

Book Review

Commercial Production of Monoclonal Antibodies -

A Guide for Scale-up

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The many advantages offered by Kohler and Milstein's hybridoma technology have been quickly recognized by those in industrial and academic institutions. Already more than 90 monoclonal antibodies have received FDA approval for in vitro diagnostic tests. One monoclonal antibody has recently been approved for the treatment of kidney transplant rejection. No doubt the number of commercially available monoclonal antibody based products will continue to increase. Despite these developments, crossing the bridge from monoclonal antibody as research tool to monoclonal antibody for commercial use remains a particular challenge.

This book addresses many of the factors to be considered for the successful scale-up of monoclonal antibodies from the laboratory setting to large scale

commercial production. Its fourteen chapters have been prepared by industrial researchers who have faced the problems of achieving economic production of high purity monoclonal antibodies in commercially useful quantities. Pre scale-up considerations such as viral contamination of the murine cell line and the ability of different media to support growth and secretion are discussed. Several chapters have been devoted to culture methodologies including the use of ceramic matrices and cell encapsulation. These techniques are reviewed in terms of effects on antibody yield and downstream processing. Although the production of monoclonal antibodies in mouse ascites is not likely to be appropriate when the antibody is destined for a therapeutic application, this method produces far greater antibody yields than presently attainable by other methods. It therefore remains a popular method for monoclonal antibody production where demands for purity are less stringent. Factors influencing monoclonal antibody production in mouse ascites fluid are reviewed. One particularly interesting and useful chapter describes the experience of one laboratory in making the transition from research facility to a production facility which satisfies Good Manufacturing Procedures.

The purification process is often the most difficult aspect of commercial antibody production. Many have already found Protein A sepharose affinity chromatography to provide a large factor of purification in a single step when purifying particular IgG classes of antibody. The greater challenge is to provide high throughput purification of those classes of monoclonal antibody which do not bind to Protein A. The final four chapters of the book describe purification procedures including high performance methods and the use of a novel matrix with the ability to bind a range of antibody classes.

Although, this text is not a comprehensive step by step guide to large scale monoclonal antibody production strategies, it has achieved its editorial goal, as set forth in the preface, in providing a source of ideas and approaches from those working the field. Indeed any book on this subject must be satisfied with providing an exchange of experiences rather than standard answers. Despite the homogeneity of monoclonal antibodies themselves, it has become increasingly clear that what works for one hybridoma may fail miserably when applied to another hybridoma cell line. It is only through the continued efforts of researchers, such as the authors in this book, to document their experience in commercial scale

antibody production that we will build up a larger picture of what may or may not be universally applicable principles.

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