Recombinant Human IFN-γ GMP

Catalog Number: 285-GMP

DESCRIPTION

Source	*E. coli*-derived human IFN-gamma protein Gln24-Gln166, with an N-terminal Met Accession # CAA31639 Produced using non-animal reagents in an animal-free laboratory. Manufactured and tested under cGMP guidelines.
N-terminal Sequence Analysis	Met-Gln$_{24}$-Asp-Pro-Tyr-Val-Lys-Glu-Ala-Glu
Predicted Molecular Mass	16.9 kDa

SPECIFICATIONS

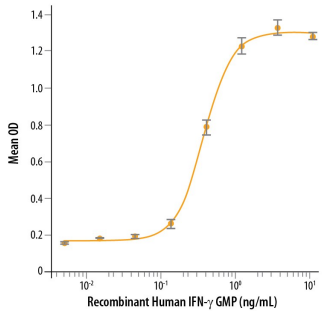
SDS-PAGE	17 kDa, reducing conditions
Activity	Measured in anti-viral assays using HeLa human cervical epithelial carcinoma cells infected with encephalomyocarditis (EMC) virus. Meager, A. (1987) in Lymphokines and Interferons, a Practical Approach. Clemens, M.J. *et al.* (eds): IRL Press. 129. The ED_{50} for this effect is 0.15-0.75 ng/mL. The specific activity of recombinant human IFN-γ is approximately 2 x 10^4 IU/µg, which is calibrated against human IFN-γ Standard (NIBSC code: 87/586).
Endotoxin Level	<0.01 EU per 1 µg of the protein by the LAL method.
Purity	>97%, by SDS-PAGE with silver staining, under reducing conditions.
Host Cell Protein	<0.5 ng per µg of protein when tested by ELISA.
Mycoplasma	Negative when tested in a ribosomal RNA hybridization assay.
Host Cell DNA	<0.0015 ng per µg of protein when tested by PCR.
Formulation	Lyophilized from a 0.2 µm filtered solution in Sodium Succinate, Mannitol and Tween® 80. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 200 µg/mL in sterile, deionized water.
Shipping	The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	**Use a manual defrost freezer and avoid repeated freeze-thaw cycles.** • A minimum of 6 months when stored at ≤ -20 °C as supplied. Refer to lot specific COA for the Use by Date. • 1 month, 2 to 8 °C under sterile conditions after reconstitution. • 3 months, ≤ -20 °C under sterile conditions after reconstitution.

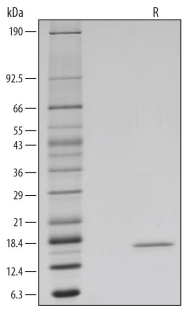
DATA

Bioactivity



GMP-grade Recombinant Human IFN-γ (Catalog # 285-GMP) demonstrates anti-viral activity in HeLa human cervical epithelial carcinoma cells infected with encephalomyocarditis (EMC) virus. The ED_{50} for this effect is 0.15-0.75 ng/mL.

SDS-PAGE



1 µg/lane of GMP-grade Recombinant Human IFN-γ (Catalog # 285-GMP) was resolved with SDS-PAGE under reducing (R) conditions and visualized by silver staining, showing a single band at 17 kDa.

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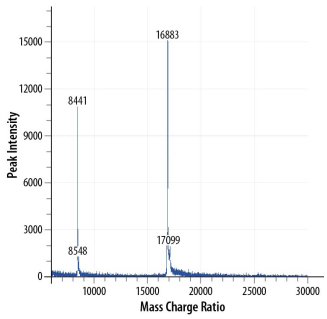
Mass Spectrometry



MALDI-TOF analysis of GMP-grade Recombinant Human IFN-γ (Catalog # 285-GMP). The major peak corresponds to the calculated molecular mass, 16881 Da. The minor peak at 17099 Da is a matrix-associated artifact of the MALDI-TOF.

BACKGROUND

Interferon-γ (IFN-γ), also known as type II or immune interferon, exerts a wide range of immunoregulatory activities and is considered to be the prototype proinflammatory cytokine (1, 2). Mature human IFN-γ exists as a non-covalently linked homodimer of 20-25 kDa variably glycosylated subunits (3). It shares 90% amino acid (aa) sequence identity with rhesus IFN-γ, 59%-64% with bovine, canine, equine, feline, and porcine IFN-γ, and 37%-43% with cotton rat, mouse, and rat IFN-γ. IFN-γ dimers bind to IFN-γ RI (α subunits) which then interact with IFN-γ RII (β subunits) to form the functional receptor complex of two α and two β subunits. Inclusion of IFN-γ RII increases the binding affinity for ligand and the efficiency of signal transduction (4, 5). IFN-γ is produced by a variety of immune cells under inflammatory conditions, notably by T cells and NK cells (6). It plays a key role in host defense by promoting the development and activation of Th1 cells, chemoattraction and activation of monocytes and macrophages, up-regulation of antigen presentation molecules, and immunoglobulin class switching in B cells. It also exhibits antiviral, antiproliferative, and apoptotic effects (6, 7). In addition, IFN-γ functions as an anti-inflammatory mediator by promoting the development of regulatory T cells and inhibiting Th17 cell differentiation (8, 9). The pleiotropic effects of IFN-γ contribute to the development of multiple aspects of atherosclerosis (7).

References:

1. Billiau, A. and P. Matthys (2009) Cytokine Growth Factor Rev. **20**:97.
2. Pestka, S. *et al.* (2004) Immunol. Rev. **202**:8.
3. Gray, P.W. and D.V. Goeddel (1982) Nature **298**:859.
4. Marsters, S.A. *et al.* (1995) Proc. Natl. Acad. Sci. **92**:5401.
5. Krause, C.D. *et al.* (2000) J. Biol. Chem. **275**:22995.
6. Schroder, K. *et al.* (2004) J. Leukoc. Biol. **75**:163.
7. McLaren, J.E. and D.P. Ramji (2009) Cytokine Growth Factor Rev. **20**:125.
8. Muhl, H. and J. Pfeilschifter (2003) Int. Immunopharmacol. **3**:1247.
9. Kelchtermans, H. *et al.* (2008) Trends Immunol. **29**:479.

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- Monitoring of stability over product shelf-life

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- N-terminal amino acid analysis, SDS-PAGE analysis, and endotoxin level (as determined by LAL assay) performed on each bulk QC lot, not on individual bottlings of each QC lot
- Post-bottling lot-specific bioassay results (compliance with an established range) and results of microbial bioburden testing (using broth culture, Sabourand's dextrose and blood agar plates with results reported at 3 days and at 7 days)
- Host Cell Protein testing performed by ELISA
- Mycoplasma testing by ribosomal RNA hybridization assay

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