

MAPTrix™-F Fibronectin mimetic mussel adhesive protein

Overview

Fibronectin is an extracellular glycoprotein that is present in both plasma and the extracellular matrix. The plasma form is synthesized by hepatocytes, and the ECM form is made by fibroblasts, chondrocytes, endothelial cells, macrophages, as well as certain epithelial cells¹.

Fibronectin is one of the primary cell adhesion molecules and is involved in a number of cellular processes including cell adhesion, migration, morphology, and regulation of cell growth and differentiation².

The fibronectin is a disulfide linked dimer and each monomer is comprised of a combination of three different types of homologous repeating domains, termed Types I, II and III.

Six type III FN repeats, including the fifth (III5), III9, III10, EDA, III14 and IIICS, are recognized by their respective integrin such as $\alpha4\beta1$ and $\alpha5\beta1$ ³.

Product Description

$\alpha4\beta1$, $\alpha5\beta1$ and $\alpha v\beta3$ is the major integrin receptor for fibronectin.

MAPTrix™-F contains fibronectin mimetic peptides that can bind to integrin $\alpha4\beta1$, $\alpha5\beta1$, $\alpha v\beta3/ \alpha v\beta5$ and heparin.

MAPTrix™-F has been demonstrated to have biological activities similar to those of the naturally occurring whole fibronectin molecule in various cell lines including osteoblast, Jurkat cell and human mesenchymal stem cell culture.

Characteristics

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

Molecular Weight:

- ~24,000 dalton

Formula:

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

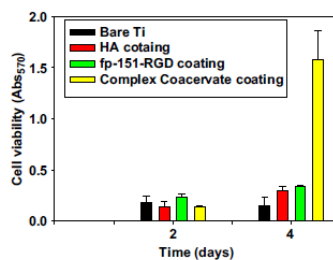
Solubility:

- Soluble in a variety of buffers, including 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

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|-----------------|--|
| · 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 fibronectin peptide is determined in a cell culture assay under serum free conditions |

Figure1: MC-3T3 cell proliferation on MAPTrix™-F coated surface



Two days after seeding with MC-3T3 cells, cell proliferation on the MAPTrix™ coacervate coated Ti was a little lower than the control group. However, after 4 days, cell proliferation on the coacervate coated Ti was the highest among all samples tested and 5 times higher than the second highest control (fp-151-RGD (MAPTrix™-F) coated Ti⁴.

Coating Procedure:

- Transfer desired volume of MAPTrix™-F solution from the vial to a dilution vessel as required.
- Dilute to desired concentration using sodium bicarbonate buffer solution (NaHCO₃: 500mM at final concentration) for uniform & even coated surface. A recommended working concentration is 0.1mg/mL. (*Note: Use these recommendations as guidelines to determine the optimal coating conditions for your culture system.*)
- Add appropriate amount of diluted MAPTrix™-F solution to the culture surface
- Incubate at room temperature or 37°C, covered, for 1-3 hours. Best uniform coated surface with 1-2 hr incubation.
- Rinse the coated surfaces carefully with sterile medium or PBS. Avoid scratching the coated surface.
- 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
161041~4	PHSRN (Type III-9)	$\alpha 5\beta 1$	161161~4	WQPPRARI (FN-C/H-V)	$\alpha 4\beta 1$, heparin
161051~4	RGD (Type III-10)	$\alpha v\beta 3$, $\alpha v\beta 5$, $\alpha 5\beta 1$	161191~4	KNNQKSEPLIGRKKT(FN-C/H-II)	heparin
161071~4	GRGDSP (Type III-10)	$\alpha 5\beta 1$	161201~4	EILDVPST (Type III CS-1)	$\alpha 4\beta 1$, $\alpha 4\beta 7$
161101~4	SPPRRARVT (FN-C/H-IV)	$\alpha 4\beta 1$, heparin	161241~4	REDV (Type III CS-5)	$\alpha 4\beta 1$
161111~4	ATETTITIS	heparin	161251~4	PHSRN-RGDSP	$\alpha 5\beta 1$

For our entire fibronectin 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, the remaining material is recommended to be used within 1 month after the vial has been opened.

References

1. Labat-Robert J., Cell-Matrix interactions, the role of fibronectin and integrins. A survey. Pathol Biol (Paris). 2012; 60(1). 15-9.
2. Miyamoto S., et al., Fibronectin and integrins in cell adhesion, signaling, and morphogenesis. Ann N Y Acad Sci. 1998; 857: 119-29.
3. Obara M, et al., The third type III module of human fibronectin mediates cell adhesion and migration. J Biochem. 2010 ; 147(3):327-35
4. D.S. Hwang, et al., Viscosity and interfacial properties in a mussel-inspired adhesive coacervate. Soft Matter. 2010; 6(14): 3232–3236.



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