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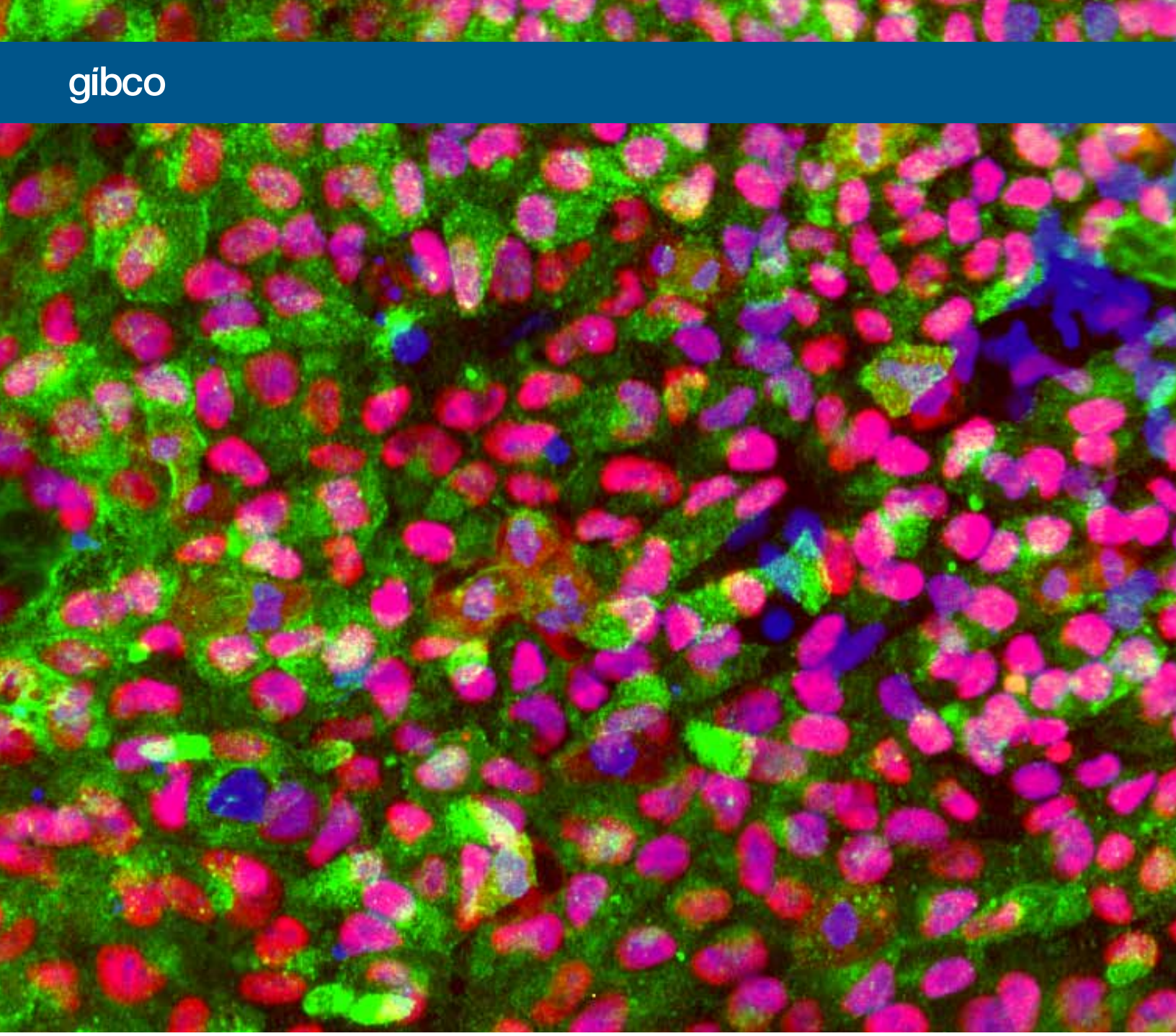


Matrices sourcebook

Your guide to Gibco extracellular matrices products

ThermoFisher SCIENTIFIC

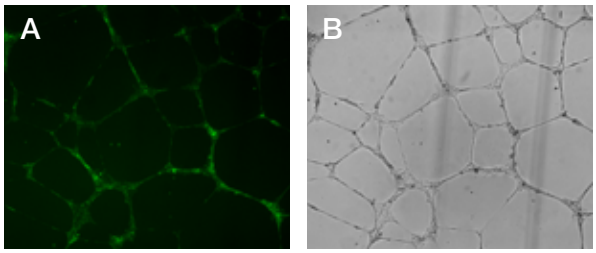
Introduction

Gibco™ products, including extracellular matrices, 3D scaffolds, and attachment proteins, are essential tools for providing enhanced cell function resulting in more *in vivo*-like cell morphology, physiologically relevant environments, and better intercellular interactions. Our products offer:

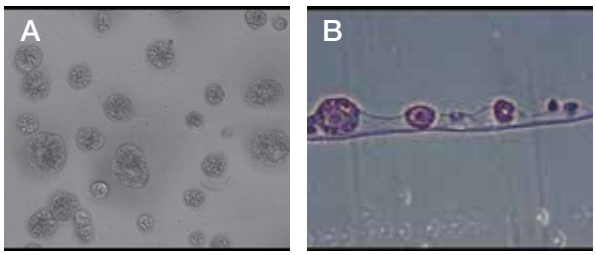
- Proven technologies essential for cell attachment
- Lot-to-lot product consistency for ease of use and greater confidence
- Broad range of applications including liver and skin biology, stem cell research, neuroscience, and oncology

Geltrex matrix products

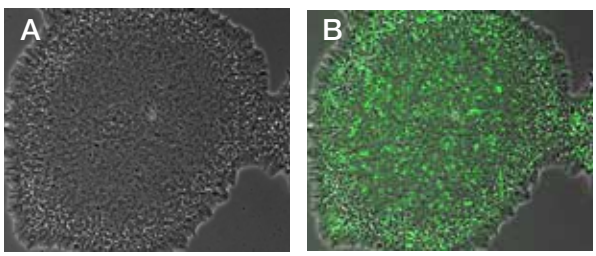
Gibco™ Geltrex™ matrix products are a soluble form of reduced growth factor (RGF) basement membrane extract (BME) purified from murine Engelbreth-Holm-Swarm tumor cells. All Geltrex products are free of the lactate dehydrogenase–elevating virus (LDEV), making them ideal for all types of cell culture and mouse *in vivo* research. In addition, consistent protein concentration from lot-to-lot and functional testing on each lot helps to decrease variability in your cell culture experiments.



(**A**) Representative fluorescent (calcein AM staining) and (**B**) phase contrast images of endothelial cell tube formation. Gibco™ Geltrex™ BME induces the reorganization of human umbilical vein endothelial cells (HUVECs) into 3D capillary-like structures.



Human mammary epithelial cells (HMEC) in three-dimensional culture using Geltrex BME were prepared using the HMEC 3D Cell Culture Protocol. Phase contrast images of cells were taken 2 days following transfer to three-dimensional culture. (**A**) Live-cell phase contrast images of acinar structures. (**B**) Hematoxylin and eosin (H&E)-stained images of formalin-fixed HMEC 3D cultures. Three-dimensional structures were sectioned perpendicular to the plane of the growth surface.



(**A**) Phase contrast image of H9 embryonic stem cells grown in Gibco™ Essential 8™ Medium (Cat. No. A1517001) on Geltrex hESC-qualified ready-to-use matrix. (**B**) Cells stained for TRA-1-60 expression.

Gibco™ Geltrex™ hESC-qualified Ready-To-Use Matrix

Ready. Set. Grow.

Geltrex hESC-qualified Ready-To-Use Reduced Growth Factor Basement Membrane Matrix, used for stem cell applications, is stored in the refrigerator (2–8°C) and comes ready to use—which means no thawing, diluting, or premature gelling.

Gibco Geltrex matrix methods

Thin gel method: For applications such as endothelial cell differentiation into capillary-like structures (tube assay), a thin gel is needed.

Thick gel method: For applications such as the differentiation of rat aorta tissue into capillary-like structures (ring assay), or cell invasion assays, a thick gel is needed.

Thin gel method (non-gelling): For applications such as propagation of primary cells that only need a protein layer and not a protein matrix, the thin layer method should be used.

Product	Quantity	Cat. No.
Geltrex hESC-qualified Ready-To-Use Reduced Growth Factor (RGF) Membrane Matrix*	50 mL	A1569601
Geltrex LDEV-Free RGF Basement Membrane Matrix	1 mL	A1413201
Geltrex LDEV-Free RGF Basement Membrane Matrix	5 mL	A1413202
Geltrex LDEV-Free hESC-qualified RGF Basement Membrane Matrix	1 mL	A1413301
Geltrex LDEV-Free hESC-qualified RGF Basement Membrane Matrix	5 mL	A1413302

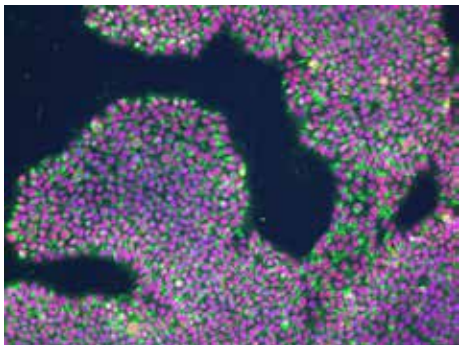
*The concentration of Geltrex hESC-qualified Ready-to-Use has been optimized for expansion of pluripotent stem cells (PSCs) and is not applicable to culture of other cell types.

Laminin

Laminin is the major glycoprotein component of basement membranes and is used to culture a variety of cell types.

Mouse laminin is isolated from Engelbreth-Holm-Swarm sarcoma cells. Among the functions it modulates are cell attachment, cell spreading, cell growth and motility, promotion of epithelial differentiation, modification of leukocyte function, and stimulation of neurite outgrowth.

Human Laminin-521 is expressed in blastocysts and therefore is ideally suited to culture of PSCs. It has been shown to improve reprogramming efficiency and recovery during challenging transitions.

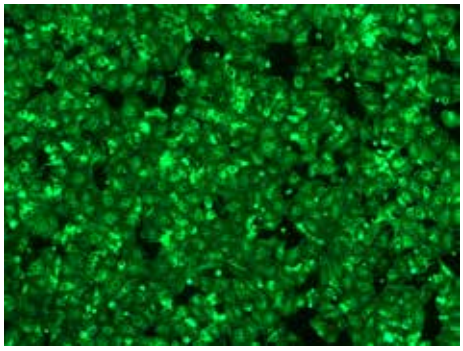


Human ESCs cultured on rhLaminin-521 in Essential 8 Medium for 20 passages maintain pluripotency. Human embryonic stem cells (ESCs) were grown under feeder-free conditions using Essential 8 Medium in wells coated with rhLaminin-521. The cells were stained for pluripotency markers using the PSC 4-Marker ICC Kit (Cat. No. A24881).

Product	Quantity	Cat. No.
Laminin Mouse Protein, Natural	1 mg	23017015
Recombinant Human Laminin-521	0.1 mg	A29248
Recombinant Human Laminin-521	1 mg	A29249

Collagen

Gibco™ Collagen type I is a heterotrimeric extracellular matrix protein found in the skin and other connective tissues. It is the most widely used extracellular matrix protein for cell culture, facilitating cell attachment, growth, differentiation, migration, and tissue morphogenesis. Collagen type I is commonly used to culture endothelial cells, muscle cells, hepatocytes, and a variety of related cell types.



Rat liver sinusoidal endothelial cells (LSEC) cultured on collagen type I and stained for SE-1 expression.

Product	Quantity	Cat. No.
Collagen I, Rat Tail	20 mL	A1048301
Collagen I, Bovine	10 mL	A1064401
Collagen I, Coated Plate, 6-well, Rat Tail	5 plates	A1142801
Collagen I, Coated Plate, 24-well, Rat Tail	5 plates	A1142802
Collagen I, Coated Plate, 96-well, Rat Tail	5 plates	A1142803

Coating Matrix Kit

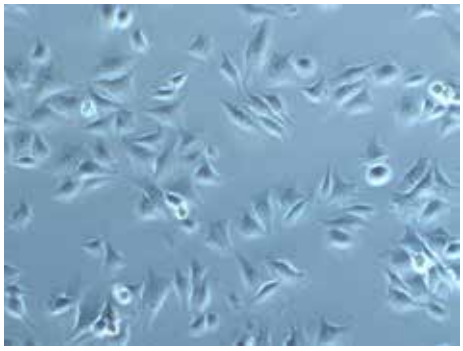
Gibco™ Coating Matrix Kit is an animal origin-free kit that enhances the growth of human keratinocytes *in vitro* and is intended for use in conjunction with Gibco™ EpiLife™ Medium or other similar keratinocyte media and a supplement combination. The kit contains one vial of recombinant plant type-1 collagen and a dilution medium. The kit may also be used for the primary isolation of keratinocytes in an animal origin-free environment.

Human epidermal keratinocytes grown in EpiLife Medium on Coating Matrix.

Product	Quantity	Cat. No.
Coating Matrix Kit, Recombinant	1 Kit	R011K

Fibronectin

Gibco™ Fibronectin protein is a large cell-surface and plasma protein that exhibits structural and adhesive properties in cell-associated fibrillar matrices. Fibronectin is important for cell attachment, proliferation, and migration, and is most commonly used in stem cell and neural applications.



BHK-21 cells grown on fibronectin protein.

Product	Quantity	Cat. No.
Fibronectin Bovine Protein, Plasma	1 mg	33010018
Fibronectin Human Protein, Plasma	5 mg	33016015

Attachment Factor Protein (0.1% gelatin)

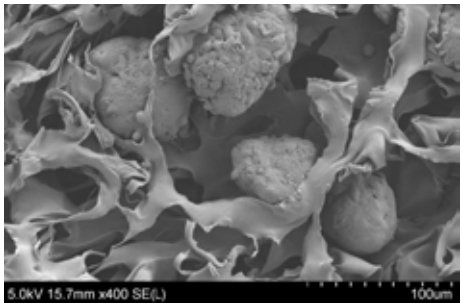
Gibco™ Attachment Factor (AF) Protein is a sterile solution (1X) containing gelatin at 0.1%. When used to coat culture surfaces, AF enhances the growth of endothelial cells. AF is commonly used when plating murine embryonic fibroblasts (MEFs) for feeder-based human and murine stem cell culture.

Mouse embryonic fibroblasts grown on AF protein.

Product	Quantity	Cat. No.
Attachment Factor Protein	100 mL	S006100

AlgiMatrix 3D Culture System

The Gibco™ AlgiMatrix™ 3D Culture System is a user-friendly, animal origin–free bioscaffold for the development of higher-fidelity cell culture models. The AlgiMatrix system supports formation of 3D cellular aggregates that more closely reflect normal cell morphology and are suitable for many cell-based screening procedures such as multicellular tumor spheroid assays and hepatocyte cocultures.



Coherent spheroidal structure formed by C3A cells cultured for three weeks on AlgiMatrix 3D Culture System plates.

Other features of the AlgiMatrix system include:

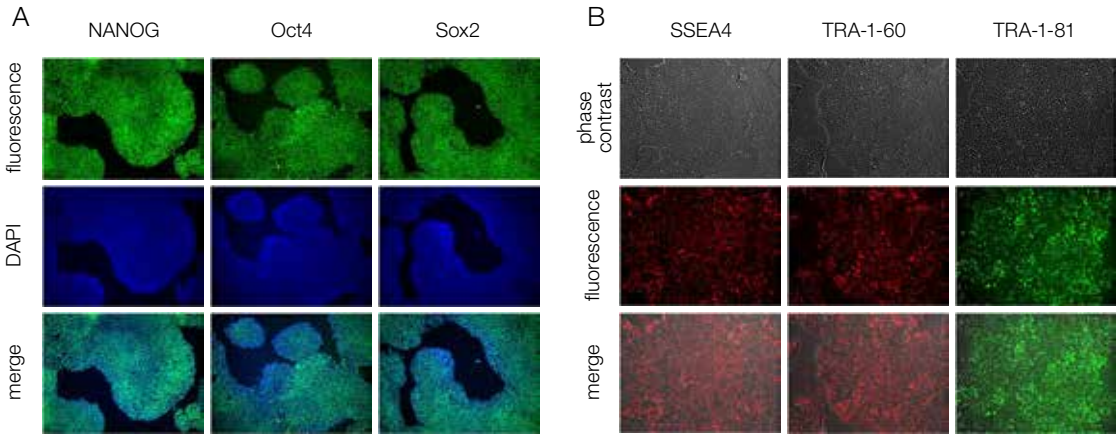
- Three-dimensional, porous alginate cell culture platform
- Chemically defined, animal origin–free material
- Supports formation of 3D cellular aggregates that more closely reflect normal cell morphology and behavior
- Easy visualization of cells
- Non-enzymatic cell recovery within minutes
- Lyophilized product available in 6-well, 24-well, and 96-well plate formats

Product	Quantity	Cat. No.
AlgiMatrix 3D Culture System	1 x 96-well plate	12684015
AlgiMatrix 3D Culture System	1 x 24-well plate	12684023
AlgiMatrix 3D Culture System	5 x 96-well plates	12684031
AlgiMatrix 3D Culture System	4 x 24-well plates	12684049
AlgiMatrix 3D Culture System	1 x 6-well plate	A1098201
AlgiMatrix 3D Culture System	4 x 6-well plates	A1098202
AlgiMatrix Firming Buffer	50 mL	A1091501
AlgiMatrix Dissolving Buffer	50 mL	A1134001

Vitronectin (VTN-N)

Gibco™ Vitronectin recombinant human protein provides a defined surface for feeder-free culture of PSCs. When used with Essential 8 Medium, VTN-N has been proven to maintain pluripotency and normal growth characteristics in multiple PSC lines. In addition, VTN-N has been shown to support PSC growth for >50 passages without any signs of karyotypic abnormalities and to maintain the ability of PSCs to differentiate into all three germline lineages.

Also available, Gibco™ CTS™ Vitronectin, has been designed specifically for use in clinical research. When used with Gibco™ CTS™ Essential 8™ Medium, this system offers a seamless transition from the research bench to clinical applications.



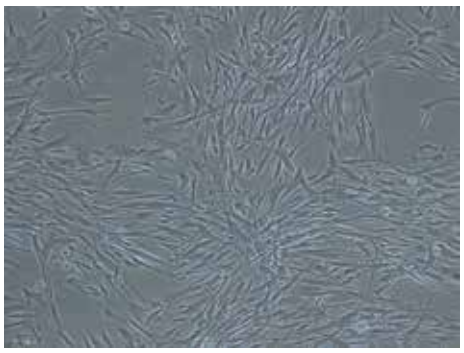
Induced pluripotent stem cells (iPSCs) derived from BJ fibroblasts using the Invitrogen™ CytoTune™-iPS Sendai Reprogramming Kit (Cat. No. A1378001) after more than eight passages in Essential 8 Medium (Cat. No. A1517001) and 0.5 µg/cm^2 VTN-N. Cells were stained for (**A**) intracellular markers and (**B**) surface markers of pluripotency.

Product	Quantity	Cat. No.
Vitronectin (VTN-N) Recombinant Human Protein, Truncated	1 mL	A14700
CTS Recombinant Human Vitronectin*	1 mL	A27940

*U.S. Pharmacopeia <1043> Ancillary materials for cell, gene, and tissue-engineering products.

CTS CELLstart Substrate

Gibco™ CTS™ CELLstart™ (cell therapy systems) Substrate is a defined substrate, containing only components of human origin (xeno-free). The Gibco™ CTS™ product line enables you to reduce your burden in qualifying reagents during your transition from research applications to clinical applications. CTS CELLstart substrate supports growth of human embryonic, induced pluripotent, mesenchymal, and neural stem cells.



Gibco™ StemPro™ BM Mesenchymal Stem Cells (Cat. No. A15652) grown on CTS CELLstart under hypoxic conditions in Gibco™ StemPro™ MSC SFM XenoFree (Cat. No. A1067501).

Product	Quantity	Cat. No.
CTS CELLstart	2 mL	A1014201

For Research Use or Manufacturing of Cell, Gene, or Tissue-Based Products. CAUTION: Not intended for direct administration into humans or animals.

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Surround yourself with support

Get the cell culture and extracellular matrices support you need—the way you want it. Cell culture work can be time-consuming, finding support shouldn't be. That's why Thermo Fisher Scientific gives you easy access to the resources you need to be successful, in a format that fits your learning preference.

Find the support you need at
thermofisher.com/3D-cellculture

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