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Key role of human leukocyte antigen in modulating HIV progression: An overview of the possible applications

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Abstract

Host and viral factors deeply influence the HIV disease progression. Among them human leukocyte antigen (HLA) locus plays a key role at different levels. In fact, genes of the HLA locus have shown the peculiar capability to modulate both innate and adaptive immune responses. In particular, HLA class I molecules are recognized by CD8⁺ T-cells and natural killers (NK) cells towards the interaction with T cell receptor (TCR) and KIR2DL1 respectively. Polymorphisms within the different HLA alleles generate structural changes in HLA class I peptide-binding pockets. Amino acid changes in the peptide-binding pocket lead to the presentation of a different set of peptides to T and natural killer (NK) cells. This review summarizes the role of HLA in HIV progression toward acquired immunodeficiency disease syndrome (AIDS) and its receptors. Recently, many studies have been focused on determining the HLA binding-peptides. The novel use of immuno-informatics tools, from the prediction of the HLA-bound peptides to the modification of the HLA-receptor complexes, is considered

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