

IL-4^{HuXp}

Recombinant Human Cytokine Authentic - Human Cell Expressed



INTRODUCTION

Cytokines are a group of proteins and polypeptides that organisms use as signaling molecules. Most cytokines are glycoproteins less than 30 kDa in size and bind to specific, high-affinity cell surface receptors. Due to their central role in the immune system, cytokines are involved in a variety of immunological, inflammatory and infectious diseases and widely used in research, diagnostics and therapeutics. Cytokines generally alter the gene expression pattern of the target cell which leads to changes in the rate of cell proliferation and/or in the state of cell differentiation. Currently, these proteins are predominantly produced in non-human cells (e.g. *E. coli*) and therefore lack authenticity due to the absence of physiologically relevant glycosylation. In addition, a number of important cytokines are not commercially available due to inadequate proteolytic processing, protein folding or other post-translational modifications that occur in the non-human cell expression systems.

HumanZyme has developed an efficient human-cell based technology, **HumaXpress™**, for scalable production of human cytokines. The company offers an expanding range of tag-free cytokines, including difficult-to-express members of the TGFβ superfamily. HumanZyme's authentic cytokines can be used as highly preferred reagents for cancer, inflammation, stem cell research, and antibody development.

IL-4

Interleukin 4 is produced by activated T cells, mast cells, and basophils. This cytokine was initially identified as a B cell differentiation factor, as well as a B cell stimulatory factor. Subsequent to the molecular cloning and expression of both human and mouse IL-4, numerous other functions have been described on B cells as well as other hematopoietic and nonhematopoietic

cells, including T lymphocytes, monocytes, macrophages, mast cells, myeloid and erythroid progenitors, fibroblasts, endothelial cells, etc. IL-4 plays a critical role in the development of allergic inflammation and asthma.

Currently, commercially available IL4 proteins are produced from *E. coli*. HumanZyme scientists have produced IL4^{HuXp} from engineered human 293 cells and the HumaXpress system. The *E. coli* expressed protein has a molecular mass of 14 kD. This compares with the IL4^{HuXp} which migrates as a major band of 19 kD due to glycosylation.

The biological activity of IL-4 was determined by the dose-dependent stimulation of the proliferation of human TF-1 cells. Both versions of IL-4 were assayed for cell proliferation at 37°C for seven days. As shown in Fig. 2, IL4^{HuXp} has 5-fold higher potency, demonstrating that it has higher activity and greater stability in cell culture conditions after seven days than *E. coli* expressed cytokine. (Our Technical Report - available on the humanzyme website - "New Protocol for Efficient Generation of Immature Human Dendritic Cells with Authentic GM-CSF^{HuXp} and IL-4^{HuXp} discusses a preferred, time saving protocol. (See product catalog number HZ-1004, HZI005 at www.humanzyme.com)

