

1. Record Nr.	UNINA9910830086703321
Titolo	Dynamic studies in biology [[electronic resource]] : phototriggers, photoswitches and caged biomolecules / / edited by Maurice Goeldner, Richard Givens
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2005
ISBN	1-280-52060-4 9786610520602 3-527-60559-2 3-527-60554-1
Descrizione fisica	1 online resource (587 p.)
Altri autori (Persone)	GoeldnerMaurice GivensRichard
Disciplina	547.2
Soggetti	Photobiochemistry Biomolecules - Separation Protective groups (Chemistry)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Dynamic Studies in Biology Phototriggers, Photoswitches and Caged Biomolecules; Contents; Foreword; Preface; List of Authors; 1 Photoremovable Protecting Groups Used for the Caging of Biomolecules; 1.1 2-Nitrobenzyl and 7-Nitroindoline Derivatives; 1.1.1 Introduction; 1.1.1.1 Preamble and Scope of the Review; 1.1.1.2 Historical Perspective; 1.1.2 Synthetic Considerations; 1.1.3 Survey of Individual Caged Compounds and Caging Groups; 1.1.3.1 2-Nitrobenzyl Cages; 1.1.3.1.1 Mechanistic Aspects of Photocleavage and By-Product Reactions of 2-Nitrobenzyl Cages 1.1.3.1.2 Representative Survey of Nitrobenzyl-Caged Compounds1. 1.3.2 7-Nitroindoline Cages; 1.1.3.2.1 Mechanistic and Structural Aspects of Photochemical Cleavage of 1-Acyl-7-nitroindolines; 1.1.3.2.2 Survey of 7-Nitroindoline Caged Compounds; 1.1.4 Conclusion; References; 1.2 Coumarin-4-ylmethyl Phototriggers; 1.2.1 Introduction; 1.2.2 Spectroscopic and Photochemical Properties; 1.2.2.1 Overview; 1.2.2.2 Phototriggers; 1.2.2.2.1 MCM Groups: 7-Alkoxy-

Substituted Coumarins; 1.2.2.2.2 DMCM Groups: 6,7-Dialkoxy-Substituted Coumarins; 1.2.2.2.3 Bhc Groups: 6-Bromo-7-alkoxy-Substituted Coumarins
1.2.2.2.4 DEACM Groups: 7-Dialkylamino-Substituted Coumarins1.
2.2.3 Target Molecules; 1.2.2.3.1 Phosphates; 1.2.2.3.2 Carboxylates and Sulfates; 1.2.2.3.3 Amines; 1.2.2.3.4 Alcohols and Phenols; 1.2.2.3.5 Carbonyl Compounds; 1.2.3 Synthesis; 1.2.3.1 Synthesis of Precursor Molecules (Caging Agents); 1.2.3.1.1 Phosphates; 1.2.3.1.2 Carboxylates; 1.2.3.1.3 Amines; 1.2.3.1.4 Alcohols and Phenols; 1.2.4 Applications; 1.2.5 Conclusion and Perspective; References; 1.3 p-Hydroxyphenacyl: a Photoremoveable Protecting Group for Caging Bioactive Substrates; 1.3.1 Introduction and History
1.3.2 p-Hydroxyphenacyl1.3.2.1 General Physical and Spectroscopic Properties; 1.3.2.2 Synthesis of pHP-Caged Substrates; 1.3.3 Mechanistic Studies; 1.3.3.1 A Triplet "Photo-Favorskii" Rearrangement; 1.3.3.2 Role of the Triplet Phenol; 1.3.3.3 Correlation of the (3)pK(a) with the Quantum Efficiency; 1.3.4 Applications; 1.3.4.1 Neurotransmitter Release; 1.3.4.2 Peptide Release; 1.3.4.3 Nucleotide Release; 1.3.4.4 Enzyme Photoswitches; 1.3.5 Advantages and Limitations; References; 1.4 Caging of ATP and Glutamate: a Comparative Analysis; 1.4.1 Introduction
1.4.2 General Properties for Caging Groups1.4.3 Caged-ATP; 1.4.3.1 Introduction; 1.4.3.2 Syntheses of the P(3)-caged ATP Derivatives; 1.4.3.3 General Properties of the Caged-ATP Molecules; 1.4.3.4 Conclusion; 1.4.4 Caged Glutamate; 1.4.4.1 Introduction; 1.4.4.2 Syntheses of the Caged Glutamate Derivatives; 1.4.4.3 General Properties of the Caged-Glutamate Molecules; 1.4.4.4 Conclusion; Abbreviations; References; 2 Mechanistic Overview of Phototriggers and Cage Release; 2.1 Introduction; 2.2 Major Photoremoveable Protecting Groups; 2.2.1 2-Nitrobenzyl (2-NB); 2.2.1.1 The Reactive Excited State 2.2.1.2 The aci-Nitro Intermediate

Sommario/riassunto

With contributions by more than 30 expert researchers, this handbook covers the whole spectrum from chemistry to cell biology and from theory to application. In so doing, it deals with a broad range of topics from the chemistry and biophysics of caged compounds to their application in time-resolved studies, comparing the properties of different caging groups. The authors describe in detail light-activation of proteins as well as nucleic acids, while a special section is devoted to multiphoton phototriggers. A must-have for every biochemist, biophysicist and molecular biologist developing an
