

# Photosynthesis

A New Approach to the Molecular,  
Cellular, and Organismal Levels

Edited by

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## Abstract

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This book is written by Russian and international authors in the field of photosynthesis research. It is dedicated to investigations of the problems of photosynthesis at different levels of organization: molecular, cellular and organismal. The book describes the multiple roles of various reactive oxygen species in photosynthetic organisms. Further, we have presented here a discussion of the structure and function of water oxidation complex (WOC) of PS II, and a possible role of Mn-bicarbonate complex in WOC. Other important topics in this book are: the structural and functional organization of the pigment-protein complexes, the structure and regulation of chloroplast ATP-synthase, the participation of molecular hydrogen in microalgae metabolism, the current concepts on the evolution and the development of photosynthetic carbon metabolism, and the adaptive changes of photosynthesis at increased CO<sub>2</sub> concentrations, as well as the photosynthetic machinery response to low temperature stress. The material available in this book is a unique report on the state of this trend in modern science. This book will be helpful not only for biophysicists, biochemists and experts in plant physiology, but also for a wider group of biologists; in addition, it is expected to be used in ongoing and future research work in the field. Lastly, and most importantly, it will serve to educate undergraduate, graduate and post-graduate students around the world.