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**BIOPROCESSING OF RECOMBINANT  
E.COLI PRODUCING  $\beta$ -GLUCURONIDASE  
ENZYME**



**IIUM Press  
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA**

# **Bioprocessing Of Recombinant *E. coli* Producing $\beta$ -Glucuronidase Enzyme**

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Edited By

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# Chapter 2

## **Improvement of Recombinant *Escherichia coli* Fermentation Producing $\beta$ -Glucuronidase Enzyme by Taguchi's Design**

*Maizirwan Mel, Hamzah Mohd Salleh, Mohd Ismail Abdul Karim  
and Mior Haslem Mior Rushidi*

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### **1. Introduction**

Fermentation is any process involving the mass culture of microorganisms, either aerobic or anaerobic. It is easy to do at small-scale level such as culture tubes, shake flasks, and stirred fermentor. Those bioreactors usually have a capacity of less than 3 liters. However, in a big-scale process using high volume capacity bioreactor, the process is complicated because the factors that may negligible in small-scale able to influence the large-scale production. Factors such as hydrodynamic, oxygen partial pressure, agitation speed, pH, and temperature affect the process by a large margin. Therefore, all these factors should be considered and analyzed during the small-scale production. All factors can be concluded in studying the growth kinetics and modeling of the process where it is used in scale up design. Any problems, shortcomings and failure can be anticipated by stimulating the process by using a mathematical model. Thus, a well sought strategy can be done to design an efficient and effective large-scale fermentation process.