B-Cell Transformation by Epstein-Barr Virus: Molecular Steps Elucidated in a B-Cell Lymphoma Model

Department of Gene Vectors

Over 95% of the population is infected with Epstein-Barr-Virus (EBV) by the age of 30. The virus infects the mucous membranes in the nasal cavity and causes glandular fever (infectious mononucleosis or kissing disease). Following the primary infection, the virus can persist throughout life in B lymphocytes, transform these cells into malignant cells, and lead to the development of B cell lymphomas. The transition from latent infection to transformation is an extremely complex molecular process. Scientists from the GSF Department of Gene Vectors together with colleagues from the University of Wisconsin in the USA have identified a gene region, which is essential for the transformation of B cells.

It has long been known that the gene that codes for the EBV nuclear antigen 1 (EBNA1) is essential for replication of the viral genome within the infected cell. Using targeted molecular alterations in a region of the EBNA1 gene, it has now been shown that this region is essential for the transcription of several transforming EBV genes. Thus EBNA1 is also critically involved in the transformation of the latent infected cell into a malignant cell.

Thus EBNA1 provides a potentially very interesting target molecule for antiviral and cancer therapy.

Literature:

- Altmann, M. et al.: Proc. Natl. Acad. Sci. USA 103, 14188-14193 (2006)

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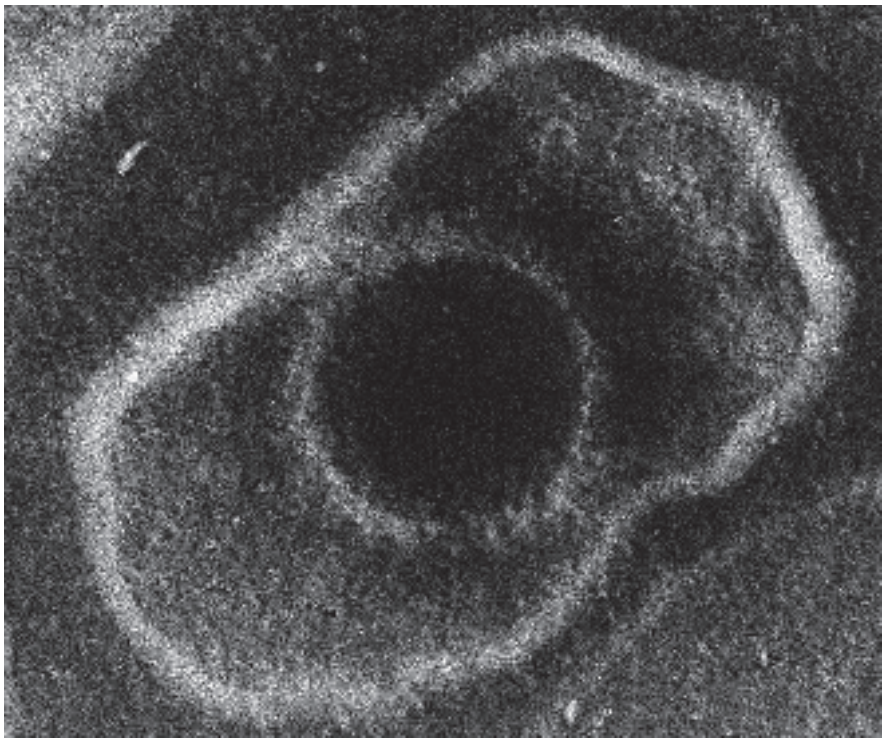

Electron micrograph of a viral particle of Epstein-Barr virus. The well-structured viral capsid is surrounded by a loose membrane. The capsid contains the genetic viral information that can cause transformation of a cell infected with EVB.