

MAPTrix™-C Collagen mimetic mussel adhesive protein

Overview

Collagen is the most abundant protein in mammals and the predominant component of extracellular matrices (ECMs). To date, 28 types of collagen have been identified and they can be further divided into several subgroups based on their structural and functional properties¹.

Collagens are trimeric protein molecules comprised of 3 polypeptide α chains. Besides the triple-helical domains, collagens contain non triple-helical (NC) domains².

Type I, II, III, V, and XI collagens form fibrous architectures called collagen fibrils; and, meshwork sheets of type IV collagens work as a scaffold for basement membranes. These collagens can also interact with cell surface receptors, primarily integrins $\alpha 1\beta 1$ and $\alpha 2\beta 1$ ^{2,3}.

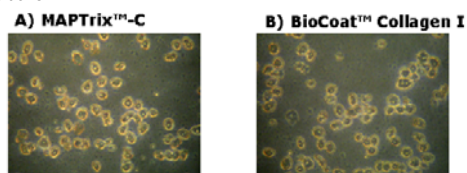
$\alpha 1\beta 1$ is the major integrin on smooth muscle cells, while $\alpha 2\beta 1$ is the major form on epithelial cells and platelets. Both forms are expressed on many cell types including fibroblasts, endothelial cells, osteoblasts, chondrocytes, and lymphocytes³.

Product Description

MAPTrix™-C is a recombinant mussel adhesive protein (rMAP) which mimics naturally occurring collagen. MAPTrix™-C incorporates a variety of collagen mimetic peptides from naturally occurring collagen type I and IV into mussel adhesive proteins. These peptide motifs are responsible for regulation of cellular functions such as cell adhesion, proliferation or differentiation. The collagen mimetic peptides can bind to integrin $\alpha 1\beta 1$ and/or $\alpha 2\beta 1$.

MAPTrix™-C has been demonstrated to have biological activities similar to those of naturally occurring collagen in primary rat hepatocyte cultures.

Figure 1: Primary hepatocyte cultured on MAPTrix™-C under serum free conditions



Light micrographs of primary rat liver hepatocytes cultured in a serum-free, supplemented medium for one day: (a) 24-well plates coated with MAPTrix™-C; and, (b) BD BioCoat™ Collagen I (Magnification=100x). Assay results showed that the hepatocyte cells grew well on both MAPTrix™-C and BD Collagen I.

Characteristics

MAPTrix™-C is produced in Kollodis' proprietary *E. coli* expression system and purified using an ISO compliant manufacturing process.

Molecular Weight:

- ~24,000 daltons

Formulation:

- The product is supplied as a 0.2 mg/mL, 0.5 mg/mL (in 2.5mg or 5.0mg vials) or 1.0 mg/mL aqueous solution in pure water.
- Lyophilized powder is also available upon request.

Solubility:

- Soluble in a variety of buffers, including pure water, under a wide range of pH conditions (pH=2~9.0)
- Note: Buffers of media containing Ca^{2+} or Mg^{2+} added to MAPTrix™ may result in the formation of insoluble aggregates. This will not occur if the buffering capacity of the diluent brings the pH to 9.0 or lower.

Quality Control

- | | |
|-----------------|--|
| · Purity | 93% by SDS PAGE |
| · pH | 6.0 ~ 7.5 |
| · Endotoxin | Less than 20 EU/mL per LAL assay |
| · Sterility | Tested and found negative for the presence of bacteria, fungi and mycoplasma |
| · Functionality | The biological activity of collagen peptide is determined in a cell culture assay under serum free conditions. |

Coating Procedure:

- Transfer the desired volume of MAPTrix™-C solution from the vial to a dilution vessel as required.
- Dilute to a desired concentration using a sodium bicarbonate buffer solution (NaHCO_3 : 500mM at final concentration) for uniform & even coated surfaces. A recommended working concentration is 0.1mg/mL. (*Note: Use the recommendation as a guideline in determining the optimal coating conditions for your culture system.*)
- Add an appropriate amount of diluted MAPTrix™-C solution to the culture surface.
- Cover and incubate at room temperature (or 37°C) for 1-3 hours. Best uniform coated surfaces are observed with 1-2 hr incubation.
- Rinse the coated surfaces carefully with sterile medium or PBS. Avoid scratching the coated surfaces.
- Refer to the Standard Coating Protocol for details, which can be downloaded at www.kollodis.com



Products

Cat. No	Peptide Motif	Receptor	Cat. No	Peptide Motif	Receptor
165011~4	GLPGER (Type I)	$\alpha 1\beta 1$	165121~4	GTPGPQGIAGQRGVV (Type I)	$\alpha 2\beta 1$
165021~4	KGHRGF (Type I)	Heparin binding	165181~4	GAPGER (Type I)	$\alpha 2\beta 1$
165041~4	GFPGER (Type I)	$\alpha 1\beta 1, \alpha 2\beta 1$	166211~4	TAGSCLRKFSTM (Type IV)	$\alpha 2\beta 1$, heparin
165051~4	GLSGER (Type I)	$\alpha 2\beta 1$	166231~4	GEFYFDLRLKGDK (Type IV)	$\alpha 2\beta 1$, heparin
165061~4	DGEA (Type I)	$\alpha 2\beta 1$	166311~4	TAIPSCPEGTVPLYS (Type IV)	unknown

For our entire collagen mimetic product listing, please visit our website at www.kollodis.com

Storage Conditions:

- Stable for a minimum of 6 months from day of shipment when stored at 2-8°C
- Remaining, unused solution of MAPTrix™ ECM can be stored at 2-8°C with appropriate sealing for 6 months. **DO NOT FREEZE** the remaining solution. However, it is recommended that the remaining material be used within 1 month after the vial has been initially opened.

References

1. Jyrki Heino. The collagen family members as cell adhesion proteins. *Bioessays*. 2007. 29(10): 1001-10
2. Sylvie Richard-Blum, et al., The collagen superfamily: from the extracellular matrix to the cell membrane. *Pathologie Biologie* 53 (2005) 430-442
3. Farndale RW, et al., Cell-collagen interactions: the use of peptide Toolkits to investigate collagen-receptor interactions. *Biochem Soc Trans*. 2008 36(Pt2):241-50

Ordering Information

USA & Worldwide

AMS Biotechnology

- www.amsbio.com
- info@amsbio.com
- +1.949.765.8365

Gentaur

- www.gentaur.com
- sales@genprice.com
- +1.408.472.2934

Kollodis BioSciences

- www.kollodis.com
- orders@kollodis.com
- +1.617.283.2182

Sigma-Aldrich

- www.sigmaaldrich.com
- +800.325.3010 (within USA)

Europe

Spain :

- Antibody Bcn
- www.antibodybcn.com
- info@antibodybcn.com
- +34.902.220.246

U.K. & The rest :

- AMS Biotechnology
- www.amsbio.com
- info@amsbio.com
- +44 (0) 1235.232100

Gentaur

- www.gentaur.com
- info@gentaur.com
- +32.1658.9045

Asia

China :

- Dakewe Biotech
- www.dakewe.com
- info@dakewe.com
- +86.755.26650164

4A Biotech Co. Ltd.

- www.4abio.com
- info@4abio.com
- +86.400.7060.959

Indonesia : Precision Tech

- www.pretech.com.sg
- scitech@pretech.com.sg
- +65. 6273.4573

Japan :

- Funakoshi Co. Ltd
- www.funakoshi.co.jp
- reagent@funakoshi.co.jp
- +81.3.5684.1620

Nacalai Tesque

- www.nacalai.co.jp
- info-tech@nacalai.co.jp
- +81.75.211.2703

Korea : KDR

- www.kdr.co.kr
- kdrbio@kdr.co.kr
- +82.2.3427.6000

Malaysia/Singapore: Precision Tech

- www.pretech.com.sg
- scitech@pretech.com.sg
- +65. 6273.4573

Taiwan: Bertec Enterprise Co., Ltd.

- www.bertec.com.tw
- bertec@bertec.com.tw
- +886.2.2228.1324

For volume ordering or bulk pricing, please contact Kollodis BioSciences or your local distributor.