The Ultimate Guide to Corning® Matrigel® Matrix

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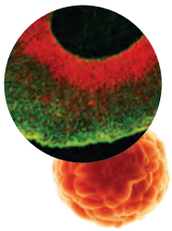
30+ Facts, Tips, and Expert Advice on the Most Widely Used ECM in Scientific Research

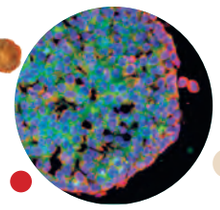
10,000+ Citations

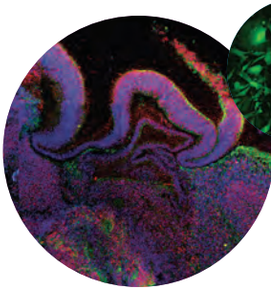
There are a few precious things in life that get better with age. Corning® Matrigel® matrix is one. As we celebrate 30 years of discoveries and 10,000 citations, we look forward to seeing what's next for this time-tested breakthrough — a solution that's more widely used today than ever. From essential applications to cutting-edge, life-changing research, Matrigel Matrix is just getting started.



For the past 30 years, Corning® Matrigel® matrix has been used by researchers in essential applications as well as in cutting edge, life changing research.

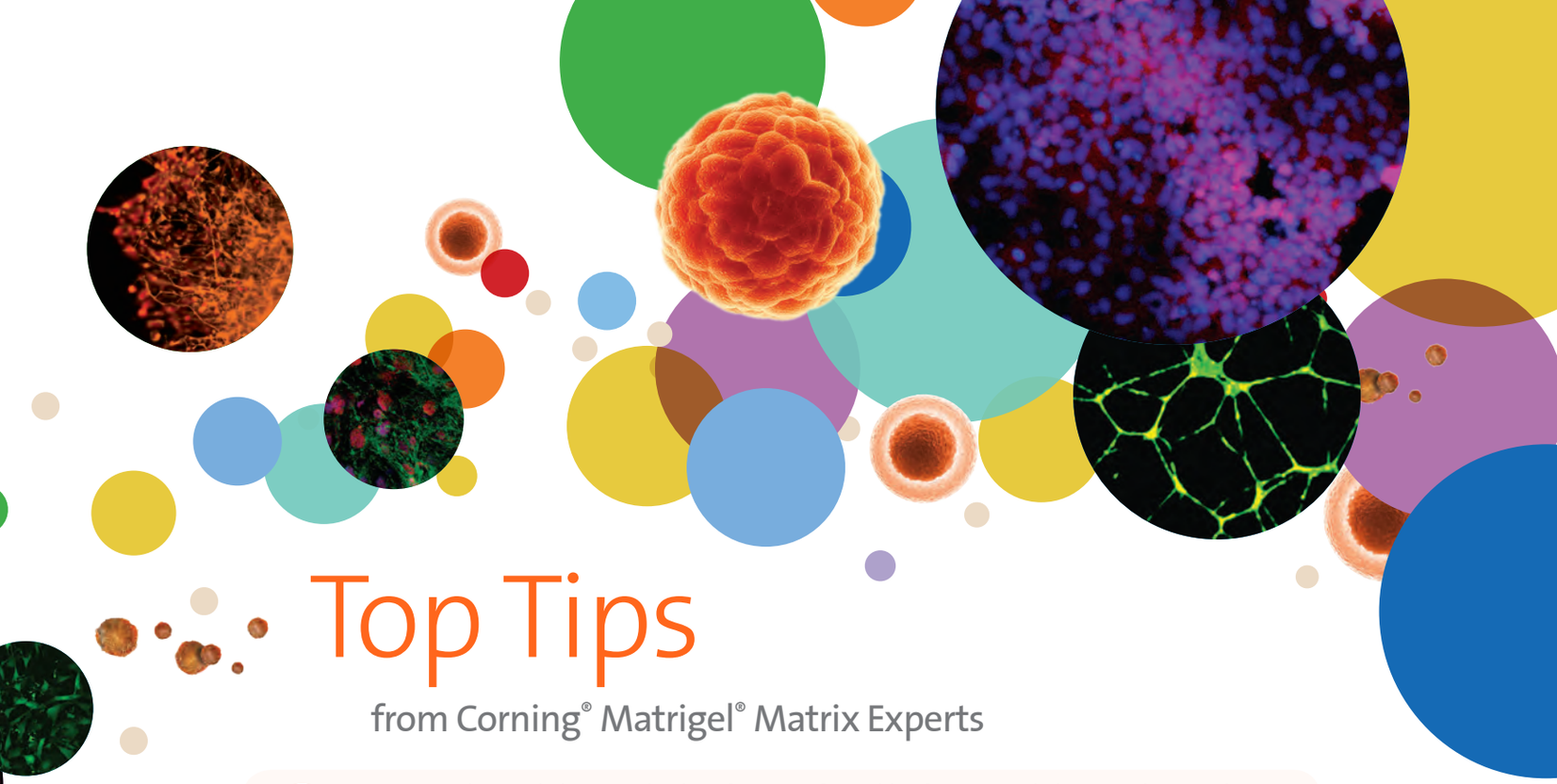
We've learned a lot over the last 30 years, and we want to share that information with you, our customers. We've compiled the ultimate guide to Corning Matrigel matrix featuring facts, tips, and expert advice on the most widely used ECM in scientific research.





Did you Know Matrigel Matrix...

- Quickly polymerizes when the temperature is elevated? Matrigel matrix will start to form a gel at 10°C and will rapidly gel at temperatures greater than 22°C.
- Raw materials and final products are tested for a wide panel of viruses including lactate dehydrogenase elevating virus (LDEV)?
- May have color variations in frozen or thawed vials, ranging from straw yellow to dark red? This is due to the interaction of carbon dioxide with the bicarbonate buffer and phenol red. Variation in color is normal and does not affect the product efficacy. This will disappear upon equilibration with 5% CO_2.
- Will be viscous but free-flowing at 4°C-10°C in standard concentrations? Phenol red and phenol red free standard concentration Matrigel products are transparent (not cloudy).
- Growth Factor Reduced formulation is useful for applications that benefit from a more highly defined basement membrane preparation?
- hESC-qualified formulation (Corning Cat. No. 354277) has been certified for use with STEMCELL Technologies' mTESR®1 medium? After 5 passages, cells remained undifferentiated by standard morphology and surface marker expression.
- High Concentration is suited for *in vivo* applications? It provides greater matrix stiffness and scaffold integrity which improves cell engraftment and augmentation of solid tumor formation.
- High Concentration formulation is very viscous and not transparent?
- Plugs can last for up to one week *in vivo*?
- Lot-specific protein concentration is recorded on each Certificate of Analysis?
- Can be used with Corning Dispase or Corning Cell Recovery solution to recover cells?
- Is available in ready-to-use, thin pre-coated Corning BioCoat™ cultureware formats for 3D cell culture as well as cell attachment and proliferation applications?
- Is available in ready-to-use Corning BioCoat cultureware formats for endothelial tube formation and invasion assays?
- Can be used with the Corning spheroid microplate to aid in tight spheroid formation for 3D cell culture research?
- Can be used with Transwell® permeable supports to perform invasion/migration assays?
- Requires temperature stability? You can consider working with Corning CoolRack®, CoolBox™ and Ice Buckets to keep cultureware and tubes cold while coating or aliquoting.
- Standard, Growth Factor Reduced, and hESC-qualified formulations are also available in bulk quantities of: 25 mL (5 x 5 mL), 50 mL (10 x 5 mL), and 100 mL (10 x 10 mL)
- Lot-specific expiration dates are recorded on each Certificate of Analysis?



Top Tips

from Corning® Matrigel® Matrix Experts

1. Use Matrigel-coated plates on the day of coating if possible. If not, coated plates can be stored in an incubator at 37°C for up to a week in serum-free medium (application-dependent). Alternatively, coated plates can be stored at 2°C to 8°C with a layer of serum-free medium. Be sure to seal the plate with parafilm and package to maintain sterility.
2. Use greater than 3 mg/mL of Matrigel matrix to form a firm gel. For *in vivo* applications do not dilute Matrigel matrix to a final concentration below 4 mg/mL.
3. Use phenol red-free products for assays that require color detection. Also, since phenol red may exhibit estrogenic effects, we recommend using phenol red-free Matrigel matrix if estrogenic effects are an application concern.
4. For any fluorescence assays, use a control experiment to determine background fluorescence since the Matrigel matrix protein components may fluoresce (excitation in the UV range) and DMEM contains substances (vitamins) that may interfere with the experiment.
5. To fix Matrigel matrix, 2% paraformaldehyde can be used. To prevent depolymerization, add 1% glutaraldehyde to the Matrigel matrix. You can produce less background fluorescence by using less glutaraldehyde.
6. Thin layers of Matrigel matrix are generally recommended for cell attachment and proliferation applications. For thin gels we recommend coating with at least 50 µL/cm^2.
7. Thick layers of Matrigel matrix are used for 3D cell culture and applications (e.g., Ring assay, cell invasion). For thick gels we recommend coating with at least 150-200 µL/cm^2.
8. For endothelial tube formation use 0.289 mL of chilled Matrigel matrix (10 mg/mL) per well of a 24-well plate. Pre-screen lots for Matrigel matrix that have a protein of at least 10 mg/mL by contacting Corning Customer Service or Scientific Support.
9. If you are performing an invasion assay, use 0.1 mL (200-300 µg/mL) of Matrigel matrix per insert (24-well).
10. If target protein concentration is less than 200 µg/mL, dilute to the final protein concentration using a serial dilution. Modulate stiffness by controlling protein concentration (higher protein concentrations = firmer gels).
11. If using a coated plate/insert, immediately aspirate liquid from top of the Matrigel matrix layer prior to use (optional).
12. When you coat a permeable support membrane, such as a Transwell permeable support, add a drop of Matrigel matrix to the center of the insert membrane, and quickly spread this volume with a pipet tip to coat the surface (Caution: do not damage the membrane with tip).

Additional Corning® Matrigel® Matrix Resources and Scientific Support

- For more information and available protocols for endothelial cell tube formation, cell invasion assay, tuning the elastic moduli, hESC and 3D *in vitro* culture visit **www.corning.com/matrigel**.
- To minimize or prevent lot-to-lot variability, you can pre-screen different lots of Matrigel matrix and select a specific lot with preferred protein and endotoxin concentrations that works for your application. To ensure that a sufficient quantity of the selected lot is available for your study, you can place a reserve order for the quantity that is required. Request online at www.corning.com/matrigel.
- Choosing the right surface for your cell and cell-based assays can mean the difference between cell culture success or failure. Corning offers a guide to surfaces selection by cell type (CLS-C-DL-AC-010), which features a list of references on Matrigel matrix across a variety of cell types (e.g., primary cells, transformed/transfected cell lines, stem cell expansion and differentiation, as well as 3D cell culture applications) to help ensure you select the surface most suited to your work.

If you have questions or need help troubleshooting or selecting a product, contact our experienced team of scientists and support specialists by email at **ScientificSupport@corning.com** or call 800.492.1110. Outside the United States, call +1.978.442.2200.

As we celebrate 30 years and 10,000 citations, we look forward to seeing what you, our customers, will continue to do with this time-tested solution.

From essential applications to cutting-edge, life-changing research, there are exciting breakthroughs in store for you and Corning Matrigel matrix.

Visit **www.corning.com/matrigel** for more information.

Do This, Not That

Corning® Matrigel® Matrix Edition

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DO THIS

- ✔ Store Matrigel matrix properly at -20°C in a non-frost-free freezer
- ✔ Aliquot Matrigel matrix after first thaw and then store at -70°C or -20°C in a frost-free freezer using polypropylene or other compatible tubes that can withstand the cold temperature. Aliquot Matrigel matrix to allow one time use post-thaw.
- ✔ Thaw Matrigel matrix properly. Submerge Matrigel matrix vials overnight in ice at 2°C to 8°C. Once thawed, swirl in ice to ensure the material is evenly distributed. Place the covered ice bucket toward the back of the refrigerator where it will not be subjected to temperature change. Use adequate amount of ice so that the Matrigel matrix vial is in ice for the entire thawing process (not in cold water).
- ✔ Keep Matrigel matrix on ice at all times during handling. Gelling is temperature-dependent.
- ✔ Pre-chill pipet tips/labware that you plan to place into contact with Matrigel matrix.
- ✔ Dilute Matrigel matrix by adding it to an ice-cold solution (serum-free medium or DPBS). Mix gently by swirling or pipetting up and down.
- ✔ Coat vessels on ice or a Corning CoolRack or Corning ThermalTray™ on ice.
- ✔ Use a positive displacement pipet (tip has a piston), or syringe to accurately measure Matrigel matrix. This is critical when measuring High Concentration Matrigel matrix formulations, which are very viscous and non-transparent.
- ✔ Use the lot-specific protein concentration (or dilution factor) provided on the Certificate of Analysis (CofA) to standardize the protein concentration. The protein concentration of High Concentration Matrigel matrix is included on the label.

NOT THAT

- ✘ Do not store Matrigel matrix in a frost-free freezer.
- ✘ Also, do not store in a freezer door or in a freezer that is opened frequently. This is recommended to minimize temperature fluctuations.
- ✘ Do not thaw Matrigel matrix in cold water or liquefied ice.
- ✘ Do not repeat freeze-thaw cycles of Matrigel matrix.
- ✘ Do not dilute Matrigel matrix with water as it may cause aggregation.
- ✘ Do not attempt to aspirate Matrigel matrix with a standard pipet (air displacement).
- ✘ Do not store Matrigel matrix solutions once mixed with a media or buffer, as this can cause instability.
- ✘ Do not use Matrigel matrix that is not aliquoted or stored properly.
- ✘ Do not use Matrigel matrix that has been thawed or held at 2°C to 8°C.
- ✘ Do not use protein concentration from a former lot, as each dilution factor is lot-specific.