

BIOMATERIALS

K

Bioinspired and biointegrated materials as new frontiers nanomaterials VII

The Symposia series I – VI on Bioinspired and Biointegrated Materials as New Frontier Nanomaterials has been running from 2009 to 2016, with a total of 1317 Presenters, featuring inspiring presentations on rapidly-developing bio-nanotechnologies for next generation nanomaterials, nanosystems and robotic nanodevices.

The VII edition of the Symposium, to be held on May 22-26 2017 in Strasburg (France), is aimed to give an overview of recent development on fundamentals and innovative applications of bio-nanotechnologies, with a special focus on biomaterials engineering and frontier nanomaterials based on emerging concepts for preparing, characterizing and applying bioinspired and biomimetic materials.

Scope:

The Symposium, boosting an interdisciplinary vision, welcomes researchers active in materials science, chemistry, physics, biotechnology and nanomedicine. Submissions reporting on interdisciplinary research efforts, especially those exploring new and emerging concepts, as well as more-developed ideas that are breaking down barriers in biomedical research, are encouraged.

The Symposium will also be the opportunity to bring together researchers from several associated international projects including the COST Actions (MP 1301 NEWGEN & CA 15107 MultiComp) and EU HORIZON 2020 FET Open Programs (LiNaBioFluid), HORIZON 2025 started Programs

Topics to be covered by the symposium:

- Cells, intracellular membranes & tissues bioscience, engineering and 3D/4D imaging
- Smart scaffolds for cell seeding and soft & bone tissue bioengineering
- Chemical and biological synthesis of biomimetic molecules and supramolecular aggregates,
- Stimuli responsive systems, including motors, rotors, switches, pumps, receptors, light emitters, energy harvesting devices at nanoscale
- New nanomaterials for smart bioresponsive interfaces with biological signaling
- Bioinspired synthesis of inorganic nanoparticles for nanomedicine
- Carbon multifunctional 2D & 3D architectures, structure-development of graphene, graphene oxide, nanocarbons
- Biosensing & biological signaling by interfaces engineering
- Electronics and photonics based on biomolecules, supramolecular assemblies, biopolymers, including nucleic acids, peptides, proteins, etc...

The participation of young investigators is strongly encouraged, to provide the most effective and exciting environment for the discussion of the latest, cutting edge results.

The E-MRS Hq and Symposium K support Young Investigators through the E-MRS Graduate Students Awards Prizes and a special support from the Symposium K's budget fund (cf. bottom of page for more details).

Projects for Focused Sessions from May 22 to May 26, 2017:

I. Cell and Tissue Nature Science, Growth at Surface/Interface, Inspired Repair & 3D/4D Imaging.

The Special Session & Young Investigator Forum are dedicated to the 2016 Nobel Laureate in Physiology or Medicine Professor Yoshinori Ohsumi "for his discoveries of mechanisms for autophagy".

Keynote Presentations:

- Tomas Webster Northeastern University, USA
- Osamu Suzuki, Tohoku University, Japan;
- Paula E. Colavita, Trinity College Dublin, Ireland;
- Yoshikatsu Akiyama, Tokyo Women's Medical University, Japan
- Masaru Tanaka, Kyushu & Yamagata Universities;
- Karsten Haupt, Compiègne University of Technology, France

START AT	SUBJECT	NUM.	ADD
18:40	<p>Functionalization of PTFE surface after plasma immersion ion implantation treatment for cardiovascular application</p> <p>Authors : Ang Gao¹, Penghui Li², Liping Tong², Huaiyu Wang², Paul K. Chu¹</p> <p>Affiliations : 1 Department of Physics & Materials Science, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong, PR China 2 Institute of Biomedicine & Biotechnology, Shenzhen Institutes of Advanced Technology, Shenzhen, Guangdong, PR China</p> <p>Resume : Small diameter vascular grafts made of expanded polytetrafluoroethylene (ePTFE) suffer from the poor patency rate because of the thrombosis and intimal hyperplasia, which are result from the lack of endothelialization and chronic inflammation. Therefore, grafts with reduced thrombogenicity, rapid endothelialization as well as the immunomodulating ability are highly desirable. In this work, plasma immersion ion implantation (PIII) technique was used to modify the surface of PTFE to meet these needs. After nitrogen (N₂) PIII treatment, PTFE surface becomes cytocompatible that is sufficient for endothelialization. More importantly, a free radical reservoir is generated underneath the surface. These free radicals continuously migrate to the surface and react with the environment. Taking advantage of this special mechanism, various functional biomolecules can be covalently immobilized on the surface of PTFE by simply incubating the modified samples in corresponding solutions. Heparin, SDF-1α, as well as the CD47 are shown to be successfully bound to the surface with their bioactivities well reserved. The resultant surface possesses the multifunctional properties of reduced thrombogenicity, endothelial progenitor cells (EPC) recruitment potential, and the anti-inflammatory ability. Therefore, this functionalized surface is promising in facilitating the rapid in-situ endothelialization and favorable host immune response that finally contribute to the superior long-term patency.</p>	K.PI.3	☆
18:40	Hybrid organic/inorganic nano-biocatalysts. A new generation of empowered enzymes	K.PI.4	☆
18:40	Bio-inspired Materials for Single Cell Encapsulation	K.PI.5	☆
18:40	Strategies for bone tissue engineering based on polymer-based magnetostrictive and magnetoelectric composites	K.PI.6	☆
18:40	Personalized Modification of Implant Surface Topography via Electrohydrodynamic Printing	K.PI.7	☆
18:40	The roles of interfacial water on proteins and cell adhesions	K.PI.8	☆