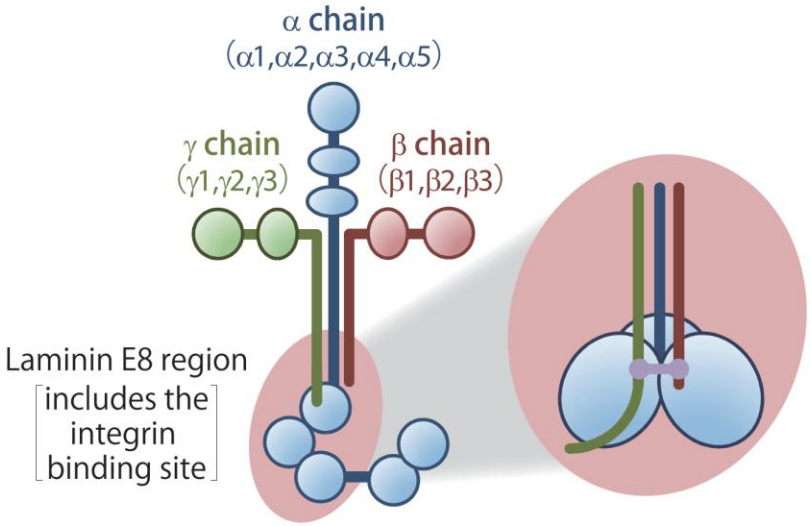

MATRIXOME

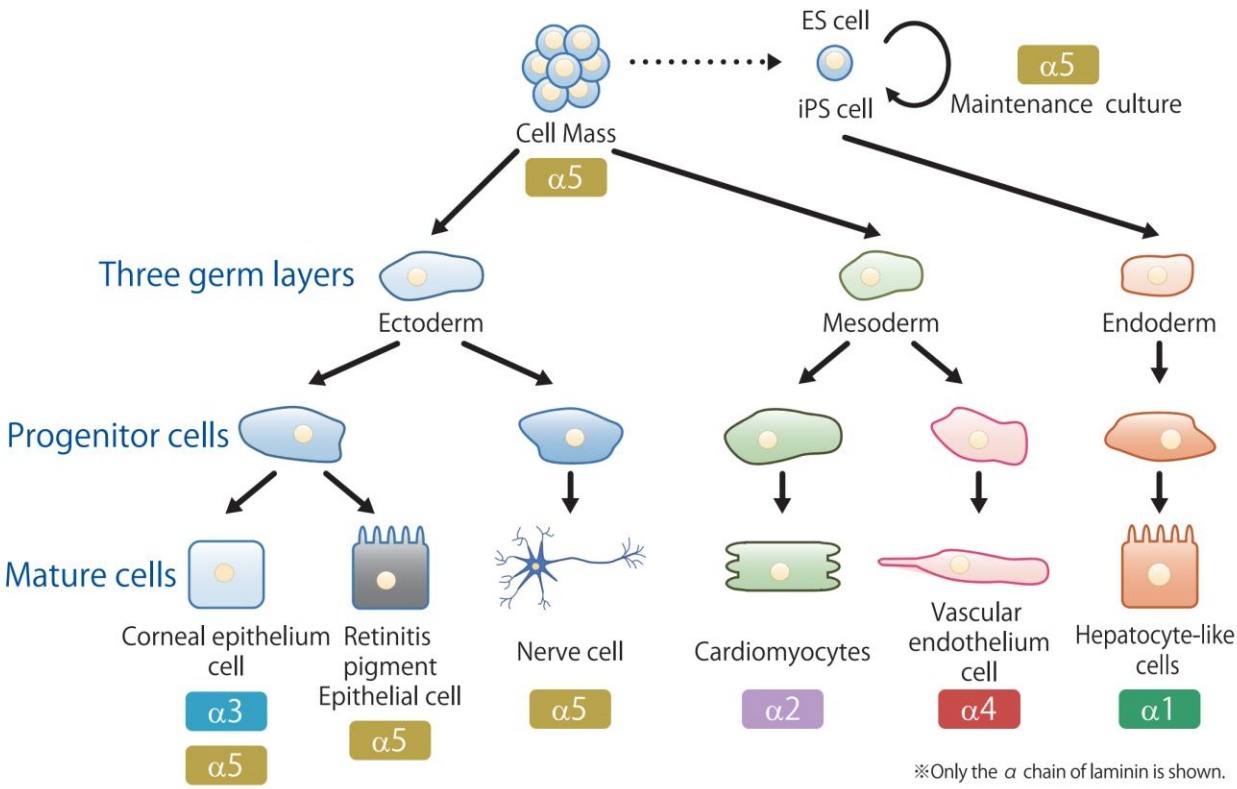
Laminin is a cell adhesion molecule

Full length laminin → Laminin E8 Recombinant fragment → High-purity purification of E8



- ☐ Laminin is a type of extracellular matrix protein.
- ☐ A heterotrimeric molecule in which α-chain, β-chain, and γ-chain are associated in a ratio of 1: 1: 1.
- ☐ Twelve isoforms have been identified.
- ☐ It functions as an adhesion molecule for various cells in the body.
- ☐ It interacts with the cell membrane receptor integrin in a region called "E8".
- ☐ Promotes cell survival and controls its behavior (migration, polarization, etc.)

Combination of laminin and cells in vivo



※Only the α chain of laminin is shown.

Cell Culture iMatrix-series

iMatrix-511

[α5,β1,γ1]

α5

iMatrix-511 silk

iMatrix-411

[α4,β1,γ1]

α4

iMatrix-332

[α3,β3,γ2]

α3

iMatrix-221

[α2,β2,γ1]

α2

iMatrix-111

[α1,β1,γ1]

α1

PMDA Approved Clinical Grade

iMatrix-511 MG

iMatrix-221 MG

- The function of laminin to control cell behavior and fate mainly depends on the α chain (5 types).
- Laminin changes during the differentiation stage of cells.

By utilizing the combination of laminin and cells in vivo for cell culture, it is possible to efficiently induce differentiation of pluripotent stem cells.

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iMatrix-511

World's First

Laminin-511 E8 Fragment
High-purity product

USE Maintenance and expansion culture of pluripotent stem cells

iMatrix-511 provides a biologically relevant, xeno-free surface optimized for the adhesion, survival, and proliferation of human pluripotent stem cells (hPSCs), including iPSCs and ESCs. It supports feeder-free, single-cell passaging and enables consistent long-term maintenance of pluripotency.

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iMatrix-511 silk

Laminin-511 E8 Fragment
High-purity product

Same performance of Matrix-511 at a lower cost

Methods for culturing ES/iPS cells

New culture method, no coating required

Products
iMatrix-511・iMatrix-511silk

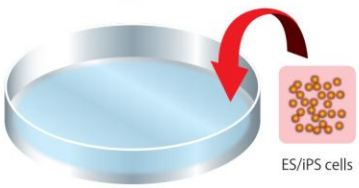
Coating Method	iMatrix-511/iMatrix-511silk concentration: 0.5 μg/cm²

STEP1

iMatrix-511/iMatrix-511silk to coat

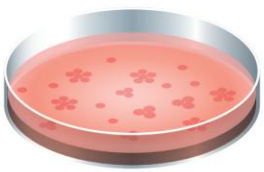
〈Coating Times〉
4℃：overnight / room temp：3 hours / 37℃：1 hour

STEP2



Seed cells

STEP3



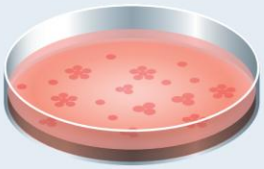
・Coating method：1mg of iMatrix-511/iMatrix-511silk is enough for ~35 6-well plates

Pre-mix Method	iMatrix-511/iMatrix-511silk concentration: 0.25 μg/cm²

STEP1

Mix iMatrix-511/iMatrix-511silk and cells and add to plate

STEP2



Method Benefits

1. No coating curing time
2. No wasted cells or plates
3. Half the amount used

※The conditions for the pre-mix method may differ depending on the combination of cells and medium. Please contact Matrixome Co., Ltd. for consultation on culture conditions.

・Pre-mix method：1mg of iMatrix-511/iMatrix-511silk is enough for ~70 6-well plates

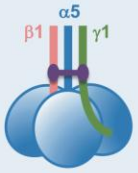
Reference：Miyazaki et al. *Sci Rep.* **7**, 41165, (2017)

Catalog #	Product Name	Package Sizes	Manufcaturing Raw Material	Refined Raw Materials	Product Grade
892 011	iMatrix-511	350μg:175μg×2pcs.	Gene Recombination CHO-S cells	CHO-S cell culture	Research Grade
892 012		1,050μg:175μg×6pcs.			
892 021	iMatrix-511silk	1,050μg:175μg×6pcs.	Gene Recombination Silkworm production system	Silkworm cocoon	Research Grade

How to Use:

STEP 1 Dilute iMatrix-511 with PBS (-) and coat the culture vessel at ※0.5μg/cm²
※The optimum coating concentration depends on the cell type and the medium used.

STEP 2 After coating, remove the iMatrix-511 solution & quickly seed the cells without drying.



Laminin511E8 Fragement

For use in ES/iPS cell culture
EDTA cell detachment method

A new cell detachment method that doesn't require a scraper or enzymes

Products
iMatrix-511・iMatrix-511silk

For 6-well plates

1. Culture ES/iPS cells on iMatrix-511 to 80-90% confluency
2. Aspirate the old medium
3. Wash twice with 2ml/well of 5mM EDTA/PBS (-)
4. 1ml/well 5mM EDTA/PBS (-) at 37℃ for 10-15 minutes ※Detachment phase
5. Aspirate the 5mM EDTA/PBS (-)
6. Add 1 ml / well Y27632 medium and remove cells by pipetting 5-10 times. And dispersed in a single cell
   ※Adjust the incubation time depending on the cell condition.

Cells are thought to accumulate the damage they receive. Cell scrapers and enzymes for detachment used in passaging damage cells.

EDTA detachment + Pre-Mix Method

Makes efficient and low cost cell culture possible!

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iMatrix-411

Laminin-411 E8 Fragment
High-purity product

USE Induction of differentiation of vascular endothelial cells from ES / iPS cells.

- Laminin-411 is abundant in the basement membrane of blood vessels and is thought to be involved in maintaining vascular homeostasis by binding to the integrin $\alpha 6\beta 1$ protein on the cell surface of vascular endothelial cells. It is also known to adhere to leukocytes and platelets, which is important for the immune system.
- iMatrix-411 is a substrate that has been reported to efficiently induce pluripotent stem cells to vascular endothelial cells and bile duct epithelial cells by binding to the integrin $\alpha 6\beta 1$ protein.

Catalog #	Product Name	Product Sizes	Product Grade
892 041	iMatrix-411	350μg:175μg×2pcs.	RUO
892 042		1,050μg:175μg×6pcs.	RUO

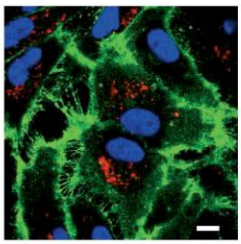

Fig. Vascular endothelial cells derived from ES cells [KhES-1]

CD31: Vascular endothelial cells
Ac-LDL: Cholesterol taken up by vascular endothelial cells
DAPI: Nucleus

Reference: Ohta et al. *Sci Rep.* **6**, 35680, (2016)

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iMatrix-332

Laminin-332 E8 Fragment
High-purity product

USE Induction of differentiation from iPS cells to corneal epithelial cells.

- iMatrix-332 is the highly purified E8 region (including the integrin binding site) of human laminin-332.
- Laminin-332 is present in keratinocytes and cornea and is known to bind to integrin $\alpha 3\beta 1$ and $\alpha 6\beta 4$ proteins.

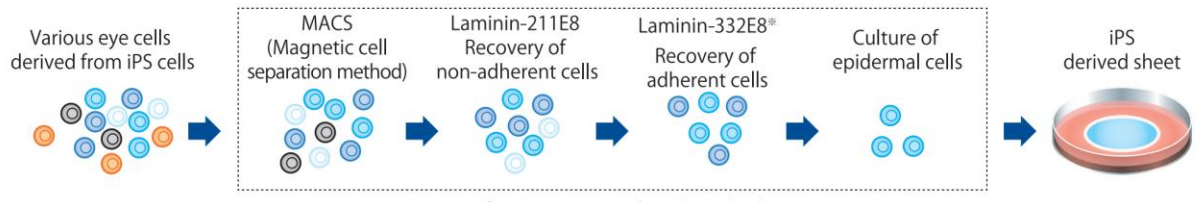

Fig. How to purify only corneal epithelial cells from various iPS cell-derived eye cells

Catalog #	Product Name	Product Size	Product Grade
892 031	iMatrix-332	350μg:175μg×2pcs.	RUO
892 032		1,050μg:175μg×6pcs.	RUO

※Laminin-332E8 is the main component of iMatrix-332.

Reference: Shibata et al. *Stem Cell Reports.* **14**(4), 663-676, (2020)

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iMatrix-221

Laminin-221 E8 Fragment
High-purity product

USE Purification / maintenance culture of cardiomyocytes / skeletal muscle cells

- Laminin-221 is abundant in the basement membrane of muscle tissues such as myocardium and skeletal muscle, and binds to the integrin α7X2β1 protein specifically expressed in this muscle tissue. It is thought that it is involved in the differentiation and function maintenance of muscle cells.
- iMatrix-221 is a substrate that exhibits high adhesive activity and selectivity as a culture medium for cardiomyocytes and skeletal muscle cells.

Catalog #	Product Name	Product Size	Product Grade
892 061	iMatrix-221	350μg:175μg×2pcs.	RUO
892 062		1,050μg:175μg×6pcs.	RUO

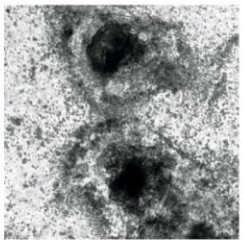

Fig. iPSC-derived cardiomyocytes cultured on iMatrix-221

※Scan the QR code for a video

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FREE SAMPLE AVAILABLE

iMatrix-111

Laminin-111 E8 Fragment
High-purity product

USE Induction of differentiation from human iPS cells to hepatoblast-like cells.

- iMatrix-111 is the highly purified E8 region (including the integrin binding site) of human laminin-111.
- Laminin-111 is known to be present in the liver and bind to integrin α7X2β1 and α6β1 proteins, and is thought to be involved in the maintenance of liver tissue function.

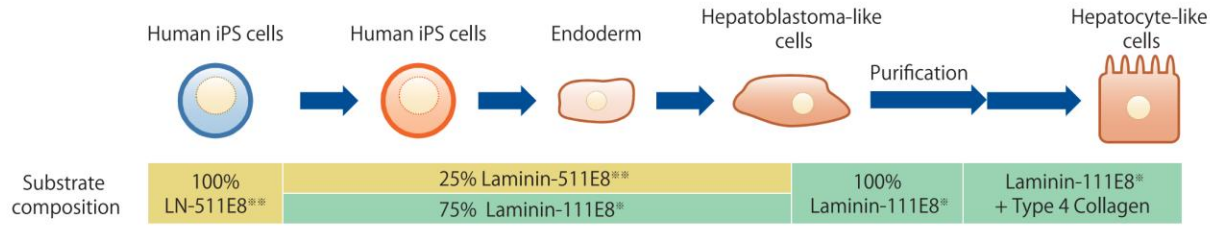

Fig. How to efficiently induce human iPS cells to hepatoblast-like cells and hepatocyte-like cells

Catalog #	Product Name	Product Size	Product Grade
892 071	iMatrix-111	350μg:175μg×2pcs.	RUO
892 072		1,050μg:175μg×6pcs.	RUO

*Laminin-111E8 is the main component of iMatrix-111.

**Laminin-511E8 is the main component of iMatrix-511

Reference: Takayama et al. *Hepatol Commun.* **1**(10), 1058-1069,

Clinical Grade Products for Culture of Clinical Cells

Regenerative Medicine Product Material Eligibility Confirmation Has Been Obtained

iMatrix-511 MG

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Please contact Matrixome directly for product details and prices.
※This product is not a drug or end-use product.

This product is a recombinant protein created based on the gene of the human laminin 511E8 fragment.
The amino acid sequence is the same as that of iMatrix-511 and iMatrix-511Silk.

	iMatrix-511silk	iMatrix-511	iMatrix-511MG
Product Grade	Reasearch Use Only	Research Use Only	Clinical Application
Material Eligibility for Products for Regenerative Medicine	—	—	Acquired
Production Method	Silkworm Cocoon	CHO-S Cells	CHO-S Cells
MCB/WCB/CAL Virus-Free Confirmation	—	Performed	Performed
Virus-Free Testing for Unrefined Bulk for Each Lot	—	—	Performed
Virus Removal Filtering in Manufacturing Process	—	—	Yes
Manufacturing Process Virus Clearance Test	—	—	Performed

Regenerative Medicine Product Material Eligibility Confirmation Has Been Obtained

iMatrix-221 MG

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Please contact Matrixome directly for product details and prices.
※This product is not a drug or end-use product.

This product is a recombinant protein created based on the gene of the human laminin 221E8 fragment.
It has the same amino acid sequence as iMatrix-221.

	iMatrix-221	iMatrix-221MG
Product Grade	Research Use Only	Clinical Application
Material Eligibility for Products for Regenerative Medicine	—	Acquired
Production Method	CHO-S Cells	CHO-S Cells
MCB/WCB/CAL Virus-Free Confirmation	Performed	Performed
Virus-Free Testing for Unrefined Bulk for Each Lot	—	Performed
Virus Removal Filtering in Manufacturing Process	—	Yes
Manufacturing Process Virus Clearance Test	—	Performed

Laminin and Integrin Interactions

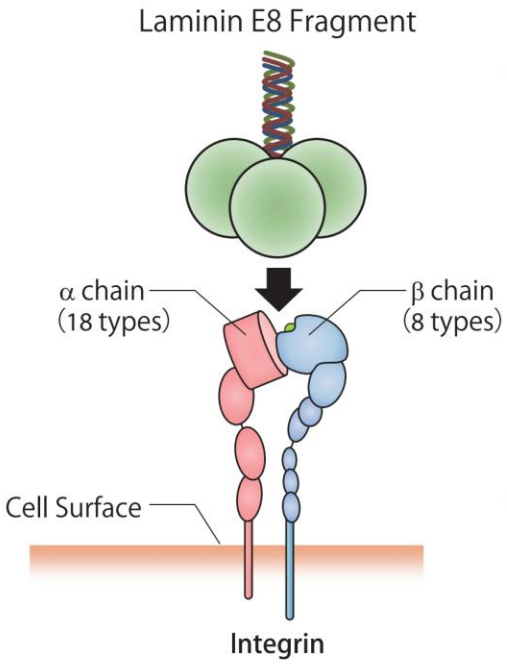


Table. Binding specificity of integrins with fragments of laminin E8 region

Laminin E8 Region		Integrin	
α	Compatible Products	α, β	Cell Expression
1	iMatrix-111	α6β1 α7X2β1	Hepatocyte-like cells
2	iMatrix-221 iMatrix-221MG	α7X2β1	Cardiomyocytes Skeletal Muscle Cells
3	iMatrix-332	α3β1 α6β4	Skin Corneal Epithelial Cells
4	iMatrix-411	α3β1 α6β1	Vascular Endothelial Cells
5	iMatrix-511 iMatrix-511silk iMatrix-511MG	α3β1 α6β1 α6β4	Pluripotent Stem Cells Inner Cell Mass Nerve Cells Retinal Pigment Cells Corneal Epithelial Cells

Fig. Integrin is a heterodimer protein consisting of α and β chains, which is expressed on the surface of cells and specifically binds to the laminin protein.

Clinically Proven, Globally Trusted

iMatrix-511 is more than a research tool — it's a foundation for clinical innovation.

- ## iPSC Stock Project

  Utilized by the Center for iPS Cell Research and Application (CiRA), iMatrix-511 supports Japan's iPSC stock project by enabling the preparation and maintenance of high-quality clinical-grade iPS cells.

  → Learn more: https://www.cira.kyoto-u.ac.jp/e/research/protocol.html

- ## ES Cell Stock Project

  At Kyoto University's Human ES Cell Research Center, iMatrix-511 is used in the development of GMP-compliant ES cell stocks for clinical applications.

  → Learn more: http://chesr.infront.kyoto-u.ac.jp/

In addition to these public initiatives, iMatrix-511 is also integrated into a number of undisclosed clinical pipelines, including early- and mid-stage clinical trials, underscoring its proven reliability in therapeutic development.

Furthermore, iMatrix-511 is compatible with automated workflows — a key advantage for institutions adopting large-scale or GMP-compliant cell manufacturing systems. Its use in single-cell cloning and iPSC expansion has been demonstrated under automation-ready conditions.

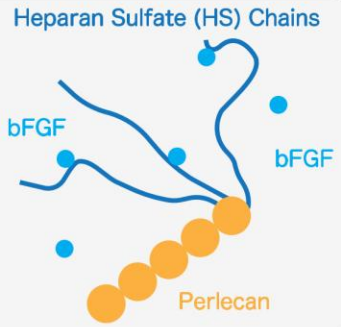
→ Related publication: CiRA Foundation – ISSCR 2021 Poster

NEXT GENERATION ECM

perLAM: Perlecan - Conjugated Laminin E8

What is Perlecan?

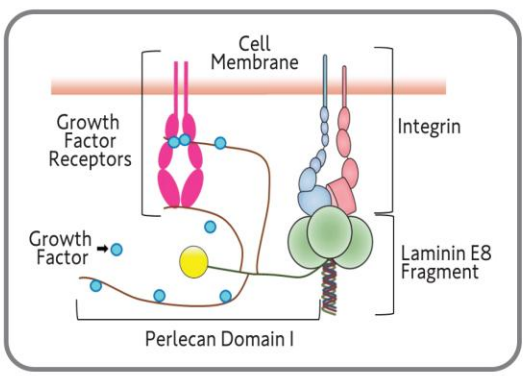
Perlecan is a multifunctional protein found in the basement membrane. It acts as a structural and signaling hub—binding important growth factors and interacting with matrix components to support cell growth, communication, and differentiation. Its unique Heparan Sulfate (HS) chains allow it to capture and stabilize molecules like bFGF, making the surrounding matrix more than just a scaffold—it becomes an active, instructive environment.



Why Use Perlecan-Conjugated Laminin?

When Perlecan's domain I is conjugated to Laminin E8 fragments, it creates a next-generation matrix called P-Laminin E8, designed specifically for stem cell culture and regenerative medicine. This engineered matrix offers the benefits of both proteins:

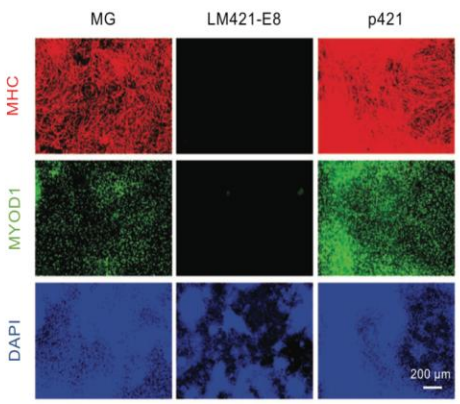
Laminin E8 promotes strong cell adhesion via integrin binding → **Perlecan domain I brings signaling power through growth factor binding**



1. **Laminin E8 Fragment**
   This truncated form of Laminin retains integrin-binding sites, ensuring strong and specific adhesion to stem cells.
2. **Perlecan Domain I**
   Conjugated to the Laminin E8, this domain includes Heparan Sulfate (HS) chains capable of capturing growth factors at the cell surface.
3. **Dual-Function Surface**
   The result is a matrix that supports both mechanical anchoring (via integrins) and biochemical signaling (via HS chains)—a synergistic approach to stem cell culture.

- Anchors cells securely through strong integrin binding.
- Enhances growth factor signaling via Heparan Sulfate chains.
- Promotes efficient skeletal muscle differentiation from hiPSCs.
- Improves culture stability and long-term cell survival.
- Retains full functionality after refrigerated storage.

Developed in collaboration with leading researchers, P-Laminin E8 is a peer-reviewed, next-generation substrate—advancing stem cell culture and regenerative medicine through the power of Perlecan.



Zhao M, et al. (2024). Adv Sci (Weinh). 26:e2308306. PMID: 38685581

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FREE SAMPLE AVAILABLE

perLAM-521

Perlecan-Conjugated Laminin-521 E8 High Purity Product

USE Inducing differentiation & promoting growth in the mesadermal cells

- Provides high integrin-binding affinity for stable and efficient cell attachment.
- Easy-to-use with both pre-mix & coating methods—ideal for streamlined workflows.
- Incorporates Heparan Sulfate (HS) chains to attract and present growth factors like bFGF.
- Facilitates mesodermal lineage differentiation and promotes robust cell proliferation.
- Capable of enhancing differentiation into mesodermal derivatives such as cardiomyocytes, endothelial cells, and skeletal muscle cells.
- A powerful alternative to Matrigel for defined, xeno-free 2D culture systems.

Catalog #	Product Name	Product Sizes	Product Grade
101 521	perLAM-521	350μg:175μg×2pcs.	RUO
101 522		1,050μg:175μg×6pcs.	RUO

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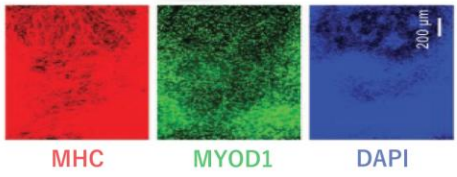
FREE SAMPLE AVAILABLE

perLAM-421

Perlecan-Conjugated Laminin-421 E8 High Purity Product

USE Inducing differentiation & promoting growth in the skeletal muscle cells

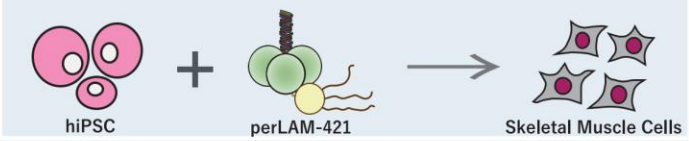
- Offers greater integrin-binding affinity for stable cell adhesion.
- Can be used with both pre-mix & coating methods.
- Contains HS chains to attract and localize growth factors.
- Effectively promotes differentiation into skeletal muscle cells.
- Enhances both cell growth and targeted lineage induction.



Reference: Zhao M, et al. (2024). Adv Sci (Weinh). 26:e2308306. PMID: 38685581

Muscle cell differentiation:

- hiPSC-derived muscle cells (Day 38)
- P-421E8 showed higher expression of muscle markers (MHC, MYOD1, DAPI) than Matrigel.



Catalog #	Product Name	Product Sizes	Product Grade
101 421	perLAM-421	350μg:175μg×2pcs.	RUO
101 422		1,050μg:175μg×6pcs.	RUO

What is Matrixome?

Matrix + ome

Extracellular matrix -ome

Matrixome comes to represent the study of the extracellular matrix by combing the word "matrix" to represent the ECM and the suffix "-ome" meaning part of the whole.

iMatrix™ Products Available Globally

Our RUO iMatrix™ products are available globally via numerous distributors located all around the world. The products are sold exclusively via these distributors. To find out more please visit our website or scan the QR code below.
Our Clinical Grade products are sold directly through Matrixome. To learn more please contact us directly.

※Scan the QR code
for a list of distributors

Scan to Visit Our Website

Scan for Cited Literature