Interleukin-1β, human (hIL-1β)

recombinant *(E. coli)*
Solution, filtered through 0,2 µm pore size membrane

Version 04
Content version: June 2011

Cat. No. 11 457 756 001 100,000 U (2 µg, 1 ml)

Store at −15 to −25°C

1. What this Product Does

Contents

100,000 U/ml (2 µg/ml) in PBS (phosphate buffered saline) and 1 mg/ml BSA (bovine serum albumin), [purity of BSA: >98%, endotoxin (LAL): <1 EU/mg BSA], filtered through 0,2 µm pore size membrane.

Storage and Stability

Stable at −15 to −25°C until the expiration date printed on the label.
Store the solution in aliquots at −15 to −25°C.
Avoid repeated freezing and thawing.

Application

Interleukin-1 (IL-1), secreted by activated monocytes or macrophages and other cell types, is a pleiotropic factor for a variety of sensitive cell.

2. How to Use this Product

2.1 Before you Begin

Working Concentration

hIL-1β exerts its biological activity in the concentration range of 5–500 U/ml (0.1–1 ng/ml).

Recommended Method of Dilution

Dilute the concentrated IL-1β solution (100,000 U/ml) with PBS or culture medium containing 1 mg/ml BSA [or HSA (human serum albumin)] or 1 –10% serum.

Reagents Required

- Culture medium, *e.g.* RPMI 1640, containing heat inactivated 10% FCS, 10 mM Hepes*, 2 mM L-glutamine, (1×) non-essential amino acids, 1 mM sodium pyruvate and 50 µM β-mercaptoethanol and 50 U/ml interleukin-2*.
- hIL-1β stock solution (100,000 U/ml; 2 µg/ml); [^{3}H]-thymidine.

2.2 Procedure

Instructions to determine the activity of recombinant human IL-1β on sensitive cells (with mouse C3H/HeJ thymocytes as an example)

❶	Seed mouse C3H/HeJ thymocytes at a concentration of 5 × 10^5 cells/well in 200 µl culture medium containing various amounts of hIL-1β [final concentration 0.5-500 U/ml (0.01 -10 ng/ml)] into microplates (tissue culture grade, 96 wells) and incubate for 3 days at 37°C and 6.5% CO_2 in a humidified atmosphere.
❷	Add 1 µCi/well [^{3}H]-thymidine, and incubate for another 24 h as described.
❸	After this incubation period, harvest the contents of each well onto glass fiber filters using a cell harvester, and determine the radioactivity incorporated into the DNA using an α-β-scintillation counter.

3. Results

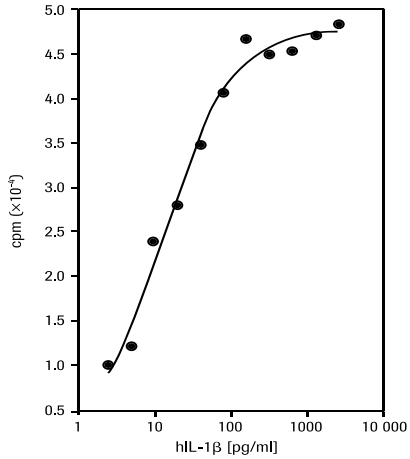

Fig. 1: [^{3}H]-thymidine incorporation into C3H/HeJ thymocytes in response to recombinant human interleukin-1β (hIL-1β), using the method described.

4. Additional Information on this Product

Background Information

Interleukin-1 (IL-1) is produced by a number of cell types, including activated macrophages, B-cells, fibroblasts, and keratinocytes (1,2). It mediates a wide range of biological activities, such as stimulation of thymocyte proliferation via induction of interleukin-2 (IL-2) release, stimulation of B-lymphocyte maturation and proliferation, fibroblast growth factor activity, and induction of acute-phase protein synthesis by hepatocytes. IL-1 has also been reported to stimulate prostaglandin and collagenase release from synovial cells, and to be identical to endogenous pyrogen and catabolin (1, 2-9). Two types of human interleukin-1 (hIL-1α and hIL-1β) have been described (1). Both types of hIL-1 stimulate proliferation and differentiation of T- and B-lymphocytes (7).

Recently, it has been shown that two different high-affinity IL-1 receptor molecules exist on different cell types. In both, human and mouse, T-cells and fibroblasts express an ≅80 kDa receptor molecule, whereas an ≅60 kDa receptor molecule was found on B-cells and neutrophils. The action of hIL-1α and hIL-1β is mediated by both receptor molecules (8-11).

IL-1 appears to have a wide range of stimulatory effects on the maturation, differentiation, and growth of many cell types involved in inflammation and development. Cells whose growth is directly or indirectly stimulated by IL-1 are fibroblasts, synovial cells, endothelial cells, epithelial cells, bone marrow cells, T-lymphocytes, and B-lymphocytes (1, 2-6).

Preparation

Recombinant Interleukin-1β, human (hIL-1β) is produced in *E. coli* and purified by standard chromatographic techniques.

Primary Structure

One polypeptide chain (154 amino acids), identical to natural human IL-1β (153 amino acids), but with an extra methionine at the amino-terminus (1,12,13).

Purity

≥95% pure as determined by HPLC or SDS-PAGE [Endotoxin level: <0.1 EU/μg (LAL-test), <10 EU/ml (LAL-test].

Specific Activity

>5.0×10^7 U/mg; [^{3}H]-thymidine incorporation into mouse C3H/HeJ thymocytes in the presence of saturating amounts of hIL-2 (50 U/ml) (14-16) (hIL-1β, NIBSC 1st international standard, 86/680) (17) (see Figure 1).

EC_{50} Definition/Unit Definition

The amount of hIL-1b that is required to support half-maximal stimulation of DNA synthesis (BrdU incorporation) with mouse C3H/HeJ thymocytes in the presence of saturating amounts of hIL-2 (50 U/ml, 25 ng/ml) (1 unit equals <0.02 ng).

Molecular Weight

17,000 Da

Species Specificity

Recombinant IL-1β, human is effective on mouse and human cells.

References

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5. Supplementary Information

Changes to Previous Version

Editorial changes

Text Conventions

To make information consistent and understandable, the following text conventions are used in this Instruction Manual:

Text Convention	Use
Numbered instructions labeled ❶, ❷, etc.	Steps in a procedure that must be performed in the order listed.

Symbols

Symbols are used in this Instruction Manual to highlight important information:

Symbol	Description
	Information Note: Additional information about the current topic or procedure.

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