

**ABSTRACT**  
**PROTECTIVE CELLULAR IMMUNE RESPONSE TO INDUCTION OF**  
**ADHESIN PROTEIN OF PILI *Mycobacterium tuberculosis* strain H37Rv**

Prevention of tuberculosis has so far been done with the BCG vaccine (*Bacille Calmette-Guerine*). Apparently BCG immunization has failed to provide protection against tuberculosis infection in adults. Therefore, development of the vaccine against tuberculosis, is still requires considering that protective effect of BCG given to adult pulmonary tuberculosis varies around 0-80%.

The development of vaccines based on bacterial surface material called adhesin as a target for vaccine development is beginning to be widely studied. The process of adhesion is one of the virulence properties of bacteria playing an important role for the occurrence of colonization until the onset of infection. *Mycobacterium tuberculosis* has pili, part of bacteria that play a role in adhesion to host epithelial cells, and pili can induce an immune response, on the basis of this mechanism pili can be used as vaccine candidate.

The purpose of this study is to reveal that pili *Mycobacterium tuberculosis* has the hemagglutinin protein which is an adhesin protein, and adhesin protein delivery can induce protective cellular immune responses that can inhibit the growth and colonization of the bacteria *Mycobacterium tuberculosis* in lung tissues.

In this study, SDS-PAGE and hemagglutination testing were performed. Pili protein with molecular weight of 11 kDa, which is a protein of hemagglutinin was obtained, and adhesion testing was conducted, the pili protein of 11kD was adhesin protein. The protein pili of 11kDa adhesin pili with Freund's complete and incomplete adjuvant were administered to mice subcutaneously. The result showed that the protein of 11kDa adhesin pili with adjuvant administered to mice can activate lymphocytes, and after analysis by MANOVA was done, it showed differences in treatments of immunization and organs being examined, in general, have a significant influence on the average number of Natural Killer cells, lymphocytes of TCD4<sup>+</sup> and TCD8<sup>+</sup> and Natural Killer cells, TCD4<sup>+</sup> and TCD8<sup>+</sup> lymphocytes were activated ( $p < 0.05$ ) and secretion IFN- $\gamma$  in the spleen, blood and lung tissue. The result of protectivity of adhesin protein pili in vivo was shown by the colony growth inhibition of *Mycobacterium tuberculosis* in lung tissues.

The conclusion is that protein of 11kDa adhesin pili *Mycobacterium tuberculosis* is protective shown from the bacterial colonies decrease in the lungs of mice.

Keywords : pili, adhesin, *Mycobacterium tuberculosis*, TCD4<sup>+</sup>, TCD8<sup>+</sup> lymphocytes.