

Standing Committees for:

- Life, Earth and Environmental Sciences (LESC)
- Physical and Engineering Sciences (PESC)

ESF Exploratory Workshop on

Biosupramolecular Chemistry

Coombe Lodge - Blagdon
Bristol, United Kingdom, 4 - 8 September 2007

Convened by:
Anthony Peter Davis and Derek N. Woolfson



The European Science Foundation (ESF) is an association of 76 Member Organisations devoted to scientific research in 30 European countries. The Mission of ESF is to provide a common platform for its Member Organisations in order to advance European research and to explore new directions for research at the European level. Through its activities, the ESF serves the needs of the European research community in a global context.

The main objectives of ESF for the years 2006-2010 as defined by its current *Strategic Plan* are to promote Science Strategy and Science Synergy, paving the way for initiatives across disciplinary and geographic boundaries in the European Research Area (ERA).

The Exploratory Workshops scheme is one of the key instruments of the Science Strategy “pillar”. Each year, ESF supports approximately 50 Exploratory Workshops across all scientific domains. The focus of the scheme is on workshops aiming to explore an emerging and/or innovative field of research or research infrastructure, also of interdisciplinary character. Workshops are expected to open up new directions in research or new domains. It is expected that a workshop will conclude with plans for specific follow-up research activities and/or collaborative actions or other specific outputs either within the frame of ESF (e.g. prepare the ground to develop a [Forward Look](#), a [Research Networking Programme](#) or a [EUROCORES](#) proposal; publication of a Policy Briefing...) or for submission to the EU 7th Framework Programme or to other European or international funding organisations.

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Main Objectives of the Workshop:

This 3-day workshop will cover science at the “biosupramolecular interface”, i.e. the boundary between supramolecular chemistry and biology. Scientific progress is often most rapid and significant at the interface between disciplines. We believe that this particular boundary could be among the most fertile in modern science. From the chemical side, supramolecular chemists look across to biology as a major source of inspiration. If their subject is defined as “the designed chemistry of the intermolecular bond” (J.-M. Lehn); it is clear that Nature is a far better supramolecular chemist than any human. Biology shows us that remarkable feats may be achieved by carefully structured molecules operating through non-covalent interactions and encourages us to develop our own capabilities. It also provides opportunities. Supramolecular systems can potentially be used to influence biology, and also to elucidate basic principles through biomimicry. On the biological side, workers are equally concerned with the fundamentals of non-covalent interactions, and some have recognised that biomolecules can themselves be used in the same way that supramolecular chemists use synthetic systems. By re-engineering the natural systems, new functions and effects can be obtained. The two communities have much in common and, potentially, could achieve a great deal by working together. The supramolecular chemist can contribute synthetic skills, design strategies based on unnatural components, the measurement techniques of physical organic chemistry and a theoretical approach rooted in the physical sciences. The biologist brings the techniques of molecular biology, designs based on natural systems (especially biopolymers) and an appreciation of the biological questions which could be addressed by collaborative work.

The meeting will bring together researchers from either side of the biosupramolecular interface, to discuss current research, future directions and potential collaborations. The first aim will be to present a broad picture of biosupramolecular chemistry, viewing the areas of mutual interest from both sides of the boundary. Specific topics will be: (a) Biomembranes, (b) Peptides and proteins (structure and recognition), (c) Enzymes and enzyme mimetics, (d) Nucleic acids, (e) Carbohydrates and (f) Model studies and principles of molecular recognition. Having reviewed the area, the participants will seek to identify future trends, and especially those directions where collaboration could open new doors. The workshop will focus especially on developing joint proposals for the EU 7th Framework Programme. It is expected that at least one such initiative will result specifically from the event.

To encourage open communication, we propose to adopt the following policy on confidentiality, as used by the Gordon Research Conferences:

“Each participant agrees that any information presented at the workshop, whether in a formal talk or discussion, is a private communication from the individual making the contribution and is presented with the restriction that such information is not for public use. Each participant assumes sole responsibility for the protection and preservation of any intellectual property rights in such member's contributions to the workshop”

PRELIMINARY PROGRAMME

Presentations should be 25 minutes in length, to allow discussion time of 10 minutes

Tuesday 4 September 2007

Arrival

Wednesday 5 September 2007

Morning Session: Model systems and principles of molecular recognition **Chair Tony Davis**

08:30-09:00

Welcome

Tony Davis, Dek Woolfson, (Bristol, UK)

Presentation of the European Science Foundation (ESF)

Salvatore Cannistraro (ESF Standing Committee for Life, Earth and Environmental Sciences)

09:00-09:35

Chris Hunter, Sheffield, UK

09:35-10:10

Thomas Schrader, Marburg, Germany

10:10-10:45

Francesco Sansone, Parma, Italy

10:45-11:15

Coffea & Tea

11:15-11:50

Ulrich Koert, Marburg, Germany

11:50-12:25

Janusz Jurczak, Warsaw, Poland

12:30-14:00

Lunch

Afternoon Session: Peptides and proteins: structure and recognition **Chair Chris Hunter**

14:00-14:35

Jeremy Kilburn, Southampton, UK

14:35-15:10

Helma Wennemers, Basel, Switzerland

15:10-15:45

Javier de Mendoza, Tarragona, Spain

15:45-16:15

Coffea & Tea

16:15-16:50

Dek Woolfson, Bristol, UK

16:50-17:25

Thomas Scheibel, Munich, Germany

17:25

Free time for Discussion

19:00

Dinner

Thursday 6 September 2007

Morning Session: Carbohydrates and nucleic acids Chair TBC

09:00-09:35	Tony Davis , Bristol, UK
09:35-10:10	Anna Bernadi , Milan, Italy
10:10-10:45	Hans-Joachim Gabius , Munich, Germany
10:45-11:15	<i>Coffea & Tea</i>
11:15-11:50	Peter Nielsen , Copenhagen, Denmark
11:50-12:25	Christian Ochsenfeld , Tübingen, Germany
12:30-14:00	<i>Lunch</i>

Afternoon Session: Enzymes and proteins: structure, selection and mimetics Chair TBC

14:00-14:35	Mikael Bols , Aarhus, Denmark
14:35-15:10	Paolo Scrimin , Padova, Italy
15:10-15:45	<i>Coffea & Tea</i>
15:45-16:15	Andrei Lupas , MPI, Tübingen, Germany
16:15-16:50	Philippe Minard , Paris, France
16:50-17:25	Andrew Griffiths , Strasbourg, France
17:25	Free time for Discussion
19:00	<i>Dinner</i>

Friday 7 September 2007

Morning Session 1: At the membrane: natural and synthetic systems **Chair Andrei Lupas**

09:00-09:35	Simon Scheuring , Institut Curie, Paris, France
09:35-10:10	Stefan Matile , Geneva, Switzerland
10:10-10:45	Hagan Bayley , Oxford, UK
10:45-11:15	<i>Coffea & Tea</i>

Morning Session 2: Industrial applications

Chair Andrei Lupas

11:15-11:50	Mike Butler , Unilever Corporate Research, UK
11:50-12:25	Benedikt Sas , Kemin Pharma, Belgium
12:30-14:00	<i>Lunch</i>

Afternoon Session

14:00-16:30	Discussion on potential collaborations and FP7 proposals <i>with Coffea & Tea</i>
16:30	<i>Departures / Free time / Further informal discussions</i>
19:00	<i>Dinner</i>

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Objectives of the ESF Standing Committee for Life, Earth and Environmental Sciences (LESC)

The main objectives of the **ESF Standing Committee for Life, Earth and Environmental Sciences (LESC)** are:

1. to identify and promote emerging scientific topics and high quality science deserving special attention in Europe;
2. to manage a wide ranging portfolio of activities of the European Science Foundation;
3. to examine and report on issues of strategic scientific importance within its fields of competence.

This committee's sphere of activities comprises the broad field of life, earth and environmental sciences:

- Biology
- Biotechnology
- Agriculture
- Earth sciences
- Climate research
- Glaciology
- Oceanography
- Environmental sciences, etc.

ESF Standing Committees support a limited number of **Exploratory Workshops** each year. These workshops allow leading European scientists to explore novel ideas at the European level with the challenging aim to "*spearhead*" new and preferably interdisciplinary areas of research. Further details are available on the internet at <http://www.esf.org/workshops>.

One desirable outcome of an ESF Exploratory Workshop may be that participants submit **high quality proposals for further ESF activities** (such as "à la carte Programmes" or a EUROCORES initiative), or **research funding applications** for submission to the EU 7th Framework Programme or to other European or international funding organisations.

In the case of **ESF Programmes** ("*à la carte*" or [EUROCORES](#)), which are financed by, and coordinated through, the European Science Foundation, a draft proposal should be submitted to the LESC Secretariat for advice, to then subsequently undergo further external refereeing. If successful in obtaining LESC's scientific recommendation, the proposal will be submitted to ESF Member Organisations for funding on a voluntary basis. More details are available at <http://www.esf.org/research-areas/life-earth-and-environmental-sciences.html>.

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Objectives of the ESF Standing Committee for Physical and Engineering Sciences (PESC)

The **ESF Standing Committee for Physical and Engineering Sciences (PESC)** covers a broad number of fields from physics, chemistry, mathematics, informatics and computer sciences, to engineering, material and technical sciences. PESC has the following responsibilities and tasks:

- to develop scientific initiatives within the ESF operational framework;
- to make proposals for 'a la carte' scientific initiatives;
- to undertake studies on large research facilities and assist in the evaluations and assessments and other special reviews requested by Member Organisations;
- to provide specialist advice and input on a wide range of ESF actions and contribute to the development of the ESF science policy agenda and take a strategic view of the scientific area for which it has responsibility; and
- where appropriate, to work with other Committees and groups in promoting multidisciplinary and interdisciplinary activities.

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