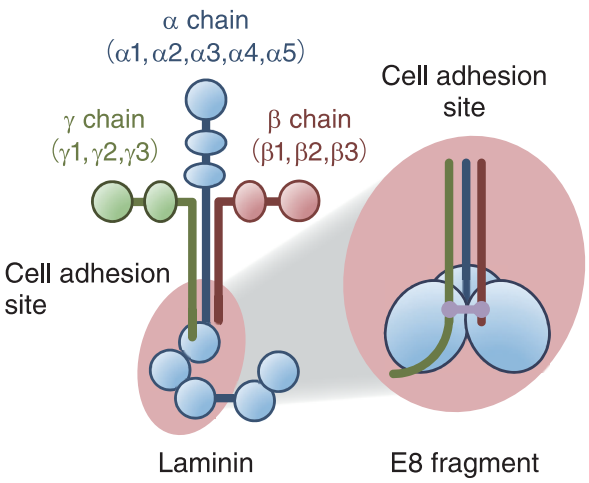
MATRIXOME

Laminins are cell adhesion proteins



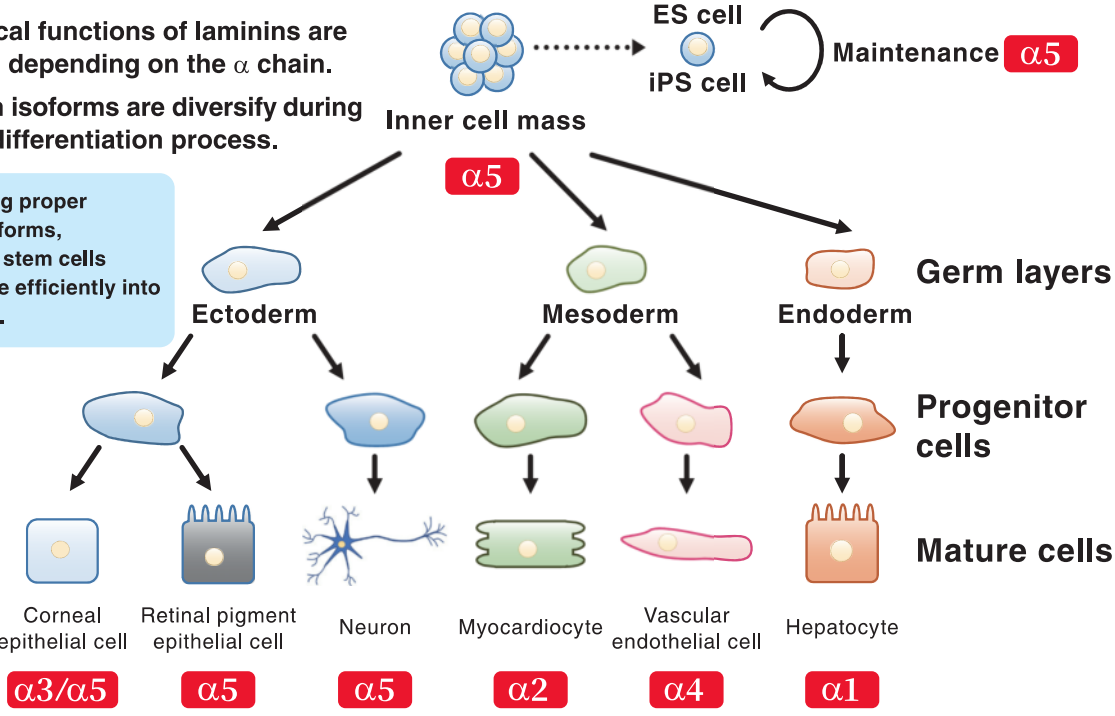
What is laminin?

- ☐ Basement membrane component
- ☐ Heterotrimer composed of α, β, and γ chains
- ☐ At least 12 isoforms in human
- ☐ Interacts with cell surface receptors, integrins
- ☐ Promotes cell survival and regulates cellular behaviors (migration and polarization) and fate (differentiation).

Combination of laminins and cell types *in vivo*

- ☐ Biological functions of laminins are exerted depending on the α chain.
- ☐ Laminin isoforms are diversify during in cell differentiation process.

By choosing proper laminin isoforms, pluripotent stem cells differentiate efficiently into target cells.



iMatrix-series Laminin E8 fragments for cell culture substrates

iMatrix-511

For maintenance and expansion of pluripotent stem cell (PSCs)

iMatrix-511 silk

Cost-efficient alternative of iMatrix-511

iMatrix-411

For induction of vascular endothelial cells from human PSCs

iMatrix-221

For maintenance and purification of cardiomyocytes and skeletal muscles

ECM Pre-mix method (WITHOUT PRE-COATING)
Miyazaki T et al. *Scientific Reports*, **7**, 41165, (2017)

References for iMatrix-511

Classifications	References	Topics
Establishment and culture of human pluripotent stem cells (hPSCs)	Miyazaki et al. *Nat. Commun.* **3**:1236, (2012)	Debut of laminin-511 E8 fragment as culture substrate for hPSCs
	Nakagawa et al. *Sci. Rep.* **4**:3594, (2014)	Feeder- and xeno-free method for generation and maintenance of hPSCs
	Takashima et al. *Cell.* **158**(6):1254-69, (2014)	Transition of hPSCs to ground-state pluripotency
	Miyazaki et al. *Sci. Rep.* **7**:41165, (2017)	Coating-free method for culturing hPSCs
	Sekine et al. *Stem Cell Res.* **24**:40-43, (2017)	Establishment of disease-specific hPSCs
	Tan et al. *Stem Cell Res.* **24**:12-15, (2017)	
	Ishida et al. *Sci. Rep.* **8**(1), 310, (2018)	Modeling diseases and genetic variations by Genome editing of human iPS cells
	Kim et al. *Nat. Commun.* **9**(1), 939, (2018)	
	Sakai-Takemura et al. *Sci. Rep*, **8**, 6555, (2018)	Premyogenic progenitors derived for hPSCs expand in floating culture
Differentiation method of hPSCs	Doi et al. *Stem Cell Reports.* **2**(3):337-50, (2014)	Dopaminergic neurons
	Ishikawa et al. *Hum. Mol. Genet.* **25**(23):5188-5197, (2016)	
	Nishimura et al. *Stem Cell Reports.* **6**(4):511-524, (2016)	
	Samata et al. *Nat. Commun.* **7**:13097, (2016)	
	Kikuchi et al. *Nature.* **548**(7669):592-596, (2017)	
	Morizane et al. *Nat. Commun.* **8**(1):385, (2017)	
	Kikuchi et al. *J. Neurosci. Res.* **95**(9):1829-37, (2017)	
	Goparaju et al. *Sci. Rep.* **7**:42367, (2017)	Motor neurons
	Burridge et al. *Nat. Methods.* **11**(8):855-60, (2014)	Cardiomyocytes
	Sougawa et al. *Sci. Rep.* **8**(1), 3726, (2018)	
	Yamauchi et al. *BBRC.* **495**(1), 1278-1284, (2018)	Ventricular-like cells
	Akiyama et al. *Sci. Rep.* **8**(1),1189, (2018)	Skeletal muscle cells
	Saito et al. *Stem Cell Res Ther.* **9**(1), 12, (2018)	Osteoblasts
	Uchimura et al. *Stem cell research.* **25**, 98-106, (2017)	Myoblasts
	Hayashi et al. *Nature.* **531**(7594):376-80, (2016)	Multiple ocular-like cells
	Hayashi et al. *Nat. Protoc.* **12**(4):683-696, (2017)	Corneal epithelial cells
	Takayama et al. *BBRC.* **474**(1):91-96, (2016)	Cholangiocytes
	Takayama et al. *Hepatol Commun.* **1**(10), 1058-1069, (2017)	Hepatocyte-like cells
	Takayama et al. *Biomaterials.* (2018)	
	Takebe et al. *Cell Reports.* **21**(10), 2661-2670, (2017)	Liver Bud
	Camp et al. *Nature.* **546**(7659):533-38, (2017)	Definitive endoderm cells
	Zhang et al. *Stem Cell Reports.* **10**(2), 1–14, (2018)	*Maintenance of hPSC for differentiation into Posterior gut progenitor cells
	Tanigawa et al. *Cell Reports.* **15**(4), 801-813, (2016)	*Maintenance of hPSC for differentiation into Nephron Progenitors
	Musah et al. *Nat.Biomed. Eng.* **1**:0069, (2017)	Podocyte
	Mae et al. *BBRC.* **495**(1), 954-961, (2018)	Ureteric bud
	Oshima et al. *BBRC.* 497(2), 719-725, (2018)	Hemoangiogenic progenitor cells
	Taguchi et al. *Cell Stem Cell.* **21**, (2017)	*Maintenance of hPSC for differentiation into Nephron Progenitors
	Kawamura et al. *Stem Cell Reports.* **6**(3):312-20, (2016)	*Maintenance of hPSC for differentiation into cardiomyocyte
	Sasaki et al. *Cell Stem Cell.* **17**(2):178-94, (2015)	*Maintenance of hPSC for differentiation into primordial germ cell-like cells
	Kojima et al. *Cell Stem Cell.* **21**(4):517-532, (2017)	
	Furuta et al. *PLoS One.* **9**(12):e112291, (2014)	*Maintenance of hPSC for differentiation into mesenchymal cells
Culture for human primary cells	Okumura et al. *Invest. Ophth. Vis. Sci.* **56**(5):2933-42, (2015)	Human corneal endothelial cells
	Hongo et al. *Invest. Ophth. Vis. Sci.* **58**(9):3325-34, (2017)	
	Polisetti et al. *Sci. Rep.* **7**(1):5152, (2017)	Efficient expansion of human limbal epithelial progenitor cells
	Ishii et al. *Stem Cell Reports.* **10**, 5562-582, (2018)	Satellite cells
Molecular mechanisms of the laminin-integrin interaction	Ido et al. *J. Biol. Chem.* **282**(15): 11144-54, (2007)	
	Ido et al. *J. Biol. Chem.* **283**(42): 28149-57, (2008)	
	Taniguchi et al. *J. Biol. Chem.* **284**(12): 7820-31, (2009)	
	Taniguchi et al. *BBRC.* **487**(3): 525-531, (2017)	
	Takizawa et al. *Sci Adv.* **3**(9) :e1701497, (2017)	

References for iMatrix-411

Classifications	References	Topics
Differentiation method of hPSCs	Ohta et al. *Sci. Rep.* **6**, 35680, (2016)	Endothelial progenitor cells
	Takayama et al. *BBRC.* **474**(1):91-96, (2016)	Cholangiocytes
Culture for cell line	Tang et al. *BioMed Res. Int.***9465383**, 1-10, (2018)	Odontoblast-like cells

References for iMatrix-221

Classifications	References	Topics
Differentiation method of hPSCs	Method for producing cardiomyocyte population from pluripotent stem cells. Patent Publication No.WO2016043168 A1. 2017-6-22.	Cardiomyocytes

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