
Preface

The broad canvas of peptide science is indebted both to its early pioneers and to the numerous international investigators who enrich this exciting discipline. The thoughts and expertise of some of these noteworthy scientists, collectively located across three continents, are represented here. The gregarious nature of the peptide science community is particularly impressive, and I am pleased that several close colleagues were able and willing to contribute to this volume. My intention, as editor of *Peptide Synthesis and Applications*, is to present the basic methodologies of contemporary peptide synthesis and to provide examples of the numerous applications that employ peptides as unique and essential materials.

As detailed in the first chapter, any reasonably competent scientist can assemble amino acids in the correct order to produce a desired peptide sequence. A course manual for basic peptide design and synthesis is also provided herein, based on a successful template used to teach peptide chemistry to undergraduate students in Stockholm. No doubt the future will see a further evolution of technologies based largely upon Merrifield's innovation of solid phase synthesis back in 1963. Thus, chapters within this volume collectively provide details of chemical ligation, the synthesis of cyclic and phosphotyrosine-containing peptides, lipoamino acid- and sugar-conjugated peptides, and more common methodologies that include peptide purification and analyses. To complete the story details of methodologies and instrumentation used for high throughput peptide synthesis are also included. Moreover, when compiling *Peptide Synthesis and Applications* my intention was to include contemporary applications of peptides that might inspire others to further expand the utility of this novel class of biomolecule. My request of many contributing authors was that they provide details of their own developments covering many different applications of peptides as novel research tools and biological probes. The design and synthesis of chimeric and cell-penetrating peptides are fields of endeavor that will no doubt provide valuable research tools and possible therapeutic leads in the foreseeable future. Details are also included of the design and application of fluorescent substrate-based peptides that can be used to determine the selectivity and activity of peptidases.

As we embrace the postgenomic era, the utility of peptides will be further exploited to both study and manipulate the many biological processes modulated by discrete molecular interactions between intracellular proteins that are a major component of the eukaryotic proteome.

Thus, *Peptide Synthesis and Applications* also includes practical details of current methodologies applicable to the identification of proteins using mass spectrometric analyses of peptide mixtures. I trust there is something here for the beginner and expert alike.

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