Human Immunodeficiency Viruses
Nitin Saksena, Ed.

HIV is one of the most important infectious disease killers to affect the world. Over the last 20 years, since its identification HIV has spread relentlessly to every continent to a greater or lesser extent. Currently, over 30 million people are infected with HIV, with 16,000 new infections every day. The burden of disease is still greatest in sub-Saharan Africa, where over 7% of the population are infected. Although the routes of transmission are largely unchanged there have been dramatic increases in heterosexual transmission in some countries; e.g. in Brazil, in 1986, one in 17 AIDS patients were women, but currently the figure is one in four.

The book consists of 22 chapters by 46 authors, and is an excellent review and update of all aspects of HIV and SIV infection. It is aimed at both the scientific and medical workers in this rapidly changing field, and the chapters follow a logical progression through the epidemiology, molecular biology, immunopathogenesis and clinical features of the infection. Although it was the aim to have overlap in the content of some of the chapters, this has resulted in unnecessary repetition in some instances, e.g. detailed description of the cellular HIV co-receptors and the role of the 32 bp deletion in the CCR5 gene in resistance to HIV infection is given in three successive chapters. Similarly, frequent grammatical errors and poor diagram quality in some of the earlier chapters detract from their overall content.

One third of the book deals with the molecular biology of the virus. Individual chapters are devoted to the structural genes, and regulatory and accessory proteins. The recent determination of the crystal structure of gp120 has revealed that not only does the molecule have neutralizing and non-neutralizing faces but also a third, immunologically silent, face. The poor immunogenicity of this molecule results from the interaction of neutralizing antibodies with this silent face. The chapters on HIV replication and recombination are well written and easy to understand, and explain all the stages of viral replication from cell entry and vpr-mediated nuclear transport to integration and the production of daughter virions. It is also becoming clear that antigen presenting cells such as dendritic cells either exposed to or supporting viral replication can facilitate efficient transmission of virus, resulting in highly productive infection of previously resting CD4 cells. Recombination between subtypes is well documented and even quadruple recombinants have been identified. Whether such hybrids result from coinfections, superinfections or both is still not clear. Currently, no phenotypic characteristics have been found to result from the genotypic differences in these hybrids. However, as the amino acid differences in M subtype viruses can be up to 25%, it is possible that there may be subtle differences in the immune response. Similarly, a vaccine designed from a B subtype virus may not protect against a B strain that has acquired a non-B subtype envelope.

Several chapters are devoted to the pathogenesis of HIV infection and the role of chemokines and their receptors. However, despite extensive research the mechanisms responsible for HIV encephalopathy are still not fully understood. This is partly because of the inaccessibility of the CNS and the fact that findings in the CSF probably result not only from replicating virus in the CNS but also from virus that is trafficking between the systemic and CNS compartments. Overall, the pathogenesis of neurological disease appears to be multifactorial, with both viral factors (NSI/SI phenotype, expression of nef and tat, gp 120 mediated damage) and host factors (expression of pro-inflammatory cytokines) being important.

The importance of the co-receptor CCR5 in virus entry into cells is fully discussed. The role of the 32 bp deletion and the effect of the homozygote and heterozygote on disease susceptibility and progression is explained. The development of inhibitors of this receptor is an active area of research; however, the possible effects on the host are not known.

The final chapters are dedicated to the clinical manifestations of the disease. The interaction between opportunistic infections and HIV, and the management of such infections, is explained. The final chapter deals with the treatment of HIV disease itself. Potent combination regimes—highly active antiretroviral therapy (HAART)—are now the standard of care in units dealing with HIV-infected patients. Although such treatments are associated with improved mortality and morbidity, there are many drug interactions and side-effects, which need to be assessed on an individual patient basis. Overall, this book provides an excellent review of the pathogenesis of HIV disease and an update on all the latest developments. The authors are to be commended, as this is a daunting task in an area of research that is moving extremely rapidly.

C. Aiken
Consultant Virologist,
Department of Microbiology and Virology,
St Bartholomew's Hospital,
London, EC 1A 7BE, UK