Insulin-like Growth Factor-I: Human, ELISA Kit

Catalog Number:	1013-1K1-IGF
Product Specification:	Insulin-like Growth Factor-I: Human, ELISA Kit
Target Molecule:	Human Insulin-like Growth Factor-I (IGF-1)
Application:	Quantitative measurement of IGF-1 in sera, plasma and other body fluids, tissue lysates or cell culture supernates.
Detection Range:	62.5 pg/ml - 4000pg/ml
Sensitivity:	< 10 pg/ml
Specificity:	No detectable cross-reactivity with IGF-2
Format:	ELISA Plate, 96 tests/plate
Quantity:	□ 1 Plate □ 4 Plates □ 10 Plates □ Other
Storage:	Stable for 4 months at 4°C and for 8 months at -20°C.
Instruction Manual:	Supplied with the kit

Related Products:

Cat# 1013-1E-IGF Insulin-like Growth Factor-I (Long R-3): Human Recombinant Protein from E.coli. *(Synonym: SOMATOMEDIN C)*

Background:

Insulin-like growth factors I and II, also known as Somatomedin C and somatomedin A, respectively, are members of the insulin family of polypeptide growth factors. Their functions include mediation of growth hormone action, stimulation of growth of cultured cells, stimulation of the action of insulin, and involvement in development and growth. They appear to be autocrine regulators of cell proliferation. Unlike most other peptide hormones, IGF I and IGF II circulate in plasma tightly bound to specific binding proteins (IGFBPs). Levels of IGF1 decrease in serum during aging and correlates positively to changes in forearm and femoral neck bone mineral density. High levels of circulating IGF1 pose a risk of breast cancer in premenopausal women and a similar association exists for prostate cancer.

Human insulin-like growth factor (IGF)-I is a basic globular polypeptide of 70 amino acids, containing six cysteine residues that form three disulphide bonds: Cys6-Cys48, Cys18-Cys6 and Cys47-Cys52. The oxidative folding of IGF-I in vitro results in two folding isomers of IGF-I. The two main products present at equilibrium are those of the native disulphide arrangement and an alternative disulphide arrangement of Cys6-Cys47, Cysl8-Cys6' and Cys48-Cys52. This is due to the fact that mature IGF-I does not contain sufficient information in its amino acid sequence to determine uniquely the native globular structure. However, the extended form, referred to as **'Long-IGF-I'** analogue contains a 13-amino-acid N-terminal fusion protein which imparts a steric constraint at a crucial point in folding, thus allowing native disulphide bonds to form efficiently. The human fusion protein-analogue of IGF-I with (Met-Phe-Pro-Ala-Met- Pro-Leu-Ser-Ser-Leu-Phe-Val-Asn [$Glu^3 \rightarrow Arg^3$]) is 83 amino acid analog that has a Glu3→Arg mutation. Human Long-R3-IGF-I is significantly more potent than human IGF-I in vitro. The enhanced potency is due to the markedly decreased binding of human Long-R3-IGF-I to IGF binding proteins which normally inhibit the biological actions of IGFs.

ELISA Kit: The kit utilizes Enzyme Linked Immunosorbent Assay (ELISA) to capture and quantitate the target molecule typically secreted or released from cells, circulating/present in sera, plasma and other body fluids, tissue lysates or cell culture supernates. The target-specific “capture” antibody is pre-coated onto high protein-binding-capacity wells of the ELISA plates. A second antibody which is biotinylated and specific to target molecule Detection Antibody) is added to the micro-wells followed by addition of avidin-Horseradish peroxidase (AHP) complex. The target molecule is quantitated by measuring the peroxidase activity of the complex (target-detection antibody-AHP) with TMB substrate. The end product of TMB substrate is yellow in color and its optical density is proportional to the amount of target captured in the microwells.

References:

1. Milner JS et al (1995) Mutations in the B-domain of insulin-like growth factor-I influence the oxidative folding to yield products with modified biological properties. Biochem. J. (1995) 308, 865-871.
2. Francis. et al. 1992 Novel recombinant fusion protein analogues of insulinlike growth factor (IGF)-I indicate the relative importance of IGF-binding protein and receptor binding for enhanced biological potency. J Mol Endocrinol 8:213–223.
3. Rinderknecht, E.; Humbel, R. E. (1978) The amino acid sequence of human insulin-like growth factor I and its structural homology with proinsulin. J. Biol. Chem. 253: 2769-2776.
4. Rotwein, P.; Pollock, K. M.; Didier, D. K.; Krivi, G. G (1986) Organization and sequence of the human insulin-like growth factor I gene: alternative RNA processing produces two insulin-like growth factor I precursor peptides. J. Biol. Chem. 261: 4828-4832.
5. Sussenbach, J. S.; Steenbergh, P. H.; Holthuizen, P (1992) Structure and expression of the human insulin-like growth factor genes. Growth Regul. 2: 1-9.