Pacific Center for Emerging Infectious Diseases Research

University of Hawai'i Mānoa

COBRE/DEPT. OF TROPICAL MEDICINE SEMINAR

How a Common Everyday Virus like Epstein-Barr Virus can Predispose for Multiple Sclerosis

Several lines of evidence have identified Epstein-Barr virus (EBV), the causative agent of infectious mononucleosis, as a potential trigger of Multiple Sclerosis (MS). Epidemiological studies indicate that the risk of developing MS is ten fold greater in individuals who were infected by EBV during childhood and twenty fold greater in those developing mononucleosis. Further, EBV infected B cells have been identified in the brain of secondary progressive MS patients. There is a direct association with the strength and quantity of the EBV –specific immune response in terms of antibody and memory CD8 T cells with MS patients, where patients have stronger memory responses than non-MS patients that also experienced EBV infection. Whether causative or a co-factor, EBV acts as a component of MS. To address EBV's role, we modeled this interaction in mice. As EBV does not infect mice, we used the mouse homolog for EBV, murine gammaherpesvirus-68 (gHV-68), to ask how latently infected mice would fare after induction of experimental autoimmune encephalitis(EAE), the accepted mouse model of MS. We demonstrated that gHV-68 latently infected mice develop a disease more reminiscent of MS following EAE induction that included the infiltration of both CD4 and CD8 T cells into the brain and spinal cord with the formation of demyelinating lesions and increased disease severity. The latent virus does not reactivate or replicate during disease demonstrating that the virus acts indirectly as an important co-factor in susceptibility. This suggests that these latently infected mice are a model that more profoundly mimics progressive MS and that EBV likely acts similarly, as a co-factor to heighten disease severity. We have further characterized these mice in terms of the role of latent infection, latently infected B cells, and its interactions with autoreactive effector T cells and antibody. This model has the potential to uncover novel targets for this unique mechanism of disease and address why many current anti-viral therapies benefit MS patients by preventing relapses.

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John A. Burns School of Medicine, Kaka'ako
Medical Education Building Auditorium (Room 315)
For further information, contact (808) 692-1654

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