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Book reviews

An Introduction to Medicinal Chemistry, third ed., G.L. Patrick. Oxford University Press, Great Clarendon Street, Oxford (2006). xxvii + 741 pp., £28.99, ISBN: 0-19-927500-9

Have you ever wondered how, and why, medication works; the reason it may possibly be addictive, or, out of curiosity, the origins of some of the drugs we use today? Well, the answers lie in chemistry – it's one of the main reasons why we are alive today. *An Introduction to Medicinal Chemistry* gives us a very detailed look at the world of medicine. It has been devised to teach students the more familiar aspects of chemistry associated with medicine. Split into 4 sections, it covers everything from DNA cloning to drug administration, receptors and neurotransmitters to enzyme catalysis, and cell structure to equations. The first section (A), titled '*Pharmacodynamics and pharmacokinetics*', is made up of eight chapters. Subjects covered include drugs and the medicinal chemist – why and where they work, proteins as drug targets and enzymes, receptors and their structure, signal transduction, nucleic acids as drug targets, and pharmacokinetics and related topics.

Section B, consisting of four chapters, focuses on the origins and development of drugs – drug discovery: finding a lead, drug design: optimising target interactions and optimising access to the target, and drug development. The next three chapters form '*Tools of the trade*'. Quantitative Structure–Activity Relationships (QSAR), combinational synthesis, and computers in medicinal chemistry are among the aspects covered in Section C. The final section, '*Selected topics in medicinal history*', comprises of seven chapters – antibacterial agents, antiviral agents, anticancer agents, cholinergics, anticholinergics, and anticholinesterases, the adrenergic nervous system, the opium analgesics, and antiulcer agents.

Under each chapter comes several subheadings, along with very detailed, but understandable, explanations, diagrams to help support these explanations, and, in some subheadings further categories are placed. Key points are located in every chapter, highlighting the more important facts of the previous article. Questions are placed at the end of each chapter to help encourage the student to learn, along with a '*Further Reading*' category which refers to different books, in case more understanding is needed.

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Biophysical and Structural Aspects of Bioenergetics, M. Wikström (Ed.). Royal Society of Chemistry, Cambridge (2005). xvii + 396, pp., £75–95, ISBN: 0-85404-346-2

'*Bioenergetics*' is a term used to describe the events of primary energy transduction in biology. This volume consists of 16 chapters, which cover a whole range of different usages for bioenergetics. Chapter 1 covers molecular bioenergetics and the proton pump of cytochrome oxidase. Proton entry, exit and pathways in cytochrome oxidase are covered in the second chapter, which leads on to structural chemical studies on the reaction mechanism of cytochrome oxidase in the next chapter. The fourth chapter goes on to discuss mechanisms of redox-coupled proton pumping by respiratory oxidases. Some of the subjects covered by this chapter include structure, pathways and molecular mechanisms for proton pumping.

Chapters 5 and 6 are focused on quantum chemical models of O_2 bond cleaving, proton pumping in cytochrome oxidase and the bc_1 complex – methods and models, proton gating/guiding, the ES complex, problematic shortcuts and kinetic estimation of SQ occupancy. The next chapter studies insights into the mechanism of mitochondrial complex I from its distant relatives, the [NiFe] hydrogenases. Complex I in energy transduction, the redox reaction, location of cofactors and substrate binding sites, mechanisms of proton pumping and the Q-cycle mechanism are among the topics discussed in chapter 8. Chapters 9 and 10 are based on structure – photosystem II from *Thermosynechococcus elongatus* and view of proton transport by bacteriorhodopsin. Specific subjects covered in

these chapters include cell culture, purification, crystallisation, retinal motions and pump energetics.

Proton Transfer is the basis of chapters 11 and 12, with FT-IR spectroscopy, bacteriorhodopsin, proton transfer vs. electron transfer, and 'normal' acids and bases among the topics covered. '*Infrared Protein Spectroscopy as a Tool to Study Protonation Reactions Within Proteins*', chapter 13, is devised using strategies to assign IR bands, properties of amino acids and protein infrared spectroscopy as its main subjects. The 14th and 15th chapters are focused on mitochondrial F_1-ATPase and permease, with hybride transfer and proton translocation making up the last chapter.

The book uses tables and diagrams to help convey and aid understanding of the subjects titled. The information is conveyed clearly with diagrams, graphs and tables labelled to help reference. Located at the end of each chapter is a reference to the books used to help develop each chapter.

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