

CHAPTER I

INTRODUCTION

Macrophages play important roles in initiation, maintenance and resolution of inflammation. Macrophages have 3 major functions. They are antigen presentation, phagocytosis and immunomodulation.

Macrophage is antigen presentation for T cell to recognize antigen, these antigens must be processed and presented on the surface of an antigen-presenting cell such as dendritic cell, macrophage and B cells. Macrophage does its function by engulfing the antigen, then processing it into small pieces and combining the antigen fragment with special membrane proteins. The antigen complexes are then displayed on the cell surfaces where T lymphocytes (T helper cells) are recognized and become activated by them.

Phagocytosis occurs when an inflammatory process is triggered by an injurious stimulus (e.g. infection, antibodies, physical injuries). Macrophages are early responders to an acute inflammation. They are phagocytes that engulf and degrade microorganisms. Macrophages are covered with a variety of receptors on their cell surfaces. Fc receptors help macrophages locate antigens that have been coated by antibodies, integrins and selectins receptors help macrophages stick to capillary walls and move to tissue.

Apart from their phagocytic function, macrophages possess an important secretory function. They secrete NO and various cytokines including IL-1 β , IL-6, IL-12 and tumor necrosis factor alpha (TNF- α). These cytokines promote inflammation and the activity of other white blood cells e.g. neutrophils and lymphocytes. Macrophages also secrete a number of proteins which are important in inflammation and wound healing e.g. COX, collagenase, elastase, and fibroblast growth factor (Copstedt-lee-Ellen C, 2005).

At present, most of the new anti-inflammatory drugs are focussing on the macrophage function since they are involved and play key roles in the inflammatory process. *Glycosmis parva*, a Thai herbal plant found in all parts of Thailand, is the plant

of our interest since the constituents in which mostly found have been investigated for their pharmacological effects e.g. antimalarial effect, anti-proliferative effect, and anti-inflammatory effect. The potential of this plant on the secretory function of the macrophages in key inflammatory cytokines and proteins are performed in this study.

Objectives of the study

To investigate the effect of *Glycosmis parva* solvent extraction on NO production, expressions of pro-inflammatory cytokines, iNOS and COX-2 in LPS stimulated-macrophages.

Expected benefits and applications

The results obtained from this experiment would clarify the effect of *G. parva* on LPS – stimulated macrophages which may be benefit for scientists to do further researches on its potential for anti-inflammatory actions. In addition, investigation of herbal medicines would bring about the evidence to support development of drugs from natural substances which is one of the national drug development policy.

Research design

Experimental research

Keywords

Glycosmis parva

TNF- α

IL-1 β

IL-6

iNOS

COX-2