

UNIVERSITI TEKNOLOGI MARA

**IDENTIFICATION OF DIFFERENTIALLY EXPRESSED GENES IN
A LUNG CANCER CELL LINE, A549 TREATED WITH GELAM
HONEY**

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ABSTRACT

Lung cancer has become one of the most deadly cancers in the world. One of the main causes of cancer is reactive oxygen species (ROS) in which it causes the increase of oxidant as compared to antioxidant. This imbalance can contribute to cancer pathogenesis. This study aims to know the differentially express gene of lung cancer cell line, Human Lung Adenocarcinoma Epithelial Cell Line 549 (A 549) when being treated with Gelam honey. Gelam honey is chosen in this research as it contains high amount of flavonoid and phenolic compounds which act as antioxidants and free radical scavenger. The amplification of lung cancer cell line A 549 by using GeneFishing™ DEG Premix Kit shows the down-regulated gene of cell treated with Gelam honey as compared to the untreated cell. The gene was successfully clone by using TOPO TA Cloning® Kit for Sequencing to identify the differentially express gene.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Cancer is a type of disease in which the cells grow uncontrollably. There are many types of cancer and it depends on where the cancer cells initiated ("Lung Cancer.org :: About Lung Cancer," 2012). With the high technologies that have been developed, cancers are curable. There are many choices of treatment to stop cancer such as chemotherapy and gene therapy. Initially, gene therapy was only useful for situations where an individual is suffering from the effects of a genetic disease caused by a mutation in a specific gene (Latchman, 2001). Nowadays, gene therapy can be used to replace, supplement or alter a patient's cellular genetic makeup to restore, correct or enhance certain biological functions (Liau, Su, & Dixon, 2001). Gene therapy of tumor cells could result in correction of their abnormal growth and reestablishment of apoptosis, or in increased radiation or drug sensitivity of the tumor cells (Toloza, 2005).

There are three important classes of genes that play roles in cancer initiation: tumor suppressor genes, proto-oncogenes, and genes involved in DNA repair mechanisms. Amplifications mutations, or deletions in these genes may lead to a de-coupling of biological mechanisms involved in the regulation of normal cell growth and differentiation that can contribute to pathogenesis of cancer (Tysnes & Bjerkvig, 2007).

This study aims to know the differentially express gene of lung cancer cell line, A 549 when being treated with Gelam honey, a Malaysian honey. There are many researches that have been done on honey. Honey is a natural substance with many medicinal effects