3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

ProductInformation

COLLAGEN TYPE I, FITC CONJUGATE
Bovine skin

Product Number **C 4361**
Storage Temperature –20 °C

Product Description

Collagen type I, FITC conjugate, is a highly purified telo-peptide free extract from bovine skin that is suitable for use as a substrate for mammalian collagenases in a fluorimetric assay procedure.[1,2] In order to minimize background levels in collagenase assays, the collagen has been pretreated enzymatically and further purified by ion-exchange chromatography. This preparation does not contain collagen type II. For collagenase assays in cell culture, the degradation products may be detected directly in the culture medium by fluorescence spectroscopy using an excitation wavelength of 490 nm and an emission wavelength of 520 nm. Each vial contains sufficient collagen for 100 tests.

Type I collagen is the major collagen of tendon and bone, but it is widely distributed in other tissues, such as skin, cornea, tooth dentin, heart valve, lung, liver, fascia, and scar tissue. Type II collagen is a major component of cartilage, while type III collagen is a major component of large blood vessels. These three collagen types form fibrils that are stabilized by the crosslinking of adjacent collagen molecules both within and between fibrils. Collagen fibrils strengthen the tissue in which they are located.

Collagenases and gelatinases are members of a group of secreted zinc metalloproteases (MMP) that, in mammals, degrade the collagens of the extracellular matrix. Collagenase-1 (MMP1, interstitial collagenase) is the principal enzyme involved in initiating the breakdown of fibrillar collagens, types I and III[3,4] while both collagenase 1, and collagenase 3 (MMP13) appear to be involved in the breakdown of type II collagen.[5,6] Gelatinases degrade denatured collagens and the nonfibrillar type IV (basement membrane) collagen.[7] Since collagens are the most abundant proteins in the body, collagenases play a key role in the remodeling that occurs in normal and disease processes.

Reagent

Collagen type I, FITC conjugate, is supplied as a solution in 0.01 M acetic acid. The collagen concentration is 1 mg/ml.

Precautions and Disclaimer

The country of origin of the bovine starting material is the United States.

Preparation Instructions

Collagen type I, FITC conjugate, must be heat denatured for use as a substrate for gelatinase. Transfer the collagen solution to a brown glass bottle and heat to 80 °C.

Storage/Stability

Collagen type I, FITC conjugate, is stable for at least 12 months when stored at acid pH at –20 °C. It degrades slowly when stored at neutral pH. For extended storage, freeze the acidic solution in working aliquots.

Related Products

Sigma offers a broad range of collagens. The following collagens are conjugated for use as collagenase substrates:

C 4486 – Collagen Type II, from bovine articular cartilage, FITC conjugate
C 5858 – Collagen-Fluorescein, bovine

For the complete list of our collagen products visit our web site at www.sigma-aldrich.com.

References

1. Wada, Y., et al., Diltiazem, a calcium antagonist, inhibits matrix metalloproteinase-1 (tissue collagenase) production and collagenolytic activity in human vascular smooth muscle cells. Int. J. Mol. Med., **8**, 561-566 (2001).
2. Baici, A., et al., A handy assay for collagenase using reconstituted fluorescein-labeled collagen fibrils. Anal. Biochem., **108**, 230-232 (1980).

3. Pilcher, B.K., et al., Collagenase-1 and collagen in epidermal repair. Arch. Dermatol. Res., **290** Suppl, S37-S46 (1998).
4. Funck, R.C., et al., Regulation and role of myocardial collagen matrix remodeling in hypertensive heart disease. Adv. Exp. Med. Biol., **432**, 35-44 (1997).
5. Neuhold, L.A., et al., Postnatal expression in hyaline cartilage of constitutively active human collagenase-3 (MMP-13) induces osteoarthritis in mice. J. Clin. Invest., **107**, 35-44 (2001).
6. Smith, R.L., Degradative enzymes in osteoarthritis. Front. Biosci., **4**, D704-D712 (1999).
7. Nguyen, M., et al., Human endothelial gelatinases and angiogenesis. Int. J. Biochem. Cell. Biol., **33**, 960-970 (2001).

LY 1/02