

# Corning® Matrigel® Basement Membrane Matrix

Certified LDEV-Free

CORNING



Corning Matrigel basement membrane matrix is effective for the attachment and differentiation of both normal and transformed anchorage-dependent epithelioid and other cell types. These include neurons<sup>5,6</sup>, Sertoli cells<sup>7</sup>, chick lens<sup>8</sup>, vascular endothelial cells<sup>9</sup>, and hepatocytes<sup>10</sup>. Matrigel matrix will influence gene expression in adult rat hepatocytes<sup>11</sup> as well as three-dimensional (3D) culture in mouse<sup>12-15</sup> and human<sup>16,17</sup> mammary epithelial cells. It will support *in vivo* peripheral nerve regeneration<sup>18-20</sup>, can be used for metabolism and toxicology studies<sup>21,22</sup>, and is the basis for several types of tumor cell invasion assays<sup>23,24</sup>. Matrigel matrix provides the substrate necessary for the study of angiogenesis both *in vitro*<sup>25,26</sup> and *in vivo*<sup>27-29</sup>. Matrigel matrix also supports *in vivo* propagation of human tumors in immunosuppressed mice<sup>30-32</sup>.

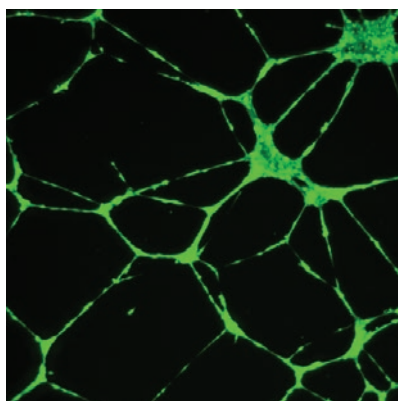
## Wide Selection of Basement Membrane Matrices

**Corning Matrigel Matrix Growth Factor Reduced (GFR)** is suited for applications where a more highly defined basement membrane preparation is desired. Available in standard Growth Factor Reduced (GFR), High Concentration (HC), and phenol red-free formats.

**Corning Matrigel Matrix High Concentration** is suited for *in vivo* applications where a high protein concentration augments growth of tumors. The high protein concentration also allows the Matrigel matrix plug to maintain its integrity after subcutaneous injection into mice. Available in standard, GFR, and phenol red-free formats.

**Corning Matrigel Matrix Phenol Red-free** is recommended for assays which require color detection (i.e., fluorescence).

Corning Matrigel hESC-qualified Matrix has been qualified as mTeSR®1-compatible by STEMCELL Technologies, thus eliminating the need for time-consuming screening in order to provide the reproducibility and consistency essential for your human embryonic stem (hES) cell research. The mTeSR1 formulation and Corning Matrigel matrix have been shown to be a successful combination for feeder-free maintenance of different WiCell™ hES cell lines for up to 20 passages (mTeSR1, STEMCELL Technologies Cat. No. 85850).



Corning Human Umbilical Vein Endothelial Cells (HUVEC-2) stained with Calcein AM and cultured on Corning Matrigel matrix.

Corning Matrigel basement membrane matrix is a solubilized basement membrane preparation extracted from the Engelbreth-Holm-Swarm (EHS) mouse sarcoma, a tumor rich in extracellular matrix proteins to include laminin (a major component), collagen IV, heparan sulfate proteoglycans, and entactin/nidogen<sup>1,2</sup>. Corning Matrigel matrix also contains TGF-beta, epidermal growth factor, insulin-like growth factor, fibroblast growth factor, tissue plasminogen activator<sup>3,4</sup>, and other growth factors which occur naturally in the EHS tumor.

## Typical Applications:

### Cell Growth and Differentiation

Corning® Matrigel® matrix is especially suited for the culture of polarized cells, such as epithelial cells. It promotes the differentiation of many cell types including hepatocytes, neurons, mammary epithelial, endothelial, and smooth muscle cells.

### In Vivo Angiogenesis Studies

Corning Matrigel matrix HC can be used to assess *in vivo* angiogenic activity of different compounds by subcutaneous injection into mice (Matrigel plug assay). The plugs are subsequently removed and analyzed for the formation of blood vessels.

### Augmentation of Tumor Growth in Nude Mice

Corning Matrigel matrix HC has been shown to promote successful transplantation of many human tumor cells including prostatic, breast, small-cell lung, colon, adrenal carcinomas, melanomas, and lymphoblastic leukemia cells. Also, it has been found to increase tumor growth rates *in vivo*.

## Quality Control

- ▶ Mouse colonies are routinely screened for pathogens via Mouse Antibody Production (MAP) testing.
- ▶ Extensive PCR testing is performed to screen for a number of pathogens, including LDEV, to ensure strict control of raw materials used during the manufacturing process.
- ▶ Tested and found negative for bacteria, fungi, and mycoplasma.
- ▶ Protein concentrations are determined by Lowry method.
- ▶ Endotoxin units are measured by Limulus Amoebocyte Lysate assay.
- ▶ Corning Matrigel matrix gel stability is tested for a period of 14 days at 37°C.
- ▶ Biological activity is determined for each lot using a neurite outgrowth assay. Chick dorsal root ganglia are plated on a 1.0 mm layer of Corning Matrigel matrix and must generate positive neurite outgrowth response after 48 hours without addition of nerve growth factor.

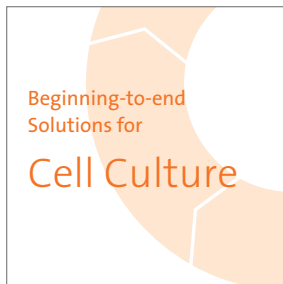
## Ordering Information

Cat. No.	Description	Size	Qty/Cs
356234	Corning Matrigel matrix, LDEV-free	5 mL	1
354234	Corning Matrigel matrix, LDEV-free	10 mL	1
356237	Corning Matrigel matrix, phenol red-free, LDEV-free	10 mL	1
356235	Corning Matrigel matrix, LDEV-free, 50 mL (5 x 10 mL)	10 mL	5
356232	Corning Matrigel matrix, LDEV-free, 25 mL (5 x 5 mL)	5 mL	5
356254	Corning Matrigel matrix, LDEV-free, 100 mL (10 x 10 mL)	10 mL	10
356230	Corning Matrigel matrix, growth factor reduced (GFR), LDEV-free	5 mL	1
354230	Corning Matrigel matrix, (GFR), LDEV-free	10 mL	1
356231	Corning Matrigel matrix, (GFR), phenol red-free, LDEV-free	10 mL	1
356252	Corning Matrigel matrix, (GFR), LDEV-free, 50 mL (5 x 10 mL)	10 mL	5
356253	Corning Matrigel matrix, (GFR), LDEV-free, 100 mL (10 x 10 mL)	10 mL	10
356238	Corning Matrigel matrix, (GFR), phenol red-free, LDEV-free, 50 mL (5 x 10 mL)	10 mL	5
356239	Corning Matrigel matrix, (GFR), phenol red-free, LDEV-free, 100 mL (10 x 10 mL)	10 mL	10
354248	Corning Matrigel matrix, high concentration (HC), LDEV-free	10 mL	1
354262	Corning Matrigel matrix, (HC), phenol red-free, LDEV-free	10 mL	1
354263	Corning Matrigel matrix, (HC), (GFR), LDEV-free	10 mL	1
354277	Corning Matrigel matrix, hESC qualified, LDEV-free	5 mL	1
356277	Corning Matrigel matrix, hESC-qualified, LDEV-free, 25 mL (5 x 5 mL)	5 mL	5
356278	Corning Matrigel matrix, hESC-qualified, LDEV-free, 50 mL (10 x 5 mL)	5 mL	10

Typical protein concentrations for Corning Matrigel matrix are between 8 to 12 mg/mL. Matrigel matrix High Concentration is 18 to 22 mg/mL. A lot-specific Certificate of Analysis is provided with each Corning Matrigel matrix lot noting exact endotoxin and protein concentrations.

## References

- Kleinman, H.K., et al., Isolation and characterization of type IV procollagen, laminin, and heparan sulfate proteoglycan from the EHS sarcoma, *Biochemistry*, 21:6188 (1982).
- Kleinman, H.K., et al., Basement membrane complexes with biological activity, *Biochemistry*, 25:312 (1986).
- Vukicevic, S., et al., Identification of multiple active growth factors in basement membrane Matrigel suggests caution in interpretation of cellular activity related to extracellular activity related to extracellular matrix components, *Experimental Cell Research*, 202:1 (1992).
- McGuire, P.G. and Seeds, N.W., The interaction of plasminogen activator with a reconstituted basement membrane matrix and extracellular macromolecules produced by cultured epithelial cells, *J. Cell. Biochem.*, 40:215 (1989).
- Biederer, T. and Scheiffele, P., Mixed-culture assays for analyzing neuronal synapse formation, *Nature Protocols*, 2(3):670 (2007).
- Li, Y., et al., Essential Role of TRPC channels in the guidance of nerve growth cones by brain-derived neurotrophic factor, *Nature*, 434:894 (2005).
- Bi, Y., et al., Use of cryopreserved human hepatocytes in sandwich culture to measure hepatobiliary transport, *Drug Metab. and Dispos.*, 34(9):1658 (2006).
- Hadley, M.A., et al., Extracellular matrix regulates sertoli cell differentiation, testicular cord formation, and germ cell development in vitro, *J. Cell Biol.*, 101:1511 (1985).
- Yu, X., et al., Essential role of extracellular matrix (ECM) overlay in establishing the functional integrity of primary neonatal rat sertoli cell/gonocyte co-cultures: An improved in vitro model for assessment of male reproductive toxicity, *Toxicological Sciences*, 84(2):378 (2005).
- Ireland, M.E., Quantification and regulation of mRNAs encoding beaded filament proteins in the chick lens, 16(8):838 (1997).
- McGuire, P.G., and Orkin, R.W., A simple procedure to culture and passage endothelial cells from large vessels of small animals, *Biotechniques*, 5(6):456 (1987).
- Bissel, D.M., et al., Support of cultured hepatocytes by a laminin-rich gel. Evidence for a functionally significant subendothelial matrix in normal rat liver, *J. Clinical Invest.*, 79:801 (1987).
- Page, J.L., et al., Gene expression profiling of extracellular matrix as an effector of human hepatocyte phenotype in primary cell culture, *Toxicological Sciences*, 97(2):384 (2007).
- Li, M.L., et al., Influence of a reconstituted basement membrane and its components on casein gene expression and secretion in mouse mammary epithelial cells, *Proc. Nat. Acad. Sci. USA*, 84:136 (1987).
- Barcellof, M.H., et al., Functional differentiation and avascular morphogenesis of primary mammary cultures on reconstituted basement membrane, *Development*, 105:223 (1989).
- Roskelley, C.D., et al., Extracellular matrix-dependent tissue-specific gene expression in mammary epithelial cells requires both physical and biochemical signal transduction, *Proc. Nat. Acad. Sci. USA*, 91(26):12378 (1994).
- Xu, R., et al., Extracellular matrix-regulated gene expression requires cooperation of SWI/SNF and transcription factors, *J. Biol. Chem.*, 282(20):14992 (2007).
- Debnath, J., et al., Morphogenesis and oncogenesis of MCF-10A mammary epithelial acini grown in three-dimensional basement membrane cultures, *Methods*, 30(3):256 (2003).
- Muthuswamy, S.K., et al., ErbB2, but not ErbB1, reinitiates proliferation and induces luminal repopulation in epithelial acini, *Nat. Cell Biol.*, 3(9):785 (2001).
- Terranova, V.P., et al., Use of a reconstituted basement membrane to measure cell invasiveness and select for highly invasive tumor cells, *Proc. Nat. Acad. Sci. USA*, 83:465 (1986).
- Albini, A., et al., A rapid in vitro assay for quantitating the invasive potential of tumor cells, *Cancer Research*, 47:3239 (1987).
- Madison, R., et al., Increased rate of peripheral nerve regeneration using bioresorbable nerve guides and laminin containing gel, *Exp. Neurology*, 88:767 (1985).
- Xu, X.M., et al., Axonal regeneration into Schwann cell-seeded guidance channels grafted into transected adult rat spinal cord, *J. Comp. Neurol.*, 351(1):145 (1994).
- Fouad, K., et al., Combining schwann cell bridges and olfactory-ensheathing glia grafts with chondroitinase promotes locomotor recovery after complete transection of the spinal cord, *The Journal of Neuroscience*, 25(5):1169 (2005).
- Kubota, Y., et al., Role of laminin and basement membrane in the morphological differentiation of human endothelial cells into capillary-like structures, *J. Cell Biol.*, 107:1589 (1988).
- Maeshima, Y., et al., Identification of the anti-angiogenic site within vascular basement membrane-derived Tumstatin, *J. Biol. Chem.*, 276(18):15240 (2001).
- Passaniti, A., et al., A simple, quantitative method for assessing angiogenesis and anti-angiogenic agents using reconstituted basement membrane, heparin, and fibroblast growth factor, *Lab Invest.*, 67:519 (1992).
- Isaji, M., et al., Tranilast inhibits the proliferation, chemotaxis and tube formation of human microvascular endothelial cells in vitro and angiogenesis in vivo, *British Journal of Pharmacology*, 122:1061 (1997).
- Kisucka, J., et al., Platelets and platelet adhesion support angiogenesis while preventing excessive hemorrhage, *Proc. Nat. Acad. Sci. USA*, 103(4):855 (2006).
- Albini, A., et al., Matrigel promotes retinoblastoma cell growth in vitro and in vivo, *Int. J. Cancer*, 52(2):234 (1992).
- Yue, W., et al., MCF-7 human breast carcinomas in nude mice as a model for evaluating aromatase inhibitors, *J. Steroid Biochem. Molec. Biol.*, 44(4-6): 671 (1993).
- Angelucci, A., et al., Suppression of EGF-R signaling reduces the incidence of prostate cancer metastasis in nude mice, *Endocrine-Related Cancer*, 13(1):197 (2006).



[www.corning.com/lifesciences/solutions](http://www.corning.com/lifesciences/solutions)

At Corning, cells are in our culture. In our continuous efforts to improve efficiencies and develop new tools and technologies for life science researchers, we have scientists working in Corning R&D labs across the globe, doing what you do every day. From seeding starter cultures to expanding cells for assays, our technical experts understand your challenges and your increased need for more reliable cells and cellular material.

It is this expertise, plus a 160-year history of Corning innovation and manufacturing excellence, that puts us in a unique position to offer a beginning-to-end portfolio of high quality, reliable cell culture consumables.

For more specific information on claims, visit the Certificates page at [www.corning.com/lifesciences](http://www.corning.com/lifesciences).

**Warranty/Disclaimer:** Unless otherwise specified, all products are for research use only. Not intended for use in diagnostic or therapeutic procedures. Not for use in humans. Corning Life Sciences makes no claims regarding the performance of these products for clinical or diagnostic applications.

For additional product or technical information, visit [www.corning.com/lifesciences](http://www.corning.com/lifesciences) or call 800.492.1110. Outside the United States, call +1.978.442.2200 or contact your local Corning sales office.

# CORNING

**Corning Incorporated**  
*Life Sciences*

836 North St.  
Building 300, Suite 3401  
Tewksbury, MA 01876  
t 800.492.1110  
t 978.442.2200  
f 978.442.2476

[www.corning.com/lifesciences](http://www.corning.com/lifesciences)

**ASIA/PACIFIC**  
**Australia/New Zealand**  
t 61 427286832

**China**  
t 86 21 3338 4338  
f 86 21 3338 4300

**India**  
t 91 124 4604000  
f 91 124 4604099

**Japan**  
t 81 3-3586 1996  
f 81 3-3586 1291

**Korea**  
t 82 2-796-9500  
f 82 2-796-9300

**Singapore**  
t 65 6572-9740  
f 65 6861-2913  
**Taiwan**  
t 886 2-2716-0338  
f 886 2-2516-7500

**EUROPE**  
CSEurope@corning.com

**France**  
t 0800 916 882  
f 0800 918 636

**Germany**  
t 0800 101 1153  
f 0800 101 2427

**The Netherlands**  
t 020 655 79 28  
f 020 659 76 73

**United Kingdom**  
t 0800 376 8660  
f 0800 279 1117

**All Other European Countries**  
t +31 (0) 206 59 60 51  
f +31 (0) 206 59 76 73

**LATIN AMERICA**  
grupoLA@corning.com

**Brasil**  
t 55 (11) 3089-7400  
**Mexico**  
t (52-81) 8158-8400