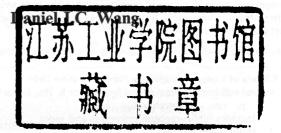
Animal Cell Bioreactors

Chester S. Ho Daniel I.C. Wang Q952

Animal Cell Bioreactors

Edited by

Chester S. Ho



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Editorial and production supervision by Science Tech Publishers, Madison, WI 53705.

Library of Congress Cataloging-in-Publication Data

Animal cell bioreactors / edited by Chester S. Ho, Daniel I. C. Wang.

p. cm. - (Biotechnology; 17)

Includes bibliographical references and index.

ISBN 0-409-90123-7

1. Animal cell biotechnology. 2. Bioreactors. I. Ho, Chester

S., 1950. II. Wang, Daniel I-chyau, 1936- III. Series.

TP248.27.A53A54 1991

660'.6-dc20

90-2654 CIP

British Library Cataloguing in Publication Data

Animal cell bioreactors.

1. Biotechnology. Applications of animal cultured cells

I. Ho, Chester S. II. Wang, Daniel I. C. III. Series 660.6

ISBN 0-409-90123-7

Butterworth-Heinemann 80 Montvale Avenue Stoneham, MA 02180

10 9 8 7 6 5 4 3 2 1

Printed in the United States of America

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Biotechnology is entering a new era. To date, many new biopharmaceutical products developed with this new technology are being sold commercially and approximately 100 are in clinical trials. According to industrial sources, over 250 more are in the research or preclinical development stage. Animal cell culture, in particular, is responsible for a wide range of medically important products, such as vaccines, antibodies, hormones, cytokines, growth factors, and enzymes. As these products advance toward commercialization, the biotechnology industry must rapidly increase the capacity requirement for large-scale in vitro production of animal cell products.

This book addresses the underlying principles and strategies in the in vitro cell culture biotechnology. It addresses the engineering aspects such as mass transfer, instrumentation, and control ensuring successful design and operation of animal cell bioreactors. The purpose of the book is to provide a comprehensive analysis and review in the advancement of the bioreactor systems for large-scale animal cell cultures.

Animal cell culture is here to stay. A broad spectrum of subjects regarding animal cell bioreactors will be useful to researchers and practitioners with different scientific backgrounds. Progress in this area will depend, to a great extent, on a concerted and continued effort by all. It is fair to state

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that much work remains to be done and that it certainly will tax the ingenuity of researchers in the years to come. Indeed, the future of animal cell culture is a bright one, and we certainly hope *Animal Cell Bioreactors* will play a role in this exciting march into the future.

We thank the contributing authors for their enthusiasm, encouragement, and efforts in making this project possible. To the staff at Butterworth–Heinemann, we are grateful for their patience and assistance during the preparation and publication of this book.

Chester S. Ho Daniel I.C. Wang

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Historical Development of Animal Cell Bioreactors

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