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An immunoinformatics approach to identify immunogenic peptide of hemagglutinin protein in H1N1 virus

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Influenza virus, which has been frequently associated with human respiratory infections, poses potential threat of widespread pandemics. The most recent outbreaks of Influenza in 2009 was the outcome of triple reassorted H1N1 called swine-origin influenza virus (S-OIV)A/H1N1. In view of the compelling need of a vaccine which is crossreactive against all the existing and eventually appearing strains of H1N1, various efforts have been made to identify conserved epitope as vaccine target. In our study, first we have predicted conserved peptide sequences of hemagglutinin (HA) obtained from all the reported strains of H1N1 using MUSCLE and AVANA tool. Three different epitope prediction tools were used for each Class I and II MHC separately. BLAST screening was employed to eliminate the peptides bearing homology with human proteome. Six out of twenty four epitopes predicted to binding class I HLA and two out of twelve epitopes predicted for Class II HLA were eliminated after BLAST analysis. Finally, ten conserved peptides containing overlapping epitopes for class I MHC and five peptides containing overlapping epitopes for class II MHC were generated. Owing to the extensive polymorphic nature of HLA alleles, population coverage analysis (tool by IEDB) was carried out for the resultant epitopes in the conserved peptides. The predicted average population coverage for class I and class II conserved peptide was 86.36% and 36% respectively. Thus, using immunoinformatics tools, we were able to select the peptide containing overlapping epitopes which may be considered as probable vaccine candidates.

Biography

Manoj Baranwal has done M.Sc from JNU, New Delhi. After that he has completed his PhD in clinical and cellular immunology from Duisburg-Essen University, Germany and continues his postdoc for one year there. He is presently working as assistant professor in Department of biotech & Env Sciences, Thapar University Patiala. He is working on Epitope Based Vaccine design in Influenza Virus (Immunoinformatics based and experimental validation) and Screening of bioactive molecules from endophytic fungi for anticancer activity; Immunomodulatory and Immunosuppressive activity. He has published four international papers in reputed journals and attended several conferences.

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