4th IBEC Symposium on Bioengineering&Nanomedicine

18 October 2011

ibec Institute for bioengineering of Catalonia

Generalitat de Catalunya

UNIVERSITAT DE BARCELONA

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4th IBEC Symposium on
Bioengineering&Nanomedicine

18 October 2011

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Welcome Letter

Dear participant,

I'm delighted to welcome you to IBEC's fourth Annual Symposium on Bioengineering and Nanomedicine, which this year gathers together more high-profile international experts than ever before to offer an unrivalled platform for interdisciplinary talks, discussions and networking.

Our symposium has grown since IBEC's first such event, which took place in November 2007. It provided the first ever public presentation of IBEC's research, as well as showcasing some of the achievements of international experts in our multidisciplinary fields of interest.

Since then, the further editions of the symposium expanded to two days and drew some 300 participants, and this year for the first time we have combined with the biomedical and biotechnology cluster, Biopol'H, and the Health Universidad de Barcelona Campus (HUBc) to offer an additional day-long workshop, Nanomedicine for Healthy Ageing. Information about the workshop, which takes place the day after the symposium, can be found on the other side of this book.

I know that we will also see many of you at 20-21 October's European Technology Platform on Nanomedicine (ETPN) Annual Meeting in Barcelona, which IBEC also co-organizes, and with all these valuable opportunities for exploration of the exciting developments in these emerging and far-reaching fields, this week promises to be a valuable experience for all researchers with an interest in bioengineering or nanomedicine.

Enjoy the symposium!

Josep A. Planell, Director of IBEC

Information for participants

Information Desk

The conference registration and information desk will be located in the main reception hall (next to the emergency entrance) of the Hospital Universitari de Bellvitge, Av. Gran Via de l'Hospitalet de Llobregat, 08907 L'Hospitalet de Llobregat. It will be staffed from 08:30 to 19:00 on Tuesday 18th October.

Badges

Each registered participant will receive a name badge. For security reasons, the badge must be clearly exhibited in order to access the congress area during all scientific and social events. Replacements for lost badges will be available from the registration desk.

Speakers/Flash presentations

Speakers and those participants giving flash presentations should upload their presentation(s) to the auditorium computer during the coffee or lunch break before their session. Those who are speaking in the first session in the morning should go to the information desk at least 15 minutes before the start of the day's programme.

Poster sessions

Posters should be hung during registration between 08:30 and 09:30 on Tuesday 18th October. Please refer to the information board in the registration area to check which board number has been allocated to you.

Posters can remain on display throughout the conference and should be removed between 18:30 and 19:00. Any posters remaining after the indicated time will be removed by the organizers, who accept no responsibility for loss or damage.

Poster sessions will take place during the coffee and lunch breaks.

Information for participants *cont.*

Certificate of attendance

If you wish to have a Certificate of Attendance, you can request one from the Secretariat at symposium@ibecbarcelona.eu.

Public transport to Barcelona and the airport

Metro: the venue is at the last stop on Line 1 (red), 'Hospital de Bellvitge'. The metro station is a few metres from the entrance, across the car park. Hours of operation: Monday to Thursday, Sundays and holidays: 05:00 to midnight. Fridays and days prior to holidays: 05:00 to 02:00. Saturday night: non-stop.

Bus: Buses run from about 06:00 to 22:00, depending on the line, and night buses from 22:00 to 06:00. Bus numbers 46, 65, 79, L70, L80, L81, L87, L94 and L95 run to and from the centre of Barcelona (Plaça Espanya or Plaça Catalunya) via the Hospital de Bellvitge.

Bus to the airport: Bus number 46 goes directly to the airport and stops very close to the hospital. Buses run every 20 minutes and the journey to the airport takes about 20 minutes.

Taxis: Taxis can be hailed in the street, or call Radio Taxi Barcelona (902 222 111) or Teletaxi Barcelona (932 134 131).

Tourist information: 932 388 091.

Programme

Tuesday, 18 October	
08:30-09:30	Registration
09:30-10:00	Opening ceremony
10:00-10:35	**Prof. Matthias Lutolf**, EFPL, Switzerland *Probing single hematopoietic stem cell fate (HSC) decision-making in artificial niches*
10:35-11:25	Flash poster presentations I
11:25-12:10	Coffee break & Poster Session
12:10-12:45	**Prof. Pau Gorostiza**, IBEC *Optical control of neurosecretion*
12:45-13:20	**Prof. Herman Gaub**, Ludwig-Maximillians-Universität Münich, Germany *Functional surface assembly by single-molecule cut-and-paste*
13:20-15:00	Lunch & Poster Session
15:00-15:35	**Prof. J. Antonio del Río**, IBEC *Myelin associated proteins, roles during development and axonal regeneration*
15:35-16:25	Flash poster presentations II
16:25-17:05	Coffee break & Poster Session

Programme *cont.*

17:10-17:45	**Prof. Mike Hughes**, University of Surrey, UK *DEP-Wells: a new paradigm for dielectrophoretic analysis of cells*
17:45-18:20	**Prof. Antoine Ferreira**, Institut PRISME, ENSI Bourges, France *Navigable drug delivery nanocapsules in blood vessels*
18:20	Awards and closing ceremony
19:00	**End of the symposium**

Wednesday, 19 October	
All day	Biopol'H-IBEC workshop on Nanomedicine for healthy ageing

...Please turn this book over for details

KEYNOTE LECTURES

Probing single hematopoietic stem cell fate (HSC) decision-making in artificial niches

Prof. Matthias Lutolf
Institute of Bioengineering, Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland

The remarkable ability of stem cells to renew themselves and to give rise to specialized cell types has raised huge hope for their clinical application. However, our limited understanding of the mechanisms that regulate stem cells poses a substantial hurdle for their clinical use: Since we know relatively little about how stem cells function, it is not surprising that we also struggle in growing them in a cell culture dish; most likely an important requirement for stem cell-based therapies.

I believe that one cause of this problem is the inadequacy of tools that we have available to study stem cells at the single cell level. That is to say, even after careful prospective isolation based on immunophenotype, individual stem cells of a well-defined population behave highly heterogeneous in culture: some cells divide rapidly and others more slowly; some self-renew while others begin to differentiate; some can give rise to more lineages than others, etc. Because of this inherent variability, population-based studies of stem cells are essentially 'black boxes' and often unable to accurately address key biological questions, such as defining the discrete development steps from a single stem cell to a complex population of specialized cells (lineage development), or elucidating the mechanisms that regulate symmetric versus asymmetric divisions of stem cells.

In this talk I will highlight recent efforts in my lab to address this important problem by developing and applying microfluidic technology to sequentially capture single HSC after multiple divisions to assess their fate, and in particular the symmetry of division, by multigene single cell qRT-PCR.

Prof. Matthias Lutolf

Prof. Matthias Lutolf *completed his undergraduate studies in Materials Engineering at ETH Zurich (1999). From 1996 to 1997 he worked as trainee for ABB (Baden-Daettwil), Sulzer Innotec (Winterthur), Contraves Space (Zurich) and Baxter Healthcare Corporation (Irvine, USA). He carried out his graduate studies at ETH and the University of Zurich. For his PhD thesis on a novel class of biologically responsive synthetic materials for tissue engineering he was awarded the ETH medal (2003), and was named as a co-inventor on four internationally issued patents in the field of polymeric biomaterials and growth factor delivery systems. In 2005, he joined the Baxter Laboratory for Stem Cell Biology at the Stanford University School of Medicine. He was awarded a Leukemia and Lymphoma Society fellowship (2006) for his research on microenvironmental regulation of hematopoietic stem cells. His current research activities as Assistant Professor at the EPFL interface biomolecular engineering with stem cell biology. In 2007 he won a prestigious European Young Investigator (EURYI) award to start up his independent research at EFPL.*

Notes

Optical control of neurosecretion

Prof. Pau Gorostiza
Institute for Bioengineering of Catalonia (IBEC)

Neurons signal to each other and to non-neuronal cells as those in muscle or glands, by means of the secretion of neurotransmitters at chemical synapses. In order to dissect the molecular mechanisms of neurotransmission, new methods for directly and reversibly triggering neurosecretion at a presynaptic terminal are necessary. We have exploited the calcium permeability of the light-gated channel LiGluR in order to reversibly manipulate cytosolic calcium concentration, and demonstrate that light-gated calcium influx allows controlling calcium-regulated exocytosis without need of applying a depolarizing solution or voltage clamping in chromaffin cells. Secretory events can be detected by amperometry under physiological (2.5 mM) extracellular calcium concentration, and their rate can be adjusted between zero and several Hz with the wavelength of light, which opens up the possibility of color-encoded manipulation of firing rate in neural circuits. Amperometry reveals that optical stimulation consistently triggers exocytosis of secretory granules, however, optical stimuli result in longer delay between stimulus and the first exocytic spike, and faster recovery than depolarization-evoked events. LiGluR triggers secretion less efficiently than native voltage-gated calcium channels because the distance between sites of calcium influx and vesicles ready to be released is larger, as shown by an increased sensitivity of optical stimuli to the application of the exogenous mobile calcium buffer EGTA. This result suggests that optical control of neurosecretion can be optimized by engineering LiGluR targetting in order to enhance coupling to vesicle sites. Optical control of neurosecretion enables studying synaptic integration and feedback loops by presynaptic stimulation, and has nanomedical applications to remotely regulate secretion of body fluids with light.

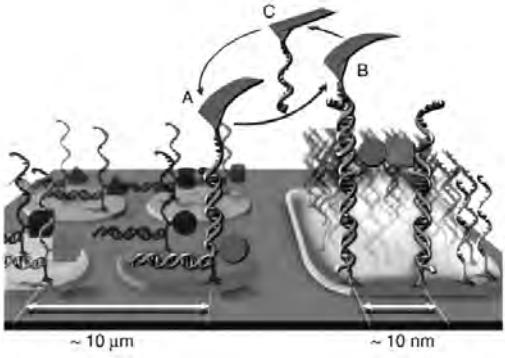
Prof. Pau Gorostiza

Prof. Pau Gorostiza *graduated in physics at the Universitat de Barcelona (UB), where he also obtained his PhD in the field of semiconductor electrochemistry. He also worked at the microscopy facility of the UB, where he gained experience in AFM and STM of biological samples, as well as in nanotechnology applied to materials science. He has visited the CNRS and the Université Pierre et Marie Curie in Paris (France), and the University of California at Berkeley (USA). His recent works include the development of optical switches for remotely controlling neuronal activity. He obtained a Young Biomedical Investigator Award of the Francisco Cobos Foundation, a Career Development Award of the Human Frontier Science Program (HFSP) and a Starting Grant of the European Research Council (ERC). He is currently ICREA Research Professor at the Institute for Bioengineering of Catalonia (IBEC).*

Notes

Functional surface assembly by single-molecule cut-and-paste

Prof. Herman Gaub
Ludwig-Maximilians-Universität Münich, Germany



Bottom up assembly of functional molecular ensembles with novel properties emerging from composition and arrangement of its constituents is a prime goal of nanotechnology. With the development of Single-Molecule Cut-and-Paste (SMC&P) we provided a platform technology for the assembly of biomolecules at surfaces. It combines the Å-positioning precision of the AFM with the selectivity of DNA hybridization to pick individual molecules from a depot chip and allows to arrange them on a construction site one by one. An overview on different applications of this technology will be given in this talk. One recent example demonstrates the functional of receptors for small molecules. By SMC&P we assembled binding sites for malachite green in a molecule-by-molecule assembly process from the two halves of a split aptamer. We show that only a perfectly joined binding site immobilizes the fluorophore and enhances the fluorescence quantum yield by several orders of magnitude. To corroborate the robustness of this approach we produced a micron-sized structure consisting of more than 500 reconstituted binding sites. To the best of our knowledge this is thby one bottom up functional bio-molecular assembly.

Prof. Herman Gaub

Prof. Herman Gaub *completed his PhD in 1984 at the TU Munich, before going to Stanford to explore antigen presentation in the immunological synapse. Back in Munich as an associate professor, he pioneered the use of atomic force microscopy for the study of mechanical properties of single molecules. Having taken over the chair for Applied Physics at the Ludwig-Maximilians University in 1995, he invented single molecule force spectroscopy techniques and applied them to the study of biopolymers. His group was the first to explore the unique mechanical properties of single proteins, and engineered the first man-made single molecule motor and pioneered single molecule cut-and-paste technology. He has received the Max Planck Award of the Alexander von Humboldt Foundation and the Langmuir Lecture Award of the American Chemical Society. He holds an adjunct professorship at the Jilin University and is a member of the German National Academy.*

Notes

Myelin associated proteins, roles during development and axonal regeneration

Prof. José Antonio del Río
Institute for Bioengineering of Catalonia (IBEC)

Adult mammalian central nervous system (CNS) axons have a limited regrowth capacity following injury. Myelin-associated inhibitors (MAIs) limit axonal outgrowth, and their blockage improves the regeneration of damaged fiber tracts. Three of these proteins, Nogo-A, MAG, and OMgp, share two common neuronal receptors: NgR1, together with its coreceptors p75(NTR), TROY, and Lingo-1; and the recently described paired immunoglobulin-like receptor B (PirB). These proteins impair neuronal regeneration by limiting axonal sprouting. Some of the elements involved in the myelin inhibitory pathways may still be unknown, but the discovery that blocking both PirB and NgR1 activities leads to near-complete release from myelin inhibition, sheds light on one of the most competitive and intense fields of neuroregeneration study in recent decades. In parallel with the identification and characterization of the roles and functions of these inhibitory molecules in axonal regeneration, data gathered in the field strongly suggest that most of these proteins have roles other than axonal growth inhibition. The discovery of a new group of interacting partners for myelin-associated receptors and ligands, as well as functional studies within or outside the CNS environment, highlights the potential new physiological roles for these proteins in processes, such as development, neuronal homeostasis, plasticity, and neurodegeneration. In this presentation, we would like to present new insights about the intracellular signaling and developmental functions of MAIs.

Prof. José Antonio del Río

Prof. José Antonio del Río *is group leader of IBEC's Molecular and Cellular Neurobiotechnology group in and Full Professor of Cell Biology in the Department of Cell Biology of the University of Barcelona. He graduated in Biology at the University of Barcelona, where he also carried out his PhD studies in Neurogenesis of interneurons in the neocortex and hippocampus (awarded with the Excellence Award to the best Doctoral Thesis in Biology). Afterwards, he made stays at the University of Frankfurt and Freiburg (Germany) and Bristol-Myers Squibb (Princeton, USA). His internationally recognized group has produced fundamental knowledge in the field of axonal guidance and neurodegenerative diseases. The team has studied the signalling cascades that are activated by the cellular prion protein and has also developed several in vitro models for nerve regeneration and neurodegeneration by using organotypic slice cultures, stem cell and cell therapy.*

Notes

DEP-Wells: a new paradigm for dielectrophoretic analysis of cells

Prof. Mike Hughes
University of Surrey, UK / DEPtech Ltd

Dielectrophoresis (DEP) is a phenomenon of induced motion in particles suspended in a non-uniform electric field. First reported about a century ago, and subjected to more rigorous examination from the 1950s under Herbert Pohl, it is known to affect cells and other biological particles, because in the absence of a permanent dipole, they experience dipolar effects due to charge induction at the interface between the cell exterior and the medium (and for more complex systems between any concentric compartment and its surroundings). Since the dielectric properties are frequency dependent, a frequency spectrum typically reveals changes in cell behaviour that can be attributed to specific electrical properties of the cell, such as the capacitance of the cell membrane, or to the ionic strength of the cytoplasm. Since these properties vary from cell type to cell type, DEP offers a low-cost, non-invasive means of determining cell electrophysiology.

Despite this, DEP has not been exploited widely as a tool for cell investigation. This may be attributable to many causes. First, the force on the cell cannot be measured directly, so a correlate must be found, such as the velocity of the particle. However, since the technique relies on field non-uniformity, the exact electric field geometry can be difficult to determine accurately, even with simulation, and the process of identifying and tracking individual cells in 3D space in order to compare expected and detected values of velocity is time consuming and allows only the tracking of small numbers of cells. Similarly, the protocols for loading and analyzing cell samples, and the subsequent analysis of the results, often required high levels of expertise in technologies more familiar to the engineer than the cell biologist. This was often compounded by the high cost of analysis chips, constructed using technology derived from the microelectronics industry.

To overcome these limitations, we have developed a novel system called DEP-well. In this, electrodes are constructed around the outer wall of a “well”, about 1mm across and 2mm deep. The field is axisymmetric, eliminating the need for complex models of electric field morphology; particles are attracted to, or repelled from, the chamber walls according to their properties, and the change in light intensity of a light beam passing through the well is mathematically proportional to the force on the cells. DEPwell’s efficacy has been demonstrated in applications from stem cell differentiation to oral cancer screening, which will be described here.

Prof. Mike Hughes

Prof. Mike Hughes *attended the University of Wales at Bangor for both his Master of Engineering (1992) and PhD (1995) studies, and has worked at Glasgow University (UK), University of California at Irvine (USA) and the University of Texas MD Anderson Cancer Center (USA). He has been at the University of Surrey since 1999, rising to Professor of Biomedical Engineering in 2007. He has authored or co-authored over 100 journal papers, conference papers, and contributed book chapters, and two books (Nanoelectromechanics in Engineering and Biology (2002) and Microengineering in Biotechnology (2010)), is named on five patents, and is a Director of DEPtech, a company created to develop products for the electrostatic analysis of cells.*

Notes

Navigable drug delivery nanocapsules in blood vessels

Prof. Antoine Ferreira
Institut PRISME, ENSI Bourges, France

This study presents the first steps of design, modeling, simulation and development of a drug delivery microrobotic system (consisting of nanoActuators and nanoSensors)* for the propulsion and navigation of ferromagnetic microcapsules in the cardiovascular system controlled by a clinical Magnetic Resonance Imaging (MRI). Engineered micro-/nano-devices may be successful vehicles for transporting, delivering and targeting drugs. The integration of ferromagnetic particles allows potential MR-tracking and automatic delivery of the biocarriers through induced forces generated by magnetic gradients. MRI systems offer a level of flexibility, provide concentration and tracking information, real-time interventional capabilities and are already widespread in hospitals. Automatic delivery of these biocarriers to specific regions of the tumor through the lymphatic vessels is of special interest at early cancer diagnostics.

In this presentation we present first, the nanocapsule design constituted of molecular elements that can function as sensors, actuators, drug delivery mechanisms; magnetic components for achieving navigation inside the human body and carbon nanotube-based nanostructures. Second, we present computational studies on controlled navigable micro/nanocapsules which are steered by magnetic gradients generated by the MRI system. The navigation modeling was studied for future development of nanocapsules designed to perform minimally invasive interventions in remote sites accessible through the human cardiovascular system (from aorta-to-capillary networks). Third, different modeling methodologies and simulations have been developed for robust control in-vivo navigation in the cardiovascular system. Finally, some micro/nanofabrication technologies (magnetic carbon nanotube-based nanocapsules and novel polymer micelle nanocarrier, based on watersoluble amphiphilic block copolymers are presented.

This work is a collaboration with Constantinos Mavroidis of the Bionano Robotics Laboratory, Dept. of Mechanical & Industrial Engineering, Northeastern University, Boston, MA, USA. It was supported by European Union's 7th FWP (Seventh Framework Programme) and its research area: ICT-2007.3.6 Micro/nanosystems under the project NANOMA: Nano-Actuators and Nano Sensors for Medical Applications.

Prof. Antoine Ferreira

Prof. Antoine Ferreira *(M'04) received the M.S. and Ph.D. degrees in electrical and electronics engineering from the University of Franche-Comté, Besancon, France, in 1993 and 1996, respectively. In 1997, he was a Visiting Researcher in the ElectroTechnical Laboratory, Tsukuba, Japan. He is currently a Professor of robotics engineering at the Laboratoire PRISME, Ecole Nationale Supérieure d'Ingénieurs de Bourges, Bourges, France. He is an author of three books on micro- and nanorobotics and more than 140 journal and conference papers and book contributions. His research interests include the design, modeling, and control of micro and nanorobotic systems using active materials, micro- and nanomanipulation systems, biological nanosystems, and bionanorobotics. Dr. Ferreira was the Guest Editor for different special issues of the IEEE/ASME Transactions on Mechatronics in 2009, International Journal of Robotics Research in 2009, and the IEEE Nanotechnology Magazine in 2008. He is associate editor in Reviews in Advanced Sciences and Engineering.*

Notes

POSTERS


Posters presentations
ibec
1 Agudo Gangolells, Idoya Breath Analysis by Ion Mobility Spectrometry in COPD and Lung Cancer Patients
2 Aguirre, Aitor PLA/Bioactive Glass Composite Enhances Endothelial Progenitor Cell Angiogenesis
3 Artés, Juan Manuel Implications for in situ Tissue Engineering Applications
4 Barreiros dos Santos, Marília Electron transfer properties of redox protein azurin measured by Tunneling Spectroscopy
5 Basomba, Joan Development of a high performance nanobased multianalyte de pathogens
6 Human Body

Posters with Flash presentation

1	Zaida Álvarez **Time: 10:35**	Nanofibers of Poly Lactic acid for nerve regeneration
2	Luis Amigo **10:38**	Polyarticulated Exoskeleton Architecture to avoid Joints Misalignment between Human and Robot
4	Marília Barreiros **10:41**	Fabrication of a multi sensor for electrochemical detection of pathogenic bacteria
7	Annalisa Calo **10:44**	Deposition of natural vesicles onto solid substrates for biosensing applications
9	Aura M. Cardona **10:47**	Computational flow and perfusion simulations for functional assessment of microvasculature and tissue engineered constructs
11	Patricia Carulla **10:50**	Neuroprotective role of PrPC against kainate-induced epileptic seizures and cell death depends on the modulation of JNK3 activation by GluR6/7–PSD-95 binding
12	Laura Casares **10:53**	Quantifying inter-cellular forces during stretch
14	Óscar Castillo **10:56**	Electrokinetic DNA transport in 20 nm high nanoslits: evidence for movement through a wall-adsorbed polymer nanogel
15	Maria del Mar Cendra **10:59**	Genome-wide transcriptional analysis of Escherichia coli NrdR regulon
19	Claudia Di Guglielmo **11:02**	Generation of reporter transgenic hES/iPS cell lines for the investigation of cardiac differentiation
22	Luis Fernández **11:05**	Study of sensory diversity and redundancy to encode for chemical mixtures
27	Marina Inés Giannotti **11:08**	pH-Responsive Polysaccharide-Based Polyelectrolyte Complexes As Nanocarriers for Lysosomal Delivery of Therapeutic Proteins
29	Xavier Giralt **11:11**	Adaptative Control Architecture Towards the Optimization of Robotic Assisted Rehabilitation Exercises

Posters with Flash presentation *cont.*

33	Georg Gramse **11:14**	AC-Electrostatic Force Microscopy in Liquid Media
34	Ana Guamán **15:35**	Quantification of biogenic amines using three different Ion Mobility Spectrometers
35	Dencho Gugutkov **15:38**	Novel Type Fibrinogen/PLA Nanofibers in Attempt to Guide the Endothelial Cells Behavior
36	Mercè Izquierdo **15:41**	Optical control of neurosecretion
39	Riccardo Levatto **15:44**	Polylactide microcarriers prepared using a green solvent: potential application
41	Andrea Malandrino **15:47**	A mechano-transport computational model for the study of intervertebral disc degeneration
49	Sara Nocentini **15:50**	Myelin-associated proteins block the migration of olfactory ensheathing cells: an in vitro study using single cell tracking and traction force microscopy
55	Pere Roca **15:53**	Adhesion maturation through force-dependent α-actinin competition with talin
61	Leonardo Sarlabous **15:56**	Evaluation of the Respiratory Muscles Efficiency in COPD patients
63	Xavier Serra **15:59**	Emergence Of Mechanical Patterns During Tissue Growth
66	Isil Tekeli **16:02**	A new tool to study zebrafish cardiac regeneration: photo-inducible CreERT2 recombinase system
67	George Toromanov **16:05**	Fate of Vitronectin at cell-biomaterial interface
68	Oiane Urra **16:08**	Sleep Dynamics Analysis as a Source of a Reliable Sleep Quality Assessment
69	Juan José Valle **16:11**	Probing the binding of Plasmodium falciparum-infected red blood cells to polysaccharides by force spectroscopy

Posters without Flash presentation

3	Juan Manuel Artés	Wired Molecular Transistor Based on Single Metalloprotein Junctions
5	Elsa Bazellières	Intercellular force transmission through cell-cell junctions during collective cell migration
6	Jean-Yves Bourges	Relationship Between Fibre Orientation and Tensile Strength of Natural Collagen Membranes for Heart Valve Leaflets
8	Isaac Canals	Cell model for Sanfilippo C syndrome using iPS cells from patients_ fibroblasts
10	Elisa Carenza	Anionic magnetic nanoparticles as cell field-guiding to locally enhance endogenous neurorepair mechanisms
13	Maria Isabel Castellanos	Biofunctionalized Co-Cr alloy surfaces for cardiovascular applications
16	Nuno Coelho	Type IV Collagen arrangement at Cell-Biomaterial Interface
17	Vito Conte	Modelling mechanical pattern formation in tissue Dynamics
18	Beatriz del Moral	Combined Impedance and Dielectrophoresis Portable Device for Point-of-Care Analysis
20	Aurora Dols Perez	Nanomechanical properties of DOPC nano-patches in dry environment
21	Daniel Esteban Ferrer	Single bacteria studies using Electrostatic Force Microscopy
23	Roland Galgoczy	Extracellular matrix based 3D cultures as tissue surrogates in terms of O2 transport
24	Sara Gallinetti	Synthesis and evaluation of new ƒÑ-TCP/£]-TCP biphasic calcium phosphate
25	Simon Garcia	Interplay between chemical and mechanical guidance during collective cell migration

Posters without Flash presentation *cont.*

26	Maria Inés Giannotti	(Nano)mechanical Stability of Lipid Bilayers: Effect of Cholesterol on DPPC Model Membrane
28	Beatriz Giraldo	Recurrence Quantification Analysis of Heart Rate Variability and Respiratory Flow Series in Patients on Weaning Trials
30	Maria Godoy Gallardo	Incorporation of silver in titanium surface by anodizing
31	Arlyng González	Extracellular Calcium Induces Osteogenic Differentiation on Mesenchymal Stem Cells through Calcium Sensing Receptor
32	Laura González	Shear Force Microscopy based on tuning fork sensors with Q and Amplitude control for nanocharacterization of Biological Samples
37	Antonio Juárez	3D-Carbon electrode dielectrophoresis: concentration and characterization of bacteria and yeast cells
38	Anna Laromaine	Peptide-Nanoparticle conjugates and 3D cell cultures, two methods for bioassays
40	Yassine Maazouz	Wettability and water absorption of calcium phosphate cements with different micro and nanostructures
42	Joana Marques	Exploration of glycosaminoglycans as targeting agents for antimalarial drug delivery
43	Andrés Martín-Quirós	Photocontrol of endocytosis through engineered inhibitory peptides
44	Yannis Missirlis	A versatile bioreactor for assessing cell behaviour due to mechanical stimulations
45	Ernest Moles	Development of antibodies and aptamers for nanovector-mediated antimalarial drug delivery
46	Sergio Mora Castilla	Chondrogenic differentiation of human induced pluripotent stem (iPS) cells in bioactive scaffolds

Posters without Flash presentation *cont.*

47	Christian Morgenstern	Comparison of Upper Airway Respiratory Resistance Measurements with the Esophageal Pressure/ Airflow Relationship during Sleep
48	Nerea Murillo Cremaes	Drug Impregnated Magnetic Nanospheres
50	Sabine Oberhansl	Facile modification of silica substrates provides a platform for direct writing surface click chemistry
51	Andy Olivares	Simulation of cell seeding on regular scaffold under numerical perfusion of particles
52	David Pastorino	Influence of Macroporosity on the antibiotic delivery from Calcium Phosphate Cements
53	Rafael Piñol	Multifunctional biomedical nanoplatform. Applications in biomedicine
54	Yvonne Richaud	Establishment and characterization of induced pluripotent stem (iPS) cell lines from Parkinson's disease patients
56	Carlos Ruiz	Mesh Convergence Study of The Intervertebral Disc
57	Nadège Sachot	Hybrid Osteogenic And Angiogenic Electrospun Fibers For Bone Tissue Engineering
58	Adriana Sánchez	Stable and efficient genetic modification of human pluripotent stem cells (hESC/IPSC) direct neural differentiation towards A9-subtype ventral midbrain dopaminergic neurons
59	Adriana Sánchez	Generation of iPS-derived dopaminergic neurons affected by Parkinson's disease
60	Aitor Sánchez Ferrero	Setup of citric acid-cross-linked elastin-like polymers hydrogels for bone tissue engineering
62	Tiziano Serra	Surface characterization of PLA/PEG/CaP glass biodegradable composite scaffolds

Posters without Flash presentation *cont.*

64	Jordi Solà	Bayes Classification of snoring subjects with and without Sleep Apnea Hypopnea Syndrome, using a Kernel method
65	Witold Tatkiewicz	Surface Cell Growth Engineering Assisted by Novel Protein Nanomaterial
70	Manuel Vinagre	Affordance inspired Human-Robot Interaction for shared tasks
71	Joan Comenge	Gold Nanoparticles as Drug Delivery System for Cisplatin: Avoiding Chemotherapy Side Effects

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