abcam

ab69508

Anti-Insulin Receptor beta antibody [C18C4]

Mouse Monoclonal Insulin Receptor beta antibody. Suitable for IHC-P, Flow Cyt, WB and reacts with Human, Mouse, Rat samples. Cited in 40 publications. Immunogen corresponding to Recombinant Fragment Protein within Human INSR.

Key facts

Isotype	IgG1
Host species	Mouse
Storage buffer	Preservative: 0.09% Sodium azide Constituents: PBS, 50% Glycerol (glycerin, glycerine)
Form	Liquid
Clonality	Monoclonal
Immunogen	Recombinant Fragment Protein within Human Insulin receptor beta. The exact immunogen used to generate this antibody is proprietary information. Database link P06213
Clone number	C18C4
Purification technique	Affinity purification Protein G
Purification notes	Purified from TCS.

Reactivity data

IHC-P

Tested

Species	Human
Dilution info	-
Notes	

	Perform heat-mediated antigen retrieval with citrate buffer pH 6 before commencing with IHC staining protocol.

Expected

Species	Mouse, Rat
Dilution info	Use at an assay dependent concentration.
Notes	-

Flow Cyt

Tested

Species	Human
Dilution info	-
Notes	ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Expected

Species	Mouse, Rat
Dilution info	Use at an assay dependent concentration.
Notes	-

WB

Tested

Species	Mouse
Dilution info	-
Notes	(developed by ECL)

Species	Rat
Dilution info	-
Notes	(developed by ECL)

Species	Human
Dilution info	-

Notes	(developed by ECL)

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 22nd May 2019. 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

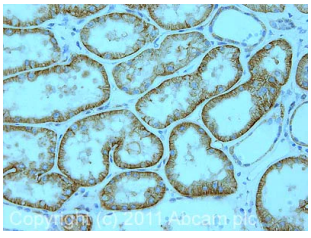
We do not recommend this combination. It is not covered by our product promise.

We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

In the unlikely event of one of our products not working as expected, you are covered by our product promise.

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Terms & Conditions.

4 product images



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Insulin Receptor beta antibody [C18C4] (ab69508)

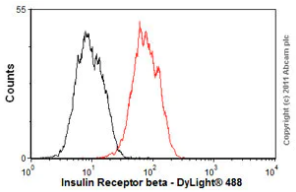
Insulin Receptor beta Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-Insulin Receptor beta antibody

IHC image of ab69508 staining in human normal kidney formalin fixed paraffin embedded tissue section, performed on a Leica Bond™ system using the standard protocol F. The section was pre-treated using heat mediated antigen retrieval with sodium citrate buffer (pH6, epitope retrieval solution 1) for 20 mins. The section was then incubated with ab69508, 1µg/ml, for 15 mins at room temperature and detected using an HRP conjugated compact polymer system. DAB was used as the chromogen. The section was then counterstained with haematoxylin and mounted with DPX.

For other IHC staining systems (automated and non-automated) customers should optimize

variable parameters such as antigen retrieval conditions, primary antibody concentration and antibody incubation times.

This image was generated using the ascites version of the product.

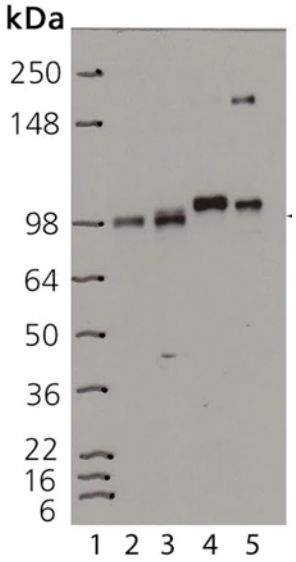


Flow Cytometry - Anti-Insulin Receptor beta antibody [C18C4] (ab69508)

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

Overlay histogram showing HepG2 cells stained with ab69508 (red line). The cells were fixed with 80% methanol (5 min) and incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions. The cells were then incubated with the antibody (ab69508, 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 IgG1 [ICIGG1] (ab91353, 2µg/1x10^6 cells) used under the same conditions. Acquisition of >5,000 events was performed.
Please note that Abcam do not have any data for use of this antibody on non-fixed cells. We welcome any customer feedback.

This image was generated using the ascites version of the product.



Western blot - Anti-Insulin Receptor beta antibody [C18C4] (ab69508)

This image was generated using the ascites version of the product.
All lanes:
Western blot - Anti-Insulin Receptor beta antibody [C18C4] (ab69508) at 1/1000 dilution

Lane 2:
HeLa lysate (Human epithelial cell line from cervix adenocarcinoma)

Lane 3:
MCF-7 lysate (Human breast adenocarcinoma cell line)

Lane 4:
PC-12 lysate (Rat adrenal gland pheochromocytoma cell line)

Lane 5:
3T3-L1 lysate (Mouse embryonic fibroblast cell line)

Developed using the ECL technique.

Predicted band size: 95 kDa

Observed band size: 98 kDa

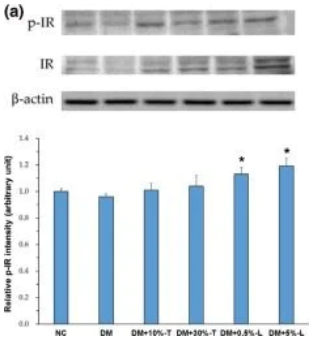


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Western blot - Anti-Insulin Receptor beta antibody [C18C4] (ab69508)

Insulin Receptor beta Western blot staining using mouse Anti-Insulin Receptor beta antibody

Insulin Receptor beta western blot using anti-Insulin Receptor beta antibody [C18C4] ab69508. Publication image and figure legend from Shih, C. K., Chen, C. M., et al., 2020, Food Nutr Res, PubMed 32425738.

ab69508 was used in this publication in western blot. This may not be the same as the application(s) guaranteed by Abcam. For a full list of applications guaranteed by Abcam for ab69508 please see the product overview.

Expression of insulin-signaling-related proteins in the muscle. Protein expression of p-IR & IR (panel a), p-Akt & Akt (panel b), and M-GLUT4 & T-GLU4 (panel c) were analyzed with Western blot of the homogenates in the gastrocnemius muscle. Data are expressed as means ± standard deviations (n = 5). p-IR, phospho-insulin receptor; IR, insulin receptor; p-Akt, phospho-protein kinase B; Akt, protein kinase B; M-GLU4, membrane glucose transporter 4; T-GLU4, total glucose transporter 4; Asterisks indicate significant difference compared to DM group. Statistical evaluation was performed using one-way ANOVA, followed by Duncan's multiple range test, $p < 0.05$.

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