

# BIOMATERIALS DAY 2017

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**Northeastern University**  
College of Engineering

# SCHEDULE OF EVENTS

**Locations: Curry Student Center Ballroom (2nd floor), McLeod Suites (3rd floor)**

7:45 – 8:00 AM: poster set-up (McLeod)

8:00 – 8:05 AM: Introductory remarks from Tom Webster (McLeod)

8:05 – 9:00 AM: **Breakfast** and poster viewing (McLeod)

9:00 – 9:30 AM: Welcome and opening remarks: Lee Makowski (Ballroom)

9:30 – 10:30 AM: **Oral presentations** (Ballroom)

10:30 – 10:45 AM: Coffee break (Ballroom, back)

10:45 AM – 12:00 PM: **Oral presentations** (Ballroom)

12:00 – 2:00 PM: **Lunch and poster viewing/judging** (McLeod)

12:00 – 1:00 PM: **Poster judging** (McLeod)

2:00 – 2:45 PM: **Oral presentations** (Ballroom)

2:45 – 3:00 PM: Coffee break (Ballroom, back)

3:00 – 4:00 PM: **Plenary Invited Speaker: David J. Mooney, PhD** (Ballroom)

4:00 – 5:00 PM: Workshop in Curry 433:

**The Science of Beer**, Naftali Fraiman, Assistant Brewer at Cape Ann Brewing Company  
(NEU Chemical Engineering, Class of 2011)

5:00 – 5:30 pm: **Closing remarks, awards** (must be present to win!), and reception  
(Ballroom)

5:45 – 7:30 pm: **Alumni mixer** (Alumni Center) – must be 21+ to attend!

# ORAL PRESENTATIONS

Ballroom, Curry Student Center

**(9:30-9:45 AM)** Alex M. Hruska: *Utilizing a fiber-like platform to investigate the biophysical regulators of metastasis in the tumor microenvironment*

**(9:45-10:00 AM)** Mubashar Rehman: *Thermoresponsive Lipid Nanoparticles for Glioblastoma Chemotherapeutical Delivery*

**(10:00-10:15 AM)** Daxing Liu: *CXCR4 binding peptide density targets triple negative breast cancer and hinders metastasis*

**(10:15-10:30 AM)** Bumjun Kim: *The Therapeutic Effect of Epigenetic Drug-encapsulating Lipid Nanoemulsions for Triple Negative Breast Cancer Cells*

**(10:30-10:45 AM) – COFFEE BREAK**

**(10:45-11:00 AM)** Jessica Fitzgerald: *A Cross-Reactive Array Based on Spectroscopically Encoded Polymers for the Classification of Biomolecules*

**(11:00-11:15 AM)** Tess Torregrosa: *A Double Look: Using Biomaterials as an Art Platform*

**(11:15-11:30 AM)** Aslihan Kazan: *Injectable hydrogels for microfluidic applications*

**(11:30-11:45 AM)** Adedokun Adedoyin: *Direct Mechanical Stimulation of MSCs Encapsulated in a Bionanocomposite Magneto-responsive Hydrogel Scaffold via an External Magnetic Field*

**(11:45 AM-12:00 PM)** Ehsan Shirzaei Sani: *Engineering an elastic hydrogel as a sprayable wound healing patch with antimicrobial properties*

**12:00-2:00 PM – LUNCH AND POSTER VIEWING / JUDGING**

**(2:00-2:15 PM)** Jonathan Soucy: *Cell-Laden Gelatin/Tropoelastin Hydrogel Composites for Peripheral Nerve Repair and Anastomosis*

**(2:15-2:30 PM)** Fatemeh Sharifi: *Prediction of urea cycle disorders via liver-on-a-chip simulation*

**(2:30-2:45 PM)** Ece Alpaslan: *Effect of pH-Varied Cerium Oxide Nanoparticles on the Growth of Gram-Positive and Negative Bacteria*

# POSTER SESSIONS

## McLeod Suites, Curry Student Center

**(#1) *Biogenic silver nanoparticles perform dual function as Berberine Carrier and Anticancer Agent against breast cancer***

Ramasamy Bhanumathi, KarupaiyaVimala, and Soundarapandian Kannan

**(#2) *Nano-Drug Delivery System for Improved Synergistic Chemotherapy of Colon Carcinoma***  
Kathirvel Rayappan, Shenbagamoorthy Sundarraj, Roberto Portillo Lara, Nasim Annabi and Soundarapandian Kannan

**(#3) *Antimicrobial Peptide-Enriched Nano-Vesicles for the Treatment of Antibiotic-Resistant Infections***

Nicole Bassous and Thomas J. Webster

**(#4) *Surface Modification of Titanium Orthopedic Implants to Reduce Infection and Inflammation***

Garima Bhardwaj and Thomas J. Webster

**(#5) *Permeability Maps for GelMA Under Different Photo-Crosslinking Times and Degrees of Methacrylation***

Hossein Goodarzi Hosseinabadi, Amir K. Miri, Reza Bagheri, and Ali Khademhosseini

**(#6) *Photo-thermally driven refreshable microactuators based on graphene oxide doped paraffin materials***

Sichao Hou, Miao Wang, Ruiqing Huo, Shouwu Guo, and Ming Su

**(#7) *Cold Atmospheric Plasma (CAP) Modified Core-shell Nanofibers for Bone Tissue Engineering Applications***

Yangfang Zhou, Mian Wang and Thomas J. Webster

**(#8) *Single Cell Array for Population-based Subcellular Toxicity Assay***

Junfei Xia, Yuting Qiu, Xiaojie Xun, Ming Su

**(#9) *Simultaneously Generating Highly Ordered Genomic DNA Microarrays and Nanostrands***

Junfei Xia, Jingjiao Guan, Ming Su

**(#10) *Cationic Self-Assembling Peptide Amphiphiles as Antibacterial Agents Against Drug-Resistant Bacteria***

Kanny (Run) Chang and Thomas J. Webster

**(#11) *Atomic Layer Deposition of Nanocrystalline TiO<sub>2</sub> Thin Films for Orthopedic Applications***

Luting Liu and Thomas J. Webster

**(#12) *Silver-coated Gold Nanorods for Anti-microbial Applications***

Junyan Zhang and Thomas J. Webster

**(#13) *DNA-Peptide Nanotubes As Artificial Extracellular Matrices For Bone Tissue Engineering***

Gujie Mi, Di Shi and Thomas J. Webster

**(#14) *Thermosensitive Liposomes for Brain Tumor-Targeted Drug Delivery***

Di Shi, Gujie Mi and Thomas J. Webster

**(#15) *Lanthanide as a Cyto-protectant***

Maximilian Bizanek, Francielli Silva Genier, Eric Dahl, Thomas J. Webster, Amit K. Roy

**(#16) *A comparison between electro and rotary-jet spinning to produce polymeric fibers with incorporated nanohydroxyapatite and carbon nanotubes: Reduced bactericidal activity and greater cell viability***

Mirian M. M. de Paula, Fernanda R. Marciano, Thomas J. Webster and Anderson O. Lobo

**(#17) *Stable encapsulation of triangular silver nanoplates with a silica shell for targeted and photothermal antibacterial treatment***

Chih-Sheng Chiang, Kanny Chang, Mian Wang and Thomas J. Webster

**(#18) *Exploring the antibacterial effects of polymerosome nanomaterials embedded with silver nanoparticles and doxorubicin***

Keerthana Subramanian, Kanny (Run) Chang and Thomas J. Webster

**(#19) *Designing nanofibers based on polyesters, hydrogels and peptides for cartilage repair***

Paria Ghannadian, Siddhi Kanakiya, Akhil Agarwal, Mirian Michelle Machado de Paula, Thomas J. Webster and Anderson de Oliveira Lobo

**(#20) *Antibacterial Selenium Nanoparticle Coatings for Field Hospitals***

James Moxley and Thomas J. Webster

**(#21) *Self Assembled DiBlock polymersomes for the treatment of mitochondrial diseases***

Jakob Farnham, Nicole Bassous and Thomas J. Webster

**(#22) *Developing Multifunctional Theranostic Vehicles for Cancer Stem Cell Therapy***

Halla Laufey Hauksdóttir, Thomas J. Webster and Már Másson

**(#23) *The effects of piezoelectric nanoparticle/polymer scaffolds on cell proliferation***

Yuan Li and Thomas J. Webster

**(#24) *Role of the microstructure topology on the mechanical properties of an elastic extra cellular matrix***

H.G. Hosseinabadi, Reza Bagheri and V. Altstadt

**(#25) *Engineering an immunomodulating and adhesive hydrogel for the diabetic wound treatment***

Bahram Saleh, Harkiranpreet Kaur Dhaliwal, Ehsan Shirzaei Sani, Mansoor Amiji and Nasim Annabi

**(#26) *Engineering conductive fibrous patches for cardiac tissue regeneration***

Brian Walker, Chu Hsiang Yu and Nasim Annabi

**(#27) *Magnetic assembly of biomimetic conductive muscle fiber constructs***

Asel Primbetova, Andrew Spencer, Chu Hsiang Yu, Ryan Koppes and Nasim Annabi

**(#28) *Engineering Antimicrobial and Osteoinductive Biomaterials for the Bone Tissue Regeneration***

Ehsan Shirzaei Sani, Seyed Hossein Bassir, Roberto Portillo Lara, Giuseppe Intini and Nasim Annabi

**(#29) *Hybrid Modality of Protein Biopharmaceuticals: A Chemo-enzymatic Site-specific Bioconjugation Mediated by Transglutaminas***

Shanshan Liu, Kevin Moulton and Zhaohui Sunny Zhou

**(#30) *Temperature Dependent Incorporation of Fluorescently labeled Type I Collagen Molecules into Native Bovine Sclera Fibrils***

Seyed Mohammad Siadat and Jeffrey W. Ruberti

**(#31) *Effect of formulation variables on the preparation of intra-articular oxaceprol loaded nanoparticles***

Emine Alarçin, Oya Kerimoğlu, Çağlar Demirbağ and Seher Karşı-Çepcioğlu

**(#32) *The Effect of Epoxide Functional Group Content on Cell Viability and Behavior***

Meryem Pehlivaner and Adam Ekenseair

**(#33) *One-pot Growth of Silver Nanoparticles on Self-Assembled PEGylated Rosette Nanotubes: Design, Preparation, and Antimicrobial Properties***

Yiwen Fan and Hicham Fenniri

**(#34) *Molecular Modeling of Fluorescent Organic Nanotubes***

Arthur Gonzales, Belete Adefris Legesse, Takeshi Yamazaki and Hicham Fenniri

**(#35) *Design and fabrication of a microfluidic-based liver-on-a-chip platform***

Fatemeh Sharifi, Ozlem Yesil Celiktas, Bahar Firoozabadi, Yu Shrike Zhang and Ali Khademhosseini



**Prof. David J. Mooney**

School of Engineering and Applied Sciences, and Wyss Institute  
Harvard University  
Cambridge, MA

**Host: Andrew Spencer**

Graduate Student, Chemical Engineering

**Building Immunity with Biomaterials**

**Monday, March 20**

Curry Ballroom

3:00pm-4:00pm

*Sponsored by the Dept. of Chemical Engineering, The Dept. of Bioengineering, and The Society For Biomaterials*

Dysfunction of the immune system underlies many diseases. However, strategies to effectively program an immune response, and reprogram undesired responses, by manipulating a patient's immune cells are at an early stage. We are creating biomaterials capable of concentrating, manipulating, and generating immune cells in the body by controlling, in space and time, the interaction of immune and stem cells with modulatory agents. The utility of this concept in the development of therapeutic cancer vaccines and recreating adaptive immunity following hematopoietic stem cell therapy will be highlighted.

Dr. Mooney is the Robert P. Pinkas Family Professor of Bioengineering at the Harvard John A. Paulson School of Engineering and Applied Sciences. He plays an active role in the major biomedical and chemical engineering professional societies, serves as an editorial advisor to several journals and publishers, organizes and chairs leading conferences and symposia, and participates on several industry advisory boards.

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# WORKSHOP

## *The Science of Beer*

Naftali Fraiman

Assistant Brewer, Cape Ann Brewing Co.

4:00 – 5:00 PM, Curry Student Center 433



Have you ever wondered about the science behind the beer brewing process? Join us for a hands-on workshop with Cape Ann Brewer Nafi Fraiman, E'11, to find out. From grain to glass, your questions about this frothy beverage will be answered!

**\*\*No alcohol will be served at this educational workshop\*\***