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ISSN 0022-2593

Published by the BMJ Publishing Group, BMA House, Tavistock Square, London WC1H 9JR, and printed in England by Latimer Trend & Company Ltd, Plymouth.

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Cell Biology: a Laboratory Handbook. Editor J E Celis. (Pp 1116; £80.00.) San Diego: Academic Press. 1995. ISBN 0121647145.

There is no doubt when looking at this handbook that it is inspired by the popular three volume tome on molecular cloning, commonly referred to as the molecular biologists bible. I wanted this to be a good book as cell biology often appears to be the poor relation of molecular biology, at least in terms of the availability of techniques books.

The handbook is divided into three volumes. Volume 1 starts with chapters on tissue culture and associated techniques with an introduction on general methods, and detection of contamination in cell cultures. The next section addresses primary cultures from embryonic tissue followed by a substantial one on specific cell culture types including keratinocytes, hepatocytes, type II pulmonary epithelial cells, fibroblasts, CNS stem cells, endothelial cells, and haemopoietic cells to name but a few. Though there are undoubtedly many excellent contributions in this section there appears to be quite an amount of variation in the depth of coverage provided by each author. However, the general layout works well with an introduction to the origin of the cells, detailed methods of isolation and culture followed by a section on pitfalls of that particular cell culture system. All sections have useful toxicity information on the particular chemicals being used. The next topic addresses cell separation techniques, particular flow cytometry and immunomagnetic bead methods. A subsequent small section on model systems to study differentiation and different lineages, specifically neuronal and epithelial cells, has very little background information and one very much gets the impression that it is merely skimming the surface of a very important area. Immortalisation of cells is covered next; however, there are major omissions as the chapters only address transgenics using SV40, and SV40T antigen as a transforming agent. There is no mention of Epstein Barr virus, retroviruses, oncogenes, etc. There is quite a useful series of chapters on cell cycle analysis using flow cytometry or centrifugation and discussion of cell synchronisation methods. This is followed by important information on cytotoxicity assays. The last section of this volume addresses senescence, the means to cause it, and the morphological criteria on which cells are said to be senescent. However, this is a very strange mixture of topics that seem to have been tagged on as an afterthought. At this point this volume seems to

lose direction; there is a section on electrophysiology (patch clamping) then on three dimensional histocultures, and it becomes really difficult to see the framework of organisation. The next section of the volume addresses other cell types, in other words non-mammalian ones. There are chapters on *Drosophila* cell culture, nematode and protozoan culture, and then an extraordinarily long chapter (40 pages) compared to the others on *Dictyostelium* with a very detailed in depth presentation of the molecular biological tools used to study this system. In contrast *Physarum* is covered in three pages and plant cells culture in two chapters, totalling 12 pages. At this point one begins to wonder at the editorial policy for these volumes. There is no doubt that there are many excellent contributions from authors at the forefronts of their fields; however, it appears that the brief given to each of them may have been interpreted somewhat differently in that the chapters have very different formats and level of in depth investigation. Part 2 of volume 1 deals with culture of viruses, propagation of SV40, polyoma, adenovirus vectors, papilloma virus in stratified epithelia, and murine leukaemia virus. In a sense the adenovirus vector chapter is somewhat out of place in that it is the only one with an extended molecular analysis section. The final part of volume 1 deals with the isolation of specific organelles from different species: golgi stacks, clathrin coated vesicles, RER from yeast, mitochondria, peroxisomes, secretory granules, and synaptic vesicles from a mammalian brain. This part of the book is very informative and gives plenty of ideas to try for any particular system under analysis. There are two chapters that appear somewhat out of place here in that they jump from organelle to protein isolation. Subsequent chapters address the isolation of centromeres, yeast spindle poles, nuclei and nuclear membrane associated proteins. These are followed by chapters on isolation of cytoplasm, nuclear matrix, snRNPs, hnRNPs ribosomes and ribosomal proteins, proteasomes, and nuclear extracts. The final two chapters seemingly tagged on the end are a method of making DNA and one for making RNA. However, it would have seemed much more appropriate to include several different methods so researchers could choose the most appropriate one for the system they were analysing. A major criticism of this series is that there is no specific volume index and one has to wait until the end of volume 3 to have any index at all.

Volume 2 provides technical backup for general cell biological experiments. The first section deals with microscopy: phase contrast, Nomarski, dark field, and interference microscopy. There then follow sections on fluorescence microscopy and confocal microscopy with a good section on the theory and differences in resolution of confocal relative to conventional fluorescence microscopy. After this point there is again some apparent loss of direction in the organisation of this volume with chapters on video enhanced microscopy being followed by another section on confocal microscopy in living versus fixed cells. The next major topic is that of electron microscopy with methods for fixing samples, embedding, staining, and then more specialised applications such as shadowing, freeze fracture and freeze etching, ultra-thin immunoelectron microscopy and scanning EM. There then follow major sections on microdissection techniques, micromanipulation of chromosomes using laser microsurgery, for ex-

ample, in microcloning. One has to wonder how many of these techniques could be acquired from reading a chapter in a book such as this and how many of them would actually be dependent on "hands on" teaching. There is an adequate histochemistry section and presentation of the use of specific stains for the detection of particular enzymes. The next section of volume 2 is possibly the one that is least useful, particularly given the availability of the excellent laboratory manual on antibodies by Harlow and Lane. The antibody section in this volume addresses how to generate rabbit polyclonals and mouse monoclonals among other techniques. Then methods for purifying IgGs and fluorescent tagging of antibodies, determination of their specificity by western blotting and immunoprecipitation, ECL, ELISA, and methods for establishing epitope specificity. This is followed by a chapter on immunocytochemistry and vital staining. The next major section of this volume is devoted to intracellular measurements; however, it is not at all clear why the topics have been chosen and why only these were considered worthy of inclusion. The final section is on cytogenetics and in situ hybridisation. Though it may be technically adequate it is historically inaccurate, there are chapters on cell hybrids, microcells, chromosome painting, FISH, RNA, and DNA in situ hybridisation. Again the lack of an index in this volume is a great omission.

Volume 3 starts with a section on transfer of micromolecules covering techniques of microinjection of DNA and RNA into somatic cells and oocytes, electroporation, Sendai virus mediated gene transfer, and finally liposomes.

The next section deals with cloning of embryos, transgenics, and gene targeting and homologous recombination in ES cells. Essentially it is not possible to do this effectively in one chapter for each topic and the inclusion of this section is questionable. Cell free extracts, permeabilised cell systems, and expression systems form the topics to be addressed in the next section. This includes baculovirus and vaccinia virus expression systems. However, it is generally an ill assorted collection of chapters. The final 300 pages of volume 3 is on analysis of proteins covering determination, preparation of tagged proteins, cell surface labelling, and then a major section on protein electrophoresis covering all types and dimensions: one and two dimensional isolation of proteins, overlay assays, staining methods, modification of cellular proteins and zymography. The final section addresses the use of lectins, microsequencing, mass spectrometry, and amino acid analysis. The remainder of this volume is taken up by a list of suppliers and the long awaited index.

In conclusion, though this series of volumes does make some useful contributions, as a whole its organisation is not very easy to follow and one wonders whether it would have been more effective if it had chosen to concentrate on the cell biology end of the spectrum rather than attempting to include all related techniques. A final matter that should be addressed by the publishers is that in order to be an effective laboratory manual, volumes such as this have to be robust. The paper in this series of volumes is exceptionally thin and is likely to have a very short half life in the normal wear and tear of a laboratory.