

THE ROLE OF POLYSACCHARIDE KRESTIN FROM *Coriolus versicolor* MUSHROOM ON IMMUNOGLOBULIN ISOTYPE OF MICE WHICH INFECTED BY *Mycobacterium tuberculosis*

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ABSTRACT

This research was aimed to determine the role of polysaccharide krestin (PSK) with different timing on levels and types of mice immunoglobulin (Ig) isotype which infected by *Mycobacterium tuberculosis*. This research used 30 adult female mice of *Mus musculus* strain, polysaccharide krestin was isolated from *Coriolus versicolor* mushroom, and for infection used *Mycobacterium tuberculosis* H37Rv (ATCC 27294 T) strain. Provision of polysaccharide krestin was done over 7 consecutive days via gavage. *Mycobacterium tuberculosis* infection was done 2 times with an interval of 1 week via intraperitoneal. Immunoglobulin isotype serums were analyzed using the ELISA test and the results were analyzed descriptively through the color reaction and OD values. The result showed the highest levels of immunoglobulin was found in the provision of PSK before and after *Mycobacterium tuberculosis* infection with total 6.280 of OD Ig isotype. Immunoglobulin isotype dominant was IgM with lambda light chain. The conclusion of this research was PSK increased mice Ig isotype levels at the time of provision before, after or before and after infection *Mycobacterium tuberculosis*. Ig isotype which was formed i.e. IgM, IgA, IgG2b, IgG3, IgG2a, IgG1 with kappa and lambda light chain.

Key words: Polysaccharide krestin, *Mycobacterium tuberculosis*, immunoglobulin isotype

INTRODUCTION

Tuberculosis (TB) is still become a serious problem in the world^[12]. This bacteria is divided into extracellular and intracellular bacteria^[2]. Specific response against extracellular bacteria with produce antibodies by B cells. While in response against intracellular bacteria, the response that happens is the cellular immune response (T cell)^[7]. However, intracellular bacteria can induce the development of T cells into Th1 cell phenotype then also can stimulate antibody production by B cells [5].

In the early formation of immunoglobulin molecules (antibodies) by B cells is stimulated by antigen^[9]. In mice, the class of immunoglobulin (Ig) based on the H-chain (heavy chain) consists of IgM, IgG, IgA, IgD, and IgE. In mice, IgG consists of four subclasses i.e. IgG1, IgG2a, IgG2b, and IgG3^[23]. In addition, there are 2 types of L-chain (light chain), namely kappa (κ) and lambda (λ)^[19].

Some researchers use the immunomodulator as an adjunctive therapy for tuberculosis^[18]. *Coriolus versicolor*

is a mushroom that commonly used in the treatment of disease. Various active components are isolated from this mushroom, both taking from fruiting bodies or culture mycelium. Active components that are important in the treatment are polysaccharide krestin (PSK) and polysaccharide peptide (PSP). Both PSK and PSP consist of active compounds named β -glucan^[16]. Beta (β)-glucan plays a role to activate macrophages and stimulate B cells in the process of antibodies production^[3]. Beta glucan increase the production of important *cytokines* there is interleukin-2 (IL-2) which stimulates the differentiation of B cells which are active^[29] then the active B cell differentiation into plasma cells (clones plasma) which can produce immunoglobulin^[30].

Looking at the capabilities of the PSK on the modulation of immune responses and saw its consumed in a long time in the community without significant side effects, the researcher wanted to investigate how the levels and kinds of immunoglobulin isotype of mice which infected by *Mycobacterium tuberculosis* on providing PSK with