

# Recombinant Human Immunodeficiency Virus Nef Protein [HIV-1/Clade B (IIIB)]

Cat. No. HUM-408 Lot. No. (See product label)

## SPECIFICATION

### Product Overview

Recombinant HIV-1 Nef (Negative Regulatory Factor) protein is produced in *E. coli* and fused with  $\beta$ -galactosidase.

### Background

Human immunodeficiency virus (HIV) is a retrovirus (genus Lentivirus) with a single-stranded, positive-sense RNA genome. Upon entry of the target cell, the viral RNA genome is converted to double-stranded DNA by a virally encoded reverse transcriptase that is present in the virus particle. This viral DNA is then integrated into the cellular DNA by a virally encoded integrase allowing the genome to be transcribed. Once the virus has infected the cell, two pathways are possible: either the virus becomes latent and the infected cell continues to function, or the virus becomes active and replicates, and a large number of virus particles are liberated to infect other cells. Infection with HIV leads to a condition in which the immune system begins to fail, leading to opportunistic infections. HIV primarily infects cells in the human immune system including CD4 T cells, macrophages and dendritic cells. Infection subsequently results in low levels of CD4 T cells via direct viral killing of infected cells, increased rates of apoptosis in infected cells and killing of infected CD4 T cells by CD8 cytotoxic lymphocytes that recognize infected cells. When CD4 T cell numbers decline below a critical level, cell-mediated immunity is lost, and the body becomes progressively more susceptible to opportunistic infections.

Nef (Negative Regulatory Factor) is expressed in the early stages of the viral life cycle by all primate lentiviruses (HIV-1, HIV-2 and SIV). It is translated from a multiply spliced mRNA which generates a myristoylated protein of 27–32 kDa highly expressed from the early stages of the infection process. Nef localizes primarily to the

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cytoplasm but also partially to the plasma membrane (PM) and is able to manipulate the host's cellular machinery and thus allow infection, survival or replication of the pathogen. It facilitates T-cell activation and the establishment of a persistent state of infection, promoting the survival of infected cells and increasing virus propagation. Its role in HIV persistence is based largely on its ability to downmodulate the surface levels the major histocompatibility complex-I (MHC I) and (MHC II) present on antigen-presenting cells (APCs) and target cells, and CD4 and CD28 present on helper T cells (Das and Jameel, 2005). Nef has a multi-functional role and although it does not contain enzymatic activity, it carries out several cellular functions due to its ability to interact with numerous host factors. Nef interacts with several proteins implicated in intracellular trafficking and plays a role in hiding or protecting infected cells from immune surveillance and by promoting virus dissemination (Basmaciogullari and Pizzato, 2014). A Nef-deleted virus vaccine has not been tested in humans although it was successfully trialled in Rhesus macaques (Daniel et al., 1992).

**Formulation** Stored in 10 mM Carbonate 10 mM BME 10 mM EDTA.

**Applications** Suitable for use in ELISA, western blot and lateral flow immunoassay.

**Notes** This product is intended for research and manufacturing uses only. It is not a diagnostic device. The user assumes all responsibility for care, custody and control of the material, including its disposal, in accordance with all regulations.

**Type** Recombinant

**ClassID 1** Infectious Disease

## GENE INFORMATION

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**Synonyms**

HIV Nef [HIV-1/Clade B (IIIB)]

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