Immunochemical Techniques for the Identification and Estimation of Macromolecules

Laboratory techniques in biochemistry and molecular biology; volume 1/III, revised edition

by J. Clausen,
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One only has to serve on a grant awarding Committee to become aware of the impact of immunological methods on the whole of medical research especially in biochemistry and molecular biology. This has of course become even more prominent since the development of monoclonal antibodies. In my own field of protein synthesis antisera to specific proteins which are undergoing study have been used for about 25 years. For these reasons a book which sets out to describe the methods available and their rationale is to be welcomed.

This book by Clausen is a second edition, the first having been published in 1969 in a series devoted to laboratory techniques in biochemistry and molecular biology. After a sound and helpful introduction the various methods are described in the following chapters, the details being confined in the main to a series of appendices. The illustrations are excellent and as would be expected the text is carefully edited.

The early chapters are concerned with the preparation of antisera, the migration of antigen and antibodies on gels, covering such techniques as immunoelectrophoresis. Then there is an explanation of radioimmunoassay, immunoenzyme-immunoassays, fluorescence and immunofluorescence techniques.

I have always had some doubts about the place of methods books in research and the present book raised my queries once again. One's first reaction is that it is best to consult an experienced colleague if one wants to apply a new method to a research problem. Only in this way is one likely to get a realistic appraisal of the suitability of the method for the particular problem. My disappointment with the book under review is that nowhere did I find a hint of the snags that are likely to arise in the use of immunological methods.

Perhaps I am biased but from the early days when I used antibodies to detect the synthesis of serum albumin in cell-free systems I learnt to interpret the results with caution. Part of the difficulty arises from the coprecipitation of a radioactive protein with the antibody precipitate to another protein. The chance of this happening can be lessened by various washing procedures, but this is not possible with immunoelectrophoresis and many claims concerning protein synthesis have been erroneously made using that technique.

Another problem arises from the specificity of the antisera. Antisera that are used for radioimmunoassay are often inadequate with respect to their specificity when used for the detection of proteins synthesised in cell free systems. Moreover, an antibody which reacts with a mature secreted protein may not react with its biosynthetic precursor. The lesson, which is too often ignored, is that one cannot be too careful in the interpretation of ones results and whenever possible various methods must be applied.

These observations do not detract from the value of the book. The conclusion is that one still needs friends who are experts in various fields but that a book is a most useful reference source. A valuable feature of the book is the list of some 900 references. I can recommend the book to any laboratory which utilises immunochemical methods.

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Advances in biochemistry and molecular biology, as in all the sciences, are based on the careful design, execution and data analysis of experiments designed to address specific questions or hypotheses. Such experimental design involves a discrete number of compulsory stages: the identification of the subject for experimental investigation.