

An Epstein-Barr virus gp350 subunit vaccine that targets the virus neutralization site

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The Epstein-Barr virus (EBV) is the etiologic agent of infectious mononucleosis and an important cofactor in nasopharyngeal carcinoma, various T and B cell lymphomas and several epithelial cancers. The major virion surface glycoprotein (gp)350 is viewed as the best vaccine candidate to prevent infectious mononucleosis and EBV-associated cancers because natural antibodies to gp350 block virus infection and effectively neutralize the virus. Our laboratory has identified peptide sequences on the gp350 molecule that are recognized by a virus neutralizing monoclonal. These peptides were shown to generate production of virus-blocking antibodies upon injection in mice. In our recent follow-up work, we postulated that a vaccine construct which correctly presents these peptides can direct the immune system to generate higher levels of protective antibody as compared to presentation of the entire gp350 molecule. To test this hypothesis, we used a prime-boost strategy wherein mice were primed with recombinant full-length gp350 (907 amino acid sequence) and boosted with a truncated form of the gp350 molecule encompassing the gp350 peptides identified in our earlier work. Results indicate that boosting with the smaller gp350 construct produced higher concentrations of neutralizing antibodies when compared to boosting with the entire gp350 molecule. These data suggest that a vaccination strategy which enables the immune system to focus on the virus neutralizing epitope can generate a more robust and effective antibody response, which translates to better protection against EBV infection.

Biography:

Dr Carolina Alfieri is a research virologist at the Sainte-Justine University Hospital Centre and associate professor with the Department of Microbiology, Infectiology and Immunology at the University of Montreal. Much of her research and publications have focused on transplant virology, with an emphasis on both mechanistic and translational aspects of Epstein-Barr virus pathogenesis in immunocompromised patients. Dr Alfieri's laboratory is currently working on the development of a subunit vaccine to confer protection against infectious mononucleosis and cancers linked to infection by the Epstein-Barr virus. This work is supported by the Canadian Institutes for Health Research and the Cancer Research Society.