UNIVERSITI TEKNOLOGI MARA

ISOLATION OF APOPTOSIS-RELATED GENES IN A549 LUNG CANCER CELL LINE TREATED WITH GELAM HONEY

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ABSTRACT

Differentially expressed genes in the A549 lung cancer cells identified using GeneFishing™ DEG Premix Kit. These genes then were further analysed by cloning and sequencing. The methods were able to successfully clone and identify differentially expressed gene and further validation is required to validate the expression of this gene in A549 cells upon treatment with honey either by Northern blot or real-time PCR. Numerous studies on the benefits of honey have been reported in the literature. They were also reported to cause apoptosis in cancer cells.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Cancer continues to be a worldwide killer. Cancer is caused by both internal factors (such as inherited mutations, hormones, and immune conditions) and environmental factors (such as tobacco, diet, radiation, and infectious organisms) (Anand et al., 2008). This research aims on lung cancer whereby smoking is the main causative agent in all types of lung cancers (Pore, Hiltermann, & Kruyt, 2010). In addition, it is preventable and requires lifestyle changes (Anand et al., 2008). Oxidative stress becomes one of the factors contributing to occurrence of lung cancer. Therefore, antioxidants are important in overcoming unbalance of oxidants and antioxidants in the body.

This research focuses on the use of Gelam honey in inducing apoptosis in A549 lung cancer cell line. Besides, research on action of Gelam honey in inducing apoptosis and anti-proliferative activity in liver cancer cells has been done. The content of phenolics and flavonoids in honey contributes to changing of gene expression in cancer cell (Jaganathan & Mandal, 2009, Jubri & Karim, 2012).

Overexpression of oncogenes, loss of tumor suppressor genes and amplification of chromosome copy number have all been associated with carcinogenesis (Singhal, Miller, Ramalingam, & Sun, 2008). Gene expression in both treated and untreated cancer cells with honey is different. This is because of apoptosis has occurred in treated cancer cells. Thus, it is crucial to undergo gene expression analysis in order to identify difference in gene expression.