## Overview

<table>
<thead>
<tr>
<th>Product name</th>
<th>Anti-Collagen I antibody</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Rabbit polyclonal to Collagen I</td>
</tr>
<tr>
<td>Host species</td>
<td>Rabbit</td>
</tr>
<tr>
<td>Specificity</td>
<td>Typically less than 1% cross reactivity against other types of collagens was detected by ELISA against purified standards. Some class specific anti-collagens may be specific for three-dimensional epitopes which may result in diminished reactivity with denatured collagen or formalin-fixed, paraffin embedded tissues. This antibody reacts with most mammalian Type I collagens and has negligible cross-reactivity with Type II, III, IV, V or VI collagens. Non-specific cross-reaction of anti-collagen antibodies with other human serum proteins or non-collagen extracellular matrix proteins is negligible. This product is not recommended for use under denaturing conditions in WB, IP, and ELISA. We would suggest testing it under native conditions. Denaturing and reducing conditions will greatly diminish reactivity and selectivity of this antibody. Abcam does not test ab34710 with endogenous samples in WB.</td>
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<tr>
<td>Tested applications</td>
<td>Suitable for: IHC-Fr, Indirect ELISA, WB, IHC-P, ELISA, ICC/IF, IP</td>
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<tr>
<td>Species reactivity</td>
<td>Reacts with: Mouse, Rat, Sheep, Goat, Horse, Cow, Human, Pig, Common marmoset</td>
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<tr>
<td>Immunogen</td>
<td>Full length native protein (purified) corresponding to Human Collagen I aa 1-1464. Collagen Type I from human and bovine placenta. Database link: P02452</td>
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<tr>
<td>General notes</td>
<td>For more protocol tips, please see: <a href="https://www.abcam.com/protocols/collagen">https://www.abcam.com/protocols/collagen</a></td>
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</table>

It is often extremely difficult to generate antibodies with specificities to collagens due to the uninterrupted "Glycine-X-Y" triplet repeat that is a necessary part of the triple helical structure. The development of type specific antibodies is dependent on NON-DENATURED three-dimensional epitopes - this may result in diminished reactivity of some antibodies with denatured collagen or formalin-fixed, paraffin embedded tissues. Anti-Collagen antibodies have been used for indirect trapping ELISA for quantitation of antigen in serum using a standard curve, for immunoprecipitation and for native (non-denaturing, non-dissociating) PAGE and western blotting for highly sensitive qualitative analysis.
Form: Liquid


Storage buffer:
- pH: 8.00
- Preservative: 0.01% Sodium azide
- Constituents: 0.146% EDTA, 4.7625% Sodium borate, 0.435% Sodium chloride

Purity: Immunogen affinity purified

Purification notes: This antibody has been prepared by immunoaffinity chromatography using immobilized antigens followed by extensive cross-adsorption against other collagens, human serum proteins and non-collagen extracellular matrix proteins to remove any unwanted specificities. Sterile filtered.

Clonality: Polyclonal

Isotype: IgG

Applications

Our Abpromise guarantee covers the use of ab34710 in the following tested applications. The application notes include recommended starting dilutions; optimal dilutions/concentrations should be determined by the end user.

<table>
<thead>
<tr>
<th>Application</th>
<th>Abreviews</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IHC-Fr</td>
<td>⭐⭐⭐⭐⭐</td>
<td>1/50 - 1/200.</td>
</tr>
<tr>
<td>Indirect ELISA</td>
<td></td>
<td>1/5000 - 1/50000.</td>
</tr>
<tr>
<td>WB</td>
<td>⭐⭐⭐⭐⭐</td>
<td>1/1000 - 1/10000.</td>
</tr>
<tr>
<td>IHC-P</td>
<td>⭐⭐⭐⭐⭐</td>
<td>Use a concentration of 5 - 10 µg/ml. Perform heat mediated antigen retrieval with citrate buffer pH 6 before commencing with IHC staining protocol.</td>
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<tr>
<td>ELISA</td>
<td>⭐⭐⭐⭐⭐</td>
<td>1/5000 - 1/50000.</td>
</tr>
<tr>
<td>ICC/IF</td>
<td>⭐⭐⭐⭐⭐</td>
<td>1/500.</td>
</tr>
<tr>
<td>IP</td>
<td></td>
<td>1/100.</td>
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</table>

Target

Function: Type I collagen is a member of group I collagen (fibrillar forming collagen).

Tissue specificity: Forms the fibrils of tendon, ligaments and bones. In bones the fibrils are mineralized with calcium.
Involvement in disease

Defects in COL1A1 are the cause of Caffey disease (CAFFD) [MIM:114000]; also known as infantile cortical hyperostosis. Caffey disease is characterized by an infantile episode of massive subperiosteal new bone formation that typically involves the diaphyses of the long bones, mandible, and clavicles. The involved bones may also appear inflamed, with painful swelling and systemic fever often accompanying the illness. The bone changes usually begin before 5 months of age and resolve before 2 years of age.

Defects in COL1A1 are a cause of Ehlers-Danlos syndrome type 1 (EDS1) [MIM:130000]; also known as Ehlers-Danlos syndrome gravis. EDS is a connective tissue disorder characterized by hyperextensible skin, atrophic cutaneous scars due to tissue fragility and joint hyperlaxity. EDS1 is the severe form of classic Ehlers-Danlos syndrome.

Defects in COL1A1 are the cause of Ehlers-Danlos syndrome type 7A (EDS7A) [MIM:130060]; also known as autosomal dominant Ehlers-Danlos syndrome type VII. EDS is a connective tissue disorder characterized by hyperextensible skin, atrophic cutaneous scars due to tissue fragility and joint hyperlaxity. EDS7A is marked by bilateral congenital hip dislocation, hyperlaxity of the joints, and recurrent partial dislocations.

Defects in COL1A1 are a cause of osteogenesis imperfecta type 1 (OI1) [MIM:166200]. A dominantly inherited connective tissue disorder characterized by bone fragility and blue sclerae. Osteogenesis imperfecta type 1 is non-deforming with normal height or mild short stature, and no dentinogenesis imperfecta.

Defects in COL1A1 are a cause of osteogenesis imperfecta type 2A (OI2A) [MIM:166210]; also known as osteogenesis imperfecta congenita. A connective tissue disorder characterized by bone fragility, with many perinatal fractures, severe bowing of long bones, undermineralization, and death in the perinatal period due to respiratory insufficiency.

Defects in COL1A1 are a cause of osteogenesis imperfecta type 3 (OI3) [MIM:259420]. A connective tissue disorder characterized by progressively deforming bones, very short stature, a triangular face, severe scoliosis, grayish sclera, and dentinogenesis imperfecta.

Defects in COL1A1 are a cause of osteogenesis imperfecta type 4 (OI4) [MIM:166220]; also known as osteogenesis imperfecta with normal sclerae. A connective tissue disorder characterized by moderately short stature, mild to moderate scoliosis, grayish or white sclera and dentinogenesis imperfecta.

Genetic variations in COL1A1 are a cause of susceptibility to osteoporosis (OSTEOP) [MIM:166710]; also known as involutional or senile osteoporosis or postmenopausal osteoporosis. Osteoporosis is characterized by reduced bone mass, disruption of bone microarchitecture without alteration in the composition of bone. Osteoporotic bones are more at risk of fracture.

Note=A chromosomal aberration involving COL1A1 is found in dermatofibrosarcoma protuberans. Translocation t(17;22)(q22;q13) with PDGF.

Sequence similarities
Belongs to the fibrillar collagen family.
Contains 1 fibrillar collagen NC1 domain.
Contains 1 VWFC domain.

Post-translational modifications
Proline residues at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains. Proline residues at the second position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some of the chains.
O-linked glycan consists of a Glc-Gal disaccharide bound to the oxygen atom of a post-translationally added hydroxyl group.

Cellular localization
Secreted > extracellular space > extracellular matrix.
Western blot - Anti-Collagen I antibody (ab34710)

Anti-Collagen I antibody (ab34710) at 1/1000 dilution + Human collagen, 50 ng

Secondary
DyLight™ 649 anti-rabbit secondary antibody at 1:20,000 for 30 min at RT at 1/20000 dilution

Other Band(s): Collagen Type I splice variants and isoforms.

ab34710 staining Collagen I in mouse kidney tissue sections by Immunohistochemistry (IHC-P - paraformaldehyde-fixed, paraffin-embedded sections). Tissue was fixed with formaldehyde and blocked with 2.5% horse serum for 1 hour at 25°C; antigen retrieval was by heat mediation in a citrate buffer. Samples were incubated with primary antibody (1/500 in PBS 1X + 3% of 2.5% horse serum) for 12 hours at 4°C. An undiluted HRP-conjugated Horse anti-rabbit polyclonal was used as the secondary antibody.

ab34710 staining Collagen I in horse bronchial fibroblast cells by Immunocytochemistry. Cells were fixed with acetone and blocking with 3% BSA was performed for 1 hour 30 minutes at 40°C. Samples were incubated with primary antibody (1/500: in 3% BSA/ PBS) for 12 hours at 4°C. An FITC-conjugated goat polyclonal to rabbit IgG was used at dilution at 1/160 as secondary antibody.
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Collagen I antibody (ab34710)

This image is courtesy of an anonymous Abreview.

ab34710 staining Collagen I in sheep jejunum tissue sections by Immunohistochemistry (IHC-P - paraformaldehyde-fixed, paraffin-embedded sections). Tissue was fixed with formaldehyde and blocked with 0.25% protein block for 1 hour at room temperature; antigen retrieval was by heat mediation in a 10 mM citrate buffer, pH 6. Samples were incubated with primary antibody (1/400) for 1 hour. An Envision + system HRP anti-rabbit, goat polyclonal (HRP polymer conjugation) was used as the secondary antibody.

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Collagen I antibody (ab34710)

This image is courtesy of an anonymous Abreview.

ab34710 staining Collagen I in pig lung tissue sections by Immunohistochemistry (IHC-P - paraformaldehyde-fixed, paraffin-embedded sections). Tissue was fixed with 10% buffered formalin and blocked with 5% serum for 1 hour at 21°C; antigen retrieval was by heat mediation in a citrate buffer. Samples were incubated with primary antibody (1/500) for 12 hours at 4°C. A Cy3-conjugated Donkey anti-rabbit polyclonal (1/200) was used as the secondary antibody.
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of marmoset kidney tissue labeling Collagen I with ab34710 at 1/500 dilution. Tissue samples were fixed with formaldehyde and blocked with 2% BSA for 10 minutes at 21°C. Heat mediated antigen retrieval was performed using citric acid. Samples were incubated with primary antibody (1/500 in TBS/BSA/azide buffer) for 2 hours at 21°C. A biotin conjugated goat anti-rabbit IgG polyclonal was used as the secondary antibody.

IHC image of Collagen I staining in normal human placenta 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 (pH 6, epitope retrieval solution 1) for 20 minutes. The section was then incubated with ab34710 at 5 µg/ml, for 15 minutes 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.

*Tissue obtained from the Human Research Tissue Bank, supported by the NIHR Cambridge Biomedical Research Centre
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Collagen I antibody (ab34710)

This image is courtesy of an Abreview by Carl Hobbs.

ab34710 staining Collagen I in cow small intestine tissue sections by Immunohistochemistry (Formalin/PFA-fixed, paraffin-embedded sections). Tissue was fixed with formaldehyde and blocked with 2% BSA for 10 minutes at 21°C; antigen retrieval was by heat mediation in a citrate buffer. Samples were incubated with primary antibody (1/1000 in TBS/BSA/azide buffer) for 2 hours at 21°C. A biotin conjugated goat anti-rabbit IgG polyclonal (1/300) was used as the secondary antibody.

Immunohistochemistry (Frozen sections) - Anti-Collagen I antibody (ab34710)

This image is courtesy of an Abreview submitted by Carl Hobbs.

ab34710 staining mouse kidney sections (ab4606) by IHC-Fr. Kidney tissue was cryoprotected with 30% sucrose, sectioned using a cryostat at 10 microns and mounted onto slides. After drying overnight in fume hood, sections were fixed in 4% formalin in PBS for 10 minutes. Blocking was performed with 1% BSA for 10 minutes at 21°C. Staining with ab34710 at a 1/100 dilution in TBS/BSA with 0.02% azide was performed for 2 hours at 21°C. A conjugated goat anti-rabbit 594 polyclonal antibody at 1/1000 was used as the secondary antibody.

Western blot - Anti-Collagen I antibody (ab34710)

Detection of collagen I in Wistar rat hepatic stellate cells in GFP-transduced (left lane) and PPAR?-transduced cell lysates (right lane). Protein staining shown below each blot depicts equal protein loading. An equal amount of the whole cell protein (100 µg) was separated by native PAGE and electroblotted to nitrocellulose membranes. Proteins were detected by incubating the membrane with anti-Collagen I antibody at a concentration of 0.2–2 µg/10 ml in TBS with 5% non-fat milk.
Immunohistochemistry of breast carcinoma staining Collagen I with ab34710 at 5μg/ml

Immunohistochemical analysis of human colon tissue sections labelling Collagen I with ab34710 at a dilution of 1/200. The sections were fixed with formaldehyde. The secondary antibody used was an HRP conjugated rabbit IgG. Antigen retrieval was heat mediated using CC1.

Immunohistochemical analysis of formaldehyde-fixed frozen bovine tendon sections, labelling Collagen I with ab34710 at a dilution of 1/500 for 2 hours at 21°C. 1% BSA was used as a blocking agent and incubated for 10 minutes at 21°C. Secondary used was a Goat anti-Rabbit Alexa Fluor® 594 conjugate used at 1/1,000.
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