

CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME III

Editors:

Md. Zahangir Alam
Ahmed Tariq Jameel
Azura Amid



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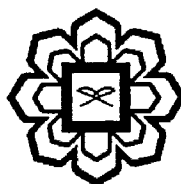
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**Department of Biotechnology Engineering
Faculty of Engineering
International Islamic University Malaysia**



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CHAPTER 9

OPTIMIZATION OF PROCESS CONDITION FOR *E. COLI* FERMENTATION PRODUCING NUCLEOCAPSID PROTEIN-AVIAN INFLUENZA VIRUS (NP-AIV)

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INTRODUCTION

Avian influenza, or also known as bird flu, is a disease caused by the avian influenza virus. From the name bird flu, avian influenza disease occurs in birds. Generally, the avian influenza viruses are being carried and present in the intestines of wild birds but they do not get sick because of it. However, sickness and death will happen to domesticated birds that are infected with the avian influenza virus. This is due to the fact that avian influenza is a highly contagious disease affecting almost all kinds of birds.

In this research, the *E. coli* obtained was cloned such that it will produce antigen from the Avian Influenza virus (H5N1). Theoretically, the recombinant antigen produced is expected to be able to induce an antibody production against the antigen, thus producing antibody against the H5N1 virus.

Experiments were carried out in batch process in bioreactor to optimize the *E coli* fermentation using different control condition for production of Nucleocapsid Protein of Avian Influenza Virus (NP-AIV). The process condition has been designed using Taguchi's method with three factors and two levels. From four experiment, at run number three where the condition of airflow rate of 2vvm, agitation rate of 300 rpm and pH of 7.4 gave the highest specific growth rate, μ and doubling time, t_d which are 0.0069 (min^{-1}) and 100.46 minutes, respectively, and result in the second highest of $Y_{X/S}$ and $Y_{P/S}$ which are 0,0042 g/g, and 1.2997 g/g, respectively.