ular mechanisms for the high selectivity of these peptides for the μ- and δ-opioid receptors in light of NMR conformational analysis. The extensive similarities between prepro regions of precursors encoding these peptides, dermaseptins and other peptides with different structure and biological activity from various amphibian species are also discussed. The authors suggest that the genes encoding these peptides are all members of the same family. The last chapter of this section by Haberman and Aguilar deals with crustacean hyperglycemic hormones. In the third section and based on their own work, Volkmann and Heck propose an attractive mechanism of action for Agelopus aperta isomerase, a novel cofactor-independent serine isomerase. Although this protein, which shares high homology with known serine proteinases, is the only isomerase discovered so far, it is likely to provide important clues to explain the incorporation of single α-amino acid residues within a peptide chain. The introduction of this chapter overlaps somewhat with the previous section. Nevertheless, these two sections represent a good overview of α-amino acid-containing peptides found in a variety of animal species. As suggested by Amiche et al., the obvious question whether such peptides might exist in mammals is still left unresolved.

The following section deals with the appearance of α-amino acids during aging. Since the original hypothesis of Kägi and Ersliev in 1940, the question of the presence of α-amino acids in tumors has remained controversial. In his chapter, G.H. Fisher relates the story of this controversy and summarizes recent data that suggest that α-amino acids are absent in tumors. In the second chapter of this section, Ingrosso and Petrea review the phenomenon of spontaneous postbiological modifications in ageing erythrocytes, also termed 'protein fatigue', which includes the formation of isomerized and racemized aspartyl residues. They discuss in detail the role of protein α-isospartyl (α-aspartyl) O-methyltransferase in the repair of ageing protein. The next brief chapter by Yamada and Kera is devoted to the proteolytic susceptibility of α-amino acid-containing peptides and α-amino acid-hydrolizing enzymes.

The final section by Bonner comes back to homochirality and life. Why are α-amino acids present in proteins and α-sugars in nucleic acids? The author reviews in detail the various hypotheses compatible with a realistic prebiotic environment that have been proposed to account for the origin of homochirality on earth. Although the search for novel α-amino acid-containing peptides in higher organisms and the understanding of their biosynthesis is an extremely exciting and rapidly expanding field, the literature reviewed in several chapters of this book, unfortunately, covers very few publications after 1996. Nevertheless, this book provides the reader with a large and comprehensive overview of the knowledge gained in the field of α-amino acids and α-amino acid-containing peptide in multicellular organisms.

G. Guichard


Reading this book, we again recognize how the technologies of protein science continue to develop through research of lysozyme as a model protein. Is there any other protein that has been investigated as extensively over as wide a range of research fields? The fields that use lysozyme are quite diverse, including evolution, chemistry, biology, biophysics, pharmacology, which are covered in 22 chapters contributed by 25 authors. Although there are several books describing a particular protein, Lysozymes: Model Enzymes in Biochemistry and Biology is one of the best documented books ever written by top senior researchers in the respective fields.

There are several aspects to describe lysozyme as a model protein. Topics are carefully chosen according to the key words 'Biochemistry and Biology'. One of the unique points of lysozyme is the existence of this enzyme in several species ranging from phage to mammal. The book starts by reviewing vertebrate lysozymes and then expands to the phage, bacterioid, plant and insect lysozymes sufficiently to make researcher acquire an overall knowledge of these lysozymes. There are also two reviews of evolution of e-type lysozyme, enabling us to see the function of this enzyme diverged to adapt to the surroundings from an evolutionary point of view.

This book also reminds us how X-ray crystallography has contributed to the development of the protein science field. In fact, lysozyme is one of the earliest enzymes in which the tertiary structure was determined by X-ray crystallography. The availability of the tertiary structure information was the most important factor in the study of lysozyme enzymology, protein folding, and thermal stability. In fact, many important investigations on the catalytic mechanism have been done based on this structural information. The book summarizes how chemical modification and genetic engineering were employed to identify the role of catalytic site residues, which were interpreted by tertiary structural information using X-ray crystallography. The book also reviews how theoretical calculation using molecular dynamics simulation was first applied to understand the catalytic mechanism of an enzyme, which is one of the unique applications of the structural information of lysozyme.

From the point of view of molecular recognition, the application of X-ray crystallography to investigate the binding of lysozyme with antigen binding fragment is quite noteworthy. Two reviews cover the kinetic and thermodynamic characterization of the binding of lysozyme and antigen binding fragment and the determination of the epitope of lysozyme by X-ray crystallography. I believe the structural determination and thermal stability of lysozyme should have been covered in greater detail.

Very recently, lysozymes were found to possess antiviral activity against HIV, reminding us of the importance of the constant study of a protein. Conversion of the catalytic mechanism has been successful in lysozymes. Although these topics should be added in the near future, these important findings also show that research on lysozymes is still very active. Using lysozyme as a model protein, this book is a valuable tool in providing an overall understanding of the key techniques of protein research.

Ryota Kuroki

Biocolorimetry: Applications of Calorimetry in the Biological Sciences; Edited by John E. Ladbury and Babur Z. Chowdhry, Wiley; Chichester, 1998. xiii + 345 pp. £ 70.00 (hb). ISBN 0-471-97781-0

Biocolorimetry: Applications of Calorimetry in the Biological Sciences is intended to fill a void in biochemical/biological publishing. Although texts about calorimetry are common, books devoted to biological applications of calorimetry are almost non-existent. The most recent text, A.E. Beezer's Biological Microcalorimetry (Academic Press, London, 1980), is out of print and may be difficult to locate even in a university library. Some general biochemistry-oriented texts may include brief sections about calorimetry, but in general, anyone wanting information about the subject has to rely on papers and reviews. This reviewer was thus excited to find theory and practice for differential scanning calorimetry (DSC), isothermal titration calorimetry (ITC), and microcalorimetry united in one volume. While serviceable, the reality did not quite measure up to expectations. This new text is too detailed for a bio calorimetry novice but the short experts. This book, at St. Anne's Press, London, is out of print and may he difficult to locate. The organization may be difficult to navigate for the non-expert, but the general biochemistry-oriented texts may include brief sections about calorimetry, but in general, anyone wanting information about the subject has to rely on papers and reviews. The reviewer was thus excited to find theory and practice for differential scanning calorimetry (DSC), isothermal titration calorimetry (ITC), and microcalorimetry united in one volume. While serviceable, the reality did not quite measure up to expectations. This new text is too detailed for a bio calorimetry novice but the short experts.
Trinucleotide Diseases and Instability; Edited by B.A. Oostra, Springer; Berlin, 1998. ix+169 pp. DM 168.00 (hb).
ISBN 3-540-63993-4

Interest in the field of trinucleotide diseases has rapidly increased. Since 1991, more than a dozen human genetic diseases have been demonstrated to be caused by unstable expansion of trinucleotide repeats.

The editorial introduction to this book promises to present highlights both of the mechanisms of repeat instability in these diseases and of the functions of normal and mutated genes involved.

The book contains 24 chapters by nine authors, covering four main topics. Under the first one (six chapters, 46 pages) the fragile X syndrome and other fragile site disorders are discussed. The second part (eight chapters, 19 pages) is dedicated to Huntington's disease. The other CAG repeat diseases are confined to one chapter of this part. Myotonic dystrophy is the content of the third one (six chapters, 56 pages). The last topic (four chapters, 33 pages) concerns a general overview of factors and mechanisms involved in the instabilities of triplet repeats. For each disease, clinical features, genetics and transmission, gene structure and expression, and mechanism of pathogenesis are presented. There are 692 references up to 1997. Each chapter is illustrated with diagrams, graphs, tables and photographs.

Unfortunately, the rapid growth of the knowledge in this field renders it very difficult to give up-to-date information without the risk of missing important topics. This is the case with the pathogenesis of the CAG repeat diseases. Intraneuronal inclusions are now clearly observed in almost all polyglutamine disorders. Even though it remains uncertain whether these aggregates are a cause or a consequence of pathogenesis, they are considered hallmarks in these processes. No mention of aggregates in these diseases is present in the book, perhaps because they were first described in 1997.

Another weakness is the lack of a specific presentation for Friedreich's ataxia. This trinucleotide disease is cited several times, but never described in detail. Since the molecular basis of the disorder has been described in 1996, the omission of this topic is surprising.

In summary, the book could be helpful as an introduction but other sources are needed for more extensive treatment and updated references.

Sergio Cocozza

Kimberly M. Taylor and Ronald T. Raines