Preface

The introduction of high-performance liquid chromatography (HPLC) to the analysis of peptides and proteins some 25 years ago revolutionized the biological sciences by enabling the rapid and sensitive analysis of peptide and protein structure through the exquisite speed, sensitivity, and resolution that can be easily obtained. Today, HPLC in its various modes has become the pivotal technique in the characterization of peptides and proteins and currently plays a critical role in both our understanding of biological processes and in the development of peptide- and protein-based pharmaceuticals.

The number of applications of HPLC in peptide and protein purification continues to expand at an extremely rapid rate. Solid-phase peptide synthesis and recombinant DNA techniques have allowed the production of large quantities of peptides and proteins that need to be highly purified. HPLC techniques are also used extensively in the isolation and characterization of novel proteins that will become increasingly important in the postgenomic age. The design of multidimensional purification schemes to achieve high levels of product purity further demonstrates the power of HPLC techniques not only in the characterization of cellular events, but also in the production of peptide- and protein-based therapeutics. HPLC continues to be at the heart of the analytical techniques with which scientists in both academia and in industry must arm themselves to be able to fully characterize the identity, purity, and potency of peptides and proteins.

The aim of *HPLC of Peptides and Proteins: Methods and Protocols* is to provide the beginner with a sufficiency of the practical information needed to develop separation and analytical protocols for peptide and protein analysis. This volume opens with an overview of the basic theory and general methodology of HPLC, with particular reference to the key separation parameters that can be manipulated to achieve high resolution. Each of the commonly used HPLC techniques are covered in Chapters 2–9, whereas methods for capillary to large-scale preparative isolation are described in Chapters 10–15. Chapters 16–27 provide those already experienced in HPLC with a number of specific applications, as in case studies to illustrate the analytical approaches to a particular separation or assay challenge, with examples drawn from contemporary fields in biochemistry and biotechnology. These applications include proteolytic mapping, posttranslational modifications, neuropeptide processing, glycopeptides and glycoproteins,

MHC-binding peptides, toxins/venoms, membrane proteins, antibodies, combinatorial and proteome analysis, and enzymatic activity.

HPLC of Peptides and Proteins: Methods and Protocols will be a valuable resource for a wide range of scientists, including biochemists, molecular biologists, pharmacologists, and microbiologists, who work with peptides and/or proteins in both academic and biotechnology laboratories.

Finally, I would like to thank all of the authors for their enthusiastic participation and excellent contributions.

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