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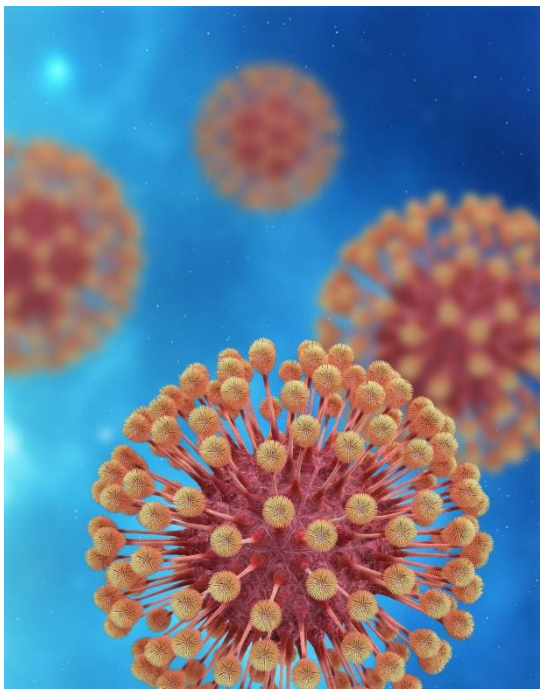
HHV-6 Elispot – Humans Herpes Virus 6



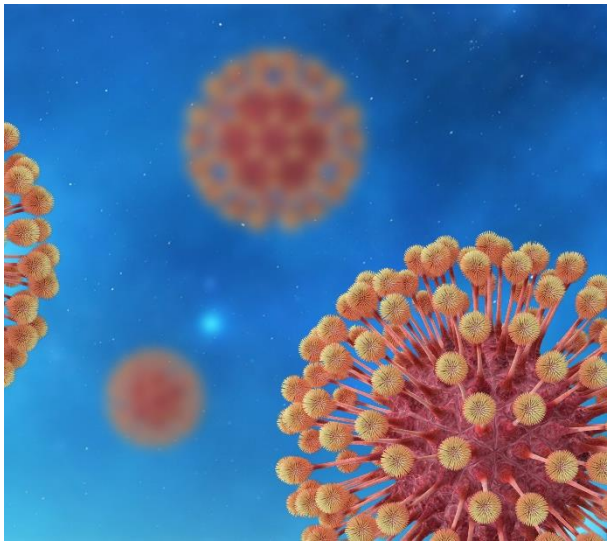
Human Herpesvirus 6 (HHV-6), is part of the Betaherpesvirinae and consists of the two human pathogenic species HHV-6A and HHV-6B. Betaherpesvirinae, are characterized based upon their ability to establish a latent infection in monocytes and retain similarities in their genes and genomic structure[1].

Human Herpesvirus 6 (HHV-6) was first discovered by a working group at the National Institutes of Health in Maryland[2]. Infections with HHV-6 are **omnipresent**, approaching 80% in seroprevalence for adults. It is demonstrated that most of the infections usually occur during infancy by **droplet infection**, but without significant symptoms[3]. Besides the later discovered human herpes virus type 7, **HHV-6** is the only known human herpes virus that **primarily infects T-lymphocytes**.

HHV-6B is known as the causative agent of **Exanthema subitum** (roseola infantum). Primary infections with HHV-6B are a common, but mild, acute febrile disease of infants with a maculopapular rash that resolves spontaneously. The initial infection may be asymptomatic or might cause clinical manifestations other than classic exanthem subitum. Symptoms include otitis, gastrointestinal or respiratory distress, and seizures.

In later stages occurring in healthy children and adults; the virus replicates in the salivary glands and is secreted in saliva without inducing any obvious pathology. It remains latent at least in lymphocytes and monocytes and persists in various tissues, possibly with a low-level replication.

HHV-6B can cause **more severe pathologies**, especially for **immunosuppressed patients**. It can infect endothelial cells, liver cells, astrocytes and oligodendrocytes[4]. HHV-6B is associated with many diseases, especially neurological diseases-including seizures, encephalitis and mesial temporal lobe epilepsy (MTLE)[5]. It's linked to contribute also to the pathology of autoimmune disease, cancer, chronic fatigue syndrome, drug hypersensitivity, endocrine conditions, hematological disorders, HIV/AIDS Progression, infertility and miscarriage, kidney disease, liver disease, lung disease, and transplant complications. Active infections with **HHV-6B** are heavily linked to **Alzheimer's disease**[6].



There's no evidence for an association between HHV-6A and any diseases. Although HHV-6A DNA and mRNA are found more frequently than HHV-6B in patients with neuroinflammatory diseases such as multiple sclerosis[7].

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The EliSpot is a single cell-based test and measures directly the number of activated T-cells due to their cytokine release. Therefore, the Elispot is a highly specific method with a high sensitivity and has long been used as the gold standard in vaccine development. It is also used for monitoring the immune status after transplantation, the progress of immune reactions as a result of immunization, desensitization, chronic infections and cancer.

- The EliSpot reflects the current activity of the pathogen in both chronic and acute infections with HHV-6
- The EliSpot is highly sensitive and can already detect a single T-cell reacting to HHV-6
- With detection limits of up to one cell in 100,000, the EliSpot is one of the most sensitive cellular test methods available
- The EliSpot is between 20 to 200 times more sensitive than an ordinary ELISA antibody test
- Through this the EliSpot is almost as sensitive as an RT-PCR (Real Time PCR) test, but it detects the pathogen protein instead of mRNA (messenger RNA)
- The EliSpot can be helpful in monitoring therapies. It should usually be negative 4 to 8 weeks after the end of an effective therapy

Since HHV-6 is the only known human herpes virus that primarily infects T-lymphocytes we recommend the following test methods for every patient with a suspected HHV-6 infection:

- HHV-6 Elispot (actual T-cell activity)
- CD3-/CD57+ cell count (chronic T-cell activity)

References:

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