

PREFACE

The Beilstein symposia address contemporary issues in the chemical and related sciences by employing an interdisciplinary approach. Scientists from a wide range of areas – often outside chemistry – are invited to present aspects of their work for discussion with the aim of not only advancing science, but also, furthering interdisciplinary communication.

Chemistry and biology are two of the most creative sciences. The ability of chemists to design and create their own research objects is a unique feature of this science, bringing it close to art. The aesthetics of symmetry, of biomolecules, or of an elegant synthesis, dissolve the boundaries between art and science. The unique art of biological systems, often unrivalled in the degrees of scale, regularly provides inspiration for chemists and biologists striving for a greater understanding of nature.

Understanding of chemical and biological systems has often been best achieved through reductionism; the bottom-up approach in going from small reaction systems to more complex systems consisting of hundreds or thousands of components is usually impractical. Complex problems are broken down into smaller parts, on the assumption that these behave in predictable, reproducible ways so that new theories or methods can be developed, tested and refined. For example, chemistry has been used very creatively to help understand pharmacological systems. Modern biology through point mutations, siRNA, cloning and knockouts, also provides many creative tools to allow many insights into complex biological systems.

An underlying theme of the symposium was the quest to increase our understanding of nature going from methodologies with regard to chemical building blocks, to complex molecules, supramolecular assemblies, cells and organisms. Complex chemical systems are, of course, not only biological in nature; comprehension of the underlying chemistry, in particular at the nano or meso-scale, of molecular organization allows a systems science approach to be applied to chemistry. Now that biologists and chemists are becoming able to modify and control biological systems, using the combined creativity and prowess of both disciplines, many hidden secrets of the biological systems in cells and organisms can be begun to be understood and investigated in a structured manner. The many parallels between contemporary chemistry and complex biological processes are resulting in innovative research projects throughout the world.

The secluded setting of Hotel Schloss Korb and its convivial atmosphere provided once again the ideal location for the symposium and the ready exchange of thoughts and ideas. Of course, despite the great efforts of all participants, not all scientific problems could be solved over the three days, but many very interesting discussions were initiated which continued well after the symposium; we will be watching the evolution of systems chemistry with much interest over the next years.

We would like to thank particularly the authors who provided us with written versions of the papers that they presented. Special thanks go to all those involved with the preparation and organization of the symposium, to the chairmen who piloted us successfully through the sessions and to the speakers and participants for their contribution in making this symposium a success.

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