

# BU MATERIALS DAY 2015 Nanomaterials in Medicine:

Improving Healthcare Through SMALL Innovations

September 25, 2015 8:15 AM - 5:00 PM Photonics Center, Room 906 8 St. Mary's Street, Boston MA 02215 Boston University



### ABOUT BU MATERIALS DAY 2015 Nanomaterials in Medicine: Improving Healthcare Through SMALL Innovations

The impact of nanomaterials on the practice of medicine far exceeds its dimensions. Nanomaterials have unique physicochemical, electromagnetic, and pharmacological properties that enable innovative strategies for diagnosing and treating disease. Targeted imaging probes engineered with nanomaterials allows clinicians and scientists to detect anatomical and pathological abnormalities indicative of disease with biomedical imaging systems. Nanomaterials have also been co-opted for chemical modification or packaging of therapeutic agents, augmenting their bio-distribution, increasing their specificity, and enhancing their efficacy while minimizing off-target adverse effect. In this symposium, leading scientists will present on medical breakthroughs that have been made possible through novel formulations and constructs of nanomaterials.

## Workshop Organizer

#### **Tyrone Porter**

Associate Professor Department of Mechanical Engineering Division of Materials Science & Engineering Boston University

# Program

#### **Morning**

8:15 a.m.	Registration Continental Breakfast, East End Lounge	
8:45 a.m.	WelcomeKenneth Lutchen, Dean, College of EngineeringDavid Bishop, Head, Division of Materials Science & Engineering	
9:00 a.m.	Vladimir Torchilin, Northeastern University	
9:40 a.m.	Muthiah Manoharan, Alnylam Pharmaceuticals	
10:20 a.m.	Coffee Break, East End Lounge	
10:30 a.m.	Heather Maynard, University of California, Los Angeles	
11:10 a.m.	Mark Grinstaff, Boston University	
11:50 a.m.	Lunch Buffet, East End Lounge	
Lunch Speaker		
12:20 p.m.	Patrick Stayton, University of Washington	
Afternoon		

1:10 p.m.	Niren Murthy, University of California, Berke	ley
1:50 p.m.	Anna Moore, Massachusetts General Hospital Harvard Medical School	/
2:30 p.m.	Coffee Break, East End Lounge	
2:40 p.m.	Andew Tsourkas, University of Pennsylvania	
3:20 p.m.	Allison Dennis, Boston University	
4:00 p.m.	Wine & Cheese Reception and Poster Session,	
	9th Floor Lobby and Room 901	Program &

Program & Abstracts

Unless otherwise noted, all events will be held in Room 906 of the Boston University Photonics Center.



# **Speakers**

#### Morning



#### Vladimir Torchilin, Ph.D.

Northeastern University Distinguished Professor, Pharmaceutical Sciences Director, Center for Pharmaceutical Biotechnology and Nanomedicine

Stimuli-sensitive combination nanopreparations of siRNA and chemotherapeutic drugs to treat multidrug resistant cancer



#### Muthiah Manoharan, Ph.D.

Alnylam Pharmaceuticals Inc. Senior Vice President of Drug Discovery Making Drugs out of siRNAs



#### Heather Maynard, Ph.D.

University of California, Los Angeles Professor, Chemistry and Biochemistry Director of the Chemistry Biology Interface Training Program Associate Director of Technology and Development for the California NanoSystems Institute

Bio-inspired and degradable nanomaterials for delivery of proteins



#### Mark Grinstaff, Ph.D.

Boston University Distinguished Professor of Translational Research Professor, Chemistry, Biomedical Engineering, Medicine, and Materials Science & Engineering Director, Center for Nanoscience and Nanotechnology Paclitaxel-Loaded Expansile Nanoparticles for the Treatment of Breast Cancer and Intraperitoneal Mesothelioma

#### Lunch Speaker



#### Patrick Stayton, Ph.D.

University of Washington Washington Research Foundation Professor, Bioengineering Director, Institute for Molecular Engineering and Sciences Director, Center for Intracellular Delivery of Biologics Intracellular Delivery of Biologic Drugs Diagnostics

#### Afternoon



Niren Murthy, Ph.D. University of California, Berkeley Professor, Bioengineering New strategies for imaging infectious diseases and oxidative stress

#### Anna Moore, Ph.D.



Massachusetts General Hospital/Harvard Medical School Professor, Radiology Director, Molecular Imaging Laboratory at the MGH/MIT/ HMS Athinoula A. Martinos Center for Biomedical Imaging Image-guided RNA-based cancer therapies

#### Andrew Tsourkas, Ph.D.

University of Pennsylvania Associate Professor, Bioengineering Associate Director, Program in Targeted Therapeutics, Institute of Translational Medicine and Therapeutics Engineering targeted nanoparticles for molecular imaging and therapeutic applications

#### Allison Dennis, Ph.D.

Boston University Assistant Professor, Biomedical Engineering and Materials Science & Engineering Engineering Thick-shelled Quantum Dot Heterostructures for Biosensing and Bioimaging

## Poster Session Room 901



Poster 1 <u>Ying Chen</u>, Boston University, SERS Analysis of Bacteria and Cancer Cells – A Novel Metabolomics and Diagnostic Tool

Poster 2 <u>Michelle Stolzoff</u>, Northeastern University, Nanomaterials for Anti-Bacterial Orthopedic Applications and Beyond

**Poster 3** <u>Nitinun Varongchayakul</u>, *Boston University*, Label-free single-molecule protein detection using Solid-State Nanopore

Poster 4 Emily Lough, Boston University, Lipid-Polymer Hybrid Nanoparticles for Chemotherapy Delivery Using Drug-Polymer Conjugates

Poster 5 Joanna Chiu, Boston University, Exploring the Effect of on cellular uptake of liposomesTAT peptide

**Poster 6** Kanny Chang, Northeastern University, Selective inhibition of MG-63 osteosarcoma cell proliferation induced by curcumin-loaded self-assembled arginine-rich-RGD nanospheres

**Poster 7**, <u>Luting Liu</u>, *Northeastern University*, **Understanding the Role of Polymer Surface Nanoscale Topography on Inhibiting Bacterial Growth for Catheter Applications** 



**Poster 8** David Stelter, Boston University, Enhanced Sampling of Coarse Grained Membranes and Wrapped Nanoparticles

**Poster 9** <u>Shanadeen Begay, Boston</u> University/Northeastern University/MIT, Weak Folding of Methionine-Enkephalin in Explicit Water: Structure vs. Function Indicators

**Poster 10** <u>Junjie Xue</u>, Boston University, Sustainable Processes for Renewable Energy and Bio-inspired Nanomaterials

Poster 11 <u>Bhushan Pattni</u>, Northeastern University, Targeted delivery of PEG-PE-based micelles encapsulating a novel pro-apoptotic drug, NCL-240, in 3D cancer cell spheroids

**Poster 12** <u>Mahboubeh Nabavinia</u>, *Harvard-MIT*, Gelatin-chitosan hybrid as an injectable thermosensitive hydrogel for tissue engineering applications

Poster 13 <u>Kun Geng</u>, Boston University, Molecular-weight dependent Tg depression of silica-supported poly(amethyl styrene) films BU Materials Day 2015 Workshop Organizer Tyrone Porter gratefully acknowledges the following sponsors:

#### **Boston University**

**The College of Engineering** Dean Kenneth Lutchen Associate Dean Catherine Klapperich

The Division of Materials Science and Engineering Division Head David J. Bishop

The Center for Nanoscience and Nanobiotechnology Director Mark Grinstaff

#### Additional thanks to:

MSE Division Staff Cheryl Stewart, Elizabeth Flagg, Ruth Mason

#### Artwork

Jasmine Carter

#### Wireless Access

**To access BU Guest:** 1. Connect to the network called "BU Guest (Unencrypted) from your list of available networks. 2. Once connected, open up a website and try navigating to a web site. You will be redirected to https://safeconnect.bu.edu:9443 for registration.

#### Accessing the eduroam network:

Wireless access is also available to eduroam participants. If you are an eduroam participant (and your computer or device is already configured to use eduroam) you will not need to connect to the BU Guest network unless you prefer to do so.





Poster Session Abstracts



www.bu.edu/mse/news/bu-materials-day-2015