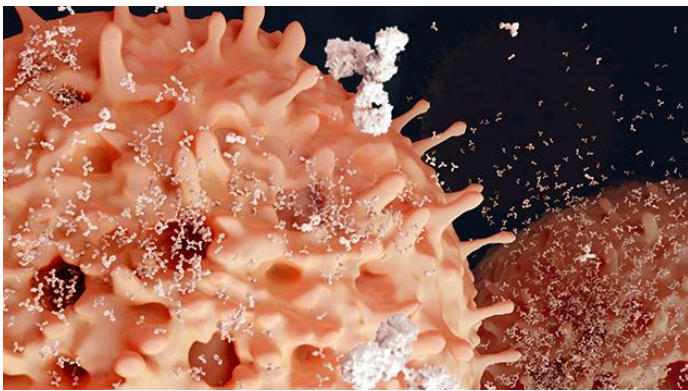




RESEARCH CONFERENCES



ESF-EMBO Conference

**Be there or die?
The role of the
microenvironment
in B cell behaviour
in health and
disease.**

16 - 21 May 2015
Sant Feliu, Spain

Chaired by: Idit Shachar
<http://bcells.esf.org/>

ESF-EMBO : Be there or die? The role of the microenvironment in B cell behaviour in health and disease

Scientific Report

Highlights & Scientific Report

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Scientific Report

Conference Highlights

Please provide a brief summary of the conference and its highlights in non-specialist terms (especially for highly technical subjects) for communication and publicity purposes. (ca. 400-500 words)

B cells are lymphocytes that play a key role in both the innate and adaptive immune response. The principal functions attributed to B cells are their ability to differentiate into plasma cells that secrete antibodies against antigens, and eventually develop into memory B cells. Long-lived plasma cells (PC) and memory B cells are the cells responsible for maintaining serological memory against childhood vaccines or infections previously met in life. However, as appreciation of the multifunctional nature of the B cells grows, their importance to health and disease is re-evaluated. An increasing emphasis is being placed on studying the multiple interactions of the microenvironment with differentiating B cells, from the earliest progenitor stage to fully differentiated plasma cells. Microenvironmental “cues” encompass signals from commensal microbiota and stimulatory and survival factors derived from interacting cells. In normal individuals, the pool of peripheral B cells is constant in size. The control of B, PC and memory B cell homeostasis is the result of a very fine balance between their maturation, proliferation and survival. Micro-environmental factors have been shown to play a critical role in maintaining lymphocyte homeostasis. Pathways and mechanisms that govern normal differentiation and survival of B cells can sometimes become dysregulated and drive pathogenic processes such as hematopoietic malignancies and autoimmune diseases.

A variety of techniques are disposable for studying the regulation of B-cell maintenance and survival in health and disease. These techniques and methodologies span a broad range of "classical" disciplines such as bacteriology, virology, cell biology, immunology, histology, biochemistry and chemistry. In addition, high-throughput sequencing, mathematical modelling and informatics will be applied expanding the multidisciplinary aspect of this proposal beyond methods of classical biology.

The meeting “Be there or die? The role of the microenvironment in B cell behaviour in health and disease” which was held in Eden Roc Hotel in Sant Feliu de Guixols, Spain, brought together eminent clinicians, biologists, mathematicians and biophysicists to discuss the explosion of paradigm-shifting discoveries in B cell biology and their relevance to healthy immunity. Basic mechanisms of B cell survival, differentiation, effector function and death were reviewed during this event. We focused on how alteration in these pathways lead to pathology and to the abnormal B cell responses observed in cancer, infection and autoimmunity. Some of the invited lecturers illustrated how the elucidation of molecular pathways operating in B cells and governing proliferation, homeostasis and cell death may lead to novel immunotherapeutic strategies to ameliorate pathological conditions in experimental models and humans.

Altogether there were 18x45 minute lectures, 2x30 minute lectures and 16x15 minute lectures from young researchers and 58 poster presentations. The closed nature of the conference was conducive

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to much discussion between delegates both during the sessions and during the refreshment breaks. The poster sessions in particular were a forum for lively and constructive discussion. The new data that has emerged and been discussed at this conference has highlighted the fact that the environment of the B cell is particularly important. Not only for survival and activation, but also possibly for educating lymphocytes during their development. Tissue sites such as bone marrow, spleen and gut require much more research in order to determine their role in the health of the immune system and the next B cell conference is planned to concentrate on these aspects of B cell biology.

I hereby authorise ESF – and the conference partners to use the information contained in the above section on ‘Conference Highlights’ in their communication on the scheme.

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Executive Summary

(2 pages max)

B cells are lymphocytes that play a key role in the immune response. A principal function of B cells is to differentiate into plasma cells that secrete antibodies against exogenous antigens, and into memory B cells that retain the memory of the encounter against future challenges.

Scientists of different disciplines, working on different problems, have ideas and results applicable to areas of research other than their own. This conference brought together clinicians, cell biologists, molecular biologists bioinformaticians and mathematicians in order to discuss the latest advances in B cell biology. The sessions were not subdivided by discipline; rather they were divided by topic and included people from different disciplines where it was appropriate.

The conference started with the session ***maintenance of B cells in health*** on regulation of B cell survival and maintenance in steady state with the presentation of four leading scientists in the field, Klaus Rajewsky, Meinrad Busslinger, Facundo Batista and a student from Claudia Mauri's lab, who replaced Claudia who was sick. The speakers described novel mechanisms involved in regulation of different stages of B cells in health. The second and third sessions ***Immune niches in health*** and ***Regulation and communication in disease*** described the importance of cells in the B cell environment in regulation of B cell survival. The role of NKT cells, osteoclasts and stroma cells in the BM were described by Elisabeth Leadbetter, Caludine Blin-Wakkach and Andreas Radbuch.

In the evening we had a key note presentation given by Fabienne Mackay. She described the important role of the BAFF family of receptors in B cell maintenance.

In the next session we continued the discussion on ***Regulation and communication in diseases***. Rita Carsetti, Mueccel Akdis, Deborah Dunn-Walters and Andrea Cerutti described the control of B cell function during inflammation. The role of IgM memory B cells, regulatory and effector memory B cells, helper neutrophils and antibody production in aged people were discussed.

In the last session B cell microenvironment- regulation of differentiation, survival and function in disease, the role of the microenvironment in CLL and HIV-1 patients were described. The speakers in this session, Jan Berger, Eric eldering, Idit Shachar, Ramit Mehr, Francesca Chiodi, Anna Sousa and Davide Robbiani provided different aspects of this topic.

Two sessions were devoted to short talks of junior researchers, who all gave an excellent presentation on varied topics. There were two evening poster sessions, which provided everyone with the time to move around and discuss science. They were lively and characterized by long lasting discussions.

Ramit Mehr chaired a session for the younger researchers to discuss career opportunities and how to plan for career progression.

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The atmosphere of the conference was highly conducive to scientific discussion between all delegates and the younger researchers in particular appreciated the chance to mingle with more senior faculty. A substantial amount of additional sponsorship was raised and used to distribute bursaries to young scientists.

There were 20 speakers, 2 of whom were chosen from the submitted abstracts. The gender balance of session speakers was F/M 9/11 45%/55%.

Conference attendees were of a wide variety of nationalities, resident mainly in Europe and affiliated countries, but also from South Africa and USA. In total about 25 countries were represented. Additional sponsorship was obtained from Biolegend and EFIS and some of the speakers funded their own travel.

Forward Look

(1 page min.)

- *Assessment of the results*
- *Contribution to the future direction of the field – identification of issues in the 5-10 years timeframe*
- *Identification of emerging topics*

At the time of writing this report we haven't had the official feedback results, but we have had many messages of support from speakers and attendees. The overall feeling was that the conference was a unique networking opportunity and everybody came away having learned something. The fact that many other immunology conferences are broad ranging so the B cell immunologists don't get such close networking opportunities was conveyed by many.

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- *Is there a need for a foresight-type initiative?*

Moving forward from here it was agreed that B cell conferences in Europe were of high importance, and we should aim eventually to have them at least once per year if possible. It is clear that B cells play many more important roles in immunology than merely producing antibodies. To fully understand the reason behind immune failure in disease conditions the contribution of B cells to the overall control of the system should not be overlooked. Particular attention needs to be paid to the fact that the location of B cells in the body can determine how well they survive various challenges, and how they respond to challenge.

Business Meeting Outcomes

- *Election of the Organising Committee of the next conference*
- *Identified Topics*
- *Next Steps*

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Since ESF does not intend to support such conferences in the future, we intend to apply to EMBO for funding. The next meeting is planned to be chaired by Claudia Mauri, a world-renowned expert on regulatory B cells and the role of B cells in autoimmune disease and myself.

Atmosphere and Infrastructure

▪ *The reaction of the participants to the location and the organisation, including networking, and any other relevant comments*

All the feedback received to date by the Chair and Co-chair regarding the scientific program and the ESF organisation has been excellent. The networking opportunities between all participants, and the general atmosphere of the conference were particularly appreciated by the delegates.

Sensitive and Confidential Information

This report will be submitted to the relevant ESF Scientific Review Group for review.

In order to promote transparency, it is ESF policy to also publish the Scientific Reports on its website. Any confidential information (i.e. detailed descriptions of unpublished research, confidential discussions, private information) should therefore not be included in this report. Confidential issues can be addressed in the next page, which will not be published.

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I hereby authorise ESF to publish the information contained in the above Scientific Report on the ESF Research Conferences webpages. No sensitive or confidential information (see above) has been included in this report

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