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defective Mutants; 2.6 Cloning of ATG Genes; 2.7 Further Genes Required for Autophagy; 2.8 Selectivity of Proteins Degraded; 2.9 Induction of Autophagy; 2.10 Membrane Dynamics During Autophagy 2.11 Monitoring Methods of Autophagy in the Yeast *S. cerevisiae* 2.12 Function of Atg Proteins; 2.12.1 The Atg12 Protein Conjugation System; 2.12.2 The Atg8 System; 2.12.3 The Atg1 Kinase Complex; 2.12.4 Autophagy-specific PI3 Kinase Complex; 2.12.5 Other Atg Proteins; 2.13 Site of Atg Protein Functioning: The Pre-autophagosomal Structure; 2.14 Atg Proteins in Higher Eukaryotes; 2.15 Atg Proteins as Markers for Autophagy in Mammalian Cells; 2.16 Physiological Role of Autophagy in Multicellular Organisms; 2.17 Perspectives; References

3 Dissecting Intracellular Proteolysis Using Small Molecule Inhibitors and Molecular Probes 3.1 Introduction; 3.2 The Proteasome as an Essential Component of Intracellular Proteolysis; 3.3 Proteasome Structure, Function, and Localization; 3.4 Proteasome Inhibitors as Tools to Study Proteasome Function; 3.4.1 Peptide Aldehydes; 3.4.2 Lactacystin; 3.4.3 Peptide Epoxyketones; 3.4.4 Cyclic Peptides; 3.4.5 Peptide Boronates; 3.4.6 Peptide Vinyl Sulfones; 3.4.7 Peptide Vinyl Sulfones as Proteasomal Activity Probes 3.4.8 Future Directions in the Development of Inhibitors of the Proteasome's Proteolytic Activities 3.5 Assessing the Biological Role of the Proteasome With Inhibitors and Probes; 3.6 Proteasome-associated Components: The Role of N-glycanase; 3.7 A Link Between Proteasomal Proteolysis and Deubiquitination; 3.7.1 Reversal of Ub Modification; 3.7.2 Ubiquitin-specific Proteases; 3.7.3 USP Reactive Probes Correlate USP Activity With Proteasomal Proteolysis; 3.8 Future Developments and Final Remarks; Acknowledgments; Abbreviations; References

4 MEKK1: Dual Function as a Protein Kinase and a Ubiquitin Protein Ligase

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### Sommario/riassunto

The second volume in a new series dedicated to protein degradation, this book discusses the mechanism and cellular functions of targeted protein breakdown via the ubiquitin pathway. Drawing on the combined knowledge of the world's leading protein degradation experts, this handy reference compiles information on the proteasome-mediated degradation steps of the ubiquitin pathway. In addition to proteasomal function and regulation, it also presents the latest results on novel members of the ubiquitin superfamily and their role in cellular regulation. Further volumes in the series cover the

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