



UNDERSTANDING THE ROLE OF ANTIBODIES IN HIV-1 INFECTION

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Abstract

Antibodies are one of the main arms of immune response and constitute a first-line of defence against HIV-1. In recent years, critical advances in understanding the roles of the antibodies in HIV-1 infection have been made. However, the strategies to induce antibodies that can control HIV-1 infection are still significantly needed. The understanding of the specificity and function of early humoral responses are important to attain this goal. Recently, several new HIV-specific broadly neutralizing antibodies have been identified, including VRC01 and PG9/16. Neutralizing antibodies are considered critical for protection against viral infections because they are able to block viral entry into target cells. Neutralizing antibodies against HIV-1 provide potent protection against AIDS virus infection in nonhuman primates and cross-reactive antibodies capable of neutralizing heterogenous primary viral isolates, broadly neutralizing antibodies, can develop during the course of HIV-1 infection. These are very rare and so far only handful have been identified. Thus, these neutralizing antibodies are of interest to vaccine researchers. Moreover, the benefit of pre-existing neutralizing antibodies that may be able to act on low viral load near the site of viral entry was the potential to protect against HIV-1 infection of HIV-1 vaccine. However, recent studies, showed that broadly neutralizing antibodies are not associated with better clinical outcomes among chronically infected patients and they correlated with higher viral load. Thus, neutralizing antibodies may be not of value in chronic infection but potential for neutralizing antibodies to prevent infection or disease if are present at the time of exposure. Several studies show that broadly neutralizing antibodies are produced by a substantial proportion of HIV-infected patients, at titers in the range shown to be protective in some passive-transfer SHIV (Simian Human Immunodeficiency Virus) experiments, Therefore, human immune system can achieve neutralizing antibodies responses at levels that could be protective. At present, the information of neutralizing response HIV-1 infection individuals were facilitated by quantitative, high-throughput new neutralization assay technologies and well characterize clonal Env-pseudotyped viruses. Thus, neutralizing antibody responses develop and epitope targets provide insights that can be applied to the design of new immunogen to induce broadly neutralizing antibodies.

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