MAPTrix™ HyGel, 3D Synthetic Extracellular Matrix

Product Overview

Hydrogels have emerged as biomimetic *in vitro* culture systems that allow cells to be grown in chemically or physically-defined microenvironments that recapitulate many critical aspects of native tissue[1,2,3].

Hydrogel biofunctionality should be engineered predictably and precisely by tailoring biochemical and mechanical properties of hydrogel, each of which directly influences cellular behavior[1].

MAPTrix™ HyGel is a recombinant mussel adhesive protein-based biosynthetic three dimensional (3D) extracellular matrix (ECM) line of products that are tailored to mimic biochemical and mechanical properties of native ECM. The MAPTrix™ HyGel line of products generates well-controlled and reproducible extracellular microenvironments as evidenced in HUVEC tube formation in serum free conditions.

Features & Applications

MAPTrix™ HyGel can be used to engineer *in vivo* like 3D ECM microenvironments by presenting combinations of MAPTrix™ ECM products to induce combinatorial integrin-mediated signaling for integrated processes similar to an *in vivo* environment.

Highlighted Features:

- Ready-to-use formula to create biochemically defined hydrogel *in situ*
- Easy-to-use. No freezing required. Stable under refrigerator conditions for 6 months
- Fully compatible with existing cell culture protocols

Applications:

- 3D cell culture for primary or stem cells including HUVEC
- 3D coating for a variety of substrates such as tissue engineering scaffolds

Product Description

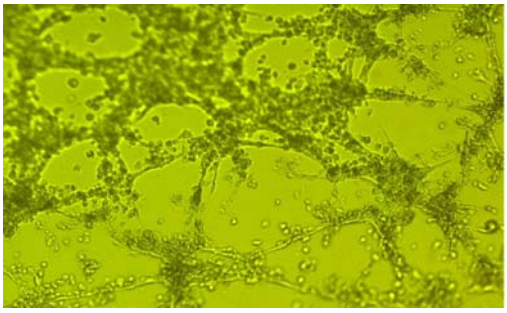
The MAPTrix™ HyGel products consist of two components: MAPTrix™ ECM, a mussel adhesive protein based ECM mimetic; and, MAPTrix™ Linker, a multi-arm polyethylene glycol derivative with a molecular weight ranging from 10,000 to 20,000 Da.

Due to the ECM derived peptide motifs recombinantly incorporated into mussel adhesive proteins (for example, the RGD motif), use of the MAPTrix™ ECM products provide biochemically well-defined extracellular microenvironments.

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 ECM derived peptide is determined in a cell culture assay under serum free conditions

Figure1: HUVEC tube formation on MAPTrix™ HyGel



Human umbilical vein endothelial cells (HUVEC) (40,000 viable cells/cm2) were seeded on a 48-well plate coated with MAPTrix™ HyGel (100 µL/cm2) that presents peptide motifs activating integrins αvβ3 and α2β1. The combinatorial activation of αvβ3-α2β1 induced endothelial tube formation in serum free conditions.

Hydrogel formation protocol:

- Dissolve MAPTrix™ ECM and MAPTrix™ Linker at a concentration of 20 mg in 1mL of PBS (1x) buffer, pH 7.4, respectively
- Vortex mix the two above solutions for 30 to 60 seconds. Alternatively, pipette up and down thoroughly to mix.
  Note: Once the MAPTrix™ Linker is added to MAPTrix™ ECM solution, you have less than 20 minutes before the hydrogel forms and it is difficult to pipette the solution.
- The prepared MAPTrix™ gelling solutions of at least 100µL per well were added to a 24-well plate and allowed to gel in a humidified incubator at 37 °C for 2~3 hours.
  Note: Pipette slowly to avoid air bubble formation in the gelling solution.
- Refer to the Standard Hydrogel Protocol for details, which can be downloaded at www.kollodis.com

Products

Cat. No	Peptide Motifs	Cat. No	Peptide Motifs
361011 - 361254	Fibronecrtin derived peptide motif: RGD, GRGDSP, PHSRN-RGDSP, REDV, SPPRRARVT, WQPPRARI	362011 - 364614	Laminin derived peptide motif: RQVFQVAYIIIKA, IKVAV, NRWHSIYITRFG, TWYKIAFQRNRK, YIGSR, RYVVLPR
365011 - 366444	Collagen derived peptide motif: GLPGER, GFPGER, DGEA, GTPGPQGIAGQRGVV, GEFYFDLRLKGDK	367011 - 367184	Cadherin derived peptide motif: ADTPPV, SHAVSS, LFSHAVVSSNG, DQNDN, HAVDI, LRAHAVDING
368011 - 368044	Vitronectin derived peptide motif: FRHRNRKGY, KKQRFRHRNRKGYRSQ, RGDV	368111 - 369714	Other ECM related protein derived peptide motif: Elastin, Tenascin-C, Nidogen, BSP, etc.

Storage Conditions:

For MAPTrix™ ECM

- Stable for a minimum of 6 months from the day of shipment when stored unopened at 2-8 °C.
- For long term storage (six months to one year), it is highly recommended that opened MAPTrix™ ECM be stored at -20°C. Opened vials can be stored at 2-8 °C for short term periods of storage (approximately several months).

For MAPTrix™ Linker

- Stable for a maximum of one year from the day of shipment when stored unopened at -20 °C.
- It is highly recommended that opened vials be stored at -20 °C

References

1. Deforest CA, et al., Advances in Bioactive Hydrogels to Probe and Direct Cell Fate. Annu Rev Chem Biomol Eng. 2012
2. Tibbitt MW, et al., Hydrogels as extracellular matrix mimics for 3D cell culture. Biotechnol Bioeng. (2009) 103(4):655-63.
3. Geckil H, et al., Engineering hydrogels as extracellular matrix mimics. Nanomedicine. (2010) 5(3):469-84.

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