School, Boston, MA

10:00 a.m.-10:15 a.m.

Systems analysis of signaling pathway adaptation to design effective PI3K-based
combination therapies using ovarian cancer patient-derived xenografts*

Ioannis K. Zervantonakis, Harvard Medical School, Boston, MA

10:15 a.m.-10:30 a.m.

Implantable microdevice for in-situ precision medicine*

Oliver Jonas, Brigham & Women's Hospital, Boston, MA

*Short talks from proffered abstracts

10:30 a.m.-11:00 a.m.	Break Harbor Foyer
11:00 a.m.-1:00 p.m.	Plenary Session 2: Microfluidics and Model Systems Harbor Ballroom Session Chairperson: Cynthia A. Reinhart-King , Cornell University, New York, NY
11:00 a.m.-11:30 a.m.	Mechanism of metastatic migration and invasion in confined matrices Cynthia A. Reinhart-King
11:30 a.m.-12:00 p.m.	Single cell functional proteomics and metabolomics: A conduit to physicochemical models of tumor biology James R. Heath, California Institute of Technology, Pasadena, CA
12:00 p.m.-12:30 p.m.	Interstitial fluid pressure, matrix compliance, and tumor phenotype Celeste M. Nelson, Princeton University, Princeton, NJ
12:30 p.m.-12:45 p.m.	Mechanobiology of epithelia on native basement membranes and relevance for cancer cell invasion* Marija Plodinec, Institute of Pathology, University Hospital Basel, Basel, Switzerland
12:45 p.m.-1:00 p.m.	Mechanisms and pathophysiologic relevance of fluid shear stress resistance in malignant cells* Michael Henry, University of Iowa, Carver College of Medicine, Iowa City, IA
1:00 p.m.-3:30 p.m.	Poster Session A/Lunch Galleria Hall
3:30 p.m.-5:30 p.m.	Plenary Session 3: Tumor Mechanobiology Harbor Ballroom Session Chairperson: Valerie M. Weaver , University of California Medical Center, San Francisco, CA
3:30 p.m.-4:00 p.m.	Extrinsic and intrinsic forces regulate cancer progression and aggression Valerie M. Weaver
4:00 p.m.-4:30 p.m.	Visualizing cell and matrix dynamics in tumors Lance L. Munn, Harvard Medical School, Boston, MA
4:30 p.m.-5:00 p.m.	Targeting the mechanosensing machinery to limit glioblastoma initiation and invasion Sanjay Kumar, University of California, Berkeley, CA
5:00 p.m.-5:15 p.m.	Glycoprotein-mediated tissue mechanics regulate glioblastoma aggression* J. Matthew Barnes, University of California San Francisco, San Francisco, CA
5:15 p.m.-5:30 p.m.	VEGF-targeted therapy induces extracellular matrix remodeling and increases mechanical barriers to therapy in colorectal cancer liver metastases* Dai Fukumura, Massachusetts General Hospital and Harvard Medical School, Boston, MA

*Short talks from proffered abstracts

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5:30 p.m.-6:45 p.m.	Funding Opportunities: Physical Sciences in Oncology Programs Harbor Ballroom
	Session Chairperson: Nastaran Z. Kuhn , National Cancer Institute, Bethesda, MD
5:30 p.m.-5:45 p.m.	Nastaran Z. Kuhn
5:45 p.m.-6:00 p.m.	Krastan B. Blagoev, National Science Foundation, Arlington, VA
6:00 p.m.-6:15 p.m.	Pushpa Tandon, National Cancer Institute, Rockville, MD
6:15 p.m.-6:30 p.m.	Piotr Grodzinski, National Cancer Institute, Bethesda, MD
6:30 p.m.-6:45 p.m.	Jamie Meredith, Cancer Research UK, London, United Kingdom

6:45 p.m.- **Evening off/Dinner on Own**

MONDAY, JUNE 27

7:30 a.m.-8:30 a.m.	Continental Breakfast Harbor Foyer
8:30 a.m.-10:30 a.m.	Plenary Session 4: Imaging Harbor Ballroom
	Session Chairperson: Ralph Weissleder , Massachusetts General Hospital, Boston, MA
8:30 a.m.-9:00 a.m.	2-hydroxyglutarate MR spectroscopy: A new window into glioma biology Elizabeth A. Maher, UT Southwestern Medical Center, Dallas, TX
9:00 a.m.-9:30 a.m.	Imaging drug delivery and nanotherapeutics Ralph Weissleder
9:30 a.m.-10:00 a.m.	Imaging tumor metabolism with hyperpolarized ¹³ C-labeled cell substrates Kevin M. Brindle, Cancer Research UK Cambridge Research Institute, Cambridge, United Kingdom
10:00 a.m.-10:15 a.m.	A biosensor mouse to predict the dissociation and spread of pancreatic cancer* Paul Timpson, The Garvan Institute of Medical Research, Sydney, Australia
10:15 a.m.-10:30 a.m.	Mutant KRAS decouples glycolysis from cell mechanics in non-small cell lung cancer* Jin Suk Park, UT Southwestern Medical Center, Dallas, TX
10:30 a.m.-11:00 a.m.	Break Harbor Foyer

*Short talks from proffered abstracts

11:00 a.m.-1:00 p.m.	<p>Plenary Session 5: Drug Delivery and Nanomedicine Harbor Ballroom</p> <p>Session Chairperson: Mark Saltzman, Yale University, New Haven, CT</p>
11:00 a.m.-11:30 a.m.	Convection-enhanced delivery of nanomaterials for glioma Mark Saltzman
11:30 a.m.-12:00 p.m.	Spherical nucleic acids as a powerful new platform for cancer immunotherapy Chad A. Mirkin, Northwestern University, Evanston, IL
12:00 p.m.-12:30 p.m.	Engineering novel approaches to drug delivery Joseph M. DeSimone, University of North Carolina, Chapel Hill, NC
12:30 p.m.-1:00 p.m.	Targeted polymeric nanoparticles: From academic innovations to clinical trials and lessons learned Omid C. Farokhzad, Brigham & Women's Hospital, Boston, MA
1:00 p.m.-3:00 p.m.	Free time/Lunch on own
3:00 p.m.-5:00 p.m.	<p>Plenary Session 6: Tumor Immunology and Immunotherapy Harbor Ballroom</p> <p>Session Chairperson: Melody A. Swartz, University of Chicago, Chicago, IL</p>
3:00 p.m.-3:30 p.m.	Lymphatic vessels in the tumor microenvironment shape the response to immunotherapy Melody A. Swartz
3:30 p.m.-4:00 p.m.	Material-based therapeutic cancer vaccines David J. Mooney, Harvard University, Cambridge, MA
4:00 p.m.-4:30 p.m.	Engineering synergistic innate and adaptive immunotherapy K. Dane Wittrup, Massachusetts Institute of Technology, Cambridge, MA
4:30 p.m.-4:45 p.m.	Polymeric mechanical amplifiers of tumor apoptosis* Michael John Mitchell, Massachusetts Institute of Technology, Cambridge, MA
4:45 p.m.-5:00 p.m.	Significant improvements in therapeutic index for conjugated payloads using a nanoparticle-drug conjugate (NDC) platform to provide sustained drug release and potentially improved anticancer effects* Chester Metcalf, III, Cerulean, Waltham, MA
5:00 p.m.-7:00 p.m.	<p>Poster Session B/Reception Galleria Hall</p>

*Short talks from proffered abstracts

CONFERENCE PROGRAM

Tuesday, June 28

7:30 a.m.-8:30 a.m.

Continental Breakfast

Harbor Foyer

8:30 a.m.-9:15 a.m.

Keynote Address

Harbor Ballroom

Session Chairperson: Joan S. Brugge, Harvard Medical School, Boston, MA

8:30 a.m.-9:15 a.m.

Non-coding RNA from discovery to therapy

Phillip A. Sharp, MIT Koch Institute for Integrative Cancer Research, Cambridge, MA

9:15 a.m.-9:30 a.m.

Break

Harbor Foyer

9:30 a.m.-11:30 a.m.

Plenary Session 7: RNA-based Therapies and Gene Editing

Harbor Ballroom

Session Chairperson: Daniel G. Anderson, Massachusetts Institute of Technology, Cambridge, MA

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

Nucleic acid delivery systems for RNA therapy and gene editing

Daniel G. Anderson

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

Two new tools in oncology: CRISPR & Fluorescent In Situ Sequencing (FISSeq)

George M. Church, Harvard Medical School, Boston, MA

10:30 a.m.-11:00 a.m.

Title to be announced

Feng Zhang, Massachusetts Institute of Technology, Cambridge, MA

11:00 a.m.-11:30 a.m.

Progression to metastatic disease: Why is microRNA so crucial?

Herbert Levine, Rice University, Houston, TX

Departure