In-silico T-cell Epitope Mapping from Antigens of *Aspergillus fumigatus* for Potential Candidate for *Aspergillus*-specific T Cells

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Abstract—*Aspergillus fumigatus is the most common ubiquitous spore-bearing fungal pathogen. It causes invasive aspergillosis in organ transplant cases, immunocompromised and HIV patients. Adoptive T-cell therapy for has gained importance in immunocompromised patients to overcome high-risk fungal infections. Thus, in-silico analyses were carried from reported A. fumigatus antigens to map epitopic region to predict potential peptides that potentially induce* Aspergillus-*specific T-cells. We used in-silico approaches to predict potential human/ Mouse MHC class-I and MHC class-II T-cell epitopes from protein sequence of A. fumigatus's allergens. A total 23 allergenic protein sequences of A. fumigatus retrieved from NCBI was subjected to protein homology against human proteome. Out of 23 allergenic proteins, 13 allergens showed high sequence similarity in human counterparts, thus eliminated due to their possible cross reactivity. Remaining 10 allergenic proteins were subjected for T-cell epitopes prediction using IEDB-AR (Immune Epitope Database-Analysis Resource) that contains experimentally characterized T-cell epitopes data from human and other animal species. Using IEDB-AR, peptides from these allergens (Aspf1, Aspf2 and Asp f5) are predicted to be recognized by both MHC class-I and MHC class-II molecules, which further could present these peptide to human T-cell to initiate adaptive immune response. Aspf1 showed region from 9-23aa for Mouse MHC class-II, and 9-17aa for Human MHC class-I and 1-15aa for Human MHC class-II T-cell epitopes. Aspf2 showed region from 5-19aa for Mouse MHC class-1, and 9-17aa and 4-18aa for Human MHC class-II T-cell epitopes. Aspf5 showed region from 318-332aa for Mouse MHC class-II, and 316-324aa Human MHC class-I and 318-322aa MHC class-II T-cell epitopes. Thus, these epitopic peptides or overlapping epitopic peptides could be designed to screen in ex-vivo studies to obtain* A. fumigatus-*specific T-cell for adoptive immunotherapy against invasive aspergillosis.*