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# Preface

The genomes of several organisms have been sequenced in recent years, and the efficient exploration of interactions among tens of thousands of gene products has moved to center stage in our quest for a detailed understanding of life at the molecular level. Molecular recognition and binding of ligands (atoms, ions, molecules) by proteins with high sensitivity and selectivity is of central importance to essentially all biomolecular processes. Therefore, a thorough understanding of protein–ligand interactions is of key importance for the basic and applied sciences. Techniques to study protein–ligand interactions have been established and refined for many years. They continue to be improved by the development of new reagents, protocols, and instrumentation. A variety of powerful experimental and theoretical tools have become available in recent years, and novel techniques are continually being introduced to meet new demands.

*Protein–Ligand Interactions: Methods and Applications* features a collection of methods for studying the interaction between proteins and ligands, including biochemical/bulk techniques, structure analysis, spectroscopy, single-molecule studies, and theoretical/computational tools. The present volume aims to provide the researcher with technical background information that will enable him or her to develop strategies for characterizing protein–ligand interactions in the most effective way. Life scientists in both academia and industry will find hands-on information regarding both established and novel approaches for the study of protein–ligand interactions. We have attempted to present a broad selection of widely applicable techniques. We hope that *Protein–Ligand Interactions: Methods and Applications* will provide a good starting point from which to embark on other, more specialized techniques.

I wish to thank all contributing authors for their hard work and considerable patience. I greatly appreciate the high quality of their presentations that made compiling this volume a particularly pleasurable experience.

**Gerd Ulrich Nienhaus**



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Methods and Applications

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