

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.

# NATURAL PERFORMANCE. SCIENTIFICALLY DEFINED.

## 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.

If you have questions about the most appropriate surface for your application, visit [www.corning.com/lifesciences](http://www.corning.com/lifesciences) or contact Corning Technical Support at 800.492.1110.

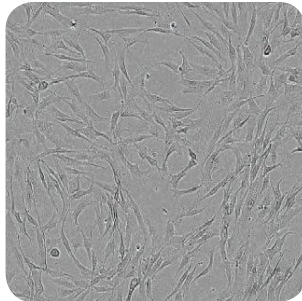
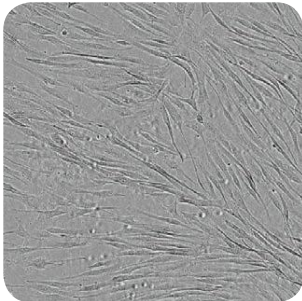
# Human Mesenchymal Stem Cells (hMSCs)

Ease of isolation and expansion of hMSCs makes them an attractive tool for allogeneic 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.

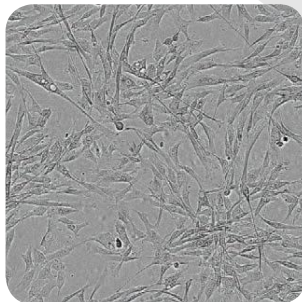
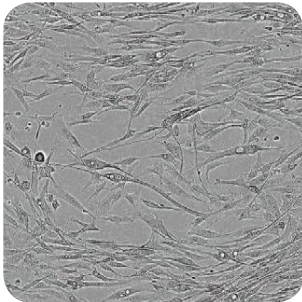
Corning PureCoat ECM Mimetic, Fibronectin Peptide

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

After Passage 2, 10X Objective

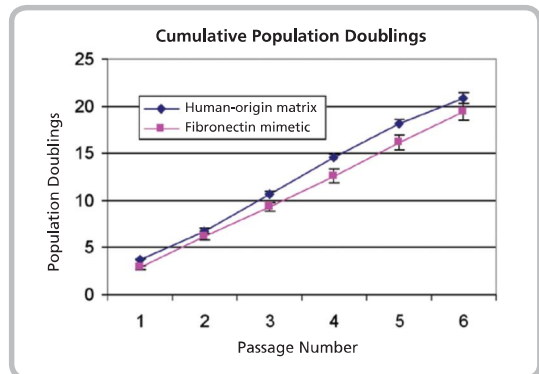


After Passage 5, 10X Objective

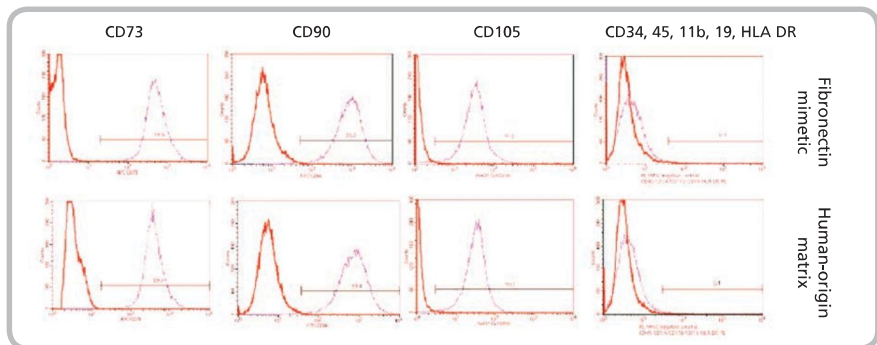


## Comparable Cell Growth, Morphology and Immunophenotype.

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.

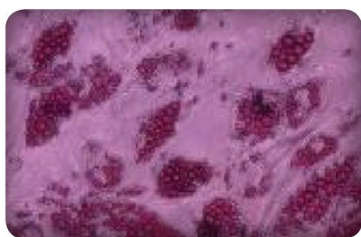


### Comparable Multilineage Differentiation Potential.

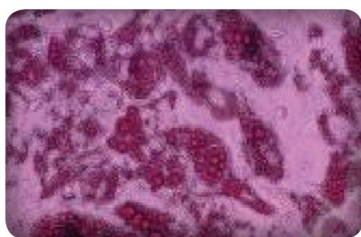
An intrinsic property of mesenchymal stem cells is their ability to differentiate into various somatic tissues (Adipocytes and Osteocytes). hMSCs cultured on the Corning® PureCoat™ ECM Mimetic Fibronectin peptide reliably retain their multipotency after multiple passages, comparable to the human-derived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

### Differentiation to Adipogenic Lineage After 3 Passages

Oil Red O stain qualitative analysis.



Corning PureCoat ECM Mimetic  
Fibronectin Peptide



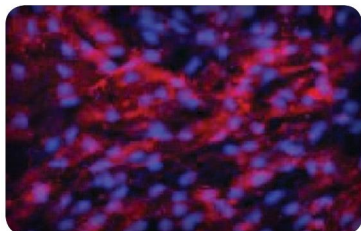
MSC Expansion Kit  
XF Protein Coated Surface



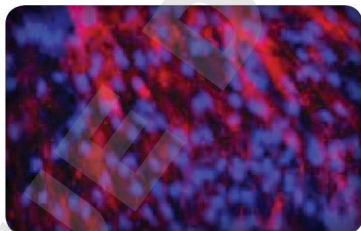
Uninduced Control

### Differentiation To Osteocytes After 3 Passages

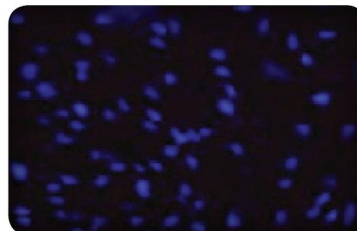
Staining for Alkaline Phosphatase activity.



Corning PureCoat ECM Mimetic  
Fibronectin Peptide

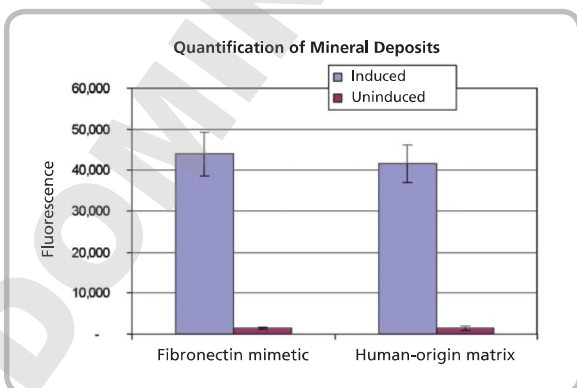


MSC Expansion Kit  
XF Protein Coated Surface



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.

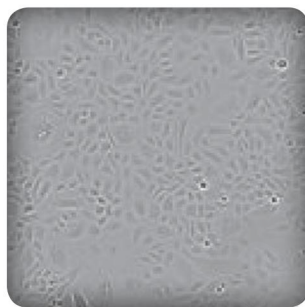
## Comparable Cell Growth and Morphology.

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.

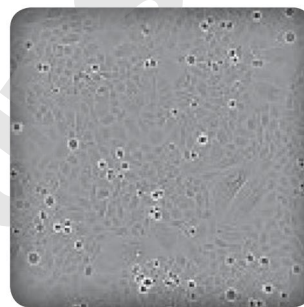
## Culture for 5 passages (10X objective)



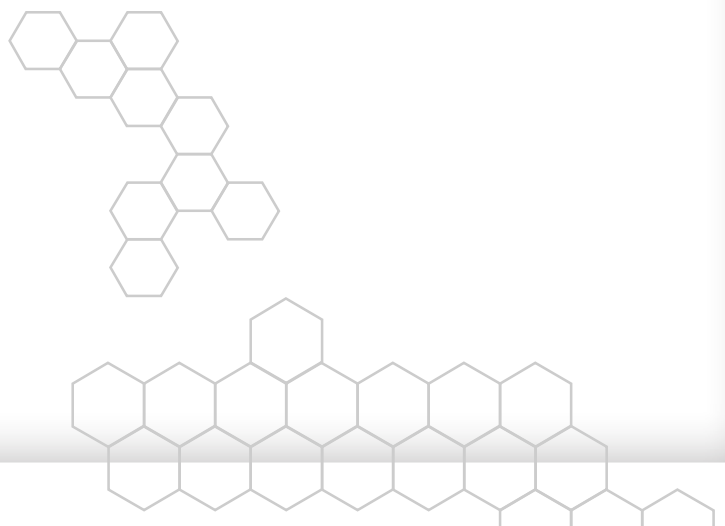
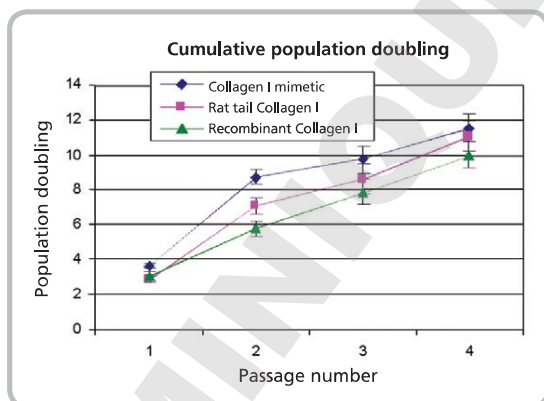
Corning PureCoat ECM Mimetic Collagen I



Recombinant Collagen I



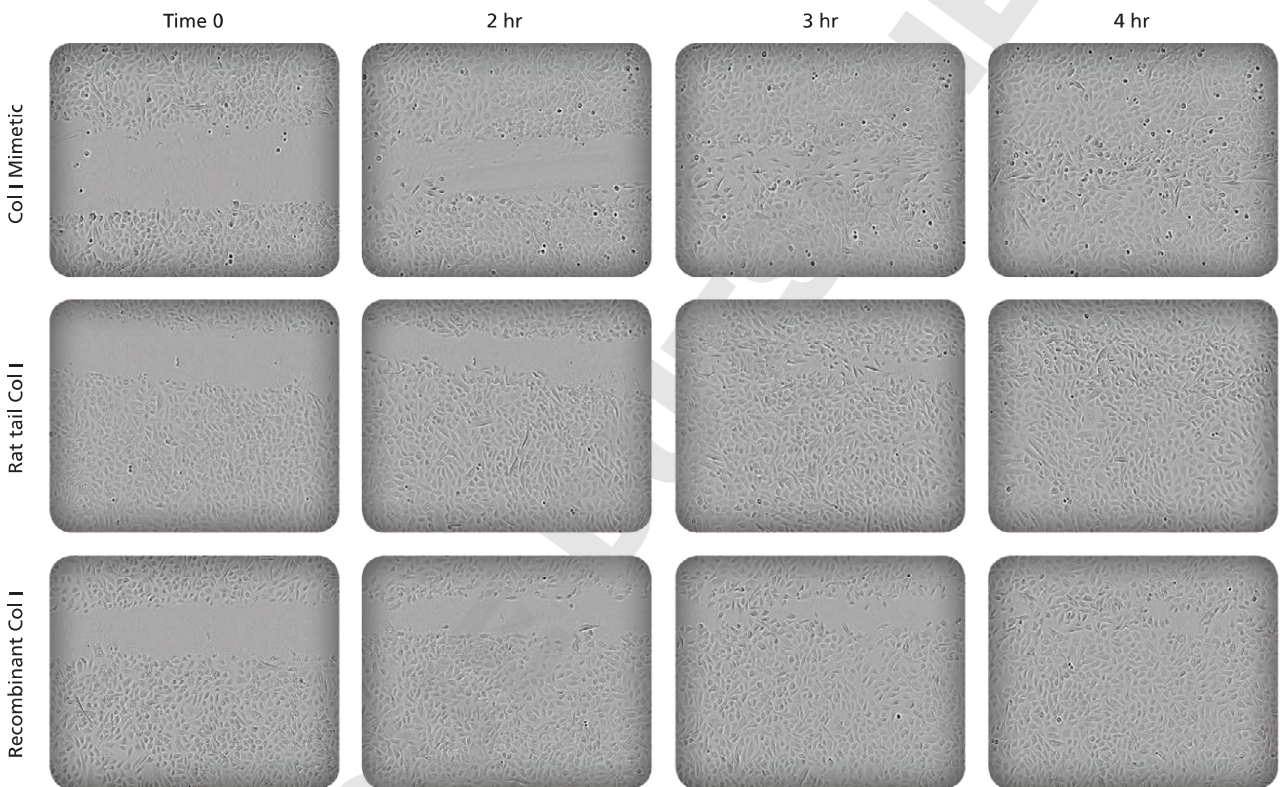
Rat Tail Collagen I





### 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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