BOOK REVIEWS

Cancer Surveys—Maturation and Differentiation in Leukaemias Vol. 1. No 2. M.F. GREAVES (Guest Editor). Series Editor, L.M. FRANKS. Oxford. Oxford University Press, 346 pp, £12.

If the standard of presentation in this second issue of **Cancer Surveys** is maintained, the series will comprise a valuable collection of useful reviews of benefit to clinicians and scientists alike. In this volume Dr. Greaves has solicited contributions from eminent workers in the field of leukaemogenesis, discussing topics ranging from regulator-dependent growth of normal and leukaemic cells to the role of karyotypic changes, viral-promoter mediated changes in cell behaviour, and aberrant differentiation programmes expressed by leukaemic cells. In his introduction, Greaves rightly points out that "the success of the newer—(research)—developments will depend critically on a synthesis of the ideas and methods used by different groups." This is particularly true in the field of normal haemopoiesis and leukaemogenesis which in the past decade has witnessed an explosion in the cell biological, biochemical and molecular biological assay systems available for analyzing the cell surface, intracellular and genomic changes occurring during growth and differentiation. The ultimate goal of course, is to understand the regulatory networks concerned with control of growth and development of stem- and lineage-restricted cells and the perturbations of this network during leukaemic transformation.

Beug, Hayman and Graf discuss their work with avian retroviruses, the possible mechanism of lineage-restricted transformation by viral "sub-type", and introduce the oncogene concept. It may be thought by some that chicken leukaemias are not relevant to understanding the human disease! Far from it. The cellular equivalent to the viral oncogenes are not expressed only in birds, but in human cells as well, and recent publications testify to the possible importance of these genes and their products in transformed human cells! This work is discussed in more detail in a chapter by Varmus who concludes that viruses which do not carry their "own" oncogene may transform cells by activating cellular oncogenes. They do this by acting as gene promoters—affecting the transcriptional activity of the region of DNA in which they have been inserted.

There is also a chapter by Harrison on differentiation of the murine erythroleukaemias. (For newcomers to this field, I can recommend the article as a thorough and competent review of this complicated field. The article discusses the possible

mode of action, and target cell specificity of several erythroleukaemia-inducing viruses and describes the various ways in which the transformed cells can be induced to express a differentiation programme. Together with the article by Sachs—on the development of myeloid leukaemia cells—this work raises real hope for the future in exploiting the differentiation ability of many leukaemias. In leukaemic cells, growth and differentiation are indeed uncoupled but the change is not irreversible. In appropriate circumstances, differentiation (clonal senescence) can be induced. In the article by McCulloch *et al.* (the "godfather" of modern experimental haematology) is described the concept that leukaemic cell growth is determined by a balance between self-renewal and determination, but that as a consequence of determination there is "a sequential expression of differentiation markers in patterns dissimilar from those of normal haemopoiesis." While several groups would disagree with this model, the suggestion put forward by McCulloch that the extent of deviation from the normal pattern may be correlated with the aggressiveness of the leukaemic cell population is an interesting one and requires further investigation. Finally, the article by Klein discusses the karyotypic changes seen in some leukaemias arising in mouse and man. In particular, both translocations and trisomies may result in the activation of oncogenes. When read in the context of the work reported by Beug and Varmus, the model is beautiful in its simplicity.

In conclusion, a readable book, well worth buying.

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Assessment of Immune Status by the Leukocyte Adherence Inhibition Test (Ed D.M.P. THOMSON). London. Academic Press, 380 pp, 1982, £29.00.

Since first described the leukocyte adherence inhibition assay (LAI) has met with some criticism. This is to be expected for any assay which claims to have diagnostic significance for malignant disease, particularly when introduced at a time (1972) when confidence in the role of cell-mediated immunity against human neoplasia was at a low ebb. Here was an assay (based upon antigen-specific reduction of adherence to plastic or glass surfaces of leukocytes) which claimed to demonstrate organ-

related reactivity similar to that shown in cytotoxicity assays—the subject of much criticism at that time.

The acceptance of the assay was not helped by the fact that three assays were identified (haemocytometer, tube and microplate) which not only revealed different patterns of reactivity in respect of correlation with the course of disease but also in the nature of responsive cells and the mechanism of reactivity. Each required a high level of manual dexterity. The validity of the assay has, however, been confirmed subsequently in elegant studies using model antigens in both animal and human systems (particularly by Powell and associates) and this test should certainly rank with the leukocyte migration inhibition assay with which it has some similarities as a measure of immune function.

This volume brings together the collected experience of the several groups that have successfully used LAI in its various forms and identifies the methodological advances, such as image analysis, and the difficulties of the test. Large sections of the work deal with the mechanisms of the different assays. Its aim is to provide easy access to the information now available in this area as well as a thorough description of the technical aspects of the tests. To be fair, much of the information has already been published in the **Cancer Research** Monograph reporting the 1978 Buffalo workshop on this assay. Those familiar with the area will find little new data on LAI (except in the paper by Thomson) and a consideration of the role in rheumatoid arthritis. The papers presented here largely retread well-worn ground. It is significant that the experience of a number of groups with less convincing data on the applicability of LAI to investigations of immune reactivity in malignant disease are not only missing but not even mentioned!

Those committed to the use of LAI will find here a useful compendium of the work of others in the field. As a review of the state of the art it succeeds admirably. A critical document of the position of LAI in cancer diagnosis it is not. If you have £30 to spend, keep it in your pocket and consult **Cancer Research**, 39, 551-662 (1979). One may ask what purpose a book like this, at such a price, has, given the economic constraints now being placed on library budgets and cancer research in general.

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Human Cancer Markers (Eds. S. SELL. and B. WAHREN). Chichester. John Wiley & Sons Ltd, 428 pp, 1982, £42.95

The interest in cancer markers continues both in the search for new markers as well as the growing use of those markers that have passed from the preliminary stage to commercial production. The anchor topics such as markers in breast, bowel and lung cancer each receive a chapter in this well constructed volume. The authors explore and explain the use and limitations of the markers in current use in many hospitals, carcinoembryonic antigen, alpha fetoprotein and a variety of hormones that can identify tumours of the endocrine system, as well as those tumours where there is an inappropriate production of hormones.

The book, which is a companion to Dr. Sell's **Cancer Markers** (Humana Press, Clifton, N.J. 1980) is presented in series of 15 site-orientated chapters, and a general overview of monoclonal antibodies. The authors vary according to the chapters. A personal viewpoint is expressed in several chapters by well known contributors to their area of research, S. Sell on the liver, J. Hobbs on the pancreas, M. Seppala on the gynaecological cancers to name a few, others write in pairs—T.M. Edgington teams with R.M. Nakamura on breast cancer, B. Wahren (the co-editor) with P. Perlmann on bladder cancer and so down through a list that takes in skin, melanoma and central nervous system; why it took 8 authors to write 9 pages about prostatic cancer is unclear, they are a veritable doctrine of doctors. I found the book helpful and filled with a lot of good information which with some cross-referencing provides an appraisal of the state of the art in 1982. However, as there has been a flood of tumour marker books and conference reports on the market recently an element of "deja vu" crept in from time to time as I read some sections. Alas! This is the problem; when so many publishing houses are in production, the better books (and this is one) often get off to a bad start with the readers fatigued by all that has gone before. Nevertheless this book stands out above the run of the mill, as a cornerstone for research and practice in the 1980's.

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