

Preface to the Second Edition

Since the publication of the first edition of 'Biochemical Pathways' in 1999 the molecular life sciences (encompassing biology, biochemistry, pharmacy and medicine) have undergone dramatic changes. With the extremely rapid development in the 'OMICS' analytical techniques (Genomics, transcriptomics, proteomics, metabolomics) we are in principle able to determine the genome of a microorganism in one day and a human genome for a couple of thousand dollars. We have also seen the advent of 'systems biology', which, based on the measured OMICS-data, aims at analysis and even prediction of biological functions by the construction of computer models. These models simulate the reaction of biological systems, including whole cells, to changes in the environment, genetic disorders or mutations.

Based on the annotation of the genome and experimental data, metabolic, regulatory and signal transduction pathways and networks are constructed and mathematically formulated. They depend entirely on our knowledge of biochemical pathways, as they are presented in this book.

As outlined in the preface to the first edition, one of us (GM) began early in the 1960s to combine an extract of the biochemical knowledge in a wall chart. The other of us (DS), towards the end of his student life saw the 'Biochemical Pathways' wall chart or 'Boehringer chart' in almost every lab working in the field of biochemistry or molecular biology. (At present, it is distributed as the 4th edition by Roche Diagnostics GmbH, Mannheim). He was impressed by the puzzle work biochemists had performed for almost one century. This presentation of important features of biochemistry was extended in the

first edition of the 'Biochemical Pathways' book, which has become the standard book of reference in his and many other labs since then. In its focus on pathways and networks it is unique and was published exactly at a time when pathways, networks and systems became the focus of biochemical research. These areas have become the major fields of DS's research work in the last decade.

The fields of activities on both sides encouraged us to combine our experiences in writing and publishing the second edition of this book. The task became larger than expected on the first glance. Since the publication of the first edition our knowledge has increased tremendously. The selection of the facts to be dealt with and their condensation into a short, but legible form was no easy task. We could persuade expert authors to help us with the book. We both had a highly enjoyable cooperation and could now finally finish this work. We want to thank all authors for their contributions. In addition, Robbe Wünschiers likes to express his gratitude to Dr. Rainer Lemke for supporting the revision of the chapters.

The book not only gained one half in volume, but every sentence and every figure had to be checked and often modified. More than half of the many hundreds of figures in the book had to be replaced, modified or added in this second edition.

We hope that it will help students and researchers to obtain a deeper understanding of the pathways and networks that determine biological functions.

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