

# **INTRODUCTION TO CELL CULTURE FOR ENGINEERING**

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Edited By

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Mohd Azmir Arifin



IIUM Press

Published by:  
IIUM Press  
International Islamic University Malaysia

First Edition, 2011  
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Perpustakaan Negara Malaysia Cataloguing-in-Publication Data

Maizirwan Mel, Mohd Azmir Arifin  
Introduction To Cell Culture For Engineering  
Maizirwan Mel, Mohd Azmir Arifin  
Include Index  
ISBN 978-967-418-124-6

ISBN 978-967-418-124-6

Member of Majlis Penerbitan Ilmiah Malaysia - MAPIM  
(Malaysian Scholarly Publishing Council)

Printed by:  
IIUM PRINTING SDN. BHD.  
No. 1, Jalan Industri Batu Caves 1/3,  
Taman Perindustrian Batu Caves,  
Batu Caves Centre Point,  
68100 Batu Caves,  
Selangor Darul Ehsan

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# Foreword

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Animal cell technology has emerged as one of the most important branch of biotechnology. The use of animal cell is increasing exponentially and has become an essential tool in nearly all biological and medical research laboratories. Animal cell has major advantage over its bacterial cell counterpart as the system has advanced metabolic network that can support the synthesis of large glycoproteins. Not limited to glycoprotein production, the applications of animal cell also has expanded to much wider areas as it is now used for many advance studies such as expression of different cloned genes, regulation of gene function, gene amplification, detailed analysis of toxic mechanism of action at cellular level, production of a variety of biomolecules at an industrial scale and screening of various useful materials like vaccines, antiviral agents and anticancer agents etc.

In this book, the information of cell and virus culture is presented with relevant methodology in a very concise format. Topics that have been covered in this book are the origin of cell culture, types of cell lines, mode and phases of culture, culture medium, serum free medium, bioreactor for animal cells, modes of bioreactor operations, microcarrier technology and virus culture.

It is my sincerest hope and prayer that this book can become a great reference to both novice and professional animal cell culturists for many years to come. I wish to thank everyone that has contributed to the publication of this book and also would like to take this opportunity to express my deepest appreciation to Assoc. Prof. Dr. Sharifah Syed Hassan for her advices and assistances throughout the editorial process.

Maizirwan Mel





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# List Of Abbreviations

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ATCC	American Type Culture Collection
BCEFi	Breast-derived CEF Immortal
CAV	Chicken Anemia Virus
CEF	Chicken Embryonic Fibroblast
CPE	Cytopathic Effect
CO <sub>2</sub>	Carbon Dioxide
DEAE	Diethylaminoethyl
DF-1	Douglas Foster
DMEM	Dulbecco's Modification of Eagle's Medium
DMSO	Dimethyl Sulfoxide
DNA	Deoxyribonucleic Acid
EBV	Epstein-Barr Virus
EDTA	Ethylenediaminetetraacetic Acid
EID <sub>50</sub>	50% Embryo Infectious Dose
EGF	Epidermal Growth Factor
FBS	Fetal Bovine Serum

FCS	Fetal Calf Serum
FGF	Fibroblast Growth Factor
HA	Haemagglutination Assay
HAU	Haemagglutination Assay Unit
HCEFi	Heart-derived CEF Immortal
HCl	Hydrochloric Acid
HeLa	Human Cervical Carcinoma
HEPES	4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid
HGF	Hepatocyte Growth Factor
HIV	Human Immunodeficiency Virus
IGF	Insulin-like Growth Factor
KGf	Keratinocyte Growth Factor
MDCK	Madin-Darby Canine Kidney
MDV	Marek Disease Virus
MEM	Minimum Essential Medium
MOI	Multiplicity of Infection
MSB-1	Marek's disease virus (MDV) transformed CD4 T cell line
NaOH	Sodium Hydroxide
NIH	National Institute of Health
PBS	Phosphate Buffered Saline
PCR	Polymerase Chain Reaction
PDGF	Platelet Derived Growth Factor

PFU	Plaque Forming Unit
PP	Plastic Plus
PTFE	Polytetrafluoroethylene
RBC	Red Blood Cells
RNA	Ribonucleic Acid
RPMI	Rosewell Park Memorial Institute
RT-PCR	Reverse Transcriptase Polymerase Chain Reaction
SBM	Serum Based Medium
SFM	Serum Free Medium
TCID <sub>50</sub>	50% Tissue Culture Infective Dose
TGF	Transforming Growth Factor

