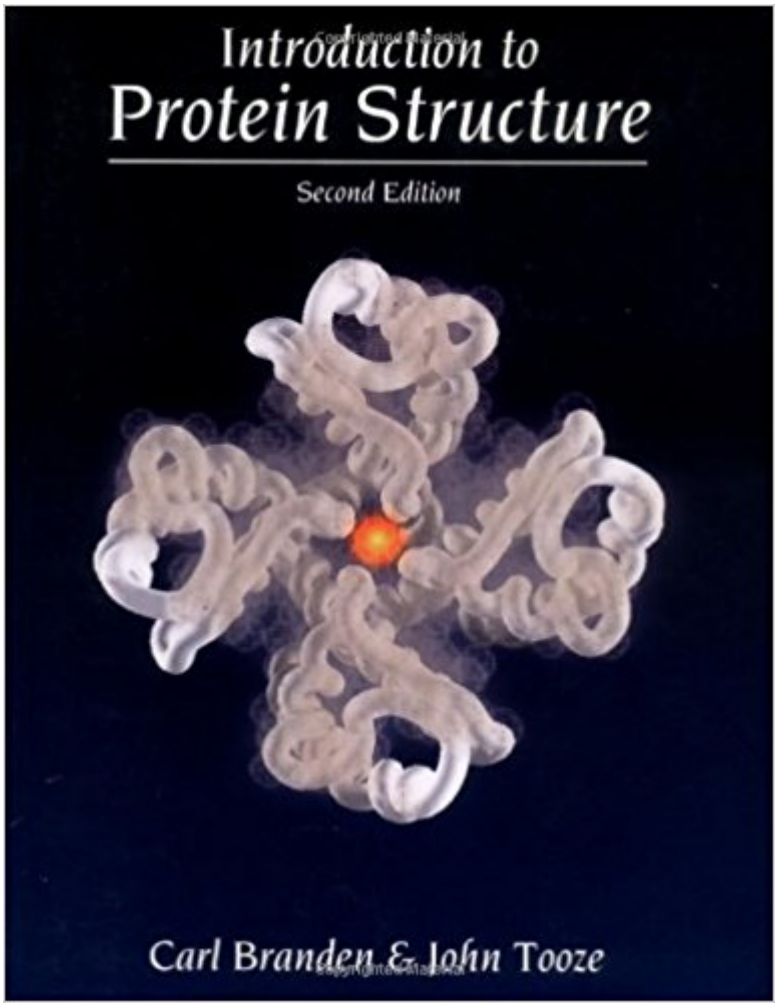
Introduction To Protein Structure



Synopsis

Introduction to Protein Structure provides an account of the principles of protein structure, with examples of key proteins in their biological context generously illustrated in full-color to illuminate the structural principles described in the text. The first few chapters introduce the general principles of protein structure both for novices and for non-specialists needing a primer. Subsequent chapters use specific examples of proteins to show how they fulfill a wide variety of biological functions. The book ends with chapters on the experimental approach to determining and predicting protein structure, as well as engineering new proteins to modify their functions.

Book Information

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Customer Reviews

This book was a pleasant surprise in almost every respect. I found it a gentle, clear exposition of material that can be hugely complicated. The text works upwards from amino acids, the building blocks, through the interactions of shape and chemical affinity, to views of proteins in action. By the time they appear, muscle fibers and virus capsules follow naturally from the discussion. This gives simple, concise descriptions of how proteins' shape emerge from its sequence. It goes on to describe protein control of DNA, to explain virus and muscle structure, and to hint at modern drug design.'Protein Structure' requires some background in organic chemistry and in the ideas of molecular genetics. For example, you should already be familiar with steric hindrance and with the idea of regulatory regions in DNA. Branden and Tooze reward the prepared reader with a well-considered series of discussions. These include enzyme action, photosynthesis, virus

self-assembly, muscle fibers, DNA binding, and more. I had never seen an actual chain of chemical events that turn light into usable chemical energy. This book stepped through it (for a bacterium, at least) in just few paragraphs and drawings. But the whole book is like that - it sustains a remarkable density of information, always in a very readable style.The text is laid out in a simple and appealing way, and is profusely illustrated. The illustration is one of this book's wonderful strengths. Almost all of the discussion is carried in diagrams as well as in words, and the authors freely use as many different diagrams as needed to make each idea understandable. The illustration style is simple and consistent; most drawings use one of three or four conventions for describing proteins.

This review refers to the second edition of this book, issued in 1999. The book, written by a noted crystallographer (Branden) and a molecular biologist (Tooze) noted for science education. Following up on an earlier edition, the present volume takes advantage of the enormous increase in solved protein structures that has occurred in the intervening years. The book is well written, clear, and makes excellent use of contrasting pastel colors to represent three-dimensional objects (proteins) on a two-dimensional page. One rather surprising omission is the lack of stereo views of proteins in a book about structure. These have become quite common in the structural biology literature, and I feel the book would have been strengthened by judicious inclusion of some examples.The book, which would be suitable for an advanced undergraduate, graduate course or for biologist wishing to delve more into structure, begins with basic amino acid properties. The secondary structure elements of alpha helix and beta sheet are next introduced, along with some of the conventions used to illustrate structure in publications. How these structural elements are formed to build motifs, and motifs in turn are built into complex structures is discussed. Protein folding and flexibility are discussed, and proteins that assist in the process (e.g., chaperones, GroEL-GroES, disulfide isomerases) are highlighted.The next several chapters deal with DNA structure, DNA recognition by helix-turn-helix motifs, and eukaryotic transcription factors. The various transcription factor families are outlined, with emphasis on their interactions with DNA. Next, the subject of enzyme catalysis is covered, using serine proteases as exemplars.

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