

## ABSTRACT

Based on the data from the Indonesian Ministry of Health, there were 2.4 million Indonesians suffering from chronic Hepatitis C in 2017. The fairly high prevalence raises the urgency to develop vaccines and diagnostic tests. It requires conserved epitope sequences from all genotypes of the Hepatitis C virus (HCV), especially from HCV that infects Indonesian patients, for vaccine and diagnostic kit development. Although there have been many studies on HCV epitopes, no research has predicted and correlated these epitopes with Indonesian HLA data. Therefore, this study aims to predict HCV epitopes with in silico method and test their antigenicity using a molecular diagnostic system. Determination of epitope candidates is carried out using the reverse vaccinology approach. This approach included the search for HCV protein sequences, variability and entropy value analysis, Indonesian HLA I and HLA II receptor analysis, similarity analysis using BLASTp (<https://blast.ncbi.nlm.nih.gov>), and used the IEDB Analysis Resource database to see the novelty of epitope candidates and also mapped the epitopes to epitope B cells. Furthermore, the selected peptides were coated on 96 well microplates and tested for epitope antigenicity using the Enzyme-Linked Immunosorbent Assay (ELISA) method. Chicken IgY that has been previously characterized by using the SDS-PAGE method and Bradford method were used as a control during the coating step. As a positive control for HCV epitopes antibody, we used epitopes from commercial ELISA kits. Fourteen epitope candidates were successfully predicted with in silico test. Two of the fourteen epitope candidates were selected and synthesized. ELISA test results on epitope control and coating control showed positive results, but the two selected epitopes still showed negative results. This indicates that there is no bond between the antibodies used and the two selected epitopes. In this research two HCV epitopes have been successfully designed, but further studies are needed to confirm the antigenicity of the two epitopes.

**Keywords:** ELISA, Epitope, HCV, Prevalence, Reverse Vaccinology.