

# CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME III

Editors:

Md. Zahangir Alam  
Ahmed Tariq Jameel  
Azura Amid



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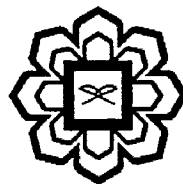
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**Department of Biotechnology Engineering  
Faculty of Engineering  
International Islamic University Malaysia**



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## CHAPTER 1

### OPTIMIZATION OF EXTRACTION PROCESS PARAMETERS FOR ANTI-CANCER AGENT FROM *SOLANUM LYCOPERSICUM*

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#### ABSTRACT

In the fight against cancer, novel chemotherapeutic agents are continually being sought to complement existing drugs. The optimize extraction process is required to ensure that the maximum yield of anti-cancer agents will be extracted. In this study, three extraction parameters were investigated on their effects toward the anti-cancer activities when applied to MCF-7 breast cancer cell line. A three-factor and three levels Box Behnken design consisting of seventeen experiments was employed including five replicates at the center point. The response variable will be the absorbance reading at 490 nm in terms of percentage cell viability. The design variables were the extraction time (min), extraction agitation speed (rpm) and solvent composition (% v/v water/methanol). The optimum extraction was found to be 82% methanol, 24 hours and 110 rpm.

*Keywords: Box Behnken design; design of experiment; Solanum lycopersicum*

#### INTRODUCTION

Cancer is one of the main human killer diseases around the globe which need to be addressed seriously. In the year 2000, for breast cancer alone there were 1,050,346 cases reported with 372,969 deaths (Ferlay, 2001). According to the National Cancer Institute, USA, it is estimated that 11,150 women will be diagnosed with and 3,670 women will die of cancer of the cervix uteri in 2007. It is an indication that there is an