



# AFM BioMed Conference

## Paris / August 23 - 27, 2011

After Barcelona 2007 (Spain), Monterey 2008 (USA), and Red Island 2010 (Croatia) AFM BioMed Conference welcomes you to Paris (France) to the Fourth International Conference on AFM in Life Sciences and Nanomedicine.

The conference is hosted and locally organized by Dr. Simon Scheuring, Institut Curie, Paris, France.

<http://www.afmbiomed.org/2011-paris.aspx>

# Program

## Featured sessions:

- High-resolution imaging
- Force and mechanical measurements
- Technical developments and theory
- AFM in Nanomedicine

## Session Chairs / Invited Speakers:

Zhifeng Shao / Noriyuki Kodera  
Carlos Bustamante / Bruno Samori  
Toshio Ando / Renato Zenobi  
Manfred Radmacher / Sandor Kasas

## Keynote Lecturer:

Christoph Gerber




We hope you will enjoy AFM BioMed Paris 2011!  
The Organizing Committee

Pierre Parot, CEA Marcoule, France  
Jean-Luc Pellequer, CEA Marcoule, France  
Daniel Navajas, University of Barcelona, Spain  
Sanjay Kumar, Berkeley, USA  
Vesna Svetlicic, Ruder Boskovic Institute, Zagreb, Croatia  
Simon Scheuring, Institut Curie, Paris, France



**Tuesday August 23**  
**MAIN SPONSOR TRAINING DAY**  
**CONFERENCE REGISTRATION**  
**WELCOME APÉRO**

**TRAINING DAY ON NOVEL AFMs & MODEs**

9h00		
12h00		
12h00	<b>LUNCH</b>	
13h00		
16h00		
19h50		
		

**20h00**

**WELCOME APÉRO**

**22h00**

Opening Ceremony

**Jacques Grassy**  
**Eric Quéméneur**  
**Simon Scheuring**

Keynote Lecture

**Christoph Gerber**

SESSIONS

<b>High-resolution imaging</b>	<b>Zhifeng Shao</b>	<b>Noriyuki Kodera</b>
<b>Force and mechanical measurements</b>	<b>Carlos Bustamante</b>	<b>Bruno Samori</b>
<b>AFM in nanomedicine</b>	<b>Manfred Radmacher</b>	<b>Sandor Kasas</b>
<b>Technical developments and theory</b>	<b>Toshio Ando</b>	<b>Renato Zenobi</b>

**Wednesday August 24**  
**CONFERENCE DAY 1 / MORNING SESSION**

7h00 8h20	REGISTRATION / POSTER INSTALLATION	
8h30 8h50	<b>OPENING CEREMONY</b>  <b>Jacques Grassy</b> <b>Eric Quéméneur</b> <b>Simon Scheuring</b>	
<b>9h00</b>	<b>INVITED LECTURE</b> <b>Video imaging of walking myosin V by high-speed atomic force microscopy</b> Noriyuki Kodera, Kanazawa University, Japan	<b>Chair: Zhiheng Shao</b>
9h30	<b>RSC is an efficient nucleosome randomizer: an AFM quantitative study on chromatin templates</b> Cendrine Faivre-Moskalenko, Ecole Normale Supérieure de Lyon, France	
9h50	<b>Dynamical study of small heat shock proteins Lo18 organization studied by LS-AFM and HS-AFM</b> Eric Lesniewska, University of Bourgogne, France	
10h10	<b>Nanomechanical coupling enables detection and imaging of 5 nm superparamagnetic particles in liquid</b> Christian Dietz, Technische Universität Darmstadt, Germany	
10h30	COFFEE BREAK	
10h50	<b>Imaging of the Xenopus laevis oocyte plasma membrane in physiological-like conditions by atomic force microscopy</b> Francesco Orsini, University of Milan, Italy	
11h10	<b>Tapping mode NSOM on supported lipid bilayers: optimization of optical fiber levers, imaging, and FCS dynamics measurements</b> Dusan Vobornik, Ecole Polytechnique Fédérale de Lausanne, Switzerland	
11h30	<b>Rotational and translational diffusion of the outer membrane porins. The protein swarm.</b> Ignacio Casuso, Institut Curie, France	
11h50	<b>Dynamics of Aquaporin-0 and Connexon in native eye lens cells membranes by high-speed atomic force microscopy (HS-AFM)</b> Adai Colom Diego, Institut Curie, France	
12h00 12h50	<b>LUNCH / POSTER I</b>	

**Wednesday August 24**  
**CONFERENCE DAY 1 / AFTERNOON SESSION**

13h00	<b>INVITED LECTURE</b> <b>Observing the osmophobic effect in action at the single molecule level</b> Bruno Samori, University of Bologna, Italy	<b>Chair: Carlos Bustamante</b>
13h30	<b>Mechanochemistry of a single polypeptide molecule: study of force-induced conformational transitions</b> Nicolas Willet, University of Liege, Belgium	
13h50	<b>Strength in numbers: probing equilibrium nanoscale thermodynamics with molecular force spectroscopy</b> Aleksandr Noy, University of California, USA	
14h10	<b>Friction of single myosin rod upon stretching</b> Yukinori Taniguchi, Japan Advanced Institute of Science and Technology, Japan	
14h30	COFFEE BREAK	
14h50	<b>Mechanotransduction of human Notch2 via the LNR-HD</b> Natalie Stephenson, The University of Manchester, UK	
15h10	<b>Single-molecule AFM characterization of individual chemically tagged DNA tetrahedra</b> Andreas Ebner, University of Linz, Austria	
15h30	<b>Mechanical testing of reference model gels and articular cartilage by atomic force microscopy</b> Ettore Landini, University of Genova, Italy	
15h50	<b>Direct nanomechanical mapping of biological membranes</b> Laura Picas, Institut Curie, France	
16h00	FREE AFTERNOON	
17h30		
17h45	<b>GUIDED LOUVRE TOUR</b> <b>Meeting: 17h45 under the glass pyramid</b>	
21h45		

**Thursday August 25**  
**CONFERENCE DAY 2 / MORNING SESSION**

FREE MORNING

<b>9h00</b>	<b>PLENARY LECTURE</b> <b>Investigation of cellular mechanics by atomic force microscopy</b> Manfred Radmacher, University of Bremen, Germany
9h30	<b>Dissecting and genetically engineering tensional homeostasis in living cells</b> Sanjay Kumar, University of California, Berkeley, USA
9h50	<b>Manipulation of individual stress fiber and focal adhesions with AFM to understand the basic mechanics of the cellular construction</b> Atsushi Ikai, Tokyo Institute of Technology, Japan
10h10	<b>Single molecule recognition force spectroscopy (SMRFS) on living cells</b> Linda Wildling, University of Linz, Austria
10h30	COFFEE BREAK
10h50	<b>Neuron-to-substrate interface of patterned 2D neural network characterized by AFM, force-volume mapping and EFM</b> Silvia Dante, Italian Institute of Technology, Italy
11h10	<b>Dynamic measurement of TAT membrane penetration</b> Elizabeth Hager-Barnard, Stanford University, USA
11h30	<b>Mechanical origin of atherosclerotic plaque weakening</b> Jan-Willem Beenakker, Leiden Institute of Physics, The Netherlands
11h50	<b>Human erythrocytes' aging: morphological and mechanical evaluation on the nanoscale</b> Marco Girasole, Istituto di Struttura della Materia, Italy
12h00	<b>LUNCH / POSTER II</b>
12h50	

Chair: Manfred Radmacher

**Thursday August 25**  
**CONFERENCE DAY 2 / AFTERNOON SESSION**

13h00	<b>POSTER SESSION</b>		
14h50			
<b>15h00</b>	<b>INVITED LECTURE</b>		<b>Chair: Toshio Ando</b>
	<b>Tip-enhanced Raman spectroscopy (TERS) for nanoscale molecular analysis and spectroscopic imaging</b> Renato Zenobi, ETH Zürich, Switzerland		
15h30	<b>Nanobiocharacterization platform for single-cell studies based on self-sensing probes</b> Jorge Otero, University of Barcelona, Spain		
15h50	<b>Direct immobilization of avidin protein on AFM tip functionalized by acrylic acid vapour at RF plasma</b> Lilian Costa, Federal University of Rio de Janeiro, Brazil		
16h10	<b>Biomolecular force-clamp measurements using a micromachined electrostatic membrane actuator</b> Hamdi Torun, Bogazici University, Turkey		
16h30	<b>COFFEE BREAK</b>		
16h50	<b>Single bacteria recognition using electrostatic force microscopy</b> Daniel Esteban-Ferrer, Institute for Bioengineering of Catalonia, Spain		
17h10	<b>Simulating non-contact AFM imaging of calcite in water</b> Bernhard Reischl, Tampere University of Technology, Finland		
17h30	<b>AFM microinjection system for operations on single living cells</b> Joanna Bitterli, Centre Suisse d'Electronique et Microtechnique SA, Switzerland		
17h50	<b>Investigation of structural and chemical changes in genetically modified <i>Saccharomyces cerevisiae</i> yeast cells by combined AFM and Raman spectroscopy</b> Denys Naumenko, Kaunas University of Technology, Lithuania		
18h00	<b>FREE AFTERNOON</b>		
20h00	<b>FREE EVENING</b>		
22h00	Local Organizers suggestions		

**Friday August 26**  
**CONFERENCE DAY 3 / MORNING SESSION**

FREE MORNING

<b>9h00</b>	<b>PLENARY LECTURE</b> <b>Use of Crooks fluctuation theorem to study the interdomain folding cooperativity of a protein</b> Carlos Bustamante, University of California, Berkley, USA
9h30	<b>The effect of co-solutes and temperature on single polypeptide adsorption</b> Sandra Kienle, Technische Universität Munich, Germany
9h50	<b>Role of JAMs in mediating metastatic progression: an AFM Study</b> Ewa Wojcikiewicz, Florida Atlantic University, USA
10h10	<b>Probing viscoelastic properties of decellularized lung matrix with atomic force microscopy</b> Tomás Luque, University of Barcelona, Spain
10h30	COFFEE BREAK
10h50	<b>Mechanical mapping of single proteins at submolecular resolution</b> Felix Rico, Institut Curie, France
11h10	<b>Force-induced formation and propagation of adhesion nanodomains on living yeast cells</b> David Alsteens, Université catholique de Louvain, Belgium
11h30	<b>Frequency dependent modulus of elasticity of a polymer blend measured with PFM and nanoindentation</b> Kim Sweers, University of Twente, The Netherlands
11h50	<b>Quantitative nanomechanical mapping of marine diatom in seawater using peak force tapping AFM</b> Galja Pletikapic, Ruder Boskovic Institute, Croatia
12h00	<b>LUNCH / POSTER III</b>
12h50	

Chair: Samori / Bustamante



**Friday August 26**  
**CONFERENCE DAY 3 / AFTERNOON SESSION**

13h00	<b>PLENARY LECTURE</b> <b>Mechanisms underlying the long-distance coordination of structural changes within a pore-forming toxin complex: intra-protein forces and cooperative subcomplexes</b> Zhifeng Shao, Shanghai Jiao Tong University, China	Chair: Kodera / Shao
13h30	<b>FM-AFM constant height imaging and force curves: high resolution study of DNA-tip interactions</b> Andrea Cerreta, Ecole Polytechnique Fédérale de Lausanne, Switzerland	
13h50	<b>High-resolution AFM by tracking the resonance frequency of ultrasmall cantilevers</b> Carl Leung, University College London, England	
14h10	<b>Myelinating and demyelinating phenotype of Trembler-J mice by atomic force microscopy and confocal microscopy</b> Gonzalo Rosso, Institute for Biological Research Clemente Estable, Uruguay	
14h30	COFFEE BREAK	
14h50	<b>Visualization of supramolecular structures by high-speed atomic force microscopy</b> Aude Laisné, Centre de Génétique Moléculaire, France	
15h10	<b>Nanoscale stiffness of collagen I triple-helices studied by AFM and computerized image processing</b> Arkady Bitler, Weizmann Institute of Science, Israel	
15h30	<b>Investigations into the formation and effect of pore forming toxins on live cells and lipid model membranes using high speed AFM</b> Georg Fantner, Ecole Polytechnique Fédérale de Lausanne, Switzerland	
15h50	<b>Effect of antimicrobial peptides on biological membranes</b> Zsolt Szegletes, Biological Research Centre of Hungarian Academy of Sciences, Hungary	
16h00	<b>KEYNOTE LECTURE</b> <b>SPM Technologies past – present – future</b> Christoph Gerber, University of Basel, Switzerland	
17h00		
17h10	FREE AFTERNOON	
19h50		
20h00	<b>GALA DINNER</b> Boarding: 19h30 Quai Branly / Tour Eiffel	
22h00		

**Saturday August 27**  
**CONFERENCE DAY 4 / MORNING SESSION**

**FREE MORNING**

<b>9h00</b>	<b>PLENARY LECTURE</b> <b>High-speed bio-AFM coming of age</b> Toshio Ando, Kanazawa University, Japan
9h30	<b>FluidFM: towards a standard tool for microorganisms</b> Pablo Dörig, ETH Zürich, Switzerland
9h50	<b>Advances in fast AFM technology for biomedical applications</b> Johannes Kindt, Bruker Nano GmbH
10h10	<b>Inherently slow and weak forward forces of neuronal growth cones measured by a drift-stabilized AFM</b> Thomas Fuhs, University of Leipzig, Germany
10h30	COFFEE BREAK
10h50	<b>AFM-based probe array platform for cell biology</b> Mélanie Favre, Centre Suisse d'Electronique et Microtechnique SA, Switzerland
11h10	<b>Noninvasive protein structural flexibility mapping by bimodal dynamic force microscopy</b> Elena Herruzo, Instituto de Microelectrónica de Madrid, Spain
11h30	<b>Force spectroscopy: data acquisition and analysis</b> Philippe Carl, France
11h50	<b>AFM-based method for imaging and magnetic characterization of isolated nanoparticles with nanometer lateral resolution</b> Stephan Block, Ernst-Moritz-Arndt Universität, Germany
12h00	<b>LUNCH / POSTER IV</b>
12h50	

Chair: Scheuring / Ando

**Saturday August 27**  
**CONFERENCE DAY 4 / AFTERNOON SESSION**

13h00	<b>INVITED LECTURE</b> <b>Stiffness tomography</b> Sandor Kasas, École Polytechnique Fédérale de Lausanne, Switzerland	<b>Chair: Kasas / Pellequer</b>
13h30	<b>Study of relation between physical properties and physiological functions of mesenchymal stem cells</b> Takanori Kihara, Osaka University, Japan	
13h50	<b>Applications of AFM in nanomedicine: from microbiology to cardiology</b> Etienne Dague, University of Toulouse, France	
14h10	<b>Characterizing a blood clot after 5300 years in ice</b> Marek Janko, Technische Universität Darmstadt, Germany	
14h30	COFFEE BREAK	
14h50	<b>AFM and QCM-D - a useful combination to understand nanomaterial-lipid membrane interactions</b> Rickard Frost, Chalmers University of Technology, Sweden	
15h10	<b>Nanoparticle drug-delivery: methods to study binding, uptake and intracellular transport of individual biofunctionalized carbon nanotubes</b> Constanze Lamprecht, University of Linz, Austria	
15h30	<b>The effects of S1P and thrombin on the micromechanical properties of human pulmonary arterial endothelial cells</b> Gina-Mirela Mustata, Northwestern University, USA	
15h50	<b>Evaluation of nuclear stiffness of isolated eukaryotic nuclei derived from human skin fibroblasts</b> Claudio Canale, Italian Institute of Technology, Italy	
16h00	<b>CONFERENCE ENDS</b> <b>ANNOUNCEMENT: AFM BIOMED 2013</b>	