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Glycosylation of envelope gp120 is affected by producer cell type and impacts HIV-1 recognition by virus-specific antibodies and cell infection

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Human immunodeficiency virus type 1 (HIV-1) entry is mediated by the interaction between a variably glycosylated envelope (Env) glycoprotein (gp120) and host-cell receptors. Approximately half of the molecular mass of gp120 is contributed by N-glycans, which serve as potential epitopes but also may shield gp120 from humoral immune response. N-glycosylation of a recombinant gp120 varies, depending on the producer cell type, and this variable glycosylation affects gp120 recognition by serum antibodies from persons infected with HIV-1 subtype B as well as A and C. The cell type-specific glycosylation of HIV-1 envelope impacts recognition of gp120 by a panel of broadly neutralizing monoclonal antibodies specific for gp120 V2 and V3 loops and for gp120 glycan-containing epitopes. Comparison of antibody reactivity with well-characterized recombinant gp120 glycoforms and the same proteins after partial removal of N-glycans elucidates important cell-type specific differences in glycosylation of gp120 which affect the recognition of gp120 by humoral immune system. Furthermore, the glycosylation of recombinant gp120 oligomers differentially impacted interaction with HIV-1 cellular receptor(s) and thus differentially inhibited the HIV-1 infection of reporter cells. Together, our results indicate that Env glycosylation affects HIV-1 infectivity as well as antibody recognition and, thus, Env glycosylation should be considered in HIV-1 vaccine design.

Biography

Milan Raska has completed his PhD at the age of 35 years from Palacky University, Olomouc, Czech Republic. He spent his Postdoctoral fellowship at the University of Alabama at Birmingham, Birmingham, AL, USA at the laboratories of Dr. Mestecky and Dr. Novak. He is currently an Associate Professor of Immunology at Faculty of Medicine and Dentistry, Palacky University, Olomouc, Czech Republic. He has published more than 40 papers in peer-reviewed journals. His research is focused on novel approaches in design of cellular- and molecular-based vaccines and on liposome-based delivery systems.

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