An Introduction to Biomedical Science in Professional and Clinical Practice

S. J. Pitt, J. M. Cunningham. Chichester: Wiley, 2009.
ISBN: 9780470057155 (Paperback).
218 pp. £27.50.

This book consists of 218 pages and eight chapters to encapsulate the career roles for biomedical scientists. It is useful for trainees and undergraduate students completing an IBMS registration portfolio as part of a co-terminus degree in biomedical science. The text is career-focused and begins with 'Introduction to a Career as a Biomedical Scientist' and 'Organisation of Pathology Departments' to 'Communication for Biomedical Scientists' and 'Quality Management'. This chapter is followed by 'Basic Principles of Working in a Laboratory', which covers health and safety, and data protection. However, the information and exercises complement the registration portfolio and will give the biomedical science student or trainee some ideas for evidence they can collect in building their portfolio. Indeed, completion of the exercises is a form of evidence they can use and cross reference to the standards in the portfolio.

The book is indexed in detail and the reader can dip in and out of the book to find information easily. Each chapter includes suggested references and websites for further information, including helpful exercises to reinforce learning. The general layout and order of the topics loosely follows the IBMS registration portfolio, although some areas have been mixed up with no real advantage to the reader.

Chapter 6 introduces the biomedical science disciplines and, in its attempt to 'push' the multidisciplinary ethos, has produced a chapter that is of little benefit. The methodologies described range from the 'out of date' and rarely used to the modern analyser, which is described in the most basic terms, with no real conception of how such analysers are run in 'real' situations. The biomedical science disciplines (Chapter 6) and laboratory techniques (Chapter 7) show some variance; for example, 'haematology and transfusion science' is described as a discipline but few techniques for transfusion science are described. The box on page 148 lists 'commonly performed haematology and transfusion science tests' but only mentions 'blood grouping' for transfusion, omitting 'compatibility testing' or 'antibody screen', which one would considered to be commonly performed. Clinical biochemistry, in Chapter 6, becomes 'clinical chemistry' in Chapter 7, and 'histopathology' (Chapter 6) loses the 'cytopathology' component by Chapter 7. Is it any wonder the general public and healthcare professionals are confounded by the different titles we have for ourselves and our subject disciplines or laboratory areas?

The text in Section 6.6 describing 'Liaison between pathology disciplines' would perhaps be better in Chapter 3 under 'Communication for biomedical scientists'. Sections 6.7 'Evaluation of a new diagnostic test' and 6.8 'Sensitivity and specificity of an assay' would be better placed in Chapter 4 'Quality management in a clinical laboratory'.

The title for Chapter 7 is misleading and might be more useful if it indicated that the techniques described were a selection of manual techniques that the student could carry out in the laboratory to provide experience in manual methods, as these tests are much more likely to be carried out using automation in most laboratories. It does, however, provoke thought, and laboratories, including those in universities, may well want to include a series of manual tests that the student or trainee can carry out as part of their training. Reference ranges are an essential aspect of laboratory medicine and these are quoted without source; at best they are meaningless and at worst misleading. A simple table for each discipline with lists of automated and manual tests would be of more use as a general overview, with what is analysed or measured in each department.

Chapter 8 (Development of Knowledge and Competence for Biomedical Scientists) gives a good overview of what is expected of a biomedical scientist once registered and practising. The concept of continuing professional development and maintaining evidence to show competence is relatively new in the biomedical scientist profession and this chapter is not only useful for newly qualified biomedical scientists but would be useful as a standalone document for all registered biomedical scientists, regardless of their length of practice.

This book is of manageable length for a student or trainee to read and will give them an accurate overview of the biomedical science profession. It is an excellent accompaniment to the IBMS registration portfolio, giving both trainee and trainer evidence that can be collected to support the portfolio.

The information about specific disciplines is variable and the order of topics is not always logical, but the book fills a much-needed gap in biomedical literature. The authors are to be commended in their dedication to this end.

J Overfield/D Shanks

Human Cancer Viruses: Principles of Transformation and Pathogenesis

J. Nicholas, K-T. Jeang, T-C. Wu eds. Basel: Karger, 2008.
ISBN: 978-3-8055-8576-7 (hardback).
244 pp. $212.

The link between viruses and cancer was a critical discovery in biology and cancer research. Although the first identification of a tumour-causing virus, the Rous sarcoma virus, occurred approximately 100 years ago, the acceptance of this association took a long time. *Human Cancer Viruses: Principles of Transformation and Pathogenesis* is edited by three respected experts in virology and oncology and collectively written by a splendid array of 23 internationally renowned scientists, many of whom teach viral oncology. This book provides a strong, comprehensive introduction to human cancer viruses, reflecting critical and dynamic changes in the field. It is the inaugural volume of the *Translational Research in Biomedicine* series, under the series editor S. H. H. Chan.

The intended readership of the book includes advanced undergraduate and postgraduate students, postdoctoral researchers and scientists studying or working in biology,

medicine or biomedical science. To appreciate this book fully requires the reader have some basic knowledge of the concepts of virology and molecular biology. Other introductory textbooks are more suitable if a fundamental knowledge of virology and its relationship to biology is required.

The book provides an overview of the six major viruses associated with human cancers (HPV, HBV, HCV, EBV, KSHV and HTLV-1), covering aspects of their molecular biology and epidemiology, progressing to clinical aspects of diseases and their prevention and treatment.

Twelve condensed review papers comprise this book. The first topic, covered in the initial three review papers, focuses on human papillomavirus (HPV), including its epidemiology, molecular pathogenesis and papillomavirus vaccines. The molecular interactions between HPV and the infected host cell upon viral entry are discussed. The second topic discussed is hepatitis C virus (HCV) and describes the organisation of its genome, including aspects of genetic variants of HCV, but concentrates on biomedical and biological systems useful for the discovery of inhibitors to the HCV protease and polymerase. The third topic considered deals with hepatitis B virus (HBV). These two review papers describe its genomic organisation and the role of HBV in causing hepatocellular carcinoma. Emphasis is placed on the role of HBx protein in hepatocarcinogenesis.

The fourth topic is the ubiquitous Epstein-Barr virus (EBV), which is described in two papers covering EBV biology, such as its gene expression programmes, pathogenesis associated with EBV, and a variety of related malignancies including lymphoid, epithelial and smooth muscle tumours. The fifth topic is that of Kaposi's sarcoma-associated herpesvirus (KSHV), also known as human herpesvirus 8. These papers introduce viral gene expression pattern, the different pathogenic mechanisms of three malignancies associated with KSHV (Kaposi's sarcoma, primary effusion lymphoma and multicentric Castleman's disease). The current animal models used to study Kaposi's sarcoma and KSHV, and therapeutic approaches to Kaposi's sarcoma, such as antiviral agent, and emerging molecular targets are also discussed. The final two papers are devoted to the retrovirus human T-cell leukaemia virus (HTLV). They focus on its genome organisation, mechanism of pathogenesis and explore how the HTLV-1 oncoprotein Tax initiates cellular transformation.

All the papers are arranged in a common format and mimic the organisation of typical review papers in scientific journals. Each begins with an abstract followed by the main substance of the paper and ends with an extensive list of references. References are exclusively review articles and research papers. These references will be a useful database for readers wishing to explore a particular topic in detail.

The book contains 35 Figures and nine Tables. Many of the illustrations are valuable; for example, those Figures illustrating the biological actions and functional interaction of HBx with cellular partners that make complex information more understandable and help readers to recall details that might otherwise be lost in the plain text.

All the topics are comprehensively discussed with up-to-date contents, and are dealt with at a suitable depth. *Human Cancer Viruses: Principles of Transformation and Pathogenesis* will contribute much to the general understanding of crucial aspects of cell transformation, emphasising the advances and current research in this exciting area. What the book covers it covers very well, combining molecular and clinical aspects of virology. The book is particularly useful for virologist and clinicians who work in this field and wish to expand and advance their knowledge on the mechanisms leading to cellular transformation and oncogenesis. However, the book describes an area of research in which new and exciting findings are announced constantly, thus some of the details and interpretations presented may now be out of date. Despite this, it provides useful supporting material for those learning and teaching cancer biology. I would certainly recommend it as supplementary reading to final-year undergraduate and postgraduate students.

Q Wang

Medical Microbiology

M. Ford ed. Fundamentals of Biomedical Science series.
Oxford: Oxford University Press, 2010.
ISBN 978-0-19-954963-4 (Paperback).
384 pp. £25.99.

Although I have taught medical microbiology for several years, this has not been restricted to students on biomedical science degrees. This series is obviously and squarely targeted at biomedical scientists, and the IBMS logo is prominent on the cover, indicating some element of endorsement – which gives the book a considerable advantage in terms of recommendation to the intended readership. However, the content may be a little restricted for students studying a more broad stroke of microbiology.

I was not familiar with the series and therefore found it really refreshing to come across a comprehensive 'textbook' that was not frighteningly long or (literally) weighty. The layout is attractive and accessible, with the text broken up by convenient subheadings. There are reviews, summaries and case studies located throughout, to help reinforce the content material, and there is substantial additional support material available online.

The content has an obvious diagnostic focus but explains the rationale and background to the tests and approaches described. The culture and identification of pathogens is described in all other medical microbiology textbooks, but not as directly as in this publication. For me, being familiar with the more general textbooks, I found the infection control section interesting, as it provides an intimate account of the activities necessary in the hospital environment. On the other hand, I do feel there is an absence of information on water and food microbiology. Virology gets a mention, noting the demise of tissue culture in diagnostic virology, alongside fungal taxonomy. Some comment on the loss of these important skills might have been interesting.

Overall, the book is up to date, highly relevant and extremely useful to its intended audience – biomedical science students intending to pursue medical microbiology. Unfortunately, the use of 'flagellae' as the plural of 'flagellum' does detract somewhat from the general quality of the publication.

J Verran

Human Genetics

A. Gardner, T. Davies. Banbury: Scion, 2009: 2nd edn.
ISBN-10: 1904842739 (Paperback).
328 pp. £24.99

The growing importance of genetics tools in modern applied health science is astonishing, as is the rate of advancement and technical innovation in this field. The reason for this may be the relatively immediate connections between academic research into human genetic diseases, the healthcare profession and private industry. Keeping students abreast of advancing technology in any human health field requires the constant updating of material; thus, it is perhaps a difficult task to write a text that is general and yet summarises the forefront of technology in the modern field of human genetics.

The second edition of *Human Genetics* aims to provide an up-to-date treatment of diagnostic tools relevant to human genetic disorders. According to the authors, this concise volume is designed as an introduction to topics in human genetics for new undergraduate students and healthcare technicians [*sic*], and as a supplement to other basic textbooks on the subject. The book may be roughly divided into three conceptual sections. The first (Chapters 1 to 4) provides a very basic review of cellular and molecular genetics in the context of human genetic disease. Coverage here touches on cellular genetics, molecular mechanisms of gene expression and population genetics, all in the explicit context of human genetic disease. The second section (Chapters 5 to 8) briefly outlines a collection of technical tools used in a clinical context, from classic cytogenetics to more modern techniques such as capillary sequencer visualisation of diagnostic genetic markers and gene expression tools such as microarrays. The last part of the book (Chapters 9 and 10) is designed as an introduction to clinical techniques in prenatal diagnostics of human genetic diseases and genetic counselling.

A strong point of the volume is its encyclopaedic litany of human genetic disorders in the context of descriptive diagnostic techniques. Also, chapters begin with a useful list of learning objectives and end with a list of suggested further reading and self-assessment questions. Thus, as a reference to technical and clinical human genetic pathology, the volume has potential as a supplementary tool in higher education.

However, the book has several limitations that are difficult to overlook. First, in general, the coverage of topics might be described as wide and shallow. In itself, shallow coverage is not a problem, but because the depth of coverage of topics is uneven it creates opportunity for confusion. Examples here, among others, are references to basics such as mitochondrial biology and pleiotropy accompanied by unclear or ambiguous explanation. Also, the Foreword cites, as motivation for the second edition, an update to new techniques, specifically emphasising microarray gene expression technology, but this is only mentioned briefly in the text other than in a general gene expression overview in Chapter 6. Finally, it is a little surprising that online human genetics resources are not discussed in more detail, given their current and rising importance in modern human genetics, with strong indications that this trend will continue.

Your reviewer was a student before the internet became popular, so I expect a textbook, even one intended to provide supplementary information on some focused subject, to be ponderous and authoritative. *Human Genetics* is a concise volume that focuses almost exclusively on technical examples of human genetic disease diagnosis, yet provides only shallow coverage of this topic, which is surprising given its title. Is this a fair criticism in the internet age, where Wikipedia is the first port of entry for many undergraduates to research advanced topics? Perhaps not, as I do think the book could be useful to some students and instructors as a reference, as long as, like Wikipedia, one is aware of its limitations.

E Harris