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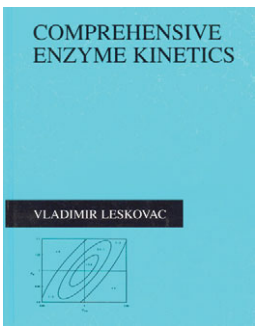

Comprehensive Enzyme Kinetics

by Vladimir Leskovac
Kluwer Academic/
Plenum Publishers,
Dordrecht. 2003, 442 pp.
ISBN 0-306-46712-7,
Hardcover, €118.00

Like most books on enzyme kinetics, Leskovac's treatise starts with an introduction to protein structure and basic chemical kinetics and catalysis, which leads into the derivation of the Michaelis–Menten equation. You could say it follows the same old formula! But where *Comprehensive Enzyme Kinetics* excels over similar publications is in its outstanding depth of treatment of the subject, while retaining a simplicity of argument that novices to the world of enzyme kinetics can follow. That's not to say it's not heavy-going at times—vast equations containing dozens of numerator and denominator terms (that make the reader wish they'd paid more attention in high school algebra and calculus class) are regularly derived. But such complex kinetic analysis is regularly accompanied by simple diagrams and graphical treatment, outlining the important slope and intercept values than can be determined and how these relate to the mechanism of an enzymatic reaction.

Following Michaelian treatment of monosubstrate reactions, the King–Altman method of deriving rate equations is explained from first principles, something many other monographs take for granted. Chapter 5 then describes the common types of enzyme inhibition, before more complex nonlinear examples are outlined in Chapter 6. The use of Cleland's rules, terminology, and shorthand notation is emphasized throughout the book, though less-commonly used alternatives are mentioned briefly.

In Chapters 8 through 12 the kinetics of bisubstrate and trisubstrate reactions are discussed in detail. Throughout the book the author tries to describe all possible variations of enzyme mechanisms and inhibition types, providing fully-derived rate equations and graphical analysis. Ordered or random; UniBi or BiBi; Theorell–Chance or ping-pong; even the 'partial rapid equilibrium ping pong bi bi' mechanism—they are all there. In these chapters the treatment gets detailed and the algebra-phobic may baulk, but perusal of the pages for summary graphs, tables, and diagrams will yield the required information for those who just want the answers without deriving them in full. The complex analysis, while perhaps requiring several passes by non-specialists, is such that experienced enzymologists searching for rigorous treatment of a specific mechanism will be pleased to find all the information they require, and more.

Allosteric and cooperative effects and the effects of temperature and pH on enzyme catalysis are discussed in Chapters 13–15, followed by chapters on isotope exchange and kinetic isotope effects. The book concludes with a section on the all-too-often neglected statistical analysis of data, outlining deficiencies with the various graphical representations of rate data, and describing methods that allow for model discrimination, including numerous programs for computer analysis of data.

Comprehensive Enzyme Kinetics certainly provides a comprehensive discussion of the kinetics of reversible enzyme mechanisms and inhibition. One omission from a truly complete treatment of the field, though, is that of irreversible inhibition, which is not mentioned at all. Hard-core enzyme kineticists with a penchant for rigorous mathematical interpretation of enzymatic reactions will find this book very much to their liking. The part-time enzymologist just looking to determine a few K_M and K_i values will also find—after sifting through various detailed explanations—exactly what they need, and while doing so may just procure a greater understanding of the processes they are investigating. In summary, I would recommend it to experts and novices alike.

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