

**Scientific Report – FEBS Workshop – WS13-040**  
**Biological Surfaces and Interfaces**  
Hotel Eden Roc, Sant Feliu de Guixols, Spain, 30/06-05/07/2013

**Organizer**

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**Co-Organizers**

Co-Chair: Catherine Picart (Grenoble INP, Grenoble, France)  
Vice Chairs: Eva-Kathrin Sinner (BOKU Vienna, Austria)  
Katharina Maniura (Empa, St. Gallen, Switzerland)  
Conference Officer Allegra Roccato (ESF, Strasbourg, France)

**Summary (max 250 words)**

The Workshop covered, in a broad sense, science and technology of relevance for interfaces between synthetic materials and biological systems or within biological systems – biointerfaces. The program was organized into invited presentations by internationally renowned researchers, complemented by shorter contributed oral presentations and poster sessions by young scientists. Invited keynote lectures by eminent researchers and a forward-look discussion put the biointerface field into a larger scientific, clinical, economical and social perspective.

The main approach in biointerface science involves preparation and characterization of functional surfaces for specific interactions with bio-systems, in vivo and in vitro, and studies of the molecular and kinetic processes occurring at such interfaces, ranging from molecular and supramolecular interactions of small molecules and biomolecules - proteins, carbohydrates, lipids, nucleic acids - to cell adhesion, differentiation and tissue formation at the interface. As such, this conference spanned a wide range of topics including biomimetic surface platforms, biomembrane and supramolecular materials, intercellular communication and cell-extracellular matrix interactions and their control by designed and intelligent surfaces, soft matter science, nanotechnology, and detection systems with down to single molecule sensitivity.

The conference was intended to be a vibrant forum for the interaction of young and senior researchers, towards the advancement of and mutual education about the biointerface field. A particular and perhaps unique feature of this Workshop is that it provided an interface between scientists from different, at times exceedingly diverse, fields. Scientists trained to speak different languages – biologists/physicians and engineers/physicists/chemists – ventured into the unknown to discover and benefit from the foreign “speak”. The Workshop was met with a very positive response from the speakers and the participants. We are pleased that the formula chosen for the Workshop program, including the Workshop location, worked out very well in stimulating interactions and exchange of ideas across all fields and between young and senior researchers.

**The Venue & Location (max 50 words)**

With its remote location at the Mediterranean Sea and its park style, the Hotel Eden Roc was ideal for this workshop. All accommodation, excellent food, beverages and a conference room (for lectures and poster sessions) were provided by the hotel. Staff was very friendly and helpful. This infrastructure clearly fostered ample interaction!

The ESF Conference Unit, headed by the ESF Conference Officer Allegra Roccato, took care of many practical aspects of organization, before, during and after the Workshop. This support was extremely useful.

## **The Scientific Programme** (max 2 pages)

**Summary of the programme:** The programme featured five sessions with distinct topics (Engineering Biointerfaces; Glycoscience and Biointerfaces; Fundamentals of Interfacial Behaviour and Interactions; Biointerfaces – Cells, Cell Targeting and Medical Applications; Nanoscale Characterization of Interfaces and Bioentities) that were presented by three to four invited speakers per Session (17 in total). Another two sessions were based on short talks by young scientists (9 in total) selected from the submitted applications, and by corporate sponsors (3 in total). Three invited Keynote Lectures by eminent scientists (Alain Brisson, Dennis Discher and Jacob Israelachvili) provided historical views and outlooks on key areas in the field. The scientific quality of the presentations was judged by the participants to be very high throughout.

Posters were on display in the conference room throughout the entire conference, with 50% of the posters being on display at any given time. Poster sessions were organized once or twice a day (5 sessions in total) in the late afternoons and/or in the evenings.

A “Forward Look” plenary discussion, moderated by the two vice chairs (Eva-Kathrin Sinner and Katharina Maniura) and featuring a panel of 5 senior participants (Dennis Discher, Jacob Israelachvili, Heike Walles, Jesus Perez Gil and Alex Bunker), complemented the scientific program.

The final conference program can be found on <http://www.esf.org/serving-science/conferences/details/2013/confdetail427/427-final-programme.html>.

### **Major changes compared to the original application:**

1. The list of invited speakers had to be modified, as speakers had either not committed or were listed as tentative choices at the time of application, or because of last-minute cancellations:

Petra Schwille (not committed at time of application) was replaced by Jacob Israelachvili  
Teruo Okano (not committed at time of application) was replaced by Jesus Perez Gil  
Thisbe Lindhorst (tentative at time of application) was replaced by Anthony Day  
Peter Seeberger (tentative at time of application) was replaced by Heike Walles  
Celeste Nelson (last-minute cancellation) was replaced by Janos Vörös  
Elisabeth Charlaix (last-minute cancellation) was replaced by Mark Biggs

2. After approval by the FEBS Member in Charge, we increased the total number of available places at the workshop. The field of Biological Surfaces and Interfaces is by definition highly multidisciplinary, and we considered a larger number of participants beneficial to cover all relevant fields appropriately. Moreover, we received many more applications with a standard that clearly merited participation than places originally available. The choice of the venue and the conference schedule ascertained that the somewhat larger number of participants did not compromise the level of informal interactions, and the possibilities to exchange ideas and information, between participants and lecturers.

**Training aspects:** The workshop brought together renowned experts in their respective fields and interested young scientists in a forum that aimed at fostering interactions between and active involvement of all participants, leading to mutual education and cross-fertilization between the areas of biology, physics, chemistry, engineering and medicine.

We emphasized creating an atmosphere conducive to informal interaction. To this end, buffet-style breakfast, lunch and dinner were shared by all participants. Most invited speakers attended the workshop throughout its total duration. Long mid-day breaks, the remote location and relaxed atmosphere of the hotel park (including a bar, many benches and tables, a pool and access to the Mediterranean Sea) ensured that most people stayed on site throughout the meeting and that there was ample opportunity for informal discussions. My personal impression, confirmed by oral and written feedback from the participants, was that these opportunities have indeed been seized: participants mixed well, irrespective of their scientific background and level of seniority.

We also reserved ample time for poster sessions - 11 hours in total. Beverages (financed by corporate sponsors) were provided throughout the three evening poster sessions. Discussions at the posters were vivid and intense: many participants virtually needed to be “chased away” from their posters upon closure of the conference room at midnight. An independent jury, consisting of 5 speakers and senior participants (Andrès Garcia, Karine Glinel, Katharina Ribbeck, Jesus Perez Gil and Robert Latour), selected

the recipients of 5 poster prizes (sponsored by Biointerphases, Acta Biomaterialia and Advanced Healthcare Materials) among the students and postdoc participants, which were awarded at the closing conference dinner.

Prior to the meeting, we asked all speakers explicitly to include a careful introduction, understandable to the non-specialist, in their lecture. We considered this crucial for a broad audience with varying backgrounds, many at the PhD student and postdoc levels. The vivid discussions after each talk indicated that this worked out very well. Depending on the length of the lecture, we reserved up to 15 minutes for discussions. In most cases, this time was indeed used, and discussions continued throughout the coffee breaks and beyond.

### **List of invited speakers:**

#### **Keynote Lectures**

- Alain Brisson (CNRS – Université Bordeaux I, FR)  
*A 25-year long journey with Annexin-A5: from structure to membrane repair and applications in disease detection*
- Dennis Discher (University of Pennsylvania, US)  
*'Self' versus 'Foreign' and Soft versus Stiff Interfaces - from survival to differentiation*
- Jacob Israelachvili (University of California Santa Barbara, US)  
*Breakthroughs and belly flops in understanding biomolecules and biosurface interactions*

#### **Session Lectures**

- Janos Vörös (ETH Zürich, CH)  
*Controlling the biointerface using potentials and currents*
- Jason Burdick (University of Pennsylvania, US)  
*Hydrogel Interfaces to Control Stem Cell Interactions*
- Karine Glinel (Université Catholique de Louvain, BE)  
*Surfaces Engineered at the Nano/Micrometer Scale to Control Bacterial and Mammalian Cell Behaviors*
- Bruno Antony (CNRS - Université de Nice Sophia Antipolis, FR)  
*Self-organization of biochemical reactions by membrane curvature*
- Anthony Day (University of Manchester, UK)  
*Structural and functional insights into sugar-protein networks in inflammation and ovulation*
- Katharine Ribbeck (Massachusetts Institute of Technology, US)  
*Mucin polymers for bioinspired filters and coatings*
- Heike Walles (University of Würzburg, DE)  
*Influence of ECM components on engineering of 3D tissue and cancer models*
- Christine Ortiz (Massachusetts Institute of Technology, US)  
*Morphometrically-controlled biological and bio-inspired suture joint interface in armor*
- Mirjam Leunissen (FOM Institute AMOLF, NL)  
*The entropic impact of tethering, multivalency and dynamic recruitment in systems with specific binding groups*
- Mark Biggs (Adelaide University, AU)  
*Molecular modeling of protein adsorption: from fundamentals to desing*
- Fiona Watt (Kings College London School of Medicine, UK)  
*Intrinsic and extrinsic control of epidermal stem cell fate*
- Ilya Reviakine (CIC biomaGUNE, ES)  
*Form lipids to platelets: interactions between biological model systems and inorganic oxides*
- Andrés Garcia (Georgia Institute of Technology, US)  
*Biofunctional materials for cell delivery and tissue repair*
- Jesus Perez Gil (Universidad Complutense de Madrid, ES)  
*Understanding the molecular mechanisms at the breathing air-liquid interface to develop novel therapeutic tools in respiratory medicine*
- Yves Dufrêne (Université Catholique de Louvain, BE)  
*Atomic force microscopy: a nanoscopic window on the cell surface*
- Sylvie Roke (EPFL, CH)  
*Nonlinear spectroscopy and imaging of soft and living systems*
- Fredrik Höök (Chalmers University of Technology, SE)  
*Label-free biomolecular interaction analysis and equilibrium-fluctuation-based single-molecule studies of cell-membrane mimics*

**Major problems encountered:** We had two cancellations of invited speakers (Celeste Nelson and Elisabeth Charlaix) at short notice. Fortunately, we could find excellent replacements (Janos Vörös and Mark Biggs, respectively) among the few senior regular applicants for the workshop.

## Key Figures on Participants

Number of Applicants for the Event: 177 (plus 8 corporate sponsors)  
Number of Accepted Participants: 112 (plus 20 invited speakers, 4 organizers, 6 corporate sponsors, the FEBS member in charge, and the ESF rapporteur)

**Total Number** of regular participants, including plenary speakers but excluding accompanying guests and local organizers of the Workshop: 144

Regular Participants Included:

- 56 graduate students
- 51 postdoctoral researchers
- 31 principal investigators from academia & industry (incl. invited speakers, chair, co-chair, vice-chairs, FEBS member in charge, ESF rapporteur)
- 6 corporate sponsors

**Invited Plenary Speakers: 20**

- 20 paid by FEBS support
- 0 paid by other sponsorship support

**Members of Organizing Committee: 5**

The Chair, the Co-Chair and the two Vice Chairs received conference and travel grants, according to the same rules as applied for the invited speakers, paid by FEBS support. Travel and accommodation of the ESF Conference Officer were part of the organizational and technical expenses covered by ESF.

## Geographic distribution of participants

- 125 participants from Europe & Turkey
- 11 participants from USA & Canada & South America
- 3 participants from Australia
- 2 participants from Asia
- 3 participants from Africa

## The Scientific Presentations Comprised

- 3 invited plenary Keynote Lectures (50 min + 15 min discussion)
- 17 invited plenary Session Lectures (either 40 + 15 min or 25 + 15 min)
- 9 plenary talks selected from applications (10 + 5 min)
- 3 plenary talks by corporate sponsors (10 + 5 min)
- 107 poster presentations (incl. 3 posters by corporate sponsors)
- 5 no presentation (FEBS member in charge, ESF rapporteur, chair, co-chair, a corporate sponsor)

For additional statistics, please see the Statistics Form.

## Feedback & Comments by Participants (max 2 pages)

For statistics on the evaluation forms, please see the FEBS Evaluation Summary Form. Additional comments by participants on questionnaires are listed below (with selected “replies”).

### Positive comments

- There is a wonderful level of discussion and plenty of time for them
  - Plenty of time for poster discussion
  - Very open and friendly conference excellent networking opportunities at all levels
  - Perfect conference for young people to meet specialist and have good discussions
  - Discussions were present after all the talks
  - The environment and programme facilitated extensive interaction with speakers
  - Good foundation of discussion, interaction with PhD, postdocs
  - Plenty of time for discussions
  - The night event is very long but the conversation of the bar are extremely useful
  - Late poster sessions were hard work
  - It was incredibly inspiring and I would like to thank you for accepting my out of field submission and the travel support
  - Poster session were long enough to lead to constructive discussion
  - Lots of questions after the talk, fruitful discussions
  - Discussions till past midnight every night
  - The conditions permit free discussion with everyone
  - The poster session discussion was very satisfactory
  - Poster session; very nice discussions
  - Good mix of excellent leaders in the field + less established researchers, mix of state of the art
- 
- Outstanding meeting, good balance between senior and junior investigators
  - Could not be better it's good that everything happens in the same place
  - This was the best conference I've participated
  - Great scientific event
  - No changes or improvements required
  - It has been a great event enjoyed and of benefit by everyone I have spoken with
  - Program; interesting speakers, new topics
  - Very good program
  - Program was very well arranged and scheduled
  - Perfectly organized, all questions quickly answered received lots of help
  - Great time table of the program
  - Very well chaired on all occasions
  - Well organised, no points of improvement
  - Everything was well organized

### Negative comments

- Poster session too late
  - Timing of poster session sometimes inadequate people were tired at late night and thus not motivated to discuss
  - Poster session not very well organized; while very successful the first day, less and less participants attended in the following days
  - There is just no time in the evening to organize any social event after poster session finish at 00:00
- Comment: poster sessions were intentionally scheduled in the evening, with an open bar to enhance the social atmosphere following Spanish customs.*
- 
- Course too long
  - Look forward to next one
  - Conference was exceptional in all terms, very well organized
  - Keep on organizing such events
  - My boss is an organiser it was an amazing conference
  - Very good organisation and program of the talks
  - This organisation should be maintained as it is well done
  - The program was very well organized and not condensed
  - The place and the atmosphere were very nice
  - Please keep as is with then novel speakers and novel ideas at 2014
  - The meeting is an important meeting to the interdisciplinary community and associated with the location
  - Overall good conference, scientific content as well as poster sessions were great
  - It is simply perfect
  - Good contribution of basic technical and application
  - This is an unusual conference because of interdisciplinarity and atmosphere
  - Please do whatever is possible to keep this wonderful conference running!
  - I've attended a couple of times and it has been very useful
  - A unique combination of scientists and talks from different disciplines
  - Lecture; very interdisciplinary at an ideal level
  - Very exciting program, highly innovative work
  - In general the gradual introduction into the various topics really good
  - Outstanding topics, interdisciplinary topics
  - Excellent dynamic speakers
- 
- Outstanding location very adapt to the format of this meeting
  - Great place
  - Very nice site, nice infrastructure
  - Great venue
  - Wonderful food and great helpful staff
  - Nice location; excellent food
  - Good location but better resort
  - Do it again at the same place
  - Clearer structure of sessions
  - Some too complex and focused lectures
  - Quality of a few invited talks were not very good
  - Discussions; bad about keeping track of time
  - Often, speakers went over their time, cutting on the discussion
  - Not enough background given by the senior speakers for the mainly student audience
  - Talks a bit too long not much time for poster sessions
  - Too long talks
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- Difficult to see the presentation slides
  - Not always easy to see slides

- Screens were not always visible from all points in the audience
- Bottom part of slide projection was poorly visible from many places
- Front video too low not fully visible for most people
- Frequent problem with microphones
- Auxiliary projectors could have had better focus
- Projector quality could be better
- Power point problems
- Problems with projectors and microphones
- Computer facilities relatively old
- Bad projectors, warm rooms, hard to see presentations
- The quality of audio-visual could be improved
- The two screens could be improved i.e. focus and screen size
- Many problems with microphones
- Having a better wire to connect laptop to projector
- Problems with microphones, slides difficult to see if not sitting in the first row
- Slide projection difficult to see in full due to the room configuration which was improved by side projectors
- Audio was a problem, especially during discussions involving several people

### **General comments**

- More focused theme throughout meeting, less tissue/engineering
  - Invite more clinicians & medical application people to provide insight as to what scientists can provide them
  - The meeting would benefit of a session of polymeric membranes
  - High quality lectures but not adapted enough to conference theme
  - Invite speakers to address specific topics
  - A wider range of subjects in the field would be appreciated
  - Having more focused theme or topic
  - The topic is a bit to brand undefined
  - More focused topic
  - Decrease the breadth of the topics
  - New initial speakers
  - Having more social society issues
  - Some lectures required better introduction in order to understand it, appreciate it better
  - More talks on fundamentals
- 
- Maybe more young scientists presentations would be good or a fast poster session like speed date style
  - One session with short presentations of PhD students
  - Make more tutorial lectures, maybe in smaller groups
  - Having more info about careers as the speakers are models
  - Have a day organized by and for PhD/postdocs
  - Having break out groups
  - Organize a small section for more applied research from "hand science" to application
  - Having a discussion session also speed date to kick-off and spark fruitful discussions
  - Having a workshop; discussions in smaller groups on e.g. 'hot topics' in the field would have been a nice addition
  - Focused small discussion groups, to make it more interactive

- The conference room was not appreciated, too small and problems with projectors
- The placement of the posters is not very good
- Lights not very good in particular for poster sessions
- Problems with lights, some posters were difficult to see
- Poor lightning for posters
- Poster arrangements should be improved
- Wifi bad
- Internet connexion to slow
- Chairs very uncomfortable and equipment unreliable
- In general uncomfortable chairs, but everything is ok

*Comment: We note that audio and video equipment and lighting during poster sessions merit improvement for future conferences.*

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- Bus driver no fit to drive
  - It was not told where the transportation is leaving everyone was waiting in the wrong place
  - Number bus place make it easier to find
  - Some small hassles such as key card inactivation
  - Food not so good
  - Resort was a bit outdated

*Comment: we think that an interactive event, run by young scientists, could be a nice addition to future workshops.*

- 
- Contributed talks should be on the first day
  - Cancel forward look plenary discussion, it seems like not for everyone
  - Poster session should be earlier
  - Poster session could start a bit earlier
  - All poster sessions should take place in the evening with an open bar
  - I suggest suppression of the 2h break after lunch and use that window for that after dinner activities so people could better rested for the following day activities
  - I suggest that the chair would enforce the end time for the lectures to avoid delays throughout the day
  - Short talks, 20 min the longest
  - More 30 min lectures
- 
- Increasing the frequency of these useful workshops and meetings
  - Duration of course should be 3 days
  - Duration of the course too short, should be 7 days

*Comment: a participant list was sent out to all participants after the workshop.*

- Subject of conference appropriate, more description about the subject in the website
- More room for poster sessions. Better projection facilities
- Workshop could be cheaper (more affordable for young scientists) if held in a less exclusive/luxurious venue
- FEBS event we took an email from your organisation
- More information for posters
- More single rooms
- Please don't put 3 people in the same room for accommodation; it's a bit difficult in the morning.