abcam

ab5831

Anti-SMN/Gemin 1 antibody [2B1]

Key facts

Isotype	IgG1
Host species	Mouse
Storage buffer	Preservative: 0.1% Sodium azide Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Immunogen	Recombinant Full Length Protein corresponding to Human SMN1. Database link Q16637
Clone number	2B1
Purification technique	Affinity purification Protein A
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →
Purification notes	Purified from tissue culture supernatant.

Reactivity data

IHC-P

Tested

Species	Human
Dilution info	5 µg/mL
Notes	Perform heat-mediated antigen retrieval with citrate buffer pH 6 before commencing with IHC staining protocol.

Expected

Species	Xenopus laevis
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Mouse
Dilution info	-
Notes	-

IP

Tested

Species	Human
Dilution info	-
Notes	-

Expected

Species	Xenopus laevis
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Mouse
Dilution info	-
Notes	-

Flow Cyt

Tested

Species	Human
Dilution info	1 µg for 10^6 Cells
Notes	ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Expected

Species	Xenopus laevis
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Mouse
Dilution info	-
Notes	-

ELISA

Expected

Species	Mouse, Xenopus laevis, Human
Dilution info	Use at an assay dependent concentration.
Notes	-

WB

Tested

Species	Human, Xenopus laevis
Dilution info	-
Notes	-

Predicted

Species	Mouse

Dilution info	-
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	-
Notes	-

Expected

Species	Xenopus laevis
Dilution info	Use at an assay dependent concentration.
Notes	-

Predicted

Species	Mouse
Dilution info	-
Notes	-

Target data

See full target information SMN1

Function

The SMN complex catalyzes the assembly of small nuclear ribonucleoproteins (snRNPs), the building blocks of the spliceosome, and thereby plays an important role in the splicing of cellular pre-mRNAs (PubMed:18984161, PubMed:9845364). Most spliceosomal snRNPs contain a common set of Sm proteins SNRPB, SNRPD1, SNRPD2, SNRPD3, SNRPE, SNRPF and SNRPG that assemble in a heptameric protein ring on the Sm site of the small nuclear RNA to form the core snRNP (Sm core) (PubMed:18984161). In the cytosol, the Sm proteins SNRPD1, SNRPD2, SNRPE, SNRPF and SNRPG are trapped in an inactive 6S pICln-Sm complex by the chaperone CLNS1A that controls the assembly of the core snRNP (PubMed:18984161). To assemble core snRNPs, the SMN complex accepts the trapped 5Sm proteins from CLNS1A forming an intermediate (PubMed:18984161). Within the SMN complex, SMN1 acts as a structural backbone and together with GEMIN2 it gathers the Sm complex subunits (PubMed:17178713, PubMed:21816274, PubMed:22101937). Binding of snRNA inside 5Sm ultimately

triggers eviction of the SMN complex, thereby allowing binding of SNRPD3 and SNRPB to complete assembly of the core snRNP (PubMed:31799625). Ensures the correct splicing of U12 intron-containing genes that may be important for normal motor and proprioceptive neurons development (PubMed:23063131). Also required for resolving RNA-DNA hybrids created by RNA polymerase II, that form R-loop in transcription terminal regions, an important step in proper transcription termination (PubMed:26700805). May also play a role in the metabolism of small nucleolar ribonucleoprotein (snoRNPs).

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	SMN also known as Survival of Motor Neuron protein or Gemin 1 is an important protein involved in the assembly of small nuclear ribonucleoproteins (snRNPs). It has a molecular mass of approximately 38 kDa. SMN proteins are expressed in almost all tissues with highest levels in spinal cord and brain tissues. They play a mechanical role in Gemin complex assisting RNA processing tasks which are essential in RNA metabolism alongside other Gemin proteins.
Biological function summary	The SMN protein operates within the SMN-Gemin complex a multi-protein assembly important for snRNP biogenesis and pre-mRNA splicing. This complex coordinates the maturation and transport of snRNPs facilitating the processing of precursor mRNAs in the nucleus. SMN and associated Gemin proteins mediate the assembly of Sm proteins onto snRNA ensuring accurate splicing mechanisms necessary for gene expression.
Pathways	The SMN protein is notably involved in the chaperone-assisted assembly pathway related to snRNP biogenesis. It plays a central role in the spliceosome assembly process working closely with Sm proteins and other RNA-binding proteins. Importantly SMN interacts with the ribonucleoprotein complex influencing mRNA splicing which integrates into the broader cell signaling pathways such as the

	cholinergic agonist pathways and RNA splicing pathways that regulate neuromuscular communication.
Associated diseases and disorders	The deficiency or malfunction of SMN protein directly relates to Spinal Muscular Atrophy (SMA) an autosomal recessive disorder. SMA is characterized by motor neuron degeneration which can be attributed to insufficient SMN protein levels leading to compromised snRNP assembly and splicing. The SMN1 gene deletion or mutation reduces the available SMN protein linking this defect with the severity of SMA. Studies suggest that altering the expression levels of the related SMN2 gene can potentially modulate disease outcomes further emphasizing the connection between SMN protein and SMA pathogenesis.

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

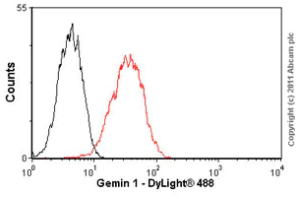
We do not recommend this combination. It is not covered by our product promise.

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.

Full details and terms and conditions can be found here:
Terms & Conditions.

6 product images

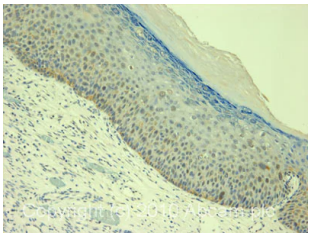


Flow Cytometry - Anti-SMN/Gemin 1 antibody [2B1] (ab5831)

SMN/Gemin 1 Flow Cytometry staining using mouse Anti-SMN/Gemin 1 antibody

Overlay histogram showing HepG2 cells stained with ab5831 (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 (ab5831, 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. This antibody gave a positive signal in HepG2 cells fixed with 100% methanol (5 min)/permeabilized in 0.1% PBS-Tween used under the same conditions.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-SMN/Gemin 1 antibody [2B1] (ab5831)

SMN/Gemin 1 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-SMN/Gemin 1 antibody

IHC image of ab5831 staining in human normal cervical carcinoma 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 ab5831, 5µg/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.

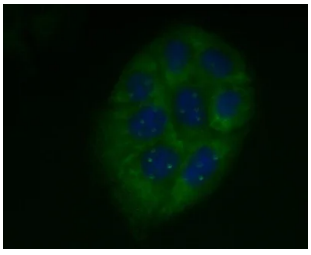


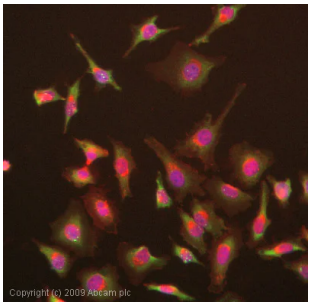
Image courtesy of an anonymous customer review.

Immunocytochemistry/ Immunofluorescence - Anti-SMN/Gemin 1 antibody [2B1] (ab5831)

SMN/Gemin 1 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-SMN/Gemin 1 antibody

ab5831 staining Gemin 1 in human HeLa cells by Immunocytochemistry/ Immunofluorescence. The cells were fixed in methanol and then blocked using 0.2% fish scale gelatin for 1 hour at 25°C. Samples were then incubated with primary antibody at 1/300 for 20 minutes at 25°C. The secondary antibody used was a donkey anti-mouse IgG conjugated to Alexa Fluor® 488 (green) used at a 1/500 dilution. Counterstained with DAPI (blue).

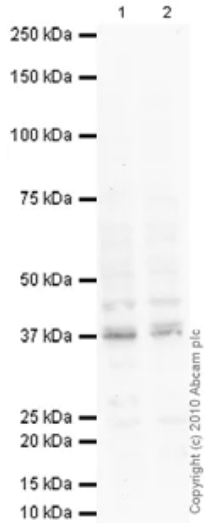
Gemin 1 is clearly visible in the cytoplasm and also as small dots in the nucleus (cajal bodies).



Immunocytochemistry/ Immunofluorescence - Anti-SMN/Gemin 1 antibody [2B1] (ab5831)

SMN/Gemin 1 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-SMN/Gemin 1 antibody

ICC/IF image of ab5831 stained HeLa cells. The cells were 4% PFA fixed (10 min) and then incubated in 1%BSA / 10% normal goat serum / 0.3M glycine in 0.1% PBS-Tween for 1h to permeabilise the cells and block non-specific protein-protein interactions. The cells were then incubated with the antibody (ab5831, 1µg/ml) overnight at +4°C. The secondary antibody (green) was Alexa Fluor® 488 goat anti-mouse IgG (H+L) used at a 1/1000 dilution for 1h. Alexa Fluor® 594 WGA was used to label plasma membranes (red) at a 1/200 dilution for 1h. DAPI was used to stain the cell nuclei (blue) at a concentration of 1.43µM.



Western blot - Anti-SMN/Gemin 1 antibody [2B1] (ab5831)

Gemin 1contains a number of potential phosphorylation sites (SwissProt) which may explain its migration at a higher molecular weight than predicted.
All lanes:
Western blot - Anti-SMN/Gemin 1 antibody [2B1] (ab5831) at 1 µg/mL

Lane 3:
HepG2 (Human hepatocellular liver carcinoma cell line) Whole Cell Lysate at 10 µg

Lane 4:
HeLa (Human epithelial carcinoma cell line) Whole Cell Lysate at 10 µg

Secondary

All lanes:
Goat polyclonal to Mouse IgG - H&L - Pre-Adsorbed (HRP) (ab65485) at 1/3000 dilution

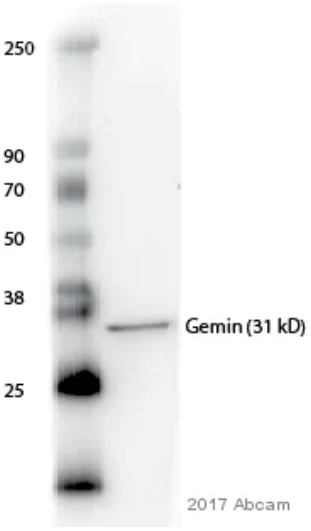
Developed using the ECL technique.

Performed under reducing conditions.

Predicted band size: 32 kDa

Observed band size: 37 kDa, 45 kDa

Exposure time: 20min



This image is courtesy of a customer review submitted by Samantha Jeschonek.

Western blot - Anti-SMN/Gemin 1 antibody [2B1] (ab5831)

All lanes:
Western blot - Anti-SMN/Gemin 1 antibody [2B1] (ab5831) at 1/100 dilution

All lanes:
Xenopus laevis st II-III oocytes whole cell lysate at 20 µg

Secondary

All lanes:
Western blot - Goat Anti-Mouse IgG Fc (HRP) (ab97265) at 1/25000 dilution

Performed under reducing conditions.

Predicted band size: 32 kDa

Observed band size: 31 kDa

Exposure time: 30s

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.