

# Protein Evolution

## Second Edition

The flood of information on gene and protein sequences from the genome projects has revolutionized molecular and evolutionary biology and led to the rapid development of the science called genomics. Reliable prediction of the function of a novel gene/protein requires complex computational analysis of genomic and protein sequence information which exploit the principles governing the evolution of protein structure and function.

This book provides an up-to-date summary of the principles of protein evolution and discusses both the methods available to analyze the evolutionary history of proteins as well as those for predicting their structure-function relationships. This second edition, while retaining its accessible style and reader-friendly organization, is completely updated and boasts a new glossary and updated references. The chapter on genome evolution has been significantly expanded in order to cover genomes of model organisms sequenced since the completion of the first edition. *Protein Evolution* is ideal for senior undergraduates and graduate students taking courses in protein structure and evolution, as well as bioinformatics. It will also be a useful supplement for students taking wider courses in molecular evolution, as well as a valuable resource for professionals in the area of functional genomics.

**László Patthy** is the head of the Extracellular Proteolysis Group of the Institute of Enzymology, Budapest. In the last 25 years the main area of his experimental research has been the molecular biology, structure, function and evolution of multidomain protein components of extracellular proteolytic systems of vertebrates. He is the author of *Protein Evolution by Exon-Shuffling* (1995) and *Protein Evolution* (Blackwell, 1999).

Cover image: The common structural domains of five modular proteinases (from top to bottom): plasminogen; urokinase; tissue plasminogen activator; prothrombin; and blood clotting factors VII, IX, and X. Kring domains are shown in red, growth factor modules in yellow, calcium-binding modules in blue, and finger domains in green. The proteinase domains are shown in white.

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