BOOKS: VIROLOGY

The New "Great Work"

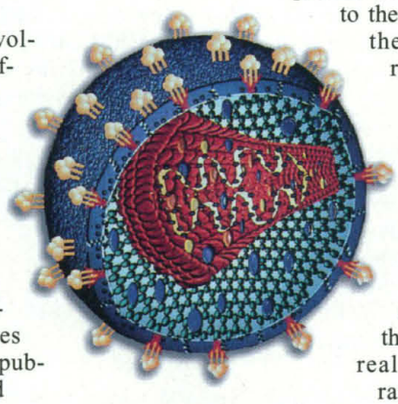
Simon Wain-Hobson

Many a scientific field has its standard reference work—a "great work" that some might go so far as to call a bible. For the study of viruses, Field's *Virology* (now in its third edition) is an obvious choice. Those whose interests are more focused on retroviruses have also had their own standard work for a number of years. Originally, it was the 1973 Cold Spring Harbor Laboratory publication *Molecular Biology of Tumor Viruses*, which spanned both RNA and DNA viruses. (For a long time the only interesting retroviruses were oncogenic. That some were pathogenic in natural outbred populations was beside the point; oncogenesis was foremost in the minds of retroviral researchers.) The "great work," encompassing all the advances resulting from cloning and sequencing, appeared in 1985 as the expanded paperback edition of *RNA Tumor Viruses*, also from Cold Spring Harbor. This text included the first cluster of sequence data from a novel retrovirus—HIV. It provided a compendium of the new discoveries that were reorienting molecular virology, and I remember taking the two volumes on holiday to Greece, thoroughly reading them from 5′ to 3′.

Retroviruses
by John M. Coffin, Stephen H. Hughes, and Harold E. Varmus, Eds.
Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1998. 859 pp. $180. ISBN 0-87969-497-1.

Since the mid-1980s, retrovirology has grown explosively, producing vast amounts of data and spawning a new generation of researchers, many of whom have concentrated their efforts on HIV (and little else). For many years, the pace was such that edited volumes in the field were nearly out of date when published, and few risked writing books for fear these also would be rapidly superseded. Although some good volumes appeared, *RNA Tumor Viruses* seemed likely to remain the "great work." Yet during these past couple of years, the field has matured sufficiently to make one realize that something was lacking.

With the arrival of *Retroviruses*, a worthy successor to the 1985 classic has finally appeared. Despite its downsized title everything about this volume, edited by John Coffin, Stephen Hughes, and Harold Varmus, is top notch. Especially noteworthy are the many superb illustrations, which include color diagrams of protein structures, molecular mechanisms, and other aspects of retroviruses and their effects. (The publisher, once again Cold Spring Harbor Laboratory Press, is also offering a set of these illustrations as slides for use in teaching, research, or clinical presentations.)



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Retroviral virion. Surface and transmembrane proteins are inserted into the envelope of a cell-derived lipid bilayer. The interior contains the Gag structural proteins and the reverse transcriptase and integrase encoded by the *pol* region. (The cartoon drawing is from *The Art of Retroviruses: A Companion Slide Set from* Retroviruses.)

And the text? A series of chapters from 22 acknowledged researchers (all but two are from the United States) has been carefully assembled. Individual contributions were intended to be independent and accessible in any order, and indeed transitions among them are easily made. A historical introduction by Peter Vogt presents the principle retroviruses, their origins and classification, and a brief chronicle of the ideas and concepts that have shaped retrovirology. The following six chapters are resolutely molecular, describing key aspects of retrovirus structure, function, and replication. We are taken from the virion to membrane docking and penetration, proviral synthesis and integration, transcription, and virion assembly. One is struck by the breadth of topics and the care given to making comparisons interesting and informative. The attention to detail is remarkable. Quite a few times I was brought up short by a detail that I had missed. Any author who has ever written a chapter or review will wince in recognition of the effort the contributors must have exerted.

A curious little "intermezzo" from the editors after the seventh chapter is designed to remind the reader that there is more to retrovirology than molecular biology. Which it does—helping to place the findings on the viral life cycle discussed in the earlier chapters in the context of interactions between retroviruses and their hosts, which are the focus of the final five chapters. These deliver the goods: the endogenous retroviruses all around us, the pathogenesis of the exogenous ones, immune responses, control of infections, and the use of retroviruses as vectors. They are good, solid chapters with much to say and provide the bold new dimensions to the "great work." I found the one on endogenous retroviruses a particularly good read, if only because the topic is an area further from my territory, so there was much for me to learn. The two chapters on retroviral pathogenesis are nicely done; they get to grips with the real systems for reality, rather than the ex vivo substitutes.

Retroviruses conjures up that book shop feeling—the exhaustion and pleasure after having spent the best part of an afternoon squatting on the floor, absorbed in the book in front of you. The only problem I have come across so far is its size. (It doesn't quite lend itself to easy reading on the loo, a favorite place of mine.) The volume is a welcome reminder that, despite the advent of electronic browsing and retrieval, nothing can beat a good book.

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Larry S. Daley and Kevin Ahern

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