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Antibody-dependent enhancement of virus infection and disease

Sol M Cancel Tirado ¹, Kyoung-Jin Yoon

Affiliations

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Abstract

In general, virus-specific antibodies are considered antiviral and play an important role in the control of virus infections in a number of ways. However, in some instances, the presence of specific antibodies can be beneficial to the virus. This activity is known as antibody-dependent enhancement (ADE) of virus infection. The ADE of virus infection is a phenomenon in which virus-specific antibodies enhance the entry of virus, and in some cases the replication of virus, into monocytes/macrophages and granulocytic cells through interaction with Fc and/or complement receptors. This phenomenon has been reported in vitro and in vivo for viruses representing numerous families and genera of public health and veterinary importance. These viruses share some common features such as preferential replication in macrophages, ability to establish persistence, and antigenic diversity. For some viruses, ADE of infection has become a great concern to disease control by vaccination. Consequently, numerous approaches have been made to the development of vaccines with minimum or no risk for ADE. Identification of viral epitopes associated with ADE or neutralization is important for this purpose. In addition, clear understanding of the cellular events after virus entry through ADE has become crucial for developing efficient intervention. However, the mechanisms of ADE still remain to be better understood.

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