Oral Programme

Sunday, 10 March 2019					
17:00-19:00	Registration | Room: Hall Auditorium				
Monday, 11 March 2019					
07:00-08:30	Registration | Room: Hall Auditorium				
Room:	Auditorium				
08:30-08:45	Welcome				
08:45-09:25	**Honorary Lecture 1: [HON1] Hybrid Materials: A successful marriage between polymers and sol-gel chemistries** C. Sanchez, *Collège de France, France*				
09:25-10:05	**Honorary Lecture 2: [HON2] Organic-inorganic hybrid materials engineered by controlled radical polymerization: How to grow polymer chains in dense environment** K. Matyjaszewski, *Carnegie Mellon University, USA*				
10:05-10:40	Coffee Break | Room: Hall Auditorium/Tramuntana 1&2				
Rooms:	Garbi	Auditorium	Tramuntana 3	Llevant	Mestral
10:40-13:00	**Symposium A: Session 1**	**Symposium B: Session 1**	**Symposium C: Session 1**	**Symposium B1: Session 1**	**Symposium ABC: Session 1**
10:40-11:00	**10:40-11:10** **Featured Talk: [FTA01] Nanocellulose-based hybrids and foams: From single fibril properties to functional assemblies** L. Bergstrom *Stockholm University, Sweden*	**[SYMB01.01]** **Triaxial piezoelectric nanocomposite fibers for energy harvesting application** F. Mokhtari*, J. Foroughi, G.M. Spinks, Z. Cheng, *University of Wollongong, Australia*	**[SYMC01.01]** **Metal pyrazolate frameworks as multifunctional catalysts for C-C and C-N bond formations** F. Cirujano*[1], E. Lopez Maya[2], J. Navarro[2], D. De Vos[1] *[1]KU Leuven, Belgium, [2]Universidad de Granada, Spain*	**[SYMB101.01]** **Active optical composites with responsive hybrid particles inside liquid inclusions** D. Doblas Jiménez*[1], J. Hubertus[1], T. Kister[1], T. Kraus[1,2] *[1]INM - Leibniz Institute for New Materials, Germany, [2]Saarland University, Germany*	**[ABC01.01]** **MicroRNA-targeted nanomedicine using porous silicon nanomaterials interfaced with nucleic acid engineering** A. Bertucci*[1,2], K-H. Kim[3], J. Kang[1], J.M. Zuidema[1], E.J. Kwon[1], D. Kim[3], S. Howell[1], F. Ricci[2], H-J. Jang[3], M.J. Sailor[1] *[1]University of California San Diego, USA, [2]University of*

					Rome Tor Vergata, Italy, [3]Kyung Hee, Republic of Korea
11:00-11:20	11:10-11:30 **[SYMA01.01]** **Controlled anchoring of iron-oxide nanoparticles on polymeric nanofibers: A simple approach towards hybrid materials and multifunctional scaffolds** H. Awada*[1], A. Al samad[1], D. Laurencin[1], R. Gilbert[2], A. El Jundi[1], L. Lemaire[3,4], F. Franconi[3,4], J. Larionova[1], Y. Guari[1], B. Nottelet[1] *[1]Université de Montpellier, France, [2]Rensselaer Polytech Inst, USA, [3]UNIV Angers, France, [4]PRISM-Icat, France*	**[SYMB01.02]** **Transparent multifunctional nanocomposite thin films: Extended study on electrophoretic deposition process of inorganic octahedral metal cluster** F. Grasset*[1,2], N.T.K. Nguyen[1,2], A. Renaud[3], M. Wilmet[1,3], M. Dubernet[1,2], N. Dumait[3], M. Amela-Cortes[3], Y. Molard[3], N. Ohashi[1,2], T. Ushikoshi[1,2] et al *[1]CNRS, Japan, [2]RCFM, NIMS, Japan, [3]Univ Rennes, France*	**[SYMC01.02]** **Exploring versatile catalytic activity of stable porphyrin based MOFs** A. Fateeva*[1], J-B. Tommasino[1], B. Abeykoon[1], F. Maillard[4], A. Sorokin[2], A. Demessence[2], T. Devic[3] *[1]University Claude Bernard Lyon 1, France, [2]IRCELYON, France, [3]Institut des Matériaux de Nantes, France, [4]LEPMI, France*	**[SYMB101.02]** **Core-dual shell heterostructure nanocomposites towards enhanced microwave absorption, heat dissipation, and sustainability** Y. Bhattacharjee*, S. Bose *Indian Institute of Science, India*	**[ABC01.02]** **Self-evolving thermal and motion sensors based on PP-g-PNIPAAm surgical meshes: From preparation to exploration of thermo-sensitivity** S. Lanzalaco*[1,2], P. Turón[1,3], C. Weis[3], C. Aleman[1,2], E. Armelin[1,2] *[1]Universitat Politecnica de Catalunya, Spain, [2]Barcelona Research Center in Multiscale Science and Engineering, Spain, [3]B. Braun Surgical, Spain*
11:20-11:40	11:30-11:50 **[SYMA01.02]** **Silk based bionanocomposite engineering for medical applications** C. Belda Marín*[1], X. Mu[2], S. Vidal Yucha[2], D. L. Kaplan[2], C. Egles[1], J. Landoulsi[1], E. Guénin[1] *[1]Sorbonne Universités, Université de Technologie de Compiègne, France, [2]Tufts University, USA*	**11:20-11:50** **Featured Talk: [FTB01]** **Membrane filtration and other applications of nanostructured polyaniline** R. Kaner *University of California, Los Angeles, USA*	**[SYMC01.03]** **Switchable photo-cathodic and photo-anodic behaviour of a metal-organic framework film in a photo-electrochemical cell** R. Ifraemov, R. Shimoni, W. He, G. Peng, I. Hod* *Ben-Gurion University of the Negev, Israel*	**[SYMB101.03]** **Functional molecular-nanostructured bulk metal oxide memory for nanoscale-nanosecond information storage** A. Balliou*, D. Skarlatos, G. Papadimitropoulos, N. Glezos *[1]NCSR Demokritos, Greece,*	**[ABC01.03]** **Cellulose-based photonic architectures** C. Dore[1], A. Espinha[1], J. Osmond[2], A. Mihi*[1] *[1]Institute of Materials Science of Barcelona ICMAB - CSIC, Spain, [2]Institute of Photonic Sciences, Spain*

Self-evolving thermal and motion sensors based on PP-*g*-PNIPAM surgical meshes: from preparation to exploration of thermo-sensitivity

Sonia Lanzalaco[1,2], Pau Turón[1,3], Christine Weis[3], Carlos Alemán[1,2], Elaine Armelin[1,2]

[1] Departament d'Enginyeria Química, EEBE, Universitat Politècnica de Catalunya, C/ Eduard Maristany, 10-14, Ed. I.2, 08019, Barcelona, Spain.
[2] Barcelona Research Center in Multiscale Science and Engineering, Universitat Politècnica de Catalunya, Campus Diagonal Besòs (EEBE), C/ d'Eduard Maristany 10-14, Edifici IS, 08019, Barcelona, Spain.
[3] B. Braun Surgical, S.A, Carretera de Terrassa 121, 08191 Rubí (Barcelona), Spain.
E-mail address: sonia.lanzalaco@upc.edu

Polypropylene (PP) mesh is one of the most commonly used prosthetic materials for repairing abdominal wall defects due to its excellent durability, low infection risk, negligible carcinogenicity and long term strength [1]. However, upon implantation it might shrink, buckle and curl, owing to physiological wound contracture, presenting high adhesion risk. The utilization of light-/mid-weight PP mesh could solve some of these problems, but it will negatively affect the surgery by decreasing the required stiffness [2].
In order to reduce the risks and improve the handling, the modification of a commercial mid-weight PP mesh leading to the production of a temperature-sensitive device able to self-evolve after implantation is presented (self-evolving motion sensor). The modification was made by grafting poly-*N*-isopropylacrylamide (PNIPAAm) onto PP mesh, a biocompatible thermo-responsive hydrogel that exhibits a large reversible volume transition at a critical temperature, T_c (~ 32°C) [3]. The PNIPAAm swells and shrinks in response to temperature leading to folding and unfolding. Commercial PP meshes were functionalized by O_2-plasma and the effect of the conditions on the grafting of PNIPAAm was evaluated. Once identified the best functionalization, a detailed study of the grafting was performed and the thermo-induced motion of the composite was investigated. Cytotoxicity, cell adhesion and proliferation studies were carried out. For the *in vitro* assays, fibroblasts and epithelial cells were used, due to their crucial role in wound healing.

Acknowledgements
This work was supported by MINECO (MAT2015-69367-R) and AGAUR (2017SGR359).S.L. acknowledges funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement Nº 796292 (Project 4D-POLYSENSE).

References
[1] (a) F.C. Usher. *Am. J. Surg.* **1959**, *97*, 629-633. (b) R.C. Read. *Hernia* **1999**, *3*, 167-171
[2] C.R. Costello et al. *J. Biomed. Mater. Res. B: Appl. Biomater.* **2007**, *83B*, 44-49
[3] S. Lanzalaco, E. Armelin, *Gels* **2017**, 3, 36