

ABSTRACT

NATALIA CHRISTINA. Development of Prototype Kit for Typhus Disease Detection based on Gold Nanoparticles with Antibody Capture Approach. Under supervised by MUKTININGSIH NURJAYADI, ASRI SULFIANTI.

Typhoid fever (typhoid) is a systemic infectious disease caused by the bacterium *Salmonella typhi*. In previous studies, a prototype of a typhoid fever detection device has been developed using an antibody capture approach with the dot blot method which produces 2 brown dots for positive samples of typhoid patients. However, due to the lack of sensitivity in the detection tool, in this study, Fim-C *S. typhi* protein was conjugated with gold nanoparticles and characterized using a UV-VIS spectrophotometer. This study aims to increase the sensitivity of serum antibody detection in typhoid fever prototypes. The results of characterization using UV-VIS spectrophotometer showed an increase in wavelength and absorbance in the conjugate solution, from 520 nm to 530 nm with absorbance from 0.027 to 0.049. The wavelength shift is caused by a bathochromic shift which indicates the conjugation of gold nanoparticles and Fim-C *S. typhi* protein. Furthermore, the test was carried out using an antibody capture approach using the dot blot method, showing that the conjugate solution can recognize antibodies from the serum of typhoid patients marked with a red dot. In addition, cross-reaction testing with *S. typhimurium*, *S. enteritidis*, *Staphylococcus aureus*, and *Shigella flexneri* bacteria did not show a red dot. Based on the results of the dot blot characterization, it can be concluded that the red dot color formed is the result of a reaction between the serum of typhoid patients and *S. typhi* protein which has been conjugated with gold nanoparticles.

Keywords: Typhoid fever, detection tools, antibody capture, recombinant Fim-C *S. typhi* protein, gold nanoparticle