abcam

ab245691

Anti-Insulin Receptor antibody [83-14]

Key facts

Isotype	IgG
Host species	Rabbit
Storage buffer	Preservative: 0.02% Proclin 300 Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Clone number	83-14
Purification technique	Affinity purification Protein A
Epitope	Recognises the extracellular domain of the Insulin Receptor alpha. Amino acids 469 - 592(exon 7 and 8) of Insulin Receptor alpha.
Light chain type	kappa
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

Flow Cyt

Tested

Species	Human
Dilution info	10 µg/mL
Notes	-

Predicted

Species	Mouse, Rat
Dilution info	-
Notes	-

Target data

See full target information INSR

Function

Receptor tyrosine kinase which mediates the pleiotropic actions of insulin. Binding of insulin leads to phosphorylation of several intracellular substrates, including, insulin receptor substrates (IRS1, 2, 3, 4), SHC, GAB1, CBL and other signaling intermediates. Each of these phosphorylated proteins serve as docking proteins for other signaling proteins that contain Src-homology-2 domains (SH2 domain) that specifically recognize different phosphotyrosine residues, including the p85 regulatory subunit of PI3K and SHP2. Phosphorylation of IRSs proteins lead to the activation of two main signaling pathways: the PI3K-AKT/PKB pathway, which is responsible for most of the metabolic actions of insulin, and the Ras-MAPK pathway, which regulates expression of some genes and cooperates with the PI3K pathway to control cell growth and differentiation. Binding of the SH2 domains of PI3K to phosphotyrosines on IRS1 leads to the activation of PI3K and the generation of phosphatidylinositol-(3, 4, 5)-triphosphate (PIP3), a lipid second messenger, which activates several PIP3-dependent serine/threonine kinases, such as PDPK1 and subsequently AKT/PKB. The net effect of this pathway is to produce a translocation of the glucose transporter SLC2A4/GLUT4 from cytoplasmic vesicles to the cell membrane to facilitate glucose transport. Moreover, upon insulin stimulation, activated AKT/PKB is responsible for: anti-apoptotic effect of insulin by inducing phosphorylation of BAD; regulates the expression of gluconeogenic and lipogenic enzymes by controlling the activity of the winged helix or forkhead (FOX) class of transcription factors. Another pathway regulated by PI3K-AKT/PKB activation is mTORC1 signaling pathway which regulates cell growth and metabolism and integrates signals from insulin. AKT mediates insulin-stimulated protein synthesis by phosphorylating TSC2 thereby activating mTORC1 pathway. The Ras/RAF/MAP2K/MAPK pathway is mainly involved in mediating cell growth, survival and cellular differentiation of insulin. Phosphorylated IRS1 recruits GRB2/SOS complex, which triggers the activation of the Ras/RAF/MAP2K/MAPK pathway. In addition to binding insulin, the insulin receptor can bind insulin-like growth factors (IGFI and IGFII). Isoform Short has a higher affinity for IGFII binding. When present in a hybrid receptor with IGF1R, 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. In adipocytes, inhibits lipolysis (By similarity).

Storage

Shipped at conditions	Blue Ice
Appropriate short-term storage duration	1-2 weeks
Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	-20°C
Aliquoting information	Upon delivery aliquot
Storage information	Avoid freeze / thaw cycle

Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

Activity summary	The insulin receptor (INSR) is a transmembrane glycoprotein that functions as a receptor for insulin. Known also as CD220 the receptor has a molecular weight of about 320 kDa. It is widely expressed in insulin-sensitive tissues such as liver muscle and adipose tissues. The insulin receptor consists of two α subunits and two β subunits forming a heterotetramer. These subunits are located outside and inside the cell membrane respectively. The α subunits bind insulin while the β subunits possess tyrosine kinase activity important for downstream signaling.
Biological function summary	Insulin receptor plays a role in facilitating the effects of insulin on glucose and lipid metabolism. When insulin a protein binds to the insulin receptor it undergoes a conformational change that activates its intrinsic kinase activity. This activation further leads to tyrosine phosphorylation of intracellular targets resulting in modulation of cellular functions. Insulin receptor also participates in the formation of signaling complexes through interaction with substrates like insulin receptor substrate (IRS) proteins which are important for the transmission of the insulin signal inside cells.
Pathways	Insulin receptor is central to the insulin signaling pathway and the mitogen-activated protein kinase (MAPK) pathway. Activation of the insulin receptor triggers the insulin signaling cascade which involves various proteins like PI3 kinase and Akt that contribute to glucose uptake and metabolism. In the MAPK pathway the insulin receptor influences gene expression related to cell growth and differentiation. These pathways intertwine with other hormone signaling systems and affect numerous physiological processes critical for maintaining metabolic homeostasis.
Associated diseases and disorders	Aberrations in insulin receptor function are linked to insulin resistance and type 2 diabetes. Defective signaling through this receptor impairs glucose transport into cells contributing to hyperglycemia. Disorders in insulin receptor activity also relate to metabolic syndrome a cluster of conditions increasing the risk of heart

disease. Proteins connected to these conditions include IRS proteins and PI3 kinase highlighting the integrated roles these components play in metabolic regulation. Developing anti-insulin receptor antibodies offers potential therapeutic interventions to modulate receptor function and manage these disorders effectively.

Product promise

Tested

We have tested this species and application combination and it works. It is covered by our product promise.

Expected

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

Predicted

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

Not recommended

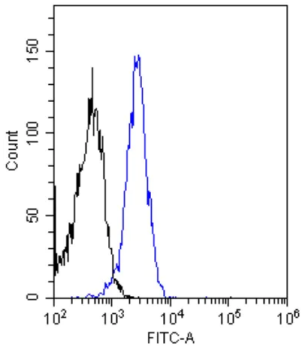
We do not recommend this combination. It is not covered by our product promise.

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Flow Cytometry - Anti-Insulin Receptor antibody [83-14] (ab245691)

Insulin Receptor Flow Cytometry staining using rabbit Anti-Insulin Receptor antibody

Flow Cytometry ab245691.
Jurkat (Human T cell leukemia cell line from peripheral blood) cells were stained with unimmunized rabbit IgG antibody (black line) or ab245691 (blue line) at a concentration of 10 µg/ml for 30 mins at RT. After washing, bound antibody was detected using anti-rabbit IgG JK (FITC-conjugate) antibody at 2 µg/ml.

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