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Predicted epitopes of HA, NA, and M2 protein using IEDB T-cell epitope prediction tool

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Vaccination against circulating strains of seasonal influenza viruses is known as the primary weapon to battle influenza epidemics. Identification of protective immunogens allows using synthetic peptides as a vaccine. Hemagglutinin, neuraminidase, and M2 protein T-cell epitopes of three influenza virus strains H1N1 (n = 1136), H3N2 (n = 1233), and H5N1(n = 79) were predicted by using IEDB T-cell Epitope Prediction Tool. Predicted epitopes bind to both MHC class I and class II alleles. Epitopes predicted with IC_{50} value lower 50 were selected. Hemagglutinin conserved epitopes in position 360–368 binds to MHC class I alleles HLA-A*29:02, HLA-A*30:02, and HLA-B*15:02; epitope sequence in position 436-444 binds to MHC class I allele HLA-A*02:06. M2 protein T-cell epitope in position 3-11 binds to MHC class I alleles HLA-A*02:01 and HLA-A*02:06, epitope in position 45-53 of M2 protein binds to MHC class I alleles HLA-A*31:01, HLA-A*03:01, and HLA-A*11:01. Neuraminidase epitope in position 38-46 binds to MHC class II alleles HLA-DPA1*02:01/DPB1*01:01, HLA-DPA1*03:01/DPB1*04:02, HLA-DQA1*01:01/DQB1*05:01, HLA-DRB1*04:04, and HLA-DRB4*01:01, epitope of neuraminidase in position 47-55 binds to MHC class II alleles HLA-DPB1*03:01/DPB1*04:01, HLA-DPA1*01/DPB1*04:01, HLA-DPA1*01:03/DPB1*02:01, HLA-DPA1*02:01/DPB1*01:01, HLA-DPA1*03:01/DPB1*04:02, HLA-DPB1*03:01/DPB1*04:01, HLA-DRB1*07:01, HLA-DRB1*11:01, HLA-DRB1*15:01, HLA-DRB5*01:01, HLA-DRB5*01:01, and HLA-DRB1*11:01. Our predicted epitopes by using IEDB T-cell Epitope Prediction Tool confirm referenced epitopes. The epitopes are conserved and have affinity to several MHC class I and II alleles, therefore they can be considered as potential candidates for influenza vaccine. Our further study will be *in vivo* analysis of predicted epitopes in different combinations for finding the most immunogenic combination.

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