abcam

ab983

Anti-Insulin Receptor beta antibody [18-44]

Mouse Monoclonal Insulin Receptor beta antibody. Suitable for Flow Cyt and reacts with Human samples. Immunogen corresponding to Native Full Length Protein corresponding to Human INSR.

Key facts

Isotype	IgG2b
Host species	Mouse
Storage buffer	pH: 7.4
Form	Liquid
Clonality	Monoclonal
Immunogen	Native Full Length Protein corresponding to Human Insulin receptor beta. Database link P06213
Clone number	18-44
Purification technique	Affinity purification Protein G
Specificity	This antibody reacts specifically with the beta subunit of the insulin receptor.
Concentration	0.6 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →
Purification notes	Purified from TCS

Reactivity data

Flow Cyt

Tested

Species	Human

Dilution info	1 µg for 10^6 Cells
Notes	ab170192 - Mouse monoclonal IgG2b, is suitable for use as an isotype control with this antibody.

Target data

See full target information Insulin receptor beta

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 conditions	+4°C
Appropriate long-term storage conditions	-20°C
Aliquoting information	Upon delivery aliquot
Storage information	Avoid freeze / thaw cycle

Notes

This product was changed from ascites to tissue culture supernatant on 19/12/2018. Please note that the dilutions may need to be adjusted accordingly. If you have any questions please do not hesitate to contact our scientific support team.

Supplementary info

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

Activity summary	Insulin Receptor beta (IR beta) also known as IRB is a subunit of the insulin receptor which is a transmembrane protein deeply involved in cellular signal transduction. This receptor has two main subunits: alpha and beta. The insulin receptor beta is responsible for the transduction of insulin's metabolic and mitogenic signals through its intrinsic tyrosine kinase activity. This subunit has a molecular mass of approximately 95 kDa and is predominantly expressed on the surface of insulin-responsive cells like liver muscle and adipose tissue cells where it mediates glucose uptake and metabolism. Its expression is usually determined through methods such as insulin western blot.
Biological function summary	The function of insulin receptor beta involves both glucose homeostasis and growth regulation as part of the tetrameric insulin receptor complex. Upon insulin binding to the receptor IR beta undergoes autophosphorylation leading to the recruitment and phosphorylation of various intracellular substrates. This interaction plays a critical role in mediating the effects of insulin such as promoting glucose uptake in cells and modulating lipid metabolism. This receptor subunit is also referred to in studies as insulin 44 or insulin 37 referring to different conceptual sizes or regulatory stages.
Pathways	The insulin signaling pathway represents the main route facilitated by insulin receptor beta. This pathway is essential for regulating glucose transport lipid metabolism and protein synthesis. Perturbations in this cascade are commonly associated with insulin resistance. The insulin receptor beta interacts with other proteins like insulin receptor substrates (IRS) during this pathway which subsequently activate key downstream pathways such as the PI3K-AKT pathway critical for cell survival and growth. This protein also plays a role in MAP kinase signaling through which it impacts gene expression related to cell growth.

Associated diseases and disorders	Insulin receptor beta relates prominently to type 2 diabetes mellitus and metabolic syndrome. Mutations or dysfunctions in IR beta can lead to defective insulin signaling causing insulin resistance a major hallmark of these conditions. Additionally it is implicated in polycystic ovary syndrome (PCOS) where altered insulin signaling influences the endocrine and metabolic profiles. Proteins like insulin receptor substrates are often examined in these contexts as they directly interact with IR beta and modulate the downstream effects seen in these diseases.

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

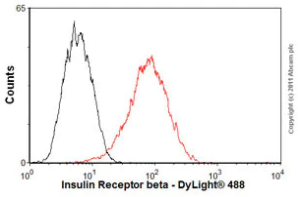
We do not recommend this combination. It is not covered by our product promise.

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1 product image



Flow Cytometry - Anti-Insulin Receptor beta antibody [18-44] (ab983)

Insulin Receptor beta Flow Cytometry staining using mouse Anti-Insulin Receptor beta antibody

Overlay histogram showing HepG2 cells stained with ab983 (red line). The cells were fixed with 4% paraformaldehyde (10 min) and then permeabilized with 0.1% PBS-Tween for 20 min. The cells were then incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions followed by the antibody (ab983, 1µg/1x10^6 cells) for 30 min at 22°C. The secondary antibody used was DyLight® 488 goat anti-mouse IgG (H+L) (ab96879) at 1/500 dilution for 30 min at 22°C. Isotype control antibody (black line) was mouse IgG2b [PLPV219] (ab91366, 2µg/1x10^6 cells) used under the same conditions. Acquisition of >5,000 events was

performed. This antibody gave a positive signal in HepG2 cells fixed with 80% methanol (5 min)/permeabilized with 0.1% PBS-Tween for 20 min used under the same conditions. This image was generated using the ascites version of the product.

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