

# Materials Research Society

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2015 MRS SPRING MEETING & EXHIBIT  
April 6–10, 2015 | San Francisco, California

**CALL FOR PAPERS**  
Abstract Submission | September 23 – October 23, 2014

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- Soft, Shape-Shifting Materials Address Biological Complexity from a Bottom-Up Approach
- Cephalopod-inspired Device Mimics Its Surroundings
- Click Chemistry Shows Promise to Create Large Organic Structures
- Active Surfaces Control Movement of Fluids and Particles
- Subsidize Green Energy by Taxing Consumption of Electricity, Asserts Article from MRS Energy & Sustainability—A Review Journal

**MRS Publications**

**Upcoming Meetings & Exhibits**

- Childcare Grants
- Discounted Lodging
- Science Writing Workshop
- 2014 MRS Fall Meeting & Exhibit  
November 30 - December 5, 2014 Boston, Massachusetts
- 2015 MRS Spring Meeting & Exhibit  
April 6-10, 2015 San Francisco, California
- XXIV International Materials Research Congress  
August 16-20, 2015 Cancun, Mexico
- 2015 MRS Fall Meeting & Exhibit  
November 29 - December 4, 2015 Boston, Massachusetts
- 8th International Workshop on Zinc Oxide and Related

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## About MRS

The Materials Research Society (MRS) was established in 1973 by a visionary group of scientists who shared the belief that their professional interests were broader in scope than existing single-discipline societies and that a new interdisciplinary organization was needed. Today MRS is a growing, vibrant member-driven organization of over 16,000 materials researchers from academia, industry and government, and is a recognized leader in the advancement of interdisciplinary materials research. Headquartered in Warrendale, Pennsylvania (USA), MRS membership now spans over 80 countries.

The Materials Research Society (MRS) is an organization of materials researchers worldwide that promotes communication for the advancement of interdisciplinary materials research and technology to improve the quality of life. The Materials Research Society will build a dynamic, interactive, global community of materials researchers to advance technical excellence by providing a framework in which the materials disciplines can convene, collaborate, integrate and advocate.

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## 2014 MRS Spring Meeting

학회기간: April 21-25, 2014

장소: San Francisco, CA



## Selected Presentations

### Symposium W: Functional Biomaterials for Regenerative Engineering

Mussel-Inspired Adhesive Interfaces for Biomedical Applications (Hakan Ceylan)

Engineering Biomaterials to Control the Wound Healing Response (Guillermo A. Ameer)

New Strategies for Engineering Human Tissues Based on Natural Origin Material Architectures (Rui L. Reis)

Polymer Adhesives for Medical Applications (Hoyong Chung)

Novel Broad-Spectrum Antimicrobial Polysaccharide-Based Materials (Peng Li)

Biomimetic Engineering and Evaluation of Multidomain Peptide Hydrogels Capable of Promoting Tissue Healing (Vivek Ashok Kumar)

Secondary Covalent Crosslinking of Shear-Thinning Hydrogels to Modulate Viscoelastic Properties In-Situ (Christopher B. Rodell)

Engineering Functional Hydrogels for Repair of Cardiac Tissue (Jason Burdick)

Engineered MMP Sensitivity within Electrospun Nanofibrous Hydrogels (Ryan Wade)

Injectable Hydrogels as Cell Delivery Matrices for Smooth Muscle Repair (Xinming Tong)

Elastin Inspired Hyaluronan Hydrogels (Isabell Nuss)

Inorganic-Organic Hydrogel Scaffolds for Osteochondral Tissue Engineering (Brennan M. Bailey)

An Injectable Piezoelectric Drug Delivery System to Target Tissue Regeneration in Tissue Engineering Applications (Daniela P. Pacheco)

Injectable Regenerative Biomaterials for Treating Cardiovascular Disease (Karen L. Christman)

Fibrin Gels as Cell-Instructive Substrates for Regenerative Medicine (Kent Leach)

Bioactive Hydrogels and Nanomaterials for Vascular Regeneration (Hyunjoon Kong)

Surface Modification of Polydimethylsiloxane (Vipra R Guneta)

Optimized Coatings for Tissue Regeneration (William Murphy)

Shape Memory Polymer Foams with Tunable Properties (Olivia J. George)

### **Symposium Y: Biomaterials for Biomolecule Delivery and Understanding Cell-Niche Interactions**

Biomimetic Patterned Biochemical and Biophysical Properties within Electrospun Nanofibrous Hydrogels (Ryan Wade)

Tuning the Physicochemical Properties of Artificial Scaffolds to Direct the 3D Self-Organization and Structure Formation of Human Glandular Epithelial Cells (Alec Cerchiari)

Engineering Biochemical and Biomechanical Signals in Hydrogels to Modulate Stem Cell Niche Interactions (Jason Burdick)

Effect of Substrate Chemistry and Toughness on Proliferation and Differentiation of Human Bone Marrow Stem Cell (Sisi Qin)

Matrix Stiffness Regulates PSC differentiation towards Smooth Muscle Cell Lineage (Soah Lee)

Deciphering Glioblastoma Cell-Niche Interactions in 3D Using Biomimetic Hydrogels with Decoupled Biochemical and Mechanical Properties (Christine Wang)

The Role of Extracellular Matrix Biophysical Properties on Human Glioblastoma Cell Malignancy (Sara Pedron)

Clinical HA Biomaterials for Cell Therapy: From Bench to Business (Glenn Prestwich)

A Self-Folding, Multi-Walled Poly(ethylene glycol) Diacrylates Hydrogel for Uniaxial, Sustained Molecular Release (Kwanghyun Baek)

Nanostructured Materials and Systems for Biomedical Applications (Jackie Y. Ying)

Shape and Morphology-Induced Effects in Nanoparticle-Mediated Drug Delivery (Samir Mitragotri)

Materials to Direct Human Pluripotent Stem Cell Differentiation (Laura Kiessling)

Facile One-Step Carbamate Modification of Polyethylenimines: Mitigated Cytotoxicity and Tremendously Enhanced Gene Transfection Efficiency (Yi-Yan Yang)

Materials Design for Probing Biological Mechanisms and Clinical Translation (Jennifer Elisseff)

Guest-Host Assembled Hyaluronic Acid Hydrogels with Tunable Biophysical Properties (Christopher B. Rodell)

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## 2014 MRS Fall Meeting

학회기간: November 30 - December 5, 2014

장소: Boston, MA



### Selected Presentations

#### Symposium D: Materials and Concepts for Biomedical Sensing

Digital Detection of Nanoparticles: Viral Diagnostics and Multiplexed Protein and Nucleic Acid Assays (M. Selim Unlu)

Vapor-Condensed Nanolenses for Label-Free Nanoparticle and Virus Imaging Using Lens-free Holographic On-Chip Microscopy (Euan McLeod)

Label-Free Detection of Single Nanoparticles and Biological Molecules Using Microtoroid Optical Resonators (Judith Su)

Engineering Gold Nanoparticles for Lateral Flow Devices to Detect Tropical Diseases (Helena de Puig)

Tunable and Biocompatible Plasmonic Sensor from Silk Hydrogel and Gold Nanostructure (Myungjae Lee)

A Plasmonic Chip for Biomarker Discovery and Point-of-Care Diagnosis of Type-1 Diabetes (Bo Zhang)

Facile Tuning of Conjugated Polymer Emission by Incorporation of Homo-Coupled Benzothiadiazole Segments (Eladio Alejandro)

A Paper-Based Device for Rapid Visualization of NADH and NAD(+)-Involved Transformation Based on Dissolution of Au Nanoparticles (Pingping Liang)

Exosome mRNA Profile as an Indicator of Drug Efficacy (Huilin Shao)

#### Symposium F: Reverse Engineering of Bioinspired Nanomaterials

The Nature of the DNA Bond (Chad A. Mirkin)

Programmable Matter and Its Transformations (Oleg Gang)

DNA Brick-Directed Engineering of Inorganic Materials (Wei Sun)

Programming the Structure of Matter in 3D Using DNA (Nadrian C. Seeman)

Bioinspired and Biomediated Production of Energy Relevant Materials (Jennifer N Cha)

Multi-Stimuli Responsive Polypeptides and Block Copolypeptide Assemblies (Timothy Deming)

Peptide-Based Hollow Spherical Nanoparticle Superstructures: Syntheses, Structures, and Emergent Properties (Nathaniel Rosi)

Targeting Collagen Strands by Triple Helical Hybridization (Michael Yu)

Syntax of “Smart” Peptide Polymers Governs Their Function (Ashutosh Chilkoti)

Predicting Protein Biomaterial Functions from Protein Designs: Interfacing Experimental and Modeling Approaches (David L. Kaplan)

Hydrogels Containing Biomimetic Topographical Features for Small Intestinal Model Systems (Megha Kamath)

Experimental Design Based Analysis of Novel Poly(L-Lactic Acid) Based Nanocomposites: Relationship between Design Parameters and Compressive Properties (Samin Eftekhari)

Artificially Engineered Protein Hydrogels that Mimic Selective Gating by the Nuclear Pore Complex (Minkyu Kim)

Elastin-Like Polypeptide/Graphene Composite Soft Actuators (Malav S Desai)

Photoactive Elastin-Like Coatings to Improve Osseointegration of Implants (Jordan Raphael)

Bio-Inspired Supramolecular Materials for Energy and Medicine (Samuel Stupp)

Mixed-Ligand Nanoparticles Interactions with Cell Membranes (Francesco Stellacci)

Synthetic Biology Approach to Cellular Adhesion and Migration Mediation by Giant Vesicles and Polymer Droplets (Joachim Pius Spatz)

Hepamine: Mussel-Inspired, Chemically Defined Adhesive Heparin Derivative for Extremely Long-Term Culture of Human Embryonic Stem Cell (Mihyun Lee)

Virus Nanoreactors and the Hierarchical Assembly of Coupled Catalytic Materials (Trevor Douglas)

Biologically Inspired Engineering of Self-Assembling and Multi-Functional Underwater Adhesives (Chao Zhong)

Engineering the Mechanical Properties of Peptide Based Hydrogels (Alberto Saiani<sup>2</sup>, Aline F. Miller)

Symmetry-Based Design of Multi-Component 2D Protein Materials (Ariel Jaques Ben-Sasson)

Biomolecule “Catch and Release” with Aptamer-Functionalized Hybrid Surfaces (Ximin He)

Infrared Invisibility Stickers Inspired by Cephalopods (Long Phan)

Responsive Gelation, Toughening, and Biocompatibility of Nanostructured Associative Protein Hydrogels Containing Elastin-Like Polypeptides (Matthew J Glassman)

Hyaluronic Acid Nanoparticle Platform for Drug and Gene Delivery (Xiaoyuan Chen)

Facile Method for Large Scale Alignment of One Dimensional Nanoparticles and Its Biomedical Application (Sheng Feng)

Reverse Engineering of Live Tissue Operation in Hydrogel Devices Combining Microfluidics and Ionic Electronics (Orlin D Velev)

### **Future Meetings**

2015 MRS Spring Meeting & Exhibit

April 6-10, 2015

San Francisco, California



2015 MRS Fall Meeting & Exhibit

November 29 - December 4, 2015

Boston, Massachusetts



### **Related Publications**

MRS Communications

MRS Bulletin

Journal of Materials Research (JMR)