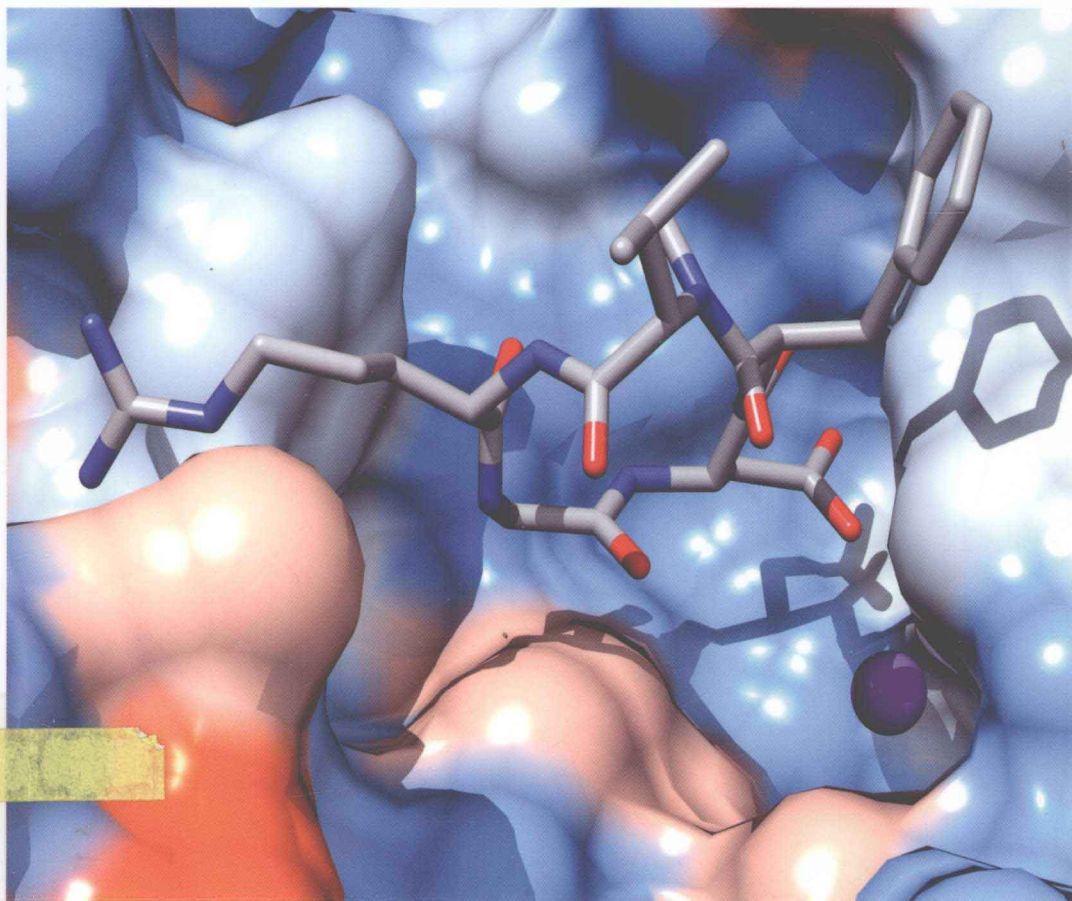


Norbert Sewald and
Hans-Dieter Jakubke

 WILEY-VCH

Peptides: Chemistry and Biology

Second, Revised and Updated Edition



Norbert Sewald and Hans-Dieter Jakubke

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Second, Revised and Updated Edition

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Preface to the second edition

Peptides are continuously gaining increasing attention for application as lead compounds for the development of drugs, as drug molecules, as molecular tools for diagnostic purposes in biochemistry, medicinal sciences as well as proteome research. Since the first edition of this book has been published, a storming development in the peptide field took place. While formerly the development of synthetic methodology prevailed, currently peptide application in a biochemical, medicinal or analytical context predominates. Many different peptide conjugates have been tailored according to specific scientific questions.

The second thoroughly revised edition of this book especially takes into account these recent developments. Many sections have been updated carefully and some of them have been re-organized and extended significantly. This is especially true for Chapter 3, dealing with the biology of peptides, Chapter 5 that focuses on synthesis concepts for peptides and proteins, as well as Chapter 6 on special peptides and peptide conjugates. The recent developments of peptide drugs required an in-depth revision of Chapter 9 which is now an up to date reference on currently available peptide and protein therapeutics. The emerging role of peptides in an analytical context called for the addition of a new Chapter 10 providing details on the role of peptides on proteomics.

The second edition of our book also very much relies on advice, help and contributions by several colleagues. While it would lead too far to mention all of them, the most significant contributions have to be acknowledged in this preface. Chapter 2 was critically revised by Hans-Jörg Hofmann, University of Leipzig. The Section 6.2 was re-written by Luis Moroder, Max-Planck-Institute of Biochemistry, Martinsried. Dirk Ullmann and Volker Schellenberger usefully contributed to updating Chapter 9 on the application of peptides and proteins. Dr. Katherina Sewald prepared excellent graphical material and molecular formulae. Jens Conradi designed the new cover picture. Dr. Frank Weinreich, Lesley Belfit, Maike Peterson, Dr. Rosemary Whitelock, and Claudia Zschernitz, who were responsible for editing and production at Wiley-VCH, are acknowledged for carefully dealing with the manuscript and converting it into a book of high quality.

We very much hope that this second edition will meet the same positive response and enthusiastic comments by our colleagues as the first edition did.

Finally we would like to dedicate this book on Chemistry and Biology of Peptides to the memory of two pioneers in the field who favorably commented on the first edition, but passed away in the meantime: Robert B. Merrifield and Murray Goodman.

Bielefeld
and
Dresden-Langebrück
August 2008

Norbert Sewald

Hans-Dieter Jakubke

Preface to the first edition

The past decades have witnessed an enormous development in peptide chemistry with regard not only to the isolation, synthesis, structure identification, and elucidation of the mode of action of peptides, but also to their application as tools within the life sciences. Peptides have proved to be of interest not only in biochemistry, but also in chemistry, biology, pharmacology, medicinal chemistry, biotechnology, and gene technology.

These important natural products span a broad range with respect to their complexity. As the different amino acids are connected via peptide bonds to produce a peptide or a protein then many different sequences are possible – depending on the number of different building blocks and on the length of the peptide. As all peptides display a high degree of conformational diversity, it follows that many diverse and highly specific structures can be observed.

Whilst many previously published monographs have dealt exclusively with the synthetic aspects of peptide chemistry, this new book also covers its biological aspects, as well as related areas of peptidomimetics and combinatorial chemistry. The book is based on a monograph which was produced in the German language by Hans-Dieter Jakubke: *Peptide, Chemie und Biologie* (Spektrum Akademischer Verlag, Heidelberg, Berlin, Oxford), and first published in 1996. In this new publication, much of the material has been completely reorganized and many very recently investigated aspects and topics have been added. We have made every effort to produce a practically new book, in a modern format, in order to provide the reader with profound and detailed knowledge of this field of research. The glossary, which takes the form of a concise encyclopedia, contains data on more than 500 physiologically active peptides and proteins, and comprises about 20% of the book's content.

Our book covers many different issues of peptide chemistry and biology, and is devoted to those students and scientists from many different disciplines who might seek quick reference to an essential point. In this way it provides the reader with concise, up-to-date information, as well as including many new references for those who wish to obtain a deeper insight into any particular issue. In this book, the “virtual barrier” between peptides and proteins has been eliminated because, from

the viewpoint of the synthesis or biological function of these compounds, such a barrier does not exist.

This monograph represents a personal view of the authors on peptide chemistry and biology. We are aware however that, despite all our efforts, it is impossible to include all aspects of peptide research in one volume. We are not under the illusion that the text, although carefully prepared, is completely free of errors. Indeed, some colleagues and readers might feel that the choice of priorities, the treatment of different aspects of peptide research, or the depth of presentation may not always be as expected. In any case, comments, criticisms and suggestions are appreciated and highly welcome for further editions.

Several people have contributed considerably to the manuscript. All the graphical material was prepared by Dr. Katherina Stembera, who also typed large sections of the manuscript, provided valuable comments, and carried out all the formatting. We appreciate the kindness of Professor Robert Bruce Merrifield, Dr. Bernhard Streb and Dr. Rainer Obermeier for providing photographic material for our book. Margot Müller and Helga Niermann typed parts of the text. Dr. Frank Schumann and Dr. Jörg Schröder contributed Figures 2.19 and 2.25, respectively. We also thank Dirk Bächle, Kai Jenssen, Micha Jost, Dr. Jörg Schröder, and Ulf Strijowski for comments and proofreading parts of the manuscript.

Dr. Gudrun Walter, Maike Petersen, Dr. Bill Down, and Hans-Jörg Maier took care that the manuscript was converted into this book in a rather short period of time, without complications.

Bielefeld
and
Dresden-Langebrück
April 2002

Norbert Sewald

Hans-Dieter Jakubke

Contents

Preface to the second edition XIII

Preface to the first edition XV

1	Introduction and Background	1
	References	4
2	Fundamental Chemical and Structural Principles	5
2.1	Definitions and Main Conformational Features of the Peptide Bond	5
2.2	Building Blocks, Classification, and Nomenclature	7
2.3	Analysis of the Covalent Structure of Peptides and Proteins	11
2.3.1	Separation and Purification	13
2.3.1.1	Separation Principles	13
2.3.1.2	Purification Techniques	17
2.3.1.3	Stability Problems	19
2.3.1.4	Evaluation of Homogeneity	20
2.3.2	Primary Structure Determination	20
2.3.2.1	End Group Analysis	21
2.3.2.2	Cleavage of Disulfide Bonds	24
2.3.2.3	Analysis of Amino Acid Composition	24
2.3.2.4	Selective Methods of Cleaving Peptide Bonds	26
2.3.2.5	N-Terminal Sequence Analysis (Edman Degradation)	28
2.3.2.6	C-Terminal Sequence Analysis	30
2.3.2.7	Mass Spectrometry	31
2.3.2.8	Peptide Ladder Sequencing	32
2.3.2.9	Assignment of Disulfide Bonds and Peptide Fragment Ordering	33
2.3.2.10	Location of Post-Translational Modifications and Bound Cofactors	34
2.4	Three-Dimensional Structure	36
2.4.1	Secondary Structure	36
2.4.1.1	Helices	37
2.4.1.2	β -Sheets	39
2.4.1.3	Turns	40
2.4.1.4	Amphiphilic Structures	42

2.4.2	Tertiary Structure	44
2.4.2.1	Structure Prediction	48
2.5	Methods of Structural Analysis	49
2.5.1	Circular Dichroism	49
2.5.2	Infrared Spectroscopy	51
2.5.3	NMR Spectroscopy	52
2.5.4	X-Ray Crystallography	54
2.5.5	UV Fluorescence Spectroscopy	55
2.6	Review Questions	56
	References	57
3	Biology of Peptides	63
3.1	Historical Aspects and Biological Functions	63
3.2	Biosynthesis	75
3.2.1	Ribosomal Peptide Synthesis	75
3.2.2	Post-Translational Modification	79
3.2.2.1	Enzymatic Cleavage of Peptide Bonds	79
3.2.2.2	Hydroxylation	80
3.2.2.3	Carboxylation	81
3.2.2.4	Glycosylation	81
3.2.2.5	Amidation	86
3.2.2.6	Phosphorylation	87
3.2.2.7	Lipidation	88
3.2.2.8	Pyroglutamyl Formation	90
3.2.2.9	Sulfation	91
3.2.2.10	Further Post-Translational Modifications	92
3.2.3	Nonribosomal Peptide Synthesis	94
3.3	Selected Biologically Active Peptides	96
3.3.1	Gastroenteropancreatic Peptide Families	96
3.3.1.1	The Gastrin Family	97
3.3.1.2	Secretin Family	98
3.3.1.3	The Insulin Superfamily	101
3.3.1.4	The Somatostatin Family	104
3.3.1.5	The Tachykinin Family	105
3.3.1.6	The Neuropeptide Y family	106
3.3.1.7	The Ghrelin Family	108
3.3.1.8	The EGF Family	109
3.3.2	Hypothalamic Liberins and Statins	110
3.3.2.1	Thyroliberin	112
3.3.2.2	Gonadoliberin	113
3.3.2.3	Corticoliberin	113
3.3.2.4	Growth Hormone-Releasing Hormone	114
3.3.3	Pituitary Hormones	115
3.3.3.1	Growth Hormone	115
3.3.3.2	Corticotropin	115

3.3.3.3	Melanotropin	117
3.3.4	Neurohypophyseal Hormones	118
3.3.4.1	Oxytocin	118
3.3.4.2	Vasopressin	119
3.3.5	Parathyroid Hormone and Calcitonin/Calcitonin Gene-Related Peptide Family	120
3.3.5.1	Parathyroid Hormone	120
3.3.5.2	Parathyroid Hormone-Related Peptides	121
3.3.5.3	The Calcitonin/Calcitonin Gene-Related Peptide Family	121
3.3.6	The Blood Pressure Regulating Peptide Families	123
3.3.6.1	Angiotensin–Kinin System	123
3.3.6.2	Endothelins and Endothelin-Like Peptides	125
3.3.6.3	Cardiac Peptide Hormones	127
3.3.7	Neuropeptides	128
3.3.7.1	Endorphins	131
3.3.7.2	Dynorphins	136
3.3.7.3	Hypocretins (Orexins)	136
3.3.7.4	Dermorphins	137
3.3.7.5	Deltorphins	138
3.3.7.6	Nociceptin/Orphanin and Nocistatin	138
3.3.7.7	Exorphins	139
3.3.7.8	The Adipokinetic Hormone/Red Pigment-Concentrating Hormone Family	140
3.3.7.9	Endomorphins	141
3.3.7.10	The Allatostatin Families	141
3.3.7.11	Neuromedins	142
3.3.7.12	Additional Neuroactive Peptides	143
3.3.8	Peptide Antibiotics	146
3.3.8.1	Nonribosomally Synthesized Peptide Antibiotics	147
3.3.8.2	Ribosomally Synthesized Peptide Antibiotics	152
3.3.9	Peptide Toxins	156
3.4	Review Questions	162
	References	163
4	Peptide Synthesis	175
4.1	Principles and Objectives	175
4.1.1	Main Targets of Peptide Synthesis	175
4.1.2	Basic Principles of Peptide Bond Formation	178
4.2	Protection of Functional Groups	181
4.2.1	N ^α -Amino Protection	182
4.2.1.1	Alkoxy carbonyl-Type (Urethane-Type) Protecting Groups	183
4.2.1.2	Carboxamide-Type Protecting Groups	192
4.2.1.3	Sulfonamide and Sulfenamide-Type Protecting Groups	192
4.2.1.4	Alkyl-Type Protecting Groups	192
4.2.2	C ^α -Carboxy Protection	193

4.2.2.1	Esters	194
4.2.2.2	Amides and Hydrazides	199
4.2.3	C-Terminal and Backbone N ^α -carboxamide Protection	199
4.2.4	Side-Chain Protection	201
4.2.4.1	Guanidino Protection	202
4.2.4.2	ω-Amino Protection	204
4.2.4.3	ω-Carboxy Protection	205
4.2.4.4	Thiol Protection	208
4.2.4.5	Imidazole Protection	211
4.2.4.6	Hydroxy Protection	214
4.2.4.7	Thioether Protection	216
4.2.4.8	Indole Protection	217
4.2.4.9	ω-Amide Protection	218
4.2.5	Enzyme-Labile Protecting Groups	220
4.2.5.1	Enzyme-labile N ^α -amino Protection	221
4.2.5.2	Enzyme-labile C ^α -carboxy Protection and Enzyme-labile Linker Moieties	223
4.2.6	Protecting Group Compatibility	223
4.3	Peptide Bond Formation	224
4.3.1	Acyl Azides	225
4.3.2	Anhydrides	226
4.3.2.1	Mixed Anhydrides	227
4.3.2.2	Symmetrical Anhydrides	229
4.3.2.3	N-Carboxy Anhydrides	229
4.3.3	Carbodiimides	231
4.3.4	Active Esters	235
4.3.5	Acyl Halides	237
4.3.6	Phosphonium Reagents	239
4.3.7	Guanidinium/Uronium Reagents	240
4.3.8	Immonium Type Coupling Reagents	242
4.3.9	Further Special Methods for Peptide Synthesis	243
4.4	Racemization During Synthesis	246
4.4.1	Direct Enolization	246
4.4.2	5(4H)-Oxazolone Mechanism	247
4.4.3	Racemization Tests: Stereochemical Product Analysis	249
4.5	Solid-Phase Peptide Synthesis (SPPS)	251
4.5.1	Solid Supports and Linker Systems	253
4.5.2	Safety-Catch Linkers	262
4.5.3	Protection Schemes	265
4.5.3.1	Boc/Bzl-protecting Groups Scheme (Merrifield Tactics)	265
4.5.3.2	Fmoc/tBu-Protecting Groups Scheme (Sheppard Tactics)	267
4.5.3.3	Three- and More-Dimensional Orthogonality	268
4.5.4	Chain Elongation	269
4.5.4.1	Coupling Methods	269
4.5.4.2	Undesired Problems During Elongation	269

4.5.4.3	Difficult Sequences	271
4.5.4.4	Chemical Strategies for SPPS Methodological Improvements	273
4.5.4.5	On-Resin Monitoring	273
4.5.5	Automation of the Process	274
4.5.6	Peptide Cleavage from the Resin	275
4.5.6.1	Acidolytic Methods	275
4.5.6.2	Side Reactions	276
4.5.6.3	Advantages and Disadvantages of the Boc/Bzl and Fmoc/tBu Schemes	277
4.5.7	Examples of Syntheses by Linear SPPS	277
4.5.8	Special Methods of Polymer-supported Synthesis	278
4.5.9	Microwave-Enhanced Peptide Synthesis	280
4.6	Biochemical Synthesis	281
4.6.1	Recombinant DNA Techniques	281
4.6.1.1	Principles of DNA Technology	282
4.6.1.2	Examples of Synthesis by Genetic Engineering	285
4.6.1.3	Cell-free Translation Systems	288
4.6.1.4	Proteins Containing Non-Proteinogenic Amino Acids – The Expansion of the Genetic Code	290
4.6.2	Enzymatic Peptide Synthesis	291
4.6.2.1	Approaches to Enzymatic Synthesis	291
4.6.2.2	Manipulations to Suppress Competitive Reactions	294
4.6.2.3	Substrate Mimetic Approach	295
4.6.3	Further Selected Biochemical Methods	297
4.6.3.1	Non-ribosomal Peptide Synthesis	297
4.6.3.2	Peptide Bond Formation by LF-Transferase	297
4.6.3.3	Antibody-catalyzed Peptide Bond Formation	297
4.7	Review Questions	300
	References	301
5	Synthesis Concepts for Peptides and Proteins	317
5.1	Strategy and Tactics	317
5.1.1	Linear or Stepwise Synthesis	317
5.1.2	Convergent Synthesis	320
5.1.3	Tactical Considerations	321
5.1.3.1	Selected Protecting Group Schemes	321
5.1.3.2	Preferred Coupling Procedures	324
5.2	Solution Phase Synthesis (SPS)	325
5.2.1	Convergent Synthesis Using Maximally Protected Segments	325
5.2.2	Convergent Synthesis Using Minimally Protected Segments	327
5.2.2.1	Chemical Approaches	327
5.2.2.2	Enzymatic Approaches	329
5.3	Solution Phase/Solid Phase-Hybrid Approaches	332
5.3.1	Solid Phase Synthesis of Protected Segments	332
5.3.2	SPS/SPPS-Hybrid Condensation of Lipophilic Segments	333

5.3.3	Phase Change Synthesis	335
5.3.4	SPS/SPPS-Hybrid Approach to Protein and Large Scale Peptide Synthesis	335
5.4	Optimized Strategies on a Polymeric Support	337
5.4.1	Standard SPPS	337
5.4.2	Convergent Solid-Phase Peptide Synthesis	339
5.4.3	Handle Approaches	341
5.4.3.1	Positively Charged Handles	341
5.4.3.2	Liquid Phase Method	342
5.4.3.3	Excluded Protecting Group Method	343
5.5	Chemical Ligation Strategies	343
5.5.1	Native Chemical Ligation	344
5.5.1.1	Facile Peptide Thioester Synthesis	346
5.5.1.2	Extended Native Chemical Ligation	346
5.5.1.3	Kinetically Controlled Ligation	348
5.5.1.4	Solid Phase Chemical Ligation	350
5.5.1.5	Alternative Approaches to Native Chemical Ligation	350
5.5.2	Expressed Protein Ligation (Intein-mediated Protein Ligation)	351
5.5.3	Prior Capture-mediated Ligation	353
5.5.3.1	Template-mediated Ligation	353
5.5.4	Non-native Chemoselective Ligation	355
5.5.4.1	Thioester- and Thioether-forming Ligations	355
5.5.4.2	Hydrazone- and Oxime-forming Ligations	356
5.5.5	Alternative Ligation Approaches	356
5.5.5.1	Staudinger Ligation	357
5.5.5.2	Ketoacid-hydroxylamine Amide Ligations	357
5.5.5.3	Expressed enzymatic ligation	358
5.5.5.4	Sortase-mediated Ligation	359
5.6	Review Questions	359
	References	360
6	Synthesis of Special Peptides and Peptide Conjugates	365
6.1	Cyclopeptides	365
6.1.1	Backbone Cyclization (Head-to-Tail Cyclization)	371
6.1.2	Side Chain-to-Head and Tail-to-Side Chain Cyclizations	380
6.1.3	Side Chain-to-Side Chain Cyclizations	380
6.2	Cystine Peptides	381
6.3	Glycopeptides	386
6.4	Phosphopeptides	395
6.5	Lipopeptides	398
6.6	Sulfated Peptides	402
6.7	Review Questions	403
	References	403
7	Peptide and Protein Design, Pseudopeptides, and Peptidomimetics	411
7.1	Peptide Design	413

7.2	Modified Peptides	418
7.2.1	Side-Chain Modification	418
7.2.2	Backbone Modification	421
7.2.3	Combined Modification (Global Restriction) Approaches	423
7.2.4	Modification by Secondary Structure Mimetics	425
7.2.5	Transition State Inhibitors	427
7.3	Peptidomimetics	428
7.4	Pseudobiopolymers	431
7.4.1	Peptoids	432
7.4.2	Peptide Nucleic Acids (PNA)	434
7.4.3	β -Peptides, Hydrazino Peptides, Aminoxy Peptides, and Oligosulfonamides	435
7.4.4	Oligocarbamates	437
7.4.5	Oligopyrrolinones	438
7.5	Macropeptides and <i>de novo</i> Design of Peptides and Proteins	439
7.5.1	Protein Design	439
7.5.2	Peptide Dendrimers	444
7.5.3	Peptide Polymers	447
7.6	Review Questions	447
	References	448
8	Combinatorial Peptide Synthesis	457
8.1	Parallel Synthesis	460
8.1.1	Synthesis in Teabags	461
8.1.2	Synthesis on Polyethylene Pins (Multipin Synthesis)	462
8.1.3	Parallel Synthesis of Single Compounds on Cellulose or Polymer Strips	464
8.1.4	Light-Directed, Spatially Addressable Parallel Synthesis	465
8.1.5	Liquid-Phase Synthesis using Soluble Polymeric Support	466
8.2	Synthesis of Mixtures	467
8.2.1	Reagent Mixture Method	468
8.2.2	Split and Combine Method	468
8.2.3	Encoding Methods	470
8.2.4	Peptide Library Deconvolution	474
8.2.5	Dynamic Combinatorial Libraries	476
8.2.6	Biological Methods for the Synthesis of Peptide Libraries	477
8.3	Review Questions	478
	References	479
9	Application of Peptides and Proteins	483
9.1	General Production Strategies	483
9.2	Improvement of the Therapeutic Potential	486
9.2.1	Peptide and Protein Drug Modifications	486
9.2.2	Peptide Drug Delivery Systems	488
9.3	Protein Pharmaceuticals	492
9.3.1	Importance and Sources	492

9.3.2	Endogenous Pharmaceutical Proteins	493
9.3.3	Engineered Protein Pharmaceuticals	493
9.3.3.1	Selected Recombinant Proteins	493
9.3.3.2	Peptide-Based Vaccines	497
9.3.3.3	Monoclonal Antibodies	498
9.3.3.4	Future Perspectives	500
9.4	Peptide Pharmaceuticals	502
9.4.1	Large-Scale Peptide Synthesis	502
9.4.2	Peptide Drugs and Drug Candidates	507
9.4.3	Peptides as Tools in Drug Discovery	515
9.4.4	Peptides Targeted to Functional Sites of Proteins	517
9.4.5	Peptides Used in Target Validation	517
9.4.6	High-throughput Screening (HTS) Using Peptides as Surrogate Ligands	518
9.4.7	Artificial Peptide Analogs in Drug Discovery	521
9.5	Review Questions	522
	References	523
10	Peptides in Proteomics	529
10.1	Genome and Proteome	529
10.2	Separation Methods	530
10.2.1	Depletion Strategies	530
10.2.2	Two-Dimensional Polyacrylamide Gel-Electrophoresis	530
10.2.3	Gel-Free Methods – Two-Dimensional Liquid Chromatography (2D-LC, MudPIT)	531
10.3	Peptide and Protein Analysis in Proteomics	532
10.3.1	Mass Spectrometry	532
10.3.2	Quantitative Proteomics	533
10.3.2.1	Metabolic Stable-Isotope Labelling	533
10.3.2.2	Tagging Methods	533
10.3.2.3	Enzymatic Stable-Isotope Labeling	535
10.4	Activity-Based Proteomics	535
10.4.1	Irreversibly Binding Affinity-Based Probes	536
10.4.2	Reversibly Binding Affinity-Based Probes	539
10.4.2.1	Inhibitor Affinity Chromatography (IAC)	540
10.4.2.2	Labelling Strategies with Reversibly Binding Protein Ligands	541
10.5	Review Questions	543
	References	543
	Glossary	547
	Index	559