Preface

The present textbook is written for students and is the product of more than three decades of teaching experience. It intends to give a broad but concise overview of the various aspects of plant biochemistry including molecular biology. We attached importance to an easily understood description of the principles of metabolism but also restricted the content in such a way that a student is not distracted by unnecessary details. In view of the importance of plant biotechnology, industrial applications of plant biochemistry have been pointed out, wherever it was appropriate. Thus special attention was given to the generation and utilization of transgenic plants.

Since there are many excellent textbooks on general biochemistry, we have deliberately omitted dealing with elements such as the structure and function of amino acids, carbohydrates and nucleotides, the function of nucleic acids as carriers of genetic information and the structure and function of proteins and the basis of enzyme catalysis. We have dealt with topics of general biochemistry only when it seemed necessary for enhancing understanding of the problem in hand. Thus, this book is in the end a compromise between a general and a specialized textbook.

To ensure the continuity of the textbook in the future, Birgit Piechulla is the second author of this edition. We have both gone over all the chapters in the fourth edition, HWH concentrating especially on Chapters 1–15 and BP on the Chapters 16–22. All the chapters of the book have been thoroughly revised and incorporate the latest scientific knowledge. Here are just a few examples: the descriptions of the metabolite transport and the ATP synthase were revised and starch metabolism and glycolysis were dealt with intensively. The descriptions of the sulfate assimilation and various aspects of secondary assimilation, especially the isoprenoid synthesis, have been expanded. Because of the rapid advance in the field of phytohormones and light sensors it was necessary to expand and bring this chapter up to date. The chapter on gene technology takes into account the great advance in this field. The literature references for the various chapters have been brought up to date. They relate mostly to reviews accessible via data banks, for example PubMed, and should enable the reader to attain more detailed information about the often rather compact explanations in the

textbook. In future years these references should facilitate opening links to the latest literature in data banks.

I (HWH) would like to express my thanks to Prof. Ivo Feussner, director of the biochemistry division – as emeritus, I had the infrastructure of the division at my disposal, an important precondition for producing this edition.

Our special thanks go to the Spektrum team, particularly to Mrs. Merlet Behncke-Braunbeck who encouraged us to work on this new edition and gave us many valuable suggestions. We also thank Fiona Heldt for her assistance.

We are very grateful to the Elsevier team for their friendly and very fruitful cooperation. Our thanks go in particular to Kristi Gomez for the vast effort she invested in advancing the publication of our translation. We also thank Pat Gonzalez and Caroline Johnson for their thoughtful support for our ideas about the layout of this book and their excellent work on its production.

Once again many colleagues have given us valuable suggestions for the latest edition. Our special thanks go to the colleagues listed below for critical reading of parts of the text and for information, material and figures.

Prof. Erwin Grill, Weihenstephan-München
Prof. Bernhard Grimm, Berlin
Steven Huber, Illinois, USA
Wolfgang Junge, Osnabrück
Prof. Klaus Lendzian, Weihenstephan-München
Prof. Gertrud Lohaus, Wuppertal
Prof. Katharina Pawlowski, Stockholm
Prof. Sigrun Reumann, Stavanger
Prof. David. G. Robinson, Heidelberg
Prof. Matthias Rögner, Bochum
Prof. Norbert Sauer, Erlangen
Prof. Renate Scheibe, Osnabrück
Prof. Martin Steup, Potsdam
Dr. Olga Voitsekhovskaja, St. Petersburg

We have tried to eradicate as many mistakes as possible but probably not with complete success. We are therefore grateful for any suggestions and comments.

Hans-Walter Heldt
Birgit Piechulla
Göttingen and Rostock, May 2008 (German edition)
July 2010 (Translation)