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ISOLATION AND MOLECULAR CHARACTERIZATION OF L-GLUTAMINASE PRODUCING BACTERIA ISOLATED FROM RED CLAY SOIL IN PUNCAK ALAM SELANGOR

By

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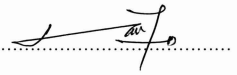
DECLARATION

I hereby declare that this thesis is my original work and has not been submitted previously or currently for any other degree at UiTM or any other institutions.



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ABSTRACT

L-glutaminase was found as an effective enzyme in medical and food industry especially for cancer therapy and flavor enhancing agent become a remarkable attention for seeking more information of its uses and application as well as its origin of production. Various L-gutaminase producers from different sources have been studied from the past years. The aim of this study is to isolate L-glutaminase producing bacteria from the red clay soil using microbiological and molecular technique. L-glutaminase producer have been isolated from rapid screening culture using submerged fermentation method. Bacteria DNA of positive L-glutaminase producer were extracted and PCR was carried out to amplify 16S rDNA gene. PCR products were sequenced and the nucleotide sequence were determine using BLAST program in NCBI website. Out of 36 bacteria isolated, 4 bacteria were positive in screening test. Result of sequencing showed *Comamonas sp*, *Stenotrophomonas sp* and *Pseudomonas sp* were isolated. This shows that red clay soil has been inhabitant by L-glutaminase producing bacteria.

Key words: Bacteria L-glutaminase, L-glutamine, therapeutic enzymes, red clay soil, 16S rDNA

CHAPTER 1
INTRODUCTION

1.1 Background

Cancer is a type of disease that caused by uncontrolled growth of abnormal cells which may affect any part of body. The spreading of these rapid growth cells will interfere with the normal cells environment thus leads to the failure of organ function and subsequently lead to death (Mustaffa, Musa, Abu, & Yusof, 2012). The latest report on the incidence of cancer worldwide updated by WHO on February 2015, indicates that 14 million new cases of cancer with 8.2 million deaths were reported since 2012. The statistics were expected to increase about 70 % in the next 20 years. In fact, about 60 % cases were reported from Africa, Asia and Central and South America that contributed about 70 % of total cases worldwide. On the other hand, report by WHO for incidence of cancer in Malaysia until 2012, about 29321 cancer cases were reported that affected both sexes (World Health Organization, 2015). Cancer becomes the third leading disease in Malaysia after cardiovascular and infectious diseases (Kean *et al.,* 2014).

Many studies have been conducted and relate the causes of cancer with many factors including lifestyle, environmental and also genetic factors. These factors are then further categorized into internal and external factors (Hesketh, 2012). The external factors include the effect from tobacco consumption, chemicals, radiation, as well as from infectious organism whereas the internal factors may be due to inherited genetic mutation, hormonal changes, immune condition and also sudden mutation that caused changes in metabolism in cell growth (Cotter *et al.,* 2007). The above factors may activate oncolytic genes that already presence in humans and thus causes proliferation and growth of the cancer cells. Many treatments have been implemented to cure cancer especially for the rapid growth of malignant cancer cells but its efficiency to treat cancer is still doubtful. The common treatment such as chemotherapy, steroids, radiation, intensive combined treatment such as bone marrow and stem cells transplant still not