



اُنِيُوْ تِكْنُوْلُوْجِيْ مَارَا
UNIVERSITI
TEKNOLOGI
MARA

**EFFECT OF *Gynura procumbens* AQUEOUS EXTRACTION ON
INTERLEUKIN-2 PRODUCTION IN PERIPHERAL BLOOD
MONONUCLEAR CELLS**

By

NADIRAH ANIS BINTI CHE ABDULLAH

**Thesis submitted in Partial Fulfillment of The Requirements for
Bachelor Of Medical Laboratory Technology (Hons),
Faculty Of Health Sciences, Universiti Teknologi Mara**

2016

ACKNOWLEDGEMENTS

First of all, I would like to express my grateful to Allah SWT for the blessing, where I am finally finished this research and able to complete the report on the time. I would like to take this opportunity to express my sincere appreciation to individuals, who have made an important contribution to this thesis. Hence, I would like to state my special and greatest gratitude to lecturers, friends and families who have been very enduring and appreciative throughout of my research time. For their assists and supports, I am especially grateful for the following person:

- En Wan Shahrman Yushdie Wan Yusoff (supervisor) for his encouragement, advice and support from the beginning of my Final Year Project until the completion of this thesis.
- En Mohd Nazri Abu (co-supervisor) for his advice, ideas and opinion for completing this thesis
- En Che Abdullah Che Soh and (parents) for their encouragement, moral support, patience, motivation, prays and understanding of my needs and requirements during completing this research.
- Lab assistant, Pn Iadah and staff at Unit Kesihatan UiTM Puncak Alam for their contribution to draw blood from blood donor for our lab work.
- My group members for their commitment, moral support and helping all lab work from beginning until completion of this thesis.
- All of my friends and my lecturers for their support, encouragements, ideas and opinion.
- To other department, Pn Farhana Misripin and Pn Mastura at Faculty Pharmacy to assist and help us during the lab work process.

TABLE OF CONTENTS

DECLARATION	ii
INTELLECTUAL PROPERTIES	iii
ACKNOWLEDGEMENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF ABBREVIATION	xiii
ABSTRACT	xv
CHAPTER 1: INTRODUCTION	1
1.1 Background	1
1.2 Problem statement	4
1.3 Significant of study	5
1.4 Research objectives	6
1.4.1 General objective	6
1.4.2 Specific objectives	6
1.5 Hypothesis of study	6
CHAPTER 2: LITERATURE REVIEW	7
2.1 Immune system	7
2.2 Immunomodulatory activity	8
2.3 Toll-Like Receptor 4	9
2.4 Interleukin-2 and its role	11
2.5 Relationship between immunomodulatory activities with medical herbal	12
2.6 <i>Gynura procumbens</i>	13
2.6.1 Medicinal properties of <i>Gynura procumbens</i>	14
2.6.2 Active phytochemical constituents from <i>Gynura procumbens</i>	16
2.7 Peripheral Blood Mononuclear Cells	17
2.8 Ficoll Density Gradient Centrifugation	17
2.9 Luminex Screening Human Magnetic Assays	18

ABSTRACT

Background: Immunomodulation is a process which can modify the immune system of an organism by intruding with its function. Medicinal herbs and their bioactive component had indicated to be a crucial source of immunomodulators. Research has proven that the herbal preparation from plant can be safer and effective rather than conventional medicines. **Objective:** In this study, we want to determine the effect of *Gynura procumbens* aqueous extraction on Interleukin-2 expression in Peripheral Blood Mononuclear Cells. **Method:** Three different doses (50, 200 and 800 µg/ml) of *Gynura procumbens* are cultured on PBMCs with or without inhibitors (CLI-095 and Polymyxin B sulfate) to determine the expression of the IL-2 using Luminex assay. **Result:** Result indicated *Gynura procumbens* aqueous extraction has immunomodulatory effect. Data was analyzed using one-way analysis of variance (ANOVA) to compare between control group and treated groups of different doses of *Gynura procumbens* were not significantly different ($P > 0.005$), as well as co-treatment with inhibitors which analyzed using Independent sample t-test also shows not significantly different ($P > 0.005$). **Conclusion:** *Gynura procumbens* aqueous extract has an immunomodulatory effect in PBMCs on expression of IL-2.

Keywords: Immunomodulatory, *Gynura procumbens*, Peripheral Blood Mononuclear Cells, Interleukin-2.

CHAPTER 1

INTRODUCTION

1.1 Background

In the past couples of decades, the growing interest regarding the health care issues has increased due to lifestyle changes in the current time shows increased risk of many chronic ailments such as diabetes, cancer, cardiovascular disease and hypertension. Furthermore, the treatment with modern medicine occasionally cannot cure those diseases instead causes unwanted side effects. Hence, the application of natural products from plants as a remedy of the disease is widely used in various regions, especially in Asia (Bodeker, 2000).

Plants are a rich source of natural chemical which provide us foods and medicines. The plants with medicinal alternatives are known as medicinal herbs because they have the chemicals with the medicinal value. The usage of medicinal herbs has been a long time by record about 60,000 years ago (Solecki, 1975). Nowadays, science and technology diversity medical services and medicines assumed that 80% of the world population still used medicinal herbs for their treatment (van Wijk, 2000). In the Far East, Chinese medicines relish a significant place in health care with 80 % and more of them coming from plants (Lee, 2000). In the western world, which is known as the birthplace of modern medicine, they had replaced the medicinal herbs to synthetic drugs in the healthcare and scientific community. In addition, the medicinal herb is a cause of new drug development with evidence about 40% of the medical drugs has chemistry of the medicinal herbs. In United State, the medicinal herbs are consumed without prescription as a dietary supplement (O'Hara et al., 1998; Bent and Ko, 2004).