

Corning® PureCoat™ ECM Mimetic Cultureware

Natural Performance. Scientifically Defined.



CORNING

The First **Animal-Free** Synthetic Surface To Mimic Natural ECM Attachment & Functionality.



Next generation Corning® PureCoat™ ECM Mimetic Cultureware is coated with biologically active synthetic animal-free peptides that are covalently linked to a proprietary surface to provide a highly consistent alternative to complex extracellular peptides. The peptides are rationally designed to mimic the cell attachment motifs of native ECM proteins, which promotes optimal cell binding and signaling in a broad range of serum-free, xeno-free, and animal-free media formulations.

There are two Corning PureCoat ECM mimetic types:

Corning PureCoat ECM Mimetic Fibronectin Peptide consists of RGD sequences to support the attachment of cell types that require Fibronectin coating including alpha-5 integrin-positive cells. It is a compatible, animal-free alternative to natural animal or human ECM surfaces, such as natural human Fibronectin for hMSC expansion and differentiation.

Corning PureCoat ECM Mimetic Collagen I Peptide supports the attachment of Collagen I-dependent cell types including alpha 2 integrin-positive cells (and others). It is a compatible, animal-free alternative to natural animal or human ECM surfaces, such as natural human Collagen I for human keratinocyte expansion.

Corning PureCoat ECM Mimetic Type	Known Compatible Cell Types Expanded in Defined Cell Culture Environments
Fibronectin Peptide	Human BM-derived Mesenchymal Stem Cells* Human Endothelial Progenitor Cells Human Adipose-derived Stem Cells Human Lung Stromal Cells CHO Cells Vero Cells
Collagen I Peptide	Human Keratinocytes* Human Corneal Cells Human Adipose-derived Stem Cells Human Endothelial Progenitor Cells Human Cord Blood-derived Mesenchymal Stem Cells (isolation) Vero Cells

Natural Performance. Scientifically Defined.

Academic and industrial cell culture has been heavily dependent on the use of complex animal-derived materials (e.g., sera, extracellular matrices, growth supplements) for the culture of a broad range of cells, to include established and transfected cell lines as well as stem cells.

One challenge associated with the use of complex and animal-derived cell culture environments is the inability to define the purity and overall quality of the produced cells for a particular application. This is exemplified by the need for scalable cell culture of stem cells, and the requirement for a high level of consistency and repeatability for use in a range of basic and applied research applications. As these technologies progress and develop, so too must the drive toward defined, animal-free environments.

Corning PureCoat ECM Mimetic cultureware is the next generation, synthetic, animal-free surface that enables researchers to move closer to animal-free, defined cell culture without compromising performance.



*See last page for information on Application Notes.

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Enables a Fully Defined Cell Culture Environment.

Corning® PureCoat™ ECM Mimetic cultureware has been demonstrated to function in a broad range of cell types and defined serum-free, xeno-free, and animal-free media. The cultureware enables researchers to tightly and reproducibly control the cell culture environment for predictable cell expansion and differentiation outcomes.

Consistency Built on cGMP-Compliant Manufacturing and Animal-Free Traceability.

Corning PureCoat ECM Mimetic cultureware is manufactured in a cGMP compliant facility which meets ISO 9001:2008 and 13485:2012 standards using animal-free components in a facility segregated from animal-derived materials. The animal-free nature of the cultureware mitigates variability and risk of contamination from adventitious organisms common to animal-sourced material. Corning PureCoat ECM Mimetic cultureware are Class I medical devices intended for use as sterile tissue culture vessels.

Pre-coated and Ready to Use at Room Temperature.

Corning PureCoat ECM Mimetic cultureware provides researchers with an alternative to tedious ECM self-coating protocols or pre-coated biological ECM surfaces requiring refrigeration. The pre-coated and room temperature stable properties of the cultureware streamline experimental workflows, thereby minimizing the risk of experimental failure due to inconsistent ECM self-coating or pre-coated biological performance failure due to incorrect storage. In addition to benefits in the lab, ECM Mimetic cultureware simplifies supply chain requirements by removing the need for costly cold chain transport and storage.

Scalable Formats to Meet a Wide Range of Cell Expansion Needs.

Corning PureCoat ECM Mimetic cultureware is available in a number of vessel formats to suit any stage of research. Currently, ECM Mimetic cultureware is available in 6 well and 24 well plates and T-75 and T-175 culture flasks. Custom services such as barcoding, bulk packaging and additional cultureware options are available. Additional vessel types and sizes are now in development.



Part Of A Family Of Advanced Surfaces.

A variety of advanced surfaces can be applied to cell culture vessels. To achieve optimal results, it is essential to use the most suitable surface for the particular cell type and cell culture environment.

Falcon® tissue culture-treated cultureware offers a highly reproducible surface that is suitable for a range of adherent cell culture environments.

Corning BioCoat™ cultureware represents the 'gold standard' for in vivo-like surfaces, based on the use of high quality Corning Extracellular matrices (ECMs), purified proteins, and attachment factors.

Corning PureCoat surfaces are a novel family of chemically synthesized and animal-free surfaces that enhance cell attachment and growth in low-serum or serum-free culture environments. The first generation of Corning PureCoat surfaces includes positively charged Corning PureCoat Amine and negatively charged Corning PureCoat Carboxyl, which have been proven to provide improved cell attachment and proliferation over standard TC-treated surfaces.

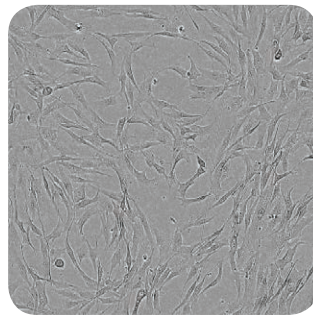
Human Mesenchymal Stem Cells (hMSCs)

Ease of isolation and expansion of hMSCs makes them an attractive tool for allogenic transplant in regenerative medicine and tissue engineering applications. Typical ex vivo expansion of hMSCs requires either bovine serum-containing media or a defined and serum-free media, plus a coating of human or animal-derived extracellular matrix (ECM) protein. Corning® PureCoat™ ECM Mimetic Cultureware Fibronectin peptide functions as a synthetic, animal-free replacement for natural human-derived biological coatings for expanding and differentiating hMSCs in defined serum-free, xeno-free, or animal-free media.

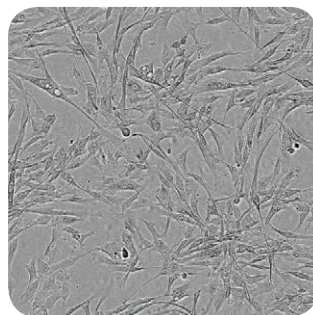
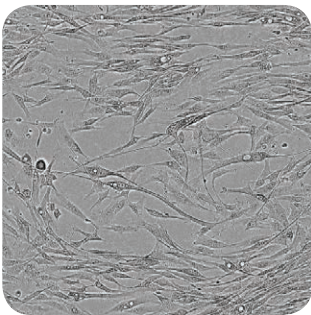
Corning PureCoat ECM Mimetic, Fibronectin Peptide

Defined, xeno-free MSC Kit with Human Origin Coating Matrix

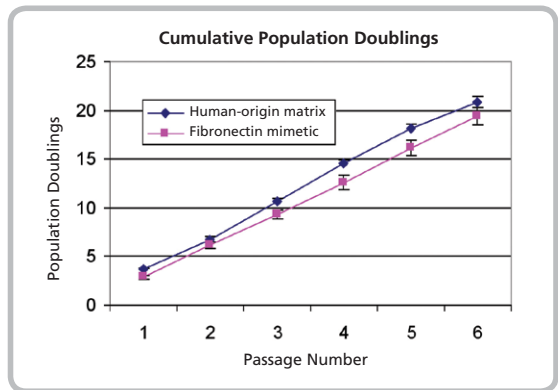
After Passage 2, 10X Objective



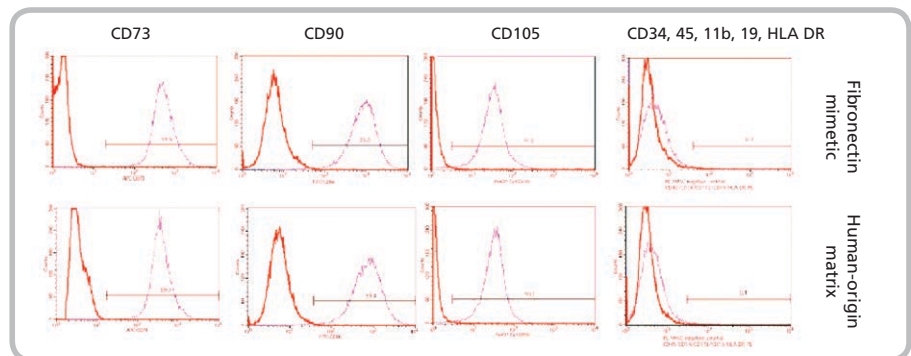
After Passage 5, 10X Objective

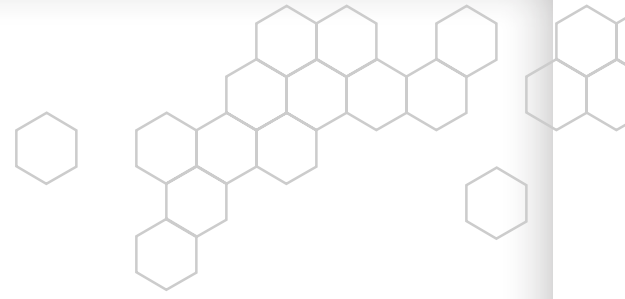


Comparable Cell Growth, Morphology and Immunophenotype. Bone marrow-derived hMSCs cultured in a defined and xeno-free media* on the Corning PureCoat ECM Mimetic Fibronectin peptide surface exhibit a tight and compact morphology and are comparable to the human origin matrix coating after 5 passages. hMSCs maintained the characteristic immunophenotype stated in the ISCT® positioning statement, as measured by flow cytometry. Cultured cells maintain a cell surface marker expression profile characteristic of hMSCs.



hMSCs cultured on Corning PureCoat ECM Mimetic Fibronectin peptide displayed a cell surface marker profile characteristic of hMSCs. Data shows expression of CD73, CD90, CD105, and the absence of CD34, CD45, CD11b, CD19, and HLA-DR. Results were comparable to the human ECM coating matrix (CM) in the kit.



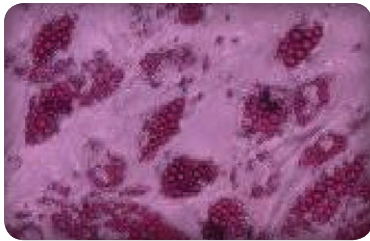


Comparable Multilineage Differentiation Potential.

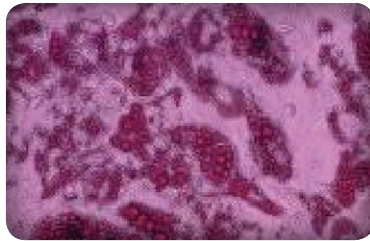
An intrinsic property of mesenchymal stem cells is their ability to differentiate into various somatic tissues (Adipocytes and Osteocytes). hMSCs cultured on the Corning® PureCoat™ ECM Mimetic Fibronectin peptide reliably retain their multipotency after multiple passages, comparable to the human-derived ECM coating proteins.

Differentiation to Adipogenic Lineage After 3 Passages

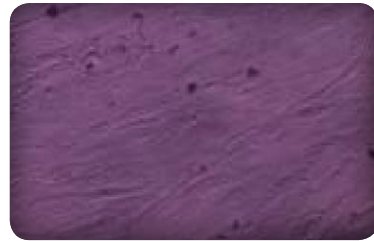
Oil Red O stain qualitative analysis.



Corning PureCoat ECM Mimetic Fibronectin Peptide



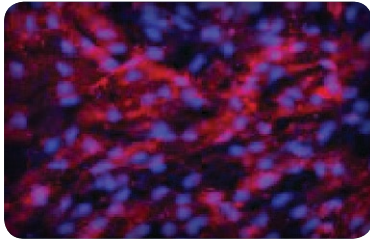
MSC Expansion Kit XF Protein Coated Surface



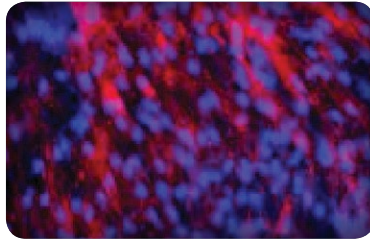
Uninduced Control

Differentiation To Osteocytes After 3 Passages

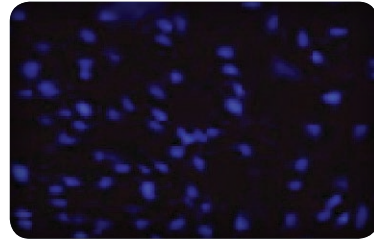
Staining for Alkaline Phosphatase activity.



Corning PureCoat ECM Mimetic Fibronectin Peptide

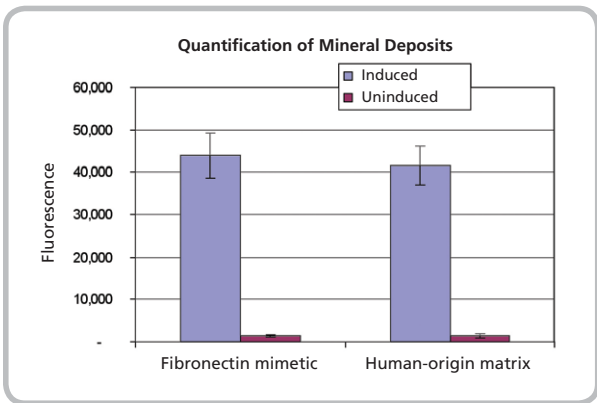


MSC Expansion Kit XF Protein Coated Surface



Uninduced Control

hMSCs cultured in MesenCult®-XF kit medium on the Corning PureCoat ECM Mimetic Cultureware surface. Cultures retain their multipotency (passage 3) and are able to differentiate into Adipogenic and Osteogenic lineages comparable to the human ECM protein in the kit.



Quantification of mineral deposits. OsteoImage™ Mineralization Kit (Lonza).

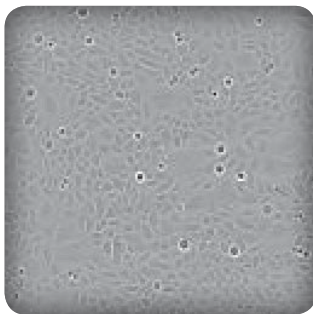
Human Keratinocytes

Keratinocyte accessibility, proliferation potential, and ease of culture has enabled the use of these cells in regenerative medicine applications. Typical ex vivo expansion of Keratinocytes requires either coating of the culture vessel with human or animal-derived extracellular matrix protein or a growth medium with bovine serum or animal-derived components. Corning® PureCoat™ ECM Mimetic Cultureware Collagen I peptide functions as a synthetic, animal-free replacement for natural human- or animal-derived extracellular matrix coatings for expanding human Keratinocytes in serum-free, xeno-free or animal-free media.

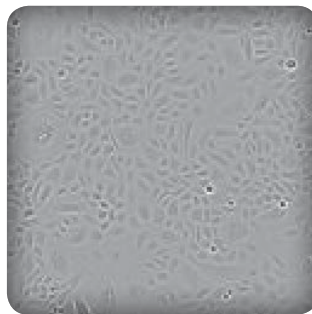
Comparable Cell Growth and Morphology.

Human neonatal Keratinocytes (HKN) cells were cultured on the Corning PureCoat ECM Mimetic Collagen I peptide surface for multiple passages in a commercially available xeno-free* medium. Cell growth and morphology on the peptide surface were comparable to cells grown on rat tail Collagen I and recombinant Collagen-coated surfaces.

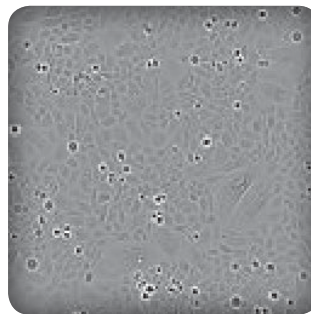
Culture for 5 passages (10X objective)



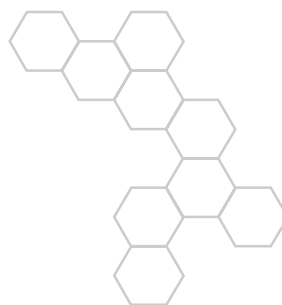
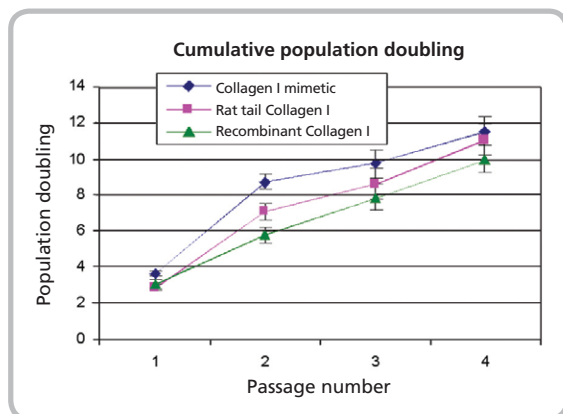
Corning PureCoat ECM Mimetic Collagen I



Recombinant Collagen I



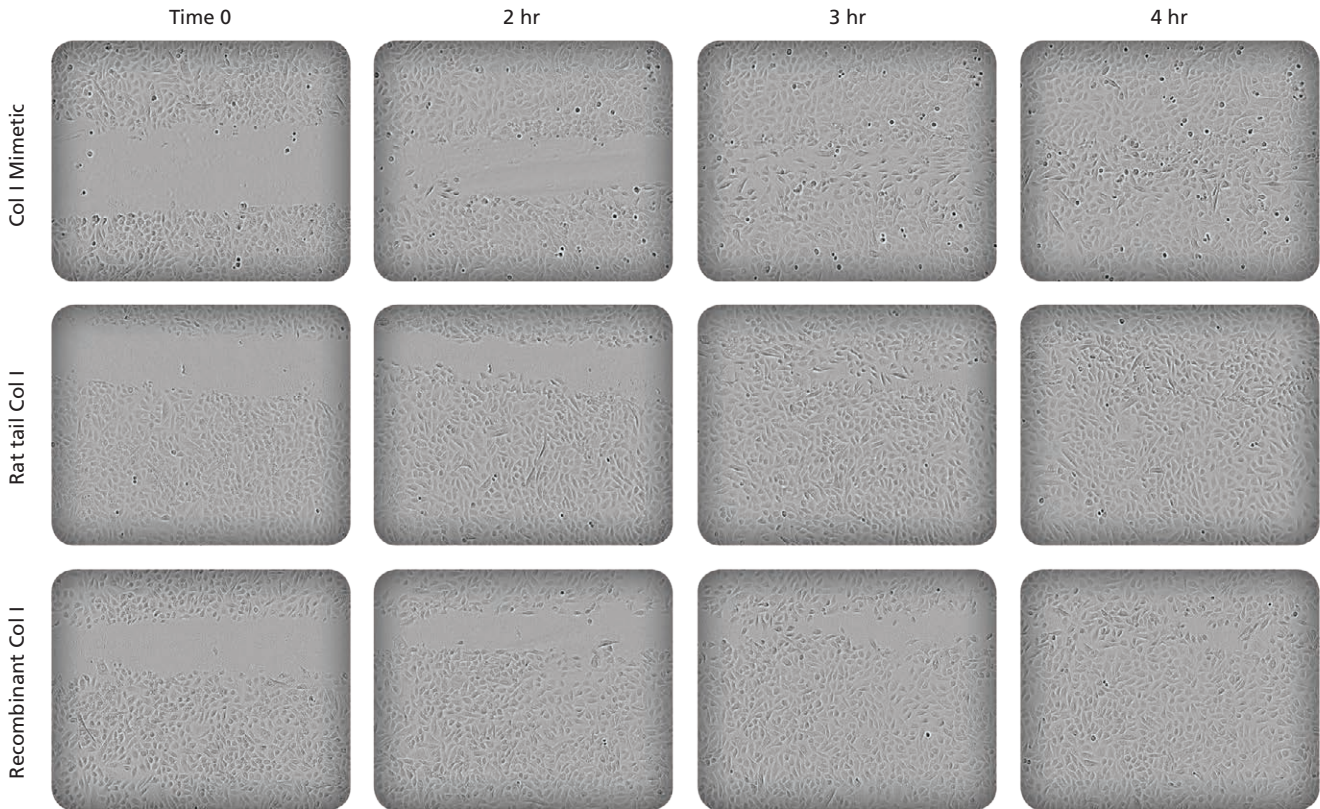
Rat Tail Collagen I





Comparable Cell Functionality.

Human neonatal Keratinocytes cultured on the Corning® PureCoat™ ECM Mimetic Collagen I surface demonstrated comparable cell migration potential compared to cells cultured on rat tail Collagen I and recombinant human Collagen I.



Cell functionality/migration assay

A 'wound' or scratch was introduced in the cell monolayer. Images captured the cell migration at 0, 2, 3, and 4 hour time points.

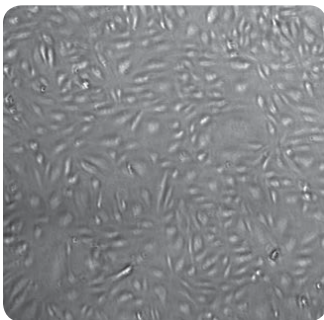
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Endothelial Progenitor Cells (EPCs)

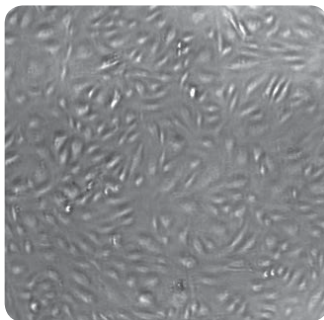
Endothelial colony forming cells (ECFCs[®]) have potential uses in regenerative medicine, such as cell therapy for cardiovascular disease, or use as biomarkers to assess disease risk. Expansion of these cells requires coating of a culture surface with human or animal-derived extracellular matrix (ECM) proteins. Corning[®] PureCoat[™] ECM Mimetic cultureware functions as a replacement for human- or animal-derived ECM proteins in serum-free or low-serum environments.

Comparable Cell Growth and Morphology.

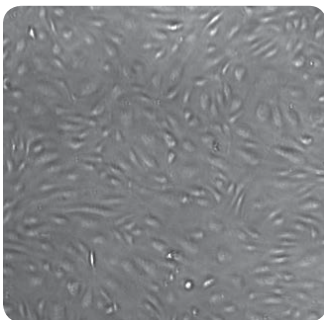
Human ECFCs cultured on Corning PureCoat ECM Mimetic cultureware surfaces (Fibronectin and Collagen I peptides) in a commercially available ECFC growth medium*, exhibit comparable cell growth and morphology to cells cultured on natural ECM proteins.



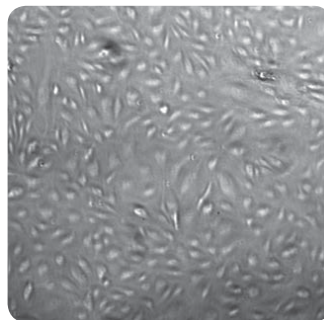
ECFCs cultured on ECM Mimetic Fibronectin Peptide



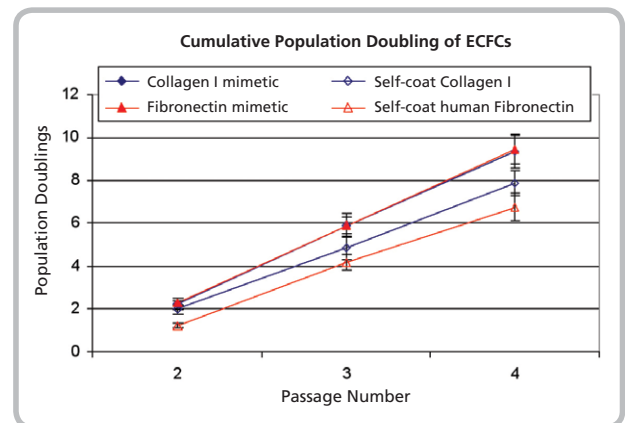
ECFCs cultured on ECM Mimetic Collagen I Peptide



ECFCs cultured on natural human Fibronectin ECM



ECFCs cultured on rat tail Collagen I ECM

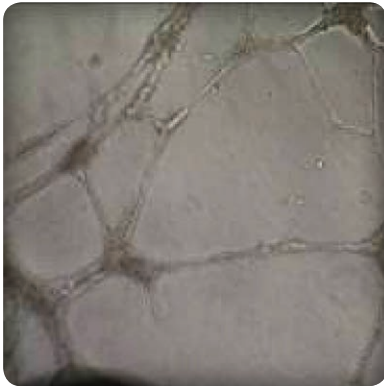


* Lonza ECFC Growth Medium (EBM[™]-2 plus EGM[™]-2 SingleQuots[™] plus ECFCs Serum Supplement).

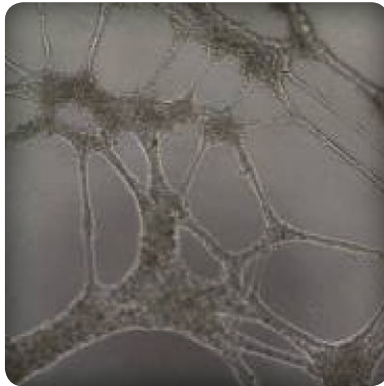
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Reliable Cell Functionality.

Human ECFCs[®] cultured on Corning[®] PureCoat[™] ECM Mimetic cultureware surfaces retain normal cell functionality as demonstrated by angiogenesis capillary tube formation assay and LDL uptake assay.



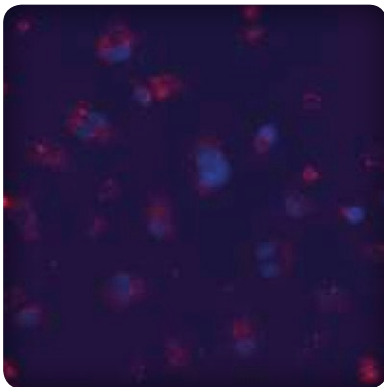
Collagen I Peptide



Fibronectin peptide

Tube formation assay.

ECFCs expanded on Corning PureCoat ECM Mimetic Fibronectin and Collagen I Peptide surfaces were plated on Corning Matrigel[®] matrix and allowed to undergo capillary tube formation overnight.



Collagen I Peptide



Fibronectin peptide

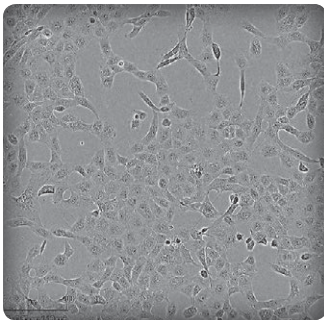
LDL uptake assay. ECFCs expanded on Corning PureCoat ECM Mimetic Fibronectin and Collagen I Peptide surfaces demonstrated the ability to ingest acetylated low density lipoprotein (AcLDL), a characteristic feature of endothelial cells. DiI AcLDL uptake (red) by ECFCs, nuclei were stained with DAPI (blue), at P3.

Other Attachment-dependant Mammalian Cell Types

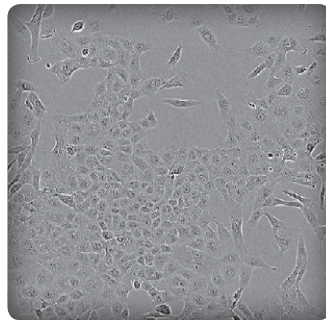
Corning® PureCoat™ ECM Mimetic Fibronectin and Collagen I peptide surfaces support enhanced attachment and proliferation of Vero and CHO-K1 cells in serum-free and protein-free media, respectively, over tissue culture (TC)-treated surfaces.

Enhanced Attachment and Proliferation of Vero Cells.

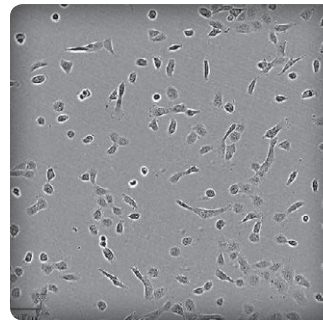
Vero cell attachment and growth were increased on Corning PureCoat Fibronectin and Collagen I peptide surfaces, compared to the uncoated TC-treated surface (recommended for Vero cell culture with the serum-free, low protein growth medium* used). In addition, Vero cells showed improved cell morphology on the ECM mimetic cultureware surface with cells appearing nicely attached and spread out, as opposed to the TC-treated cultureware, where cells appeared rounded and clumpy.



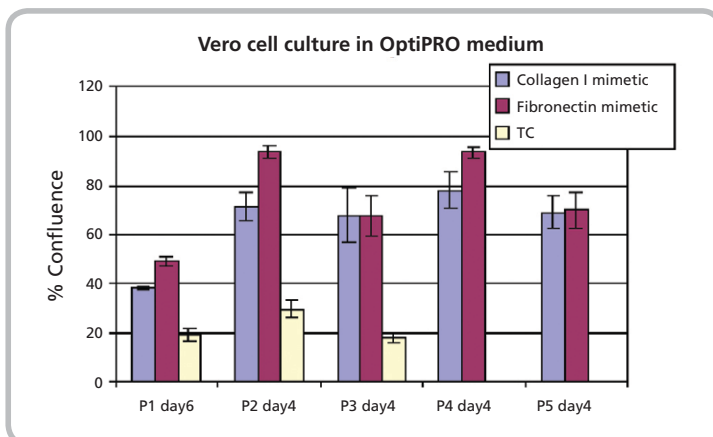
Vero cells cultured on the Corning PureCoat ECM Mimetic Collagen I peptide



Vero cells cultured on the Corning PureCoat ECM Mimetic Fibronectin peptide



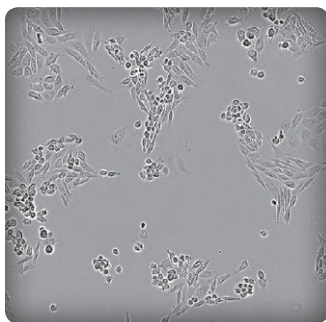
Vero cells cultured on TC-treated culture surface



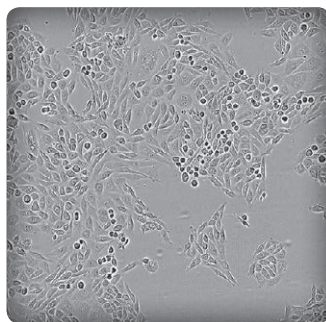


Enhanced Attachment and Proliferation of CHO-K1 Cells.

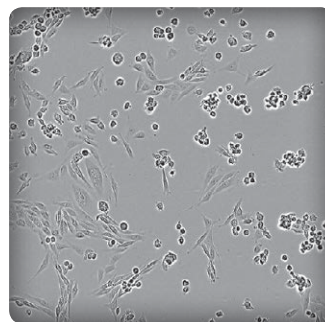
CHO-K1 cells cultured in a protein-free, chemically defined medium* on Corning® PureCoat™ Fibronectin peptide surface grew faster than those on the TC-treated surface, as reflected by their confluence. Consistent with published evidence on the growth of CHO-K1 on natural Collagen, Corning PureCoat Collagen I peptide surface did not support CHO-K1 attachment and growth.



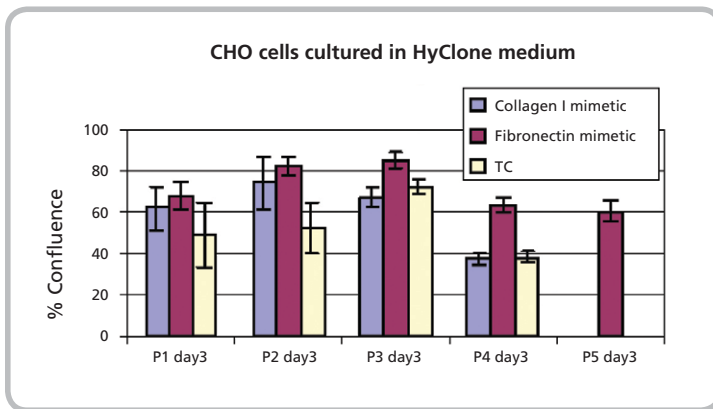
CHO-K1 cells cultured on the Corning PureCoat ECM Mimetic Collagen I peptide



CHO-K1 cells cultured on the Corning PureCoat ECM Mimetic Fibronectin peptide



CHO-K1 cells cultured on TC-treated culture surface



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*HyClone™ SFM4CHO cell culture medium (ThermoFisher Scientific).

Product Attributes

- Animal component-free, synthetic peptide coating covalently attached to cultureware
- cGMP manufacturing process compliant (ISO 9001-2008 and 13485:2012)
- Compatible with a wide range of serum-free, xeno-free and animal-free media formulations
- Sterile, SAL10⁻³, and non-pyrogenic
- Non-cytotoxic
- Quality control tested using an appropriate cell attachment assay
- Room temperature stable 18 months from date of manufacture
- Cultureware material is USP class VI polystyrene suitable for cell culture
- Compatible with a broad range of cell dissociation reagents
- Lot traceable; certificate of compliance and analysis (lot-specific) available online

Application Notes

Available online

Application Note 492.

Human Endothelial Colony Forming Cell Expansion

Application Note 493.

Culture of Human Keratinocytes

Application Note 494.

Culture of Human Bone Marrow-derived Mesenchymal Stem Cells

Application Note 495.

Animal-free Synthetic Surfaces for Serum-free Culture of Adherent Cells

Ordering Information

Corning® PureCoat™ ECM Mimetic Cultureware Fibronectin Peptide

Description	Package Qty/case	Packaging Description	Cat. No.
6 well plate	10	Individually packaged vessels in moisture-proof bags, 10 each	356240
24 well plate	10		356241
T-75 Flask, 75 cm ² , vented cap, canted neck	10		356242
T-175 Flask, 175 cm ² , vented cap, canted neck	10		356243

Corning PureCoat ECM Mimetic Cultureware Collagen Type I Peptide

Description	Package Qty/case	Packaging Description	Cat. No.
6 well plate	10	Packaged 5 vessels to a pack; 2 packs	356270
24 well plate	10		356271
T-75 Flask, 75 cm ² , vented cap, canted neck	10		356272
T-175 Flask, 175 cm ² , vented cap, canted neck	10		356273

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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

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Mexico

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