

Preface to the second edition

Just as the first edition, the new version of this book is also intended for beginners in protein evolution, genome evolution and molecular bioinformatics to provide a concise summary of the principles of the evolution of protein structure and function. I tried to write the book in a readable form at a level accessible to undergraduates and graduate students as well as to newcomers to the field.

The manuscript of the first edition of this book was completed in 1998, at a time when the genomics revolution (and the associated revolution in bioinformatics) was just starting to unfold. As a result of the rapid increase in the number of completely sequenced genomes and the development of novel tools of bioinformatics some of the chapters of the first edition aged very rapidly. This is especially true for Chapter 8 (Protein Evolution by Assembly from Modules) and Chapter 9 (Genome Evolution and Protein Evolution), therefore in the second edition these chapters had to be modified and expanded significantly. The updated Chapter 9 now covers the genomes of key model organisms sequenced since the completion of the first edition and also discusses important novel issues of the evolution of the genomes of organelles and viruses. The chapters also dedicate more space to the issue of lateral gene transfer and alternative splicing.

The other chapters of the book, summarizing well-established aspects of proteins, protein-coding genes and general principles of protein evolution were updated to focus on new developments in these areas, giving key references that may guide readers in the most recent primary literature.

Unlike the first version of this book, the second edition includes references to the most widely used databases and bioinformatic tools that are currently available for the analysis of the evolutionary history of proteins, as well as for the prediction of the structure, function and structure–function aspects of proteins and protein-coding genes. (The web sites were selected based on their current popularity, which seems to guarantee that they would survive during the lifetime of the second edition.)

Many colleagues helped in finding errors in the first edition and gave valuable suggestions for improvement. I wish to thank László Bányai and Mária Trexler for carefully reviewing the entire manuscript and for their help in the preparation of the figures.

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