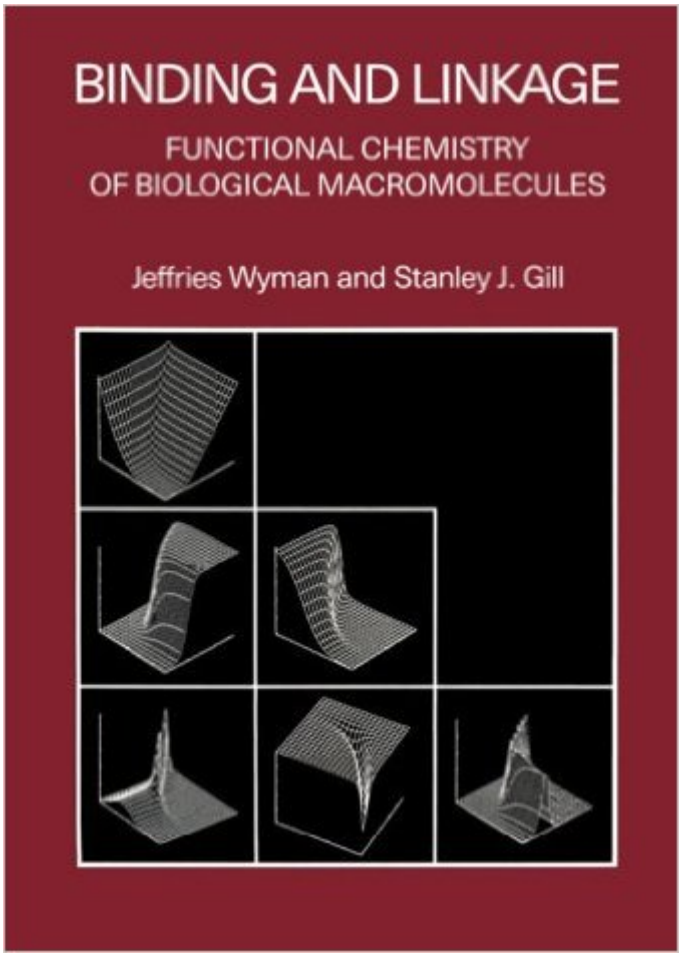
Binding And Linkage: Functional Chemistry Of Biological Macromolecules



Synopsis

Ligand-macromolecule interactions are of fundamental importance in the control of biological processes. This book applies the principles of linkage thermodynamics to polyfunctional macromolecular systems under equilibrium conditions, and describes the binding, linkage, and feedback phenomena that lead to control of complex metabolic processes. The first chapter sets out the different processes (conformational changes, changes in state of aggregation, phase changes) involving biological macromolecules which are affected by chemical variables (such as ligands) or physical variables (such as temperature and pressure). The general effects of ligands on micromolecular conformations and interactions are illustrated with specific examples from the respiratory proteins, electron-transport proteins, and nucleic acid binding proteins. Subsequent chapters develop these themes, and describe in detail how the mathematics of regulation and control can be applied to macromolecules in biological system. This book should be of interest to all those using thermodynamics to understand the physical chemical basis of control of life processes. It is designed for graduate students and researchers in biophysical chemistry.

Book Information

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Customer Reviews

Wyman and Gill’s treatment of thermodynamic linkage (with respect to biological macromolecules) is probably THE reference material in the field. It should be, seeing as the seminal works on thermodynamic linkage and mathematical treatment of these phenomena were elucidated by Wyman, Gill and co-workers.However, as a learning tool, I found this book pretty worthless, and this

is after having already had 3 (different) thermodynamics courses prior to my exposure to this book. Clearly, Wyman and Gill are research scientists, not scientist-educators.As a reference work, the book is reasonably good...so I can understand why experienced thermodynamics teachers and professors might gravitate towards it. However, if you are at the point of needing such a specialized thermodynamics book as a reference, you are clearly already comfortable with the material, and there is no need for this book. The alternative is simple--save yourself the cost and frustration of obtaining this book, and simply refer to the original scholarly articles, which are now easily obtained online. They are more complete, with more useful background and introductory material, and a more lucid mathematical treatment than is afforded in this book.

I am a biophysicist and used this book to derive binding curves as part of my PhD thesis research. Wyman and Gill present their work in a understandable and clear fashion. The book is largely based off of the papers published by Gill and De Cera over a ten year period, but it shows their work in a general and flowing manner-which you would not get if you just read all the papers seperately. Each section references all the corresponding papers, so you can get more detail on any given topic. While combing through the book, I noticed some very small errors with some equations (typo -wrong symbol) or with some references (wrong paper citated, not applicable). But generally if you follow along the derivation of any binding polynomials he presents, you can catch the little errors.Altogether a wonderful resource that educates you in how to derive a binding curve for hemoglobin and other macro molecules, given certain conditions and restraints.

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