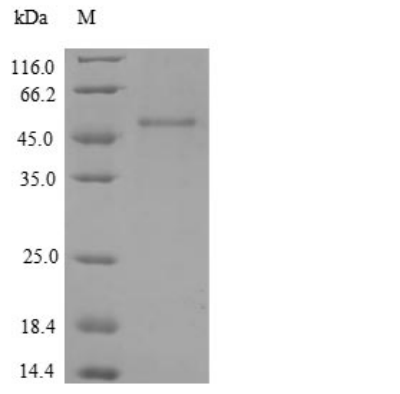
Recombinant Human Insulin-like growth factor 1 receptor (IGF1R), partial

Product Code	CSB-EP011087HU
Relevance	Receptor tyrosine kinase which mediates actions of insulin-like growth factor 1 (IGF1). Binds IGF1 with high affinity and IGF2 and insulin (INS) with a lower affinity. The activated IGF1R is involved in cell growth and survival control. IGF1R is crucial for tumor transformation and survival of malignant cell. Ligand binding activates the receptor kinase, leading to receptor autophosphorylation, and tyrosines phosphorylation of multiple substrates, that function as signaling adapter proteins including, the insulin-receptor substrates (IRS1/2), Shc and 14-3-3 proteins. Phosphorylation of IRSs proteins lead to the activation of two main signaling pathways: the PI3K-AKT/PKB pathway and the Ras-MAPK pathway. The result of activating the MAPK pathway is increased cellular proliferation, whereas activating the PI3K pathway inhibits apoptosis and stimulates protein synthesis. Phosphorylated IRS1 can activate the 85 kDa regulatory subunit of PI3K (PIK3R1), leading to activation of several downstream substrates, including protein AKT/PKB. AKT phosphorylation, in turn, enhances protein synthesis through mTOR activation and triggers the antiapoptotic effects of IGFIR through phosphorylation and inactivation of BAD. In parallel to PI3K-driven signaling, recruitment of Grb2/SOS by phosphorylated IRS1 or Shc leads to recruitment of Ras and activation of the ras-MAPK pathway. In addition to these two main signaling pathways IGF1R signals also through the Janus kinase/signal transducer and activator of transcription pathway (JAK/STAT). Phosphorylation of JAK proteins can lead to phosphorylation/activation of signal transducers and activators of transcription (STAT) proteins. In particular activation of STAT3, may be essential for the transforming activity of IGF1R. The JAK/STAT pathway activates gene transcription and may be responsible for the transforming activity. JNK kinases can also be activated by the IGF1R. IGF1 exerts inhibiting activities on JNK activation via phosphorylation and inhibition of MAP3K5/ASK1, which is able to directly associate with the IGF1R.When present in a hybrid receptor with INSR, binds IGF1. PubMed:12138094 shows that hybrid receptors composed of IGF1R and INSR isoform Long are activated with a high affinity by IGF1, with low affinity by IGF2 and not significantly activated by insulin, and that hybrid receptors composed of IGF1R and INSR isoform Short are activated by IGF1, IGF2 and insulin. In contrast, PubMed:16831875 shows that hybrid receptors composed of IGF1R and INSR isoform Long and hybrid receptors composed of IGF1R and INSR isoform Short have similar binding characteristics, both bind IGF1 and have a low affinity for insulin.
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	P08069

Alias	Insulin-like growth factor I receptor ;IGF-I receptor; CD221
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	YNITDPEELETEYPFFESRVDNKERTVISNLRPFTLYRIDIHSCNHEAEKLGCSA SNFVFARTMPAEGADDIPGPVTWEPRPENSIFLKWPEPENPNGLILMYEIKYG SQVEDQRECVSRQEYRKYGGAKLNRLNPGNYTARIQATSLSGNGSWTDPVF FYVQAKTGYE
Lead Time	3-7 business days
Source	E.coli
Gene Names	IGF1R
Expression Region	763-931aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal GST-tagged
Mol. Weight	46.4kDa
Protein Description	Partial

Image



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.

Description

Recombinant human IGF1R production in E. coli starts with co-cloning the target gene into an expression vector with an N-terminal GST-tag gene, which is introduced into E. coli cells. The target gene encodes the 763-931aa of human IGF1R. These cells are grown and induced for protein expression. The cells are lysed to release the protein, which is purified using affinity chromatography. Protein purity is checked using SDS-PAGE, exceeding 90%.

The IGF1R is a transmembrane glycoprotein with an intrinsic kinase moiety [1]. IGF1R is crucial in various physiological processes, including growth, development, and metabolism. Studies have shown that mutations in the IGF1R gene can lead to growth retardation both during intrauterine development and postnatally [2][3]. IGF1R can influence longevity. Evidence has indicated that certain mutations in the IGF1R gene are associated with increased lifespan

[4][5].

IGF1R regulates cellular signaling pathways, such as the PI3K/AKT/mTOR pathway and the Raf/MEK/ERK pathway [6]. IGF1R is implicated in cancer progression. Research has demonstrated that IGF1R is linked to breast cancer metastasis and is a potential target for cancer vaccines [7][8]. IGF1R has been related to have a dual role in breast cancer, where both activation and inhibition of IGF1R can impact tumor development [9].

References:
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[9] J. Bulatowicz and T. Wood, Activation versus inhibition of igf1r: a dual role in breast tumorigenesis, Frontiers in Endocrinology, vol. 13, 2022. https://doi.org/10.3389/fendo.2022.911079

Reconstitution

We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a

concentration of 0.1-1.0 mg/mL.We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.