

Volume Preface

The photochemistry and photobiology of flavins is a field which has important implications for chemistry, biology, and medicine. In view of its interdisciplinary diversity a monograph covering the major aspects on this subject must by necessity be a multiauthored book. Therefore, it has been one of our fundamental motivations to secure contributions from experts who would provide the necessary broad coverage. Each one of the chapters provides an overview of historical developments, state-of-the-art, and future perspectives in different areas of interest related to flavins.

The first part of this book is devoted to the properties and applications of flavins in solution, with chapters dealing with the general properties of flavins, their photochemistry in aqueous and organic solvents, the interaction of the excited states of flavins with amines and their application to the initiation of vinyl polymerization. The following chapters address topics which underline the important role performed by flavin-promoted photoreactions in biological systems, such as riboflavin as a visible light sensitizer in the aerobic photodegradation of ophthalmic and sympathomimetic drugs, the antiviral and antibacterial effects observed in solutions exposed to light in the presence of riboflavin and their applications to blood safety and transfusion medicine. The possible role of flavins in light-induced toxicity with special focus on the eye lens is also discussed in depth.

The final part of the book deals with the special class of flavoproteins, for which the properties of the photoexcited states of the different redox states of their flavin cofactor are essential for their biological activities. There is one chapter dealing with the blue-light initiated DNA repair by photolyase, and three chapters devoted to the flavin-based photoreceptors in plants, bacteria and eukaryotic photosynthetic flagellates, respectively. The mechanisms of light activation in flavin-binding photoreceptors are analysed in the last chapter.

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