IMMUNOGENICITY ASSAY OF KatG PROTEIN FROM *Mycobacterium tuberculosi*s IN MICE: PRELIMINARY SCREENING OF TB VACCINE

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The tuberculosis (TB) disease is still widely found even though BCG vaccine given to many people. Ineffectiveness of the BCG vaccine is one of causes that make the difficulties in preventing TB transmission. Objective of the research was to determine the immunogenicity of KatG protein of M. tuberculosis clinical isolate L19 in mice. The KatG protein as antigen was prepared by expression of the katG gene of M. tuberculosis clinical isolate L19 in Escherichia coli BL21 using pColdII-DNA vector. After purification by affinity chromatography, the KatG was vaccinated to mice to detect its immunogenicity. The expression of katG in E. coli BL21 could result in KatG protein with molecular weight 80 kDa in sodium dodecyl sulfate gel electrophoresis (SDS-PAGE). The pure KatG protein could significantly stimulate the immune response of mice by triggering the antibodies production of IgG1, IgG2a, IgG2b, IgG2c, IgG3, and IgM. The highest antibody level was obtained when the mice were vaccinated by KatG L19 with the dose of 45 µg/ml. Of the antibodies, the IgG2c isotype was dominantly produced in the blood serum. The KatG protein exhibited a high immunogenicity in mice, so it is possible to develop as a vaccine candidate for TB. A clinical test should be performed in a future to ensure its safety as a therapeutic protein.

K e y w o r d s : KatG, immunogenicity, M. tuberculosis, vaccine, clinical isolate.

Tuberculosis (TB) is a major health problem throughout the world causing a large number of deaths, more than any other single infectious disease, that is caused by *Mycobacterium tuberculosis* infection. There were strategies to reduce the spread of TB including the use of Anti TB therapeutic, but the pandemics of Multidrug-Resistant TB (MDR TB) have emerged since 1990 that causing TB more difficult to treat [1]. Tuberculosis control with preventive actions through the development of a vaccine became one of the main concerns in current TB control program. Bacillus Calmette Guerin (BCG) is a TB vaccine that contains live bacteria that have been weakened (attenuated), it can stimulate the immune system but do not cause disease in healthy people. The BCG vaccine can not be given to people who are clinically immunosuppressed [2]. The BCG is currently used in many countries with a high prevalence of TB to prevent childhood tuberculous meningitis and miliary disease [3]. It is also approved by the FDA for vaccination against tuberculosis and for the treatment of bladder cancer [4]. In spite of the BCG vaccine is used throughout the world, the facts showed BCG is still not effective because the TB cases are still high. The protection provided by BCG varies widely from 0-80%, then it continuously decrease up to 17% in the next 15 years [1]. In an effort to answer those problems, is necessary to develop a new TB vaccine.