DETERMINATION OF TUMOR NECROSIS FACTOR - α LEVEL IN PERIPHERAL BLOOD MONONUCLEAR CELLS TREATED WITH *GYNURA PROCUMBENS*

By

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Thesis Submitted in Partial Fulfillment of the Requirement for Bachelor of Medical Laboratory Technology (Hons.), Faculty of Health Sciences, Universiti Teknologi MARA

JULY 2016

ACKNOWLEDGEMENT

In the name of Allah SWT, the most Beneficent, the most Merciful, all praise to Allah SWT for all incredible gift endowed upon me and for giving the health and strength to proceed the study and enable me to complete this thesis. I would like to take this opportunity to express my sincere appreciation and gratitude to everyone who has contributed either directly or indirectly throughout this project especially to my supervisor, Mr Nazri bin Abu and Mr Wan Shahriman Wan Yushdie as my co-supervisor for the consistent consultation, invaluable advice, guidance and enthusiasm given for this project. I also would like to express my appreciation to Universiti Teknologi MARA (UiTM) because this project was supported by Research Acculturation Grant Scheme (RAGS) UiTM. RAGS number : RAGS/1/2014/SKK10/UITM/12.

Thousands of thanks and great appreciation to my parents, Kamaludin bin Daud and and also to my beloved siblings for their financial support, prayers, expectations and encourage for my success. I also like to take opportunity to thanks to Lab Staff, BMS Diagnostics (M) SDN BHD Staff and all Postgrad students at Postgrad Laboratory, Level 6, FSK 1, 5.

Last but not least, I would like to say brilliant thanks to all my group members, Muhammad Azim Aizuddin Shokhimi, Zuraini Danial, Hanalene Deliza Husaini, Nurul Nadirah Nadzri and other friends for their ideas, suggestions and assistance me for completing this project. “May Allah bless and reward them for their generosity”.

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Abstract

DETERMINATION OF TUMOR NECROSIS FACTOR - α LEVEL IN PERIPHERAL BLOOD MONONUCLEAR CELLS TREATED WITH *Gynura procumbens*

Gynura procumbens is plant come from family of Asteraceae and is an annual evergreen shrub that grows plenteous in Southest Asia area such as Malaysia, Thailand and Indonesia. G. procumbens is traditionally used for treatment of kidney disease, cancer, rash, constipation, migrains, hypertension, eruptive fevers and diabetes mellitus. The following project was conducted to study the determination of Tumor Necrosis Factor – α (TNF – α) level in Peripheral Blood Mononuclear Cells (PBMC) when treated by using *G.procumbens*. *G.procumbens* leaf was extracted by aqueous and ethanolic method with different concentration (50 µg/mL, 200 µg/mL and 800 µg/mL). Fresh human blood then layered with Ficoll using density gradient separation segregation method to separate the red blood cells and white blood cells. Then at cell culture method, *G.procumbens* ethanolic and aqueous extraction and PBMC will be added to different comparing group. RPMI used as a media, Polymyxin B as a LPS inhibitor and CLI 0.95 acts as TLR4 inhibitor. The level detection of TNF – α was determined by using Luminex® Magnetic Assay. Even though, comparing with aqueous and ethanolic extraction with different concentration (50 µg/mL, 200 µg/mL and 800 µg/mL), there was no exact value in the expression of TNF – α when detection by using Luminex® Magnetic Assay. For that reason, statistical analysis by using SPSS method was unnecessary to be calculated. The result proved that *G.procumbens* is safe to be consumed by humans because *G.procumbens* does not show effect on the production of TNF – α because it is the one of the pro-inflammatory cytokines which is important in signaling and promote systemic inflammation.). In contrast, *G.procumbens* exhibit in function as TNF – α inhibitor while TNF – α is vice versa.

CHAPTER ONE

INTRODUCTION

1.1 Background

Herbal medicines are now gaining popularity in developing countries as the remedies are believed to be harmless. The remedies of the plant is natural and commonly used by the locals (Rosidah *et al.*, 2009). In Southeast Asia, herbal plants are commonly used as an alternative choice to treat certain diseases. One of the plants that are commonly used as herbal remedies is *Gynura Procumbens*. *G.procumbens*, also known by local as 'sambung nyawa', is an annual evergreen shrub with a fleshy stem and purple tint. This plant is mostly found in Borneo, Java, and Peninsular Malaysia. *G.procumbens* leaf is known as non-toxic and it has been used to treat many diseases such as diabetes, kidney disease, hypertension and cancer (Rosidah *et. al*, 2009). The plant has the highest total of flavonoid contents and exhibits the highest antioxidative content (Kaewseejan & Siriamornpun, 2015). A number of studies have been conducted regarding the pharmacological activities of *G.procumbens*. (Iskandar *et. al.*, 2002) stated that the leaf or aerial part of *G.procumbens* showed an inflammatory and (Abrika et al. 2013) stated that *G.procumbens* can be used an alternative medicine against increasing of blood pressure.

It is believed that several plant polysaccharides have been recognized for their potent immune-stimulating activity which has an ability to enhance activation of macrophages (Scheptekin and Quinn, 2006). Polysaccharide-mediated immune cells stimulation happens by binding of to various cell surface receptors or activation of intracellular signalling pathway (Hsu *et al.*, 2004). Lipopolysaccharide (LPS) is a major component of outer wall of gram negative