

## Product datasheet

### Anti-Titin antibody [EPR24455-21] ab284860

Recombinant RabMAb

9 Images

#### Overview

<b>Product name</b>	Anti-Titin antibody [EPR24455-21]
<b>Description</b>	Rabbit monoclonal [EPR24455-21] to Titin
<b>Host species</b>	Rabbit
<b>Tested applications</b>	<b>Suitable for:</b> IHC-Fr, IHC-P, WB <b>Unsuitable for:</b> Flow Cyt (Intra), ICC/IF or IP
<b>Species reactivity</b>	<b>Reacts with:</b> Mouse, Rat, Human
<b>Immunogen</b>	Recombinant fragment. This information is proprietary to Abcam and/or its suppliers.
<b>Positive control</b>	WB: Human heart, Human skeletal muscle, Mouse heart, Mouse skeletal muscle, Rat heart and Rat skeletal muscle lysates. IHC-P: Human cardiac muscle, Human skeletal muscle, Mouse cardiac muscle and Rat cardiac muscle tissues. IHC-Fr: Human frozen heart tissue sections.
<b>General notes</b>	This product is a recombinant monoclonal antibody, which offers several advantages including: <ul style="list-style-type: none"> <li>- High batch-to-batch consistency and reproducibility</li> <li>- Improved sensitivity and specificity</li> <li>- Long-term security of supply</li> <li>- Animal-free production</li> </ul> For more information <a href="#">see here</a> . Our RabMAb <sup>®</sup> technology is a patented hybridoma-based technology for making rabbit monoclonal antibodies. For details on our patents, please refer to <a href="#">RabMAb<sup>®</sup> patents</a> .

#### Properties

<b>Form</b>	Liquid
<b>Storage instructions</b>	Shipped at 4°C. Store at +4°C short term (1-2 weeks). Upon delivery aliquot. Store at -20°C.
<b>Storage buffer</b>	pH: 7.2 Preservative: 0.01% Sodium azide Constituents: 59% PBS, 40% Glycerol (glycerin, glycerine), 0.05% BSA
<b>Purity</b>	Protein A purified
<b>Clonality</b>	Monoclonal
<b>Clone number</b>	EPR24455-21

Isotype

IgG

## Applications

### The Abpromise guarantee

Our **Abpromise guarantee** covers the use of ab284860 in the following tested applications.

The application notes include recommended starting dilutions; optimal dilutions/concentrations should be determined by the end user.

Application	Abreviews	Notes
IHC-Fr		Use a concentration of 0.5 µg/ml.
IHC-P		1/2000. Perform heat mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.
WB		1/1000. Predicted molecular weight: 3816 kDa.

### Application notes

Is unsuitable for Flow Cyt (Intra), ICC/IF or IP.

## Target

### Function

Key component in the assembly and functioning of vertebrate striated muscles. By providing connections at the level of individual microfilaments, it contributes to the fine balance of forces between the two halves of the sarcomere. The size and extensibility of the cross-links are the main determinants of sarcomere extensibility properties of muscle. In non-muscle cells, seems to play a role in chromosome condensation and chromosome segregation during mitosis. Might link the lamina network to chromatin or nuclear actin, or both during interphase.

### Tissue specificity

Isoform 3, isoform 7 and isoform 8 are expressed in cardiac muscle. Isoform 4 is expressed in vertebrate skeletal muscle. Isoform 6 is expressed in cardiac tissues.

### Involvement in disease

Defects in TTN are the cause of hereditary myopathy with early respiratory failure (HMERF) [MIM:603689]; also known as Edstrom myopathy. HMERF is an autosomal dominant, adult-onset myopathy with early respiratory muscle involvement.

Defects in TTN are the cause of familial hypertrophic cardiomyopathy type 9 (CMH9) [MIM:613765]. Familial hypertrophic cardiomyopathy is a hereditary heart disorder characterized by ventricular hypertrophy, which is usually asymmetric and often involves the interventricular septum. The symptoms include dyspnea, syncope, collapse, palpitations, and chest pain. They can be readily provoked by exercise. The disorder has inter- and intrafamilial variability ranging from benign to malignant forms with high risk of cardiac failure and sudden cardiac death.

Defects in TTN are the cause of cardiomyopathy dilated type 1G (CMD1G) [MIM:604145]. Dilated cardiomyopathy is a disorder characterized by ventricular dilation and impaired systolic function, resulting in congestive heart failure and arrhythmia. Patients are at risk of premature death.

Defects in TTN are the cause of tardive tibial muscular dystrophy (TMD) [MIM:600334]; also known as Udd myopathy. TMD is an autosomal dominant, late-onset distal myopathy. Muscle weakness and atrophy are usually confined to the anterior compartment of the lower leg, in particular the tibialis anterior muscle. Clinical symptoms usually occur at age 35-45 years or much later.

Defects in TTN are the cause of limb-girdle muscular dystrophy type 2J (LGMD2J) [MIM:608807]. LGMD2J is an autosomal recessive degenerative myopathy characterized by progressive weakness of the pelvic and shoulder girdle muscles. Severe disability is observed within 20 years of onset.

Defects in TTN are the cause of early-onset myopathy with fatal cardiomyopathy (EOMFC) [MIM:611705]. Early-onset myopathies are inherited muscle disorders that manifest typically from birth or infancy with hypotonia, muscle weakness, and delayed motor development. EOMFC is a titinopathy that, in contrast with the previously described examples, involves both heart and skeletal muscle, has a congenital onset, and is purely recessive. This phenotype is due to homozygous out-of-frame TTN deletions, which lead to a total absence of titin's C-terminal end from striated muscles and to secondary CAPN3 depletion.

### Sequence similarities

Belongs to the protein kinase superfamily. CAMK Ser/Thr protein kinase family.

Contains 132 fibronectin type-III domains.

Contains 152 Ig-like (immunoglobulin-like) domains.

Contains 19 Kelch repeats.

Contains 1 protein kinase domain.

Contains 17 RCC1 repeats.

Contains 14 TPR repeats.

Contains 15 WD repeats.

### Domain

ZIS1 and ZIS5 regions contain multiple SPXR consensus sites for ERK- and CDK-like protein kinases as well as multiple SP motifs. ZIS1 could adopt a closed conformation which would block the TCAP-binding site.

The PEVK region may serve as an entropic spring of a chain of structural folds and may also be an interaction site to other myofilament proteins to form interfilament connectivity in the sarcomere.

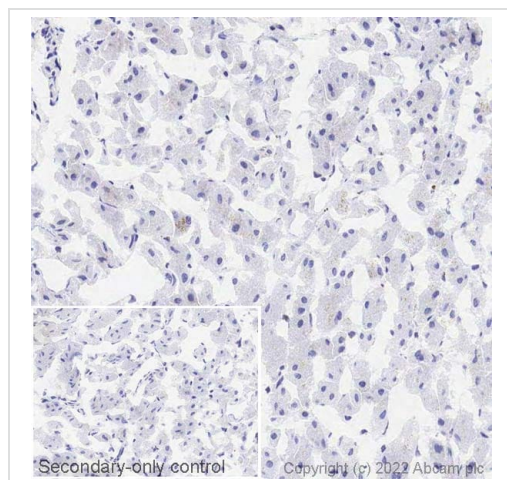
### Post-translational modifications

Autophosphorylated (By similarity). Phosphorylated upon DNA damage, probably by ATM or ATR.

### Cellular localization

Cytoplasm. Nucleus.

## Images

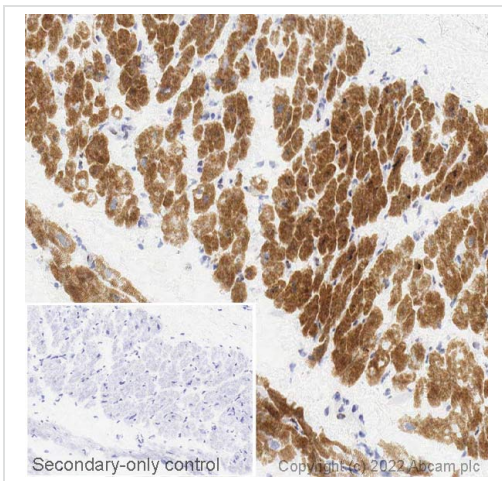


Immunohistochemistry (Frozen sections) - Anti-Titin antibody [EPR24455-21] (ab284860)

Lab

Negative control image: IHC image of Titin staining in a section of human normal frozen liver\* performed on a Leica Biosystems BOND® RX instrument using the standard protocol. The section was fixed in 10% paraformaldehyde (10 min) prior to staining. The section was incubated with ab284860, 0.5ug/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. The inset secondary-only control image is taken from an identical assay without primary antibody.

\*Tissue obtained from the Human Research Tissue Bank, supported by the NIHR Cambridge Biomedical Research Centre  
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.



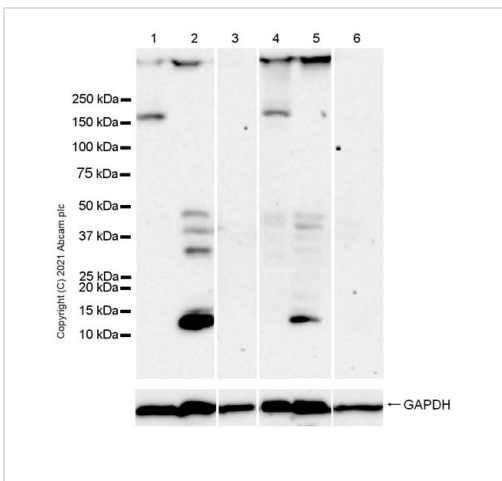
Immunohistochemistry (Frozen sections) - Anti-Titin antibody [EPR24455-21] (ab284860)

Lab

IHC image of Titin staining in a section of human normal frozen heart performed on a Leica Biosystems BOND<sup>®</sup> RX instrument using the standard protocol. The section was fixed in 10% paraformaldehyde (10 min) prior to staining. The section was incubated with ab284860, 0.5ug/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. The inset secondary-only control image is taken from an identical assay without primary antibody.

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.

\*Tissue obtained from the Human Research Tissue Bank, supported by the NIHR Cambridge Biomedical Research Centre



Western blot - Anti-Titin antibody [EPR24455-21] (ab284860)

**All lanes** : Anti-Titin antibody [EPR24455-21] (ab284860) at 1/1000 dilution

**Lane 1** : Mouse heart tissue lysate

**Lane 2** : Mouse skeletal muscle tissue lysate

**Lane 3** : Mouse lu tissue lysate 20

**Lane 4** : Rat heart tissue lysate

**Lane 5** : Rat skeletal muscle tissue lysate

**Lane 6** : Rat lu tissue lysate 20

### Secondary

**All lanes** : Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated (**ab97051**) at 1/100000 dilution

**Predicted band size:** 3816 kDa

Blocking and diluting buffer and concentration: 5%

NFDM/TBST Negative control: lung (PMID:15752755)

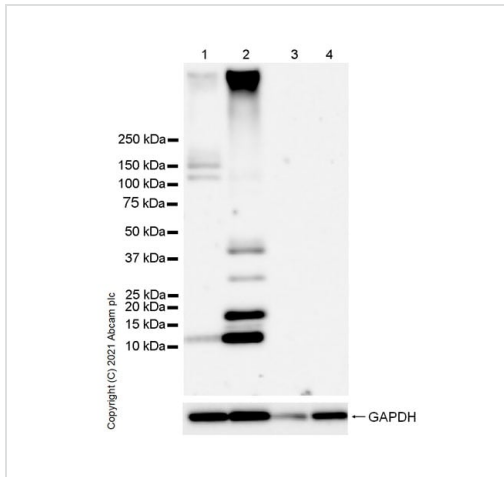
The multiples bands observed in the WB have been reported in literature (PMID:25877298)

Ab284860 recognizes TTN at a MW >>250 kDa. In skeletal muscle, ab284860 recognizes the complete TTN protein at >>250 kDa as

well as the cleavage products of TTN generated by CAPN3, at 13 kDa, 15 kDa, 18 kDa and 45 kDa. In cardiac muscle, ab284860 recognizes the complete TTN protein at >>250 kDa as well as bands at 13 and 150 kDa.

This blot was developed using a higher sensitivity ECL substrate.

Exposure time: 3 minutes



Western blot - Anti-Titin antibody [EPR24455-21]  
(ab284860)

**All lanes :** Anti-Titin antibody [EPR24455-21] (ab284860) at 1/1000 dilution

**Lane 1 :** Human heart tissue lysate

**Lane 2 :** Human skeletal muscle tissue lysate

**Lane 3 :** Human liver tissue lysate

**Lane 4 :** Human lung tissue lysate

#### **Secondary**

**All lanes :** VeriBlot for IP secondary antibody(HRP)([ab131366](#)) at 1/5000 dilution

**Predicted band size:** 3816 kDa

Blocking and diluting buffer and concentration: 5%

NFDM/TBST Negative control: liver, lung (PMID: 15752755)

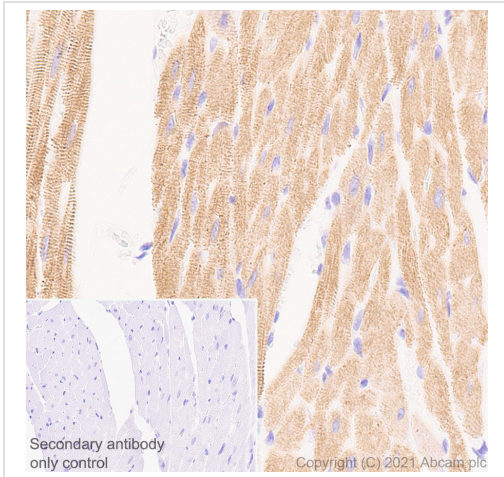
The multiples bands observed in the WB have been reported in literature (PMID:25877298)

Ab284860 recognizes TTN at a MW >>250 kDa. In skeletal muscle, ab284860 recognizes the complete TTN protein at >>250 kDa as well as the cleavage products of TTN generated by CAPN3, at 13 kDa, 15 kDa, 18 kDa and 45 kDa. In cardiac muscle, ab284860 recognizes the complete TTN protein at >>250 kDa as well as bands at 13 and 150 kDa.

This blot was developed using a higher sensitivity ECL substrate.

Exposure time: 48 seconds



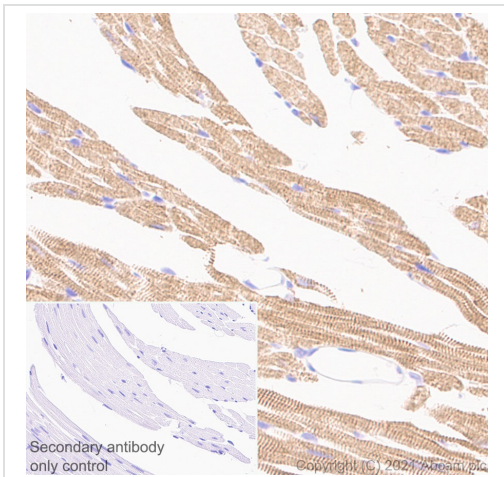


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Titin antibody [EPR24455-21] (ab284860)

Immunohistochemical analysis of paraffin-embedded Rat cardiac muscle tissue labelling Titin with ab284860 at 1/4000 (0.167 ug/ml) followed by a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**). Positive staining on rat cardiac muscle. The section was incubated with ab284860 for 10 mins at room temperature. The immunostaining was performed on a Leica Biosystems BOND® RX instrument Counterstained with Hematoxylin.

Secondary antibody only control: Secondary antibody is a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**).

Heat mediated antigen retrieval with Tris-EDTA buffer (pH 9.0, epitope retrieval solution2) for 20 mins

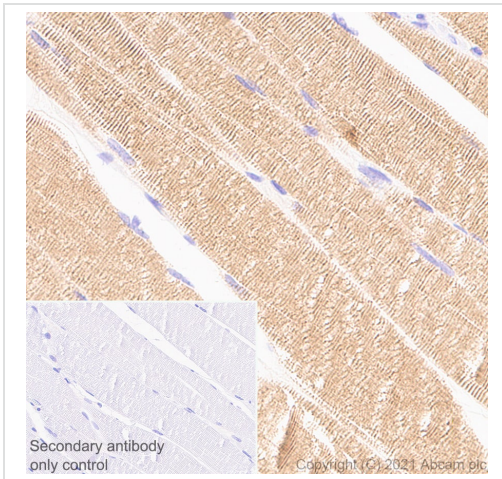


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Titin antibody [EPR24455-21] (ab284860)

Immunohistochemical analysis of paraffin-embedded Mouse cardiac muscle tissue labelling Titin with ab284860 at 1/4000 (0.167 ug/ml) followed by a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**). Positive staining on mouse cardiac muscle (PMID:15752755). The section was incubated with ab284860 for 10 mins at room temperature. The immunostaining was performed on a Leica Biosystems BOND® RX instrument Counterstained with Hematoxylin.

Secondary antibody only control: Secondary antibody is a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**).

Heat mediated antigen retrieval with Tris-EDTA buffer (pH 9.0, epitope retrieval solution2) for 20 mins

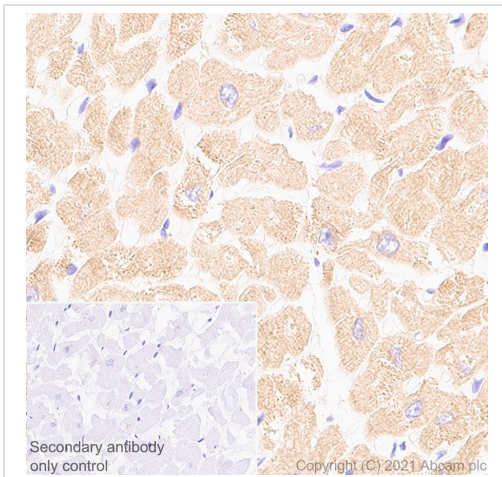


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Titin antibody [EPR24455-21] (ab284860)

Immunohistochemical analysis of paraffin-embedded Human skeletal muscle tissue labelling Titin with ab284860 at 1/2000 (0.334 ug/ml) followed by a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**). Positive staining on human skeletal muscle. The section was incubated with ab284860 for 10 mins at room temperature. The immunostaining was performed on a Leica Biosystems BOND® RX instrument Counterstained with Hematoxylin.

Secondary antibody only control: Secondary antibody is a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**).

Heat mediated antigen retrieval with Tris-EDTA buffer (pH 9.0, epitope retrieval solution2) for 20 mins

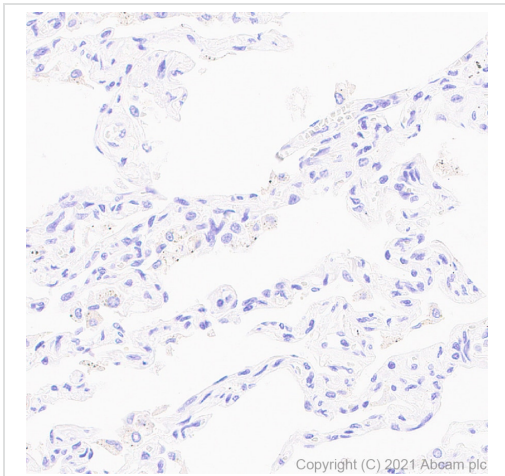


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Titin antibody [EPR24455-21] (ab284860)

Immunohistochemical analysis of paraffin-embedded Human cardiac muscle tissue labelling Titin with ab284860 at 1/2000 (0.334 ug/ml) followed by a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**). Positive staining on human cardiac muscle (PMID:24725620). The section was incubated with ab284860 for 10 mins at room temperature. The immunostaining was performed on a Leica Biosystems BOND® RX instrument Counterstained with Hematoxylin.

Secondary antibody only control: Secondary antibody is a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**).

Heat mediated antigen retrieval with Tris-EDTA buffer (pH 9.0, epitope retrieval solution2) for 20 mins



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Titin antibody [EPR24455-21] (ab284860)

Immunohistochemical analysis of paraffin-embedded Human lung tissue labelling Titin with ab284860 at 1/2000 (0.334 ug/ml) followed by a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**). Negative control: no staining on human lung. The section was incubated with ab284860 for 10 mins at room temperature. The immunostaining was performed on a Leica Biosystems BOND® RX instrument Counterstained with Hematoxylin.

Secondary antibody only control: Secondary antibody is a ready to use Rabbit specific IHC polymer detection kit HRP/DAB (**ab209101**).

Heat mediated antigen retrieval with Tris-EDTA buffer (pH 9.0, epitope retrieval solution2) for 20 mins

**Please note:** All products are "FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES"

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- We provide support in Chinese, English, French, German, Japanese and Spanish
- Extensive multi-media technical resources to help you
- We investigate all quality concerns to ensure our products perform to the highest standards

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