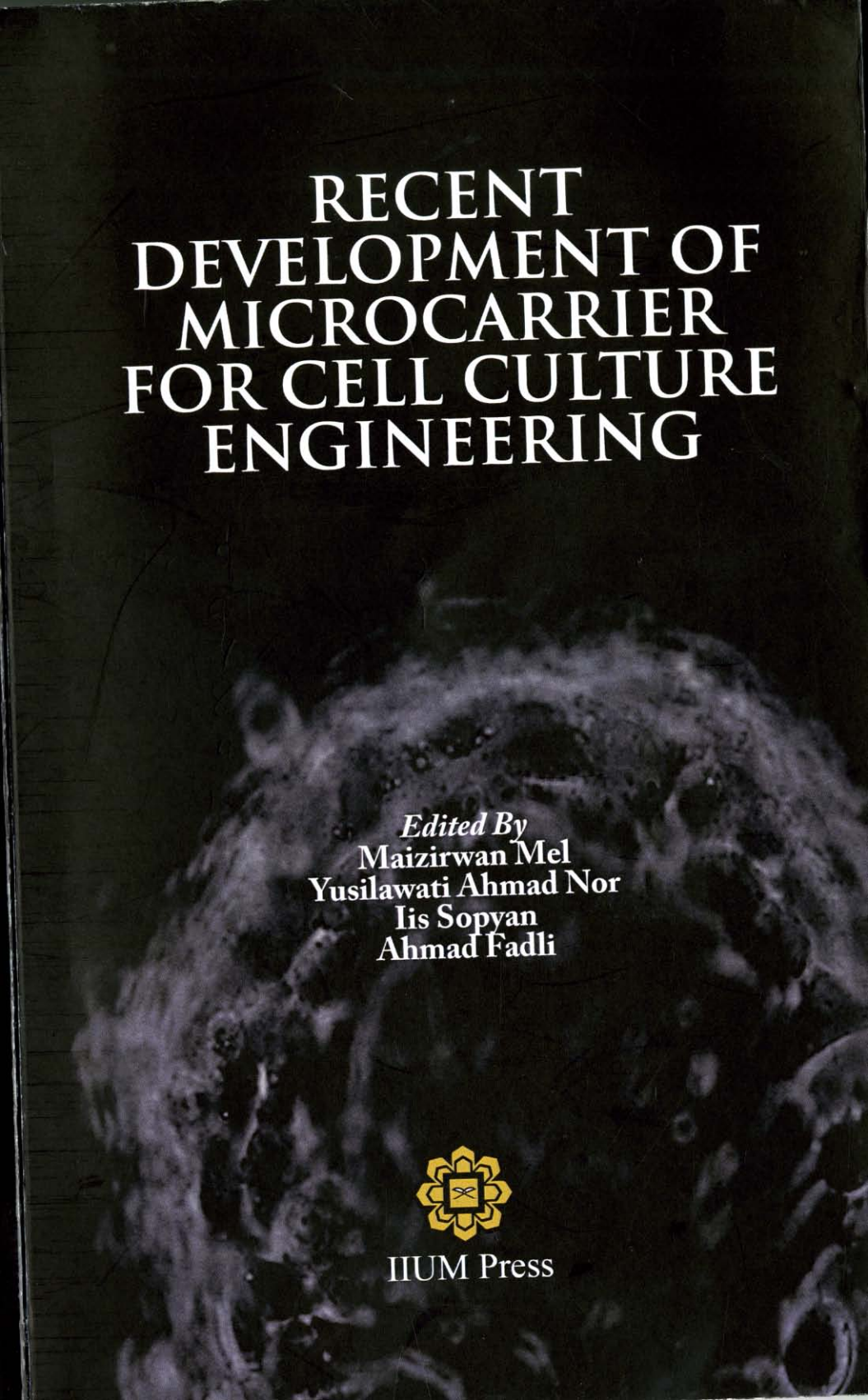
RECENT DEVELOPMENT OF MICROCARRIER FOR CELL CULTURE ENGINEERING



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Chapter 14

Optimization of Process Conditions for High Cell Density Proliferation of DF1 Cells in Bioreactor

Maizirwan Mel, Mohd Azmir Arifin, Hajar Naemah Sohif and Sharifah Syed Hassan

1. Introduction

DF-1 cells which was discovered by Douglas N. Foster is a spontaneously immortalized continuous cell line derived from chicken embryonic fibroblast, CEF (Kim et al., 2001). The cell line is widely used in various researches as it has rapid cell proliferation and useful as substrates for virus propagation, recombinant protein expression and recombinant virus production (Freshney, 2005). The cell line is anchorage dependent thus it requires surface for attachment (e.g. microcarrier beads) when cultured in stirred tank bioreactor (Himly et al, 1998). In this study, growth of DF-1 cells in bioreactor will be optimized by manipulating several process parameters.

2. Methodology

Dulbecco's Modification of Eagle's Medium (DMEM) supplemented with 7% fetal bovine serum was used to culture and maintain DF-1 cells. By using STATISTICA® software, 3**(3-1) Fractional Factorial Design was generated and was used to assist the cell growth optimization study. Three parameters that were chosen to be manipulated in nine