### Overview

**Product name**  
Human Pro-Collagen I alpha 1 ELISA Kit

**Detection method**  
Colorimetric

**Precision**

<table>
<thead>
<tr>
<th>Sample</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>CV%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>8</td>
<td></td>
<td></td>
<td>1.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>CV%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>3</td>
<td></td>
<td></td>
<td>3%</td>
</tr>
</tbody>
</table>

**Sample type**  
Cell culture supernatant, Serum, Plasma, Cell culture extracts, Tissue Extracts

**Assay type**  
Sandwich (quantitative)

**Sensitivity**  
5.3 pg/ml

**Range**  
39.06 pg/ml - 2000 pg/ml

**Recovery**

<table>
<thead>
<tr>
<th>Sample type</th>
<th>Average %</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>93</td>
<td>91% - 94%</td>
</tr>
<tr>
<td>Cell culture media</td>
<td>99</td>
<td>97% - 101%</td>
</tr>
<tr>
<td>Heparin Plasma</td>
<td>101</td>
<td>94% - 107%</td>
</tr>
<tr>
<td>EDTA Plasma</td>
<td>108</td>
<td>105% - 114%</td>
</tr>
<tr>
<td>Citrate Plasma</td>
<td>106</td>
<td>102% - 110%</td>
</tr>
</tbody>
</table>

**Sample specific recovery**

**Assay time**  
1h 30m
**Assay duration**
One step assay

**Species reactivity**
**Reacts with:** Human

**Does not react with:** Mouse, Rat, Cow

**Product overview**
Pro-Collagen I alpha 1 in vitro SimpleStep ELISA® (Enzyme-Linked Immunosorbent Assay) kit is designed for the quantitative measurement of human Pro-Collagen I alpha 1 protein in serum, plasma, cell culture supernatants, and cell and tissue extract samples.

The SimpleStep ELISA® employs an affinity tag labeled capture antibody and a reporter conjugated detector antibody which immunocapture the sample analyte in solution. This entire complex (capture antibody/analyte/detector antibody) is in turn immobilized via immunoaffinity of an anti-tag antibody coating the well. To perform the assay, samples or standards are added to the wells, followed by the antibody mix. After incubation, the wells are washed to remove unbound material. TMB substrate is added and during incubation is catalyzed by HRP, generating blue coloration. This reaction is then stopped by addition of Stop Solution completing any color change from blue to yellow. Signal is generated proportionally to the amount of bound analyte and the intensity is measured at 450 nm. Optionally, instead of the endpoint reading, development of TMB can be recorded kinetically at 600 nm.

**Sensitivity:**
Samples diluted in Sample Diluent NS MDD = 5.6 pg/mL
Samples diluted in 1X Cell Extraction Buffer PTR MDD = 5.3 pg/mL

**Notes**
Type I collagen is the most abundant structural protein of connective tissues such as skin, bone and tendon. It is synthesized as a pro-collagen molecule that is characterized by a 300 nm triple helical domain flanked by globular N- and C-terminal propeptides. Specifically, human Pro-Collagen I alpha 1 consists of a signal peptide (amino acids (aa) 1-22), a propeptide (aa 23-161), the mature chain (aa 162-1218), and another propeptide (aa 1219 – 1464). The non-helical propeptides are removed by procollagen N- and C-proteinase activities so that the mature triple helices can self-assemble into collagen fibrils that provide tensile strength to tissues.

**Tested applications**
**Suitable for:** Sandwich ELISA

**Platform**
Pre-coated microplate (12 x 8 well strips)

**Properties**

**Storage instructions**
Store at +4°C. Please refer to protocols.

<table>
<thead>
<tr>
<th>Components</th>
<th>1 x 96 tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X Human Pro-Collagen I alpha 1 Capture Antibody</td>
<td>1 x 600µl</td>
</tr>
<tr>
<td>10X Human Pro-Collagen I alpha 1 Detector Antibody</td>
<td>1 x 600µl</td>
</tr>
<tr>
<td>10X Wash Buffer PT (<a href="#">ab206977</a>)</td>
<td>1 x 20ml</td>
</tr>
<tr>
<td>50X Cell Extraction Enhancer Solution (<a href="#">ab193971</a>)</td>
<td>1 x 1ml</td>
</tr>
<tr>
<td>5X Cell Extraction Buffer PTR (<a href="#">ab193970</a>)</td>
<td>1 x 10ml</td>
</tr>
<tr>
<td>Antibody Diluent CPI</td>
<td>1 x 6ml</td>
</tr>
</tbody>
</table>
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 hydroxyapatite.

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.

**Applications**

Our Abpromise guarantee covers the use of ab210966 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>Sandwich ELISA</td>
<td></td>
<td>Use at an assay dependent concentration.</td>
</tr>
</tbody>
</table>

**Images**

Background-subtracted data values (mean +/- SD) are graphed.

Example of human Pro-Collagen I alpha 1 standard curve in Sample Diluent NS.
Example of human Pro-Collagen I alpha 1 standard curve in Sample Diluent 1X Cell Extraction Buffer PTR.

Background-subtracted data values (mean +/- SD) are graphed.

The concentrations of Pro-Collagen I alpha 1 were measured in duplicates, interpolated from the Pro-Collagen I alpha 1 standard curves and corrected for sample dilution. Undiluted samples are as follows: serum 1%, plasma (citrate) 1%, plasma (EDTA) 1%, and plasma (heparin) 1%. The interpolated dilution factor corrected values are plotted (mean +/- SD, n=2). The mean Pro-Collagen I alpha 1 concentration was determined to be 142.1 ng/mL in serum, 135.9 ng/mL in plasma (citrate), 112.1 ng/mL in plasma (EDTA) and 102.1 ng/mL in plasma (heparin).

The concentrations of Pro-Collagen I alpha 1 were measured in duplicate and interpolated from the Pro-Collagen I alpha 1 standard curve and corrected for sample dilution. The interpolated dilution factor corrected values are plotted (mean +/- SD, n=2). The mean Pro-Collagen I alpha 1 concentration was determined to be 1.62 ng/mL in IMR-90 extract.
Serum from ten individual healthy human female donors was diluted 1:200 and measured in duplicate. Interpolated dilution factor corrected values are plotted (mean +/- SD, n=2). The mean Pro-Collagen I alpha 1 concentration was determined to be 197.3 ng/mL with a range of 113.0 – 417 ng/mL.

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