

ESF RESEARCH CONFERENCES

Rapporteur Report

Partnership:	ESF-EMBO
Conference Title:	Biological Surfaces and Interfaces
Dates:	26 June – 1 July 2011
Chair:	Fredrik Höök
Rapporteur:	Ralf Richter

General Comments

The conference covered the scientific area of interfaces between materials and biological systems. This area is by its nature highly interdisciplinary. It spans across the traditional disciplines biology, chemistry, physics and medicine, and includes modern research fields such as materials science and engineering, biotechnology, bioinformatics and nanotechnology. As Vice Chair of the conference, I was involved in the selection of the abstracts, as chair of Session 7, and as the moderator of the "Forward Look" Plenary Discussion.

Quality of Scientific Programme, Presentations and Discussion

The conference was divided into five Sessions with distinct topics (Engineering Biointerfaces, Cells at Interfaces, Nanomedicine, Lipid-Based Biointerfaces, Small-Scale Analysis) that were presented by three to five invited speakers per Session. Another two Sessions were based on short presentations by speakers selected from the submitted abstracts, and by sponsors, respectively. Three after-dinner Keynote Lectures by eminent scientists (Buddy Ratner, Marcus Textor and Helmut M \ddot{u} hlwald) provided historical views and outlooks on key areas in the field. The scientific quality of the presentations was high to very high. Discussions after the talks were intense, critical and at a high scientific level. The content of the oral presentations, as well as the posters, covered fundamental research questions, enabling technologies and applications, perhaps with a focus on enabling technologies.

Informal Networking and Exchange; Atmosphere

Plenty of time was provided for informal discussions, in the form of extended lunch breaks of more than 3 hours, and 30 minute coffee breaks, during meals and at the afternoon and late-evening Poster Sessions. The extended lunch break was very appreciated by the participants. The Poster Sessions were highly interactive. Lively discussions until and beyond closure of the conference room at midnight involved the whole spectrum of participants, from students to senior scientists.

Balance of Participants

Without knowing the statistics, I would estimate that the majority of the participants were students or postdocs. The ratio between young and senior participants was clearly appropriate to foster high level training and discussions. The scientific background of the participants was widely spread, as would be expected and desired for this research area. 80% of the conference participants came from research groups in Europe, representing a total of 24 countries (incl. Russia, Turkey and Israel). Among these countries, Switzerland, Germany, Sweden and Spain were most strongly represented. The remaining 20% came from America, Asia and Australia.

Outlook and Future Developments

Given the high level of informal discussions, it can be expected that numerous new collaborations will emerge from this conference!

The "Forward Look" Session was headed by a panel of 5 leading scientists (Buddy Ratner, Marcus Textor, Ole Mouritsen, Claudia Steinem, Paul Cremer) and an editor of Nature Materials (Pep Pamiés). In the beginning, panel members briefly addressed a few future challenges, which was followed by a plenary discussion. A number of grand challenges in the fields of biology, medicine and energy were identified to which the biointerface community could contribute, in particular: microbial infections, inflammation, biocompatibility, control of stem cell fate, the future of screening technologies, and biointerfaces & energy storage. The plenary discussion made also clear that there exist a number of unsolved fundamental research questions (including the role of water, confinement and entropy in interactions at interfaces) and conceptual challenges (design of hierarchical assemblies in 2D and 3D, interfaces out of equilibrium) related to the self-organisation of soft matter. Addressing these questions could potentially create entirely new opportunities for the biointerface field.

It was notable that the meeting presented a wide spectrum of enabling technologies (e.g., smart surfaces or particles with various functionalities, multifunctional 3D materials for cell culture, novel sensing approaches, high resolution *in situ* imaging and other characterization techniques). Some technologies are currently at the stage of proof of concept, and some are already heading towards applications. For the further evolution of this field, it would be useful to see that these technologies are increasingly implemented to address challenges in biotechnology, biology or medicine. Future editions of this ESF-EMBO Symposium, covering both fundamental research questions, enabling technologies and applications, should be a suitable place to foster the further evolution of the biointerface field. In addition, Exploratory Workshops should be useful to encourage the development of emerging application areas or fundamental research questions.

Follow-up

A paper in a suitable scientific journal that summarizes the meeting and provides an outlook of grand challenges to which the biointerface community could contribute, might be useful to define the current position of and potential new developments in the field.

Organisation and Infrastructure

All participants were accommodated in the Hotel Eden Roc in which also the conference took place. With its location at the Mediterranean coast, this garden-like hotel complex with a relaxed atmosphere is clearly very attractive for conferences of this style. The hotel staff was friendly and helpful. Food was excellent and more than sufficient. Talks and poster sessions were held in the same room. Beverage and snacks during breaks were served in close proximity. This infrastructure clearly fostered ample interaction between all participants. In my discussion with participants, I received a lot of positive feedback and only rarely negative criticism. If there is one point to remark, than it is the air-conditioning in the conference room, which was hard to maintain at pleasant temperature homogeneously throughout the room.

Summary & Overall Assessment

The objective of the conference was to bring together outstanding researchers and young scientists in the broadly defined and interdisciplinary field of biointerfaces in a stimulating environment, to foster knowledge transfer between scientists active in different disciplines and provide the best possible training of students in Europe. As far as my personal impression goes, this objective was clearly achieved. The feedback from conference participants that I have talked to was overwhelmingly positive. The combination of plenary talks by excellent researchers with long breaks for informal discussions was clearly appreciated. The field of biointerfaces keeps growing and the conference was a vibrant forum for interaction across various scientific disciplines.

About ESF Research Conferences

The Scheme

This conference is part of the European Science Foundation's (ESF) Research Conferences Scheme. The Scheme aims to promote scientific excellence and frontier level research throughout Europe and the rest of the world. Conferences aim to provide leading scientists and other participants, including young researchers, with a platform to present their work, to discuss the most recent developments in their fields of research and to network.

Conference Format

The core activities should be based on lectures by invited speakers, who are leaders in their respective fields, followed by extensive discussion periods. An informal exchange of ideas, both inside and outside the lecture room, should be encouraged, and the number of sessions in the daily timetable should be limited in order to allow sufficient time for interaction between the participants. Time should be reserved for a 'Forward Look Plenary Discussion' about future developments in the field.

Participants can take all their meals together to encourage further contact and networking, which can be particularly beneficial to younger researchers who may be less outspoken in the formal lecture room setting. In order to gain optimum benefit from the conference, both the speakers and the participants are asked to stay for the whole duration.

Division of Tasks

The Conference Chair is responsible for ensuring the quality of the scientific programme through the selection and invitation of speakers, and through the selection of participants.

The ESF Conferences Unit is responsible for managing all the logistical aspects of the conference organisation, including the provision of an on-site secretariat.

Further information: www.esf.org/conferences