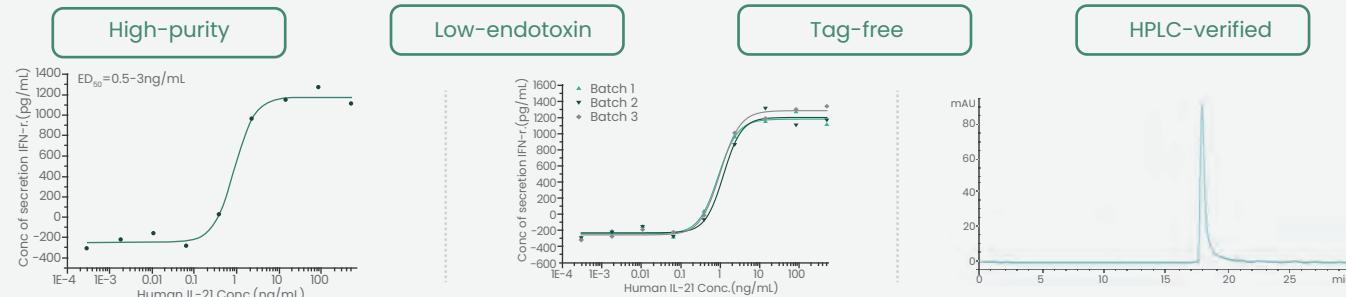


# Premium Recombinant Cytokines

## IL-21: A Modulator in Allergy, Cancer, and Viral Infections

Interleukin 21 (IL-21) is an IL-2 family cytokine that strongly associated with inflammation and autoimmunity. It also exerts divergent effects on lymphoid cell leukemia and lymphomas. Clinical trials with IL-21 have yielded favorable results in cancer treatment, while the development of IL-21 inhibitors is in progress for treating autoimmune diseases. The biological functions of IL-21 are mediated via a heterodimeric receptor consisting of the IL-21R and the common  $\gamma$ -chain ( $\gamma$ c/CD132) receptor.

### Human IL-21 Protein: 10584-HNAE



Ability to induce Interferon-gamma secretion by human natural killer lymphoma NK-92 cells.

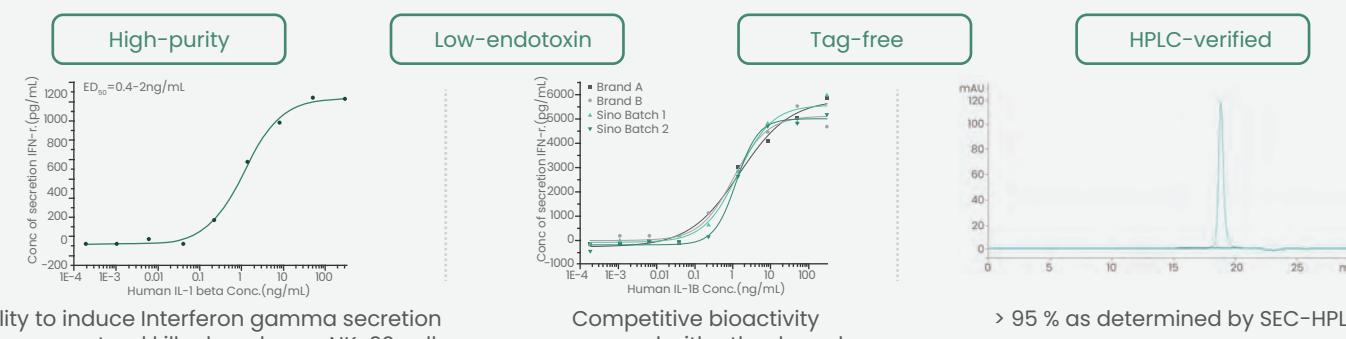
Batch-to-batch Consistency

> 95 % as determined by SEC-HPLC

## IL-1 beta Primes Innate Immunity

Interleukin-1 $\beta$  (IL-1 $\beta$ ), along with IL-1 alpha and IL18, orchestrates the immune response through multiple downstream mechanisms. IL-1 beta transduces its signal through binding with the receptor IL1RI, which is complexed with the accessory protein IL1RACP. IL-1 beta signaling is negatively regulated by the decoy receptor IL1-RII and the receptor antagonist IL1RA.

### Human IL-1 beta Protein: 10139-HNAE



Ability to induce Interferon gamma secretion by human natural killer lymphoma NK-92 cells.

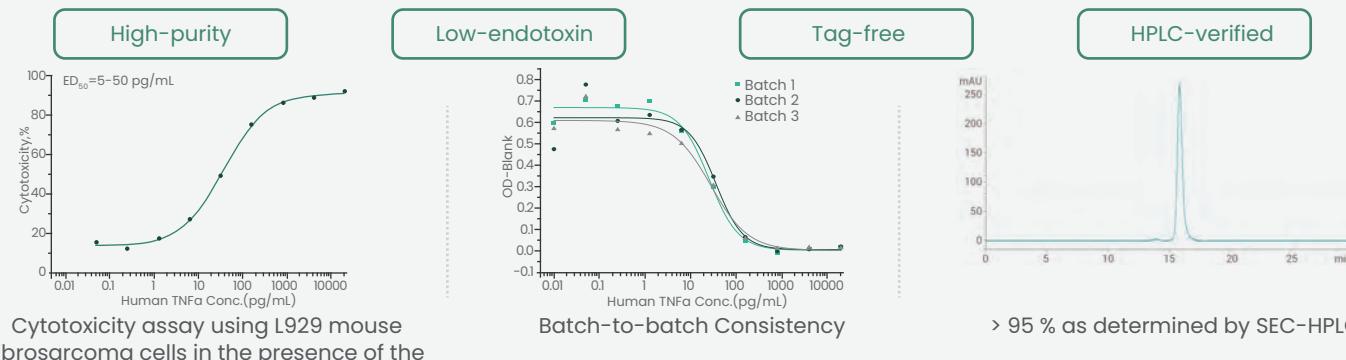
Competitive bioactivity compared with other brand

> 95 % as determined by SEC-HPLC

## TNF-alpha: A Master Pro-inflammatory Cytokine

Tumor Necrosis Factor-alpha (TNF- $\alpha$ ) is a cytokine important in nearly all acute inflammatory reactions by acting as an amplifier of inflammation. TNF- $\alpha$  blockade has been used worldwide to treat inflammatory conditions, e.g., rheumatoid arthritis. Targeting TNF- $\alpha$  to treat cancer and cardiovascular diseases is also being evaluated in clinical trials.

### Human TNF- $\alpha$ Protein: 10602-HNAE



Cytotoxicity assay using L929 mouse fibrosarcoma cells in the presence of the metabolic inhibitor actinomycin D.

Batch-to-batch Consistency

> 95 % as determined by SEC-HPLC

