



## Recombinant Bovine IL-4

Catalog Number: GR104155

### Background

Interleukin-4, abbreviated IL-4, is a cytokine that is expressed in a variety of tissues including lymphocytes and leukocytes, is a key regulator in humoral and adaptive immunity and has many biological roles, including the stimulation of activated B-cell and T-cell proliferation, and the differentiation of CD4<sup>+</sup> T-cells into Th2 cells. IL-4 induces differentiation of naive helper T cells (Th0 cells) to Th2 cells. Upon activation by IL-4, Th2 cells subsequently produce additional IL-4. The cell that initially produces IL-4, thus inducing Th0 differentiation, has not been identified, but recent studies suggest that basophils may be the effector cell.<sup>[1]</sup> It is closely related and has functions similar to Interleukin 13. Like IL-13, Interleukin 4 (IL-4) is critical for responses to parasitic helminthes.<sup>[2]</sup> IL-4 up-regulates MHC class II production and decreases the production of Th1 cells, macrophages, IFN-gamma, and dendritic cell IL-12. Tissue macrophages play an important role in chronic inflammation and wound repair. The presence of IL-4 in extravascular tissues promotes alternative activation of macrophages into M2 cells and inhibits classical activation of macrophages into M1 cells. An increase in repair macrophages (M2) is coupled with secretion of IL-10 and TGF- $\beta$  that result in a diminution of pathological inflammation. This cytokine was co-discovered by Maureen Howard and William Paul<sup>[3]</sup> and by Dr. Ellen Vitetta and her research group in 1982. The nucleotide sequence for human IL-4 was isolated four years later confirming its similarity to a mouse protein called B-cell stimulatory factor-1 (BCSF-1).<sup>[4]</sup>

### References

1. Sokol, C.L., et al. (2008) *Nat Immunol* **9** (3): 310–318.
2. Liang, H-E, et al. (2012) *Nature Immunology*, **13**: 58–66.
3. Howard M, Paul WE (1982). *Lymphokine Res.* **1** (1): 1–4.
4. Yokota T et al. (1986). *Proc. Natl. Acad. Sci. U.S.A.* **83** (16): 5894–8.



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### Description

Quantity: 10 µg

Accession #: NP\_776346.1

Sources: expressed in *E. coli*.

Composition: His25-Cys135

Molecular weight: 13 kDa

Activity: Measured in a cell proliferation assay using TF1 human erythroleukemic cells. Kitamura, T. *et al.* (1989) *J. Cell Physiol.* 140:323.

The ED50 for this effect is 0.25 ng/ml.

Endotoxin level: <0.8 EU per 1 µg of the protein by the LAL method.

Purity: > 98%, by SDS-PAGE under reducing conditions and visualized by silver staining.

Formulation: Lyophilized from a 0.2 µm filtered solution in PBS with BSA as a carrier protein.

Reconstitution: reconstitute at 100 µg/ml in sterile PBS and store at -20°C ~ -70°C for up to 3 months.

Shipping and storage: The product is shipped at ambient temperature or with ice pad. Upon receipt, store it immediately at -20°C to avoid loss of activity and use it in 3 months.

### DECLARATION

THIS REAGENT IS FOR IN VITRO LABORATORY TESTING AND RESEARCH USE ONLY. DO NOT USE IT FOR CLINICAL DIAGNOSTICS. DO NOT USE OR INJECT IT IN HUMANS AND ANIMALS.

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