

PREFACE

The Beilstein workshops 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 to advance science, but also, to enhance interdisciplinary communication.

Molecular interactions are of central importance to chemistry and biology; they control molecular events and states. The macrostructure and function of biomolecular compounds – proteins, nucleic acids, carbohydrates and lipids – are governed by molecular interactions, as are synthetic chemistry and catalysis of chemical reactions.

Understanding the evolution of biopolymers is required to rationalise the directed and undirected design of functional molecules. Large scale experiments or detailed computational studies are often impractical. Therefore, simple model systems, such as RNA secondary structure and lattice proteins have to be adapted to study general statistical and topological features of genotype (sequence) to phenotype (structure) maps.

Cellular processes require the interaction of many biomacromolecules such as proteins, RNA, carbohydrates etc. within and across several cellular compartments. Determining the collective network of such interactions is an important aspect of understanding the role and regulation of the individual members of such interacting networks.

Molecular Interactions bring chemistry to life in living organisms, but chemistry is a science that scientists can bring to life. Complex syntheses of natural products, elegantly controlled chemical reactions, the understanding of how proteins fold or DNA replicates, design of new pharmaceuticals or the docking of ligands in targets are all good examples of this. Central to all this work is not only the structure of the molecules in question but also a well founded understanding of how these molecules interact.

The rapid progress in structural and molecular biology over the past fifteen years has allowed chemists to access the structures of enzymes, of their complexes and of mutants. This wealth of structural information has led to a surge in the interest in enzymes as elegant chemical catalysts in such a way that enzymology became to be a distinguished field with important contributions to medicine and basic science.

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 workshop, to the chairmen who piloted us successfully through the sessions and to the speakers and participants for their contribution in making this workshop a success

Frankfurt/Main, July 2007

Martin G. Hicks
Carsten Kettner