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Book reviews

Antibodies: A Laboratory Manual. Edited by ED HARLOW and DAVID LANE. Cold Spring Harbor: Cold Spring Harbor Laboratory. New York. 1988. 726 pages. Paper $50.00. ISBN 0 87969 314 2.

The use of antibodies to detect antigens either *in situ* or isolated from cell extracts has revolutionised our approach to understanding cell biology. In situ staining of antigens using techniques such as immunofluorescence or immunoelectron microscopy allows us to localise antigens within the cell. SDS–PAGE analysis of immunoprecipitated antigens and western blotting procedures enable us to assign molecular sizes to protein antigens. Other techniques allied to immunoprecipitation, such as pulse-chase experiments using radioactively labelled precursors, give us valuable information on the time of antigen synthesis, rates of degradation for given antigens and also antigen processing profiles. In addition antibodies enhance the purification procedures of many antigens through immunoaffinity chromatography and also allow accurate quantitation of antigens within samples through various forms of immunoassay.

These techniques and the need to raise the antibodies necessary to pursue them have universal application throughout cell biology and the laboratory manual edited by Harlow and Lane usefully brings all the required methodology under one cover. The editors state that the idea for this book was inspired by 'the cloning manual', *Molecular Cloning: a Laboratory Manual*, by Maniatis, Fritsch and Sambrook (published by Cold Spring Harbor Laboratory, 1982). In the same way as this book aided scientists to enter the field of molecular biology, Lane and Harlow hope their book will enable scientists to enter the world of antibody methodology. In attempting this they probably set themselves a harder task than Maniatis *et al.* because of immunology's underlying complexity.

A major source of readers will undoubtedly come from the realms of molecular biology and many of these will not be fully acquainted with the vast strides made in our understanding of immunology over the past decade. The first four chapters, therefore, present an overview of our understanding of the immune response, antibody molecules, antibody–antigen interactions and the immune response. These chapters are succinct and clear and are backed up by comprehensive reading lists for those who wish to delve into the theory in more detail.

Following on from these introductory chapters Lane and Harlow proceed to document the immunological procedures required of modern biology. Chapters 5–8 deal with the raising of both polyclonal sera and monoclonal antibodies, the growth of hybridomas and the storage and purification of antibodies. Chapters 9–14 deal with the use of antibodies to detect and purify antigens. Each chapter contains a few introductory pages outlining the general principles and theory underlying the techniques and follows up with detailed protocols on all the standard procedures likely to be encountered, plus a few of the more exotic ones also. The chapters are clearly laid out and this, together with good cross-referencing, makes the book extremely easy to use.

The manual also contains many useful hints to the experimenter contemplating a new technique. For example, in the case of raising antisera to synthetic peptides, not only are the methods and merits of coupling peptides to carrier proteins documented, but sound advice is also given on the type of peptide likely to yield the best results. Similarly, when discussing monoclonal antibody production in a supremely well written chapter, the point is forcibly made that good assays should be available and that sera from the test animals should be of adequate quality before proceeding with fusions to yield hybridomas. A simple point, but one that if not followed may lead to months of fruitless work.

If the manual has a failing it is perhaps that it concentrates on protein antigens to the exclusion of all others. A chapter giving an overview of the use of antibodies to detect non-protein antigens would be a useful addition. However, this criticism is minor when placed in the context of such a useful text. For less than the price of a batch of ^{125}I protein A, this book is well worth the investment for any laboratory contemplating the use of antibodies.

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Genetics and Alzheimer's Disease. Edited by P. M. SINET, Y. LAMOUR and Y. CHRISTEN pp. 179 Springer-Verlag, Berlin, Heidelberg and New York 1988. Price DM 108

Alzheimer's disease (AD), named after a German neurologist of the last century, is one of the most

serious problems of our ageing population. At one time it was considered a form of presenile dementia confined to the fifth and sixth decades of life. But it is now becoming clear that this, the commonest form of dementia, may begin more often after the age of 60. Much has been written about this fascinating disorder and this current text, the edited proceedings of a meeting held in Paris in 1988, summarizes many of the recent findings.

There is no doubt that the disorder is often familial but genetic studies are difficult because of the late age at onset and difficulties in clearly defining the disease on the basis of clinical criteria. Furthermore, there is increasing evidence of heterogeneity with earlier onset in some families and later onset in others. Also relatives of individuals with what is referred to as the AAAA syndrome (Amnesia, Aphasia, Apraxia and Agnosia) have a higher risk of becoming demented than relatives of cases with pure dementia. Dermatoglyphic abnormalities have been found more commonly in some affected families than others. But undoubtedly the most exciting findings have been in regard to linkage studies and the relationship to Down's syndrome.

Individuals with Down's syndrome who survive to middle age often develop an Alzheimer-like disorder and autopsy studies have revealed neuropathological changes in the brain similar to AD. In particular there is an accumulation of amyloid A4 protein (beta protein). The gene locus for this protein has been localised to chromosome 21 and it was therefore tempting to believe that this might also prove to be the locus for AD. Linkage studies have now shown that the gene for early onset AD (mean age of onset less than 60) is located on chromosome 21, but not at the locus for amyloid protein. The AD gene locus is *not* identical with the amyloid locus. Furthermore, familial late onset AD (mean age of onset greater than 60), which is a more common disorder, may not be located on chromosome 21 [but see *Lancet* 1, 352–354 (1989)]. AD would therefore appear to be genetically heterogeneous.

In many families where the disease affects individuals in several generations, the disease does not always appear to be fully penetrant. Sometimes this may be because a gene carrier died from some other cause at an age before AD would have become manifest. But it also seems very likely that some, as yet unrecognized, environmental factors are involved.

The final part of the book is devoted to several papers which examine the nature, molecular structure and function of amyloid protein. It is already becoming clear that studies along these lines may well help us to understand more of the pathogenesis of this tragic disease which now affects around 1% of the population.

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The Use of Plant Genetic Resources. Edited by A. H. D. BROWN, D. R. MARSHALL, O. H. FRANKEL and J. T. WILLIAMS. International Board for Plant Genetic Resources: Cambridge University Press, Cambridge, UK. 1989. 382 pages. Paperback, $17.95 ISBN 0 521 36886 3; Hardback, $49.50 ISBN 0 521 34584 7.

This book is the result of a workshop convened by the International Board for Plant Genetic Resources (IBPGR) in 1986, with the intention of exploring how the use of collections, primarily of seed samples from designated source populations, is limited or can be facilitated. The 22 papers included are grouped into 6 sections: the first two sections describe the uses to which collections have been put, the third discusses the size and design of collections, the fourth discusses some factors and principles for evaluating them, the fifth considers the special problems of creating collections of wild relatives of domesticated species, and the last reviews new technologies that may affect the utility of collections

A persistent theme is that with notable exceptions, breeders have not used the collections very extensively despite increased efforts over the past 20 years. Large samples are now available in seed banks and other storehouses, but their genes are not often seen in breeding populations or in released varieties of the major crop species and their relatives. If the lack of use is due to a longer than expected lag time in varietal development, or to inefficiencies in disseminating seeds or information, then merely increasing breeding efficiency will solve the problem. However, as suggested by Frankel in Ch. 15, '... the prevailing strategy for evaluation has not been altogether successful. And the proposed cure, more of the same, scarcely inspires confidence.' Apparently, breeders see the bottleneck to the potential outpouring of benefits from these collections as a lack of evaluation and other prebreeding activities. While this problem may hardly seem of interest to geneticists other than plant breeders, one wonders whether there is, in fact, a genetical problem. If genotypes or populations can be characterized by standard descriptors, and standard tests can be used to analyze performance, then evaluation problems only involve efficient screening through large sets of materials. In this vein, methods are discussed for sampling and reducing collections to small 'core' sets for maximum differentiation and for screening entries by correlated measures either of their source environment, or of detectable linked loci. Further, it is asserted in the last chapters that many gene actions have major and direct effects on traits of economic importance that are consistent when transferred among species even across different kingdoms. Therefore, evaluation should be only a matter of more detailed gene cataloging.

Obviously however, evaluation is not easily reducible to observations of genes or of environmental