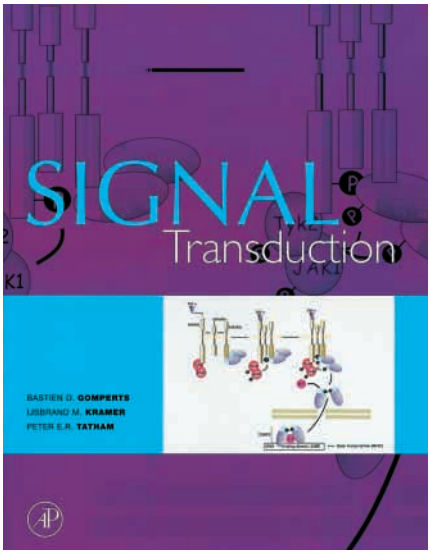
Lines of communication



Signal Transduction

by Bastien D. Gomperts, Ijsbrand M. Kramer and Peter E. R. Tatham

Academic Press (2002) 424 pages. ISBN 0-12-289631-9
$79.95

The field of signal transduction is moving at such a rapid pace that it has become customary for journal reviews to contain updates added in proof. This, coupled with the large number of pathways involved and their apparent complexity, has ensured that this textbook does not enter a crowded marketplace. To date we have *The Biochemistry of Cell Signalling* by Ernst J. M. Helmreich (recently reviewed in *J. Cell Sci.*; Helmreich, 2001), which covers similar ground, while multi-authored review compendiums constitute the bulk of the available reference material in this research area. The challenge then is to provide a textbook that is up to date, clearly written, well illustrated and strikes an authoritative balance between the presentation of facts and an overview of fundamental concepts and principles. *Signal Transduction* contains 18 chapters in total, and the authors state that the book divides conveniently into two parts. The first is dedicated to fundamental mechanisms, concentrating on hormones, their receptors and the generation and function of second messengers. This includes chapters covering GTP-binding proteins, effector enzymes, calcium and signal transduction and protein kinases A and C. A chapter on the regulation of visual transduction also falls within this section. The second half of the book is dedicated to signalling processes initiated by growth factors and adhesion molecules, and includes chapters on growth factors, receptor and non-receptor protein tyrosine kinases, PI 3-kinases, signalling from adhesion molecules, receptor-bound protein serine/threonine kinases, protein dephosphorylation and protein domains involved in signalling.

First impressions of this book are overwhelmingly positive and this is largely due to the uniformly high quality of the illustrations. These really are superb and are firmly grounded in the revolution that PowerPoint has brought to scientific presentation in general. The diagrams are particularly useful where complex pathways and interactions need to be illustrated, and the authors have broken many such pathways down into digestible (and logical) portions, which are well described by the accompanying text. The subject matter covered here is wide ranging and by necessity this book packs in a huge number of facts. In some instances this onslaught is tempered by the inclusion of historical or experimental detail, but at times the sheer rate at which new players are introduced (or revisited) can be wearing. As for being up to date, the bibliographies at the end of each chapter contain references to work published as recently as 2000 and this is a considerable achievement given the time it must have taken to produce a book of this scope. Another positive feature is the high quality of the marginal notes. I noticed that where there were occasional weaknesses in the main text these notes became more frequent, almost as if they were added retrospectively to tidy things up a little.

This book is not without its share of mistakes and omissions. There are a number of elementary errors, such as referring to budding yeast as *Saccharomyces pombe* (p. 189) or the description of transferrin as a growth factor (p. 22). More seriously, on p. 241 it is stated that "p21CIP1/WAF1 also interacts with the transcriptional machinery through binding to proliferating cell nuclear antigen (PCNA), a DNA polymerase". This should be 'replication' machinery and PCNA is not a DNA polymerase (PCNA is an auxiliary protein for DNA polymerase-δ). I was also struck by an unfortunate bias in certain passages. For instance, the idea that p53 is an exonuclease that participates directly in the repair of damaged DNA (p. 242) is controversial to say the least, as is the assertion (p. 338) that Bcl2 interacts directly with Apaf (this should be Apaf-1). With respect to the latter, it would be helpful to see important statements such as this backed up with a primary literature reference. As for omissions, I was surprised to see no direct reference to the emerging role of scaffold and anchoring proteins in organising and regulating signalling through the MAP kinase and PKA pathways, respectively. No mention is made of the impact that specific MAP kinase inhibitors have made in defining physiological functions for the ERK and p38 pathways. Finally, coverage of the protein tyrosine phosphatase superfamily in Chapter 17 omits any reference to the elegant structural studies of these proteins and the dissection of their common catalytic mechanism. This work has in fact made a major contribution to solving the difficult problem of identifying physiological substrates for these enzymes by using 'substrate-trapping' mutants.

Despite these minor reservations this book represents a considerable achievement. Most importantly it conveys most of the key information and concepts and it does so in a stylish and well-presented volume. This book will take its place amongst the core reading and lecture materials for a number of undergraduate courses and will also find a place on the shelves of many laboratories, where it will be a valuable resource as an introductory text for PhD students or postdoctoral workers entering the field.

Reference

Helmreich, E. J. M. (2001). *The Biochemistry of Cell Signalling*. Oxford: Oxford University Press.

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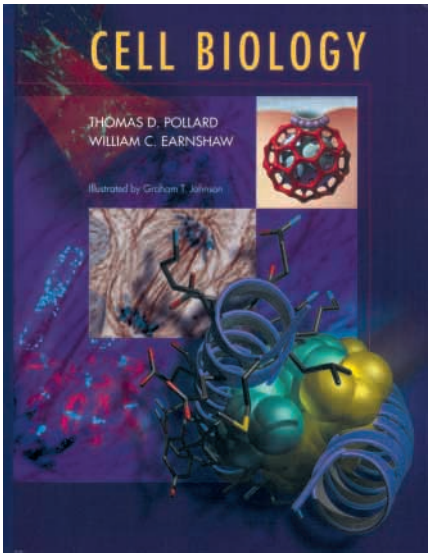
The story so far



Cell Biology

by Thomas D. Pollard and William C. Earnshaw

Saunders (2002) 805 pages. ISBN 0-7216-3997-6
£34.99

Catching sight of a copy of *Cell Biology* on my desk, a colleague waved his hand at a shelf full of similar titles and rather plaintively enquired, "Do we need another one of these?" The distinguished authors might have responded to such a question with Blake's line, "The road of excess leads to the palace of wisdom." However, well aware of the risk of simply adding to the pile, they have in fact defined their remit with care. Noting that as yet there is no blueprint that completely describes how cells work, and making it clear that *Cell Biology* is not a biochemistry, histology or developmental biology textbook, they have compiled an anthology of 49 short, highly focussed stories – a sort of 'fruitfly-on-the-wall' documentary of the lives and functions of cells. The stories fall into eight groups that are more or less as one might predict and include membranes, genomes, gene expression and nuclear organisation, signal transduction, adhesion and the extracellular matrix and the cell cycle.

The layout follows the now standard format in which short sections of text with clear headings and highlighted key words are accompanied by high quality photographs. Considerable thought has gone into the summary data contained in many tables, and the highly professional appearance is completed by copious illustrations for which Graham T. Johnson is credited on the cover. The diagrams are generally excellent, my only reservation being that some black text labels are difficult to discern against the colour of the labelled object. Many coloured molecular structures are also included, each accompanied by the Protein Data Base accession number.

A major theme of the book is to limit the amount of text and illustrate all the major points, thereby rendering the book tractable for busy students. To this end, the authors note that, although there are some 35,000 human genes, in practical terms this daunting number can be reduced to more manageable proportions by considering the detailed function of the best understood member of each protein family, thereby defining the general principles by which the whole family works. This approach works well, and succinct summaries of individual families have been formulated with care. Thus, for example, a clear and up-to-date review of protein phosphatases is provided in one table supplemented by only about two pages of text.

In *Cell Biology* the authors have made a valiant and in many ways successful effort to produce a distinctive approach to the subject. They probably would not suggest it was an essential purchase for students of biology or medicine. Nevertheless, *Cell Biology* is an informative and beautifully produced book that elucidates general themes and provides substantial detail without overwhelming the uninitiated.

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