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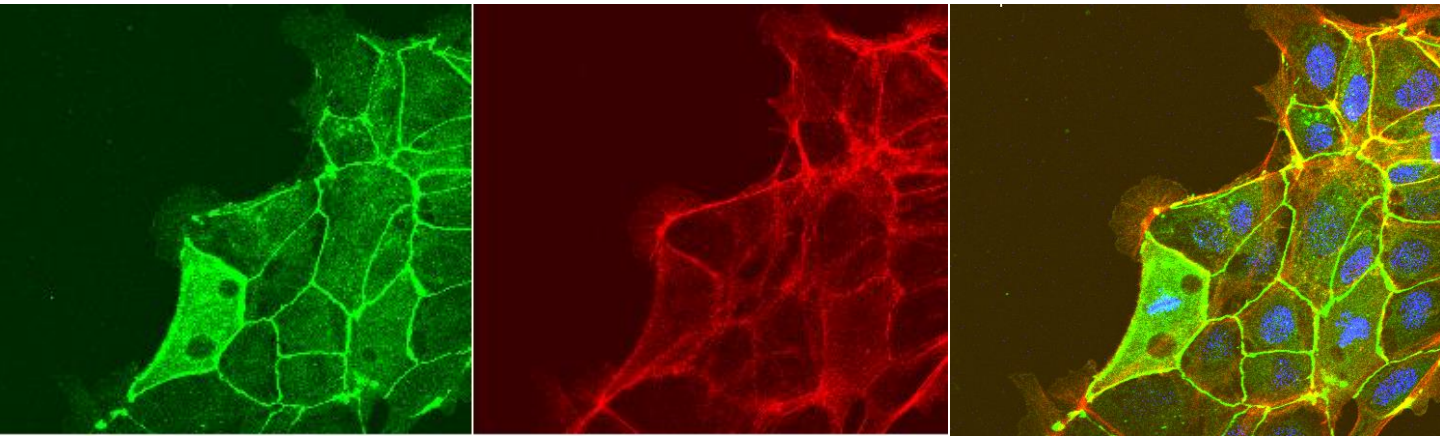
Substrate for ES/iPS Cells

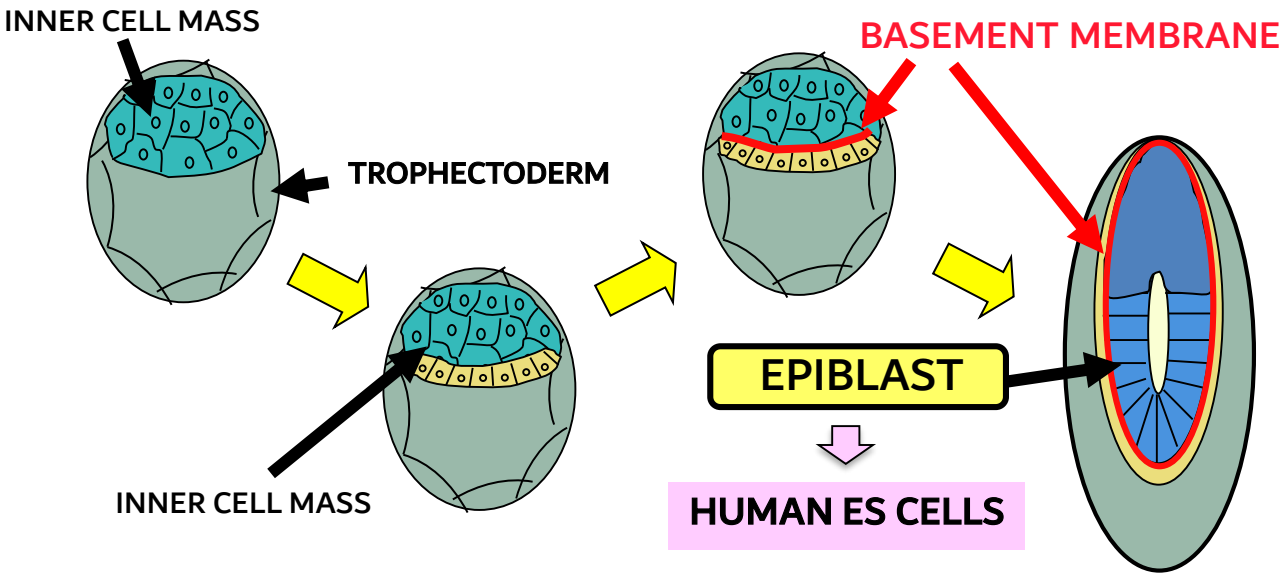
iMatrix-511

Recombinant Human Laminin-511 E8 Fragments

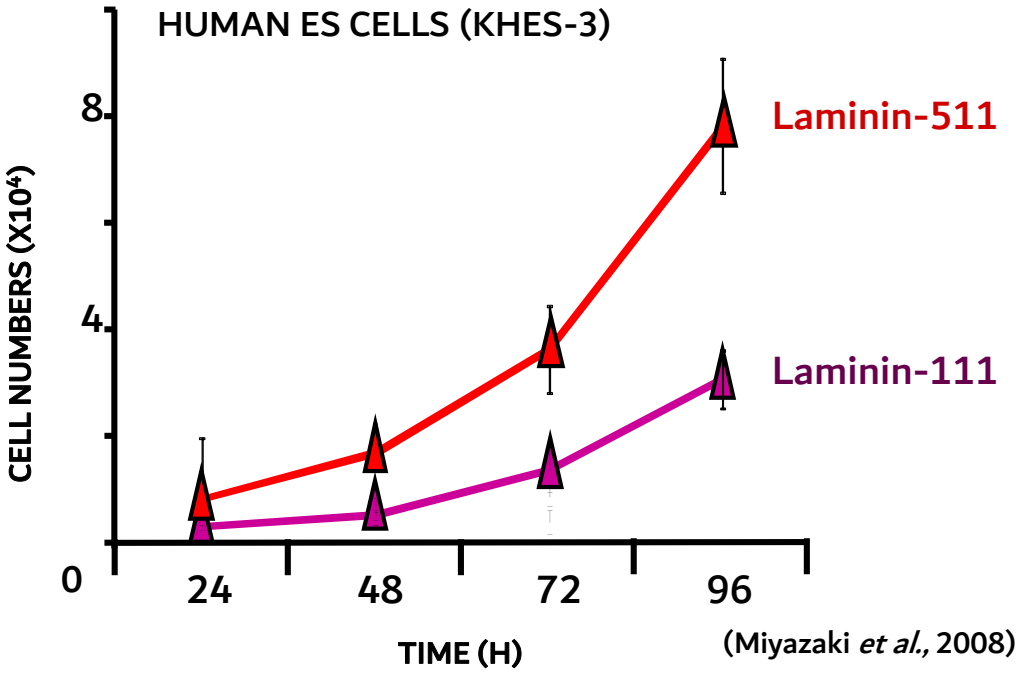


Laminin-511 Expressed in Early Development

Day 3.5	Day 4	Day 4.5	Day 5.5



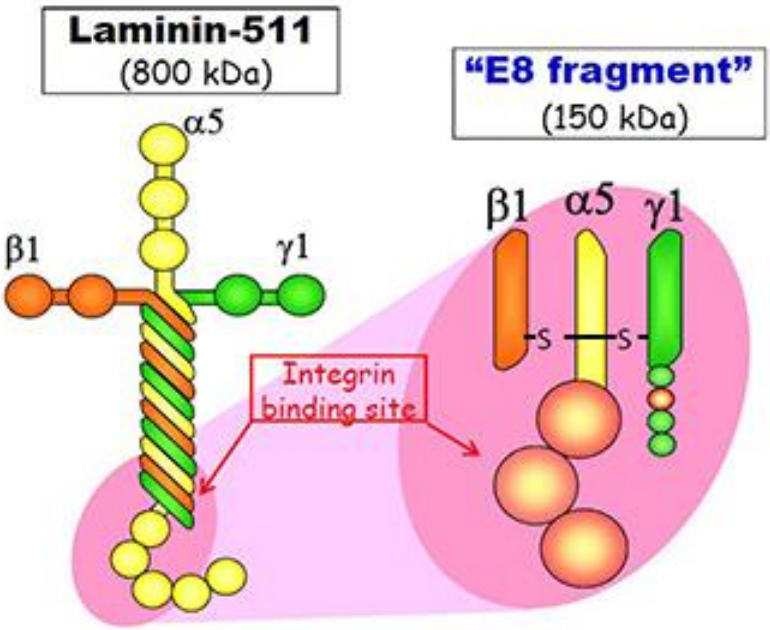
Effect of Laminin-511 on Feeder-Free Stem Cell Culture



(Miyazaki *et al.*, 2008)

Laminin-511 coating enhances the ES cell growth.

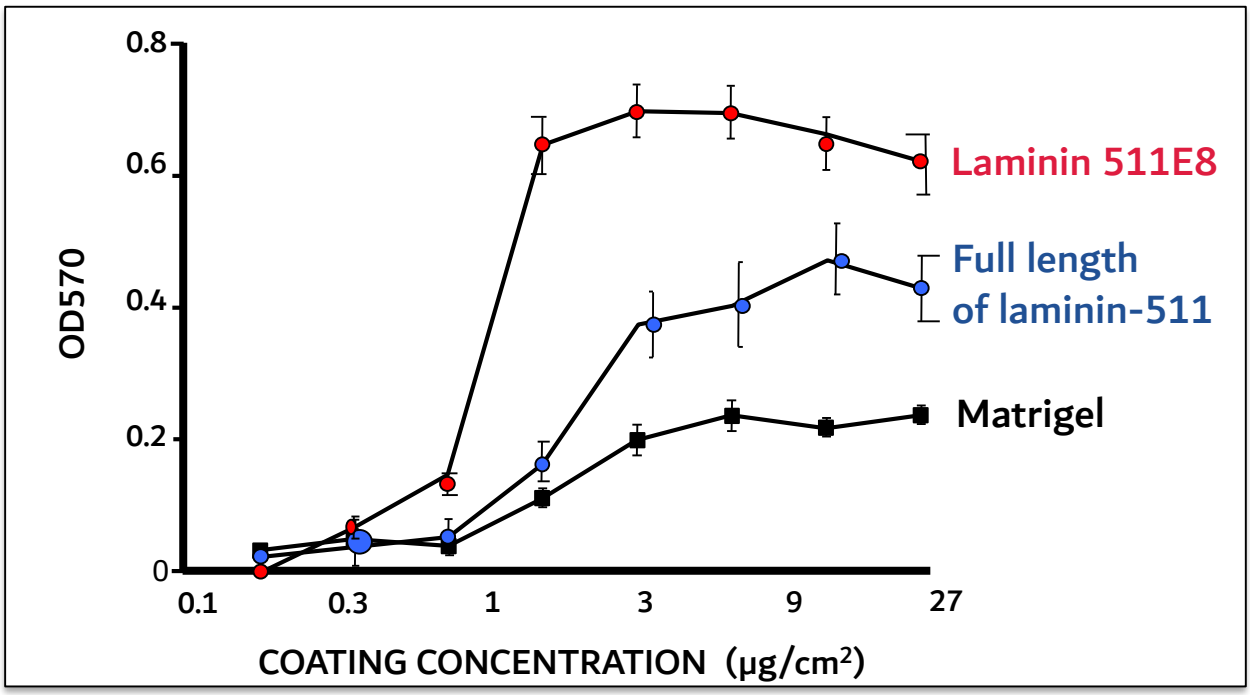
Laminin – More Than 12 Isoforms



	α	β	γ
Laminin-111	α1	β1	γ1
Laminin-211	α2	β1	γ1
Laminin-121	α1	β2	γ1
Laminin-221	α2	β2	γ1
Laminin-332	α3	β3	γ2
Laminin-311	α3	β1	γ1
Laminin-321	α3	β2	γ1
Laminin-411	α4	β1	γ1
Laminin-421	α4	β2	γ1
Laminin-511	α5	β1	γ1
Laminin-521	α5	β2	γ1
Laminin-213	α2	β1	γ3

E8 Fragment contains the integrin binding site.

Laminin 511 E8 Fragment - the Best Substrate



The binding activity of Laminin 511 E8 Fragment against ES cell was better than Full length 511 and traditional substrate.

The same function was confirmed in human iPS cells

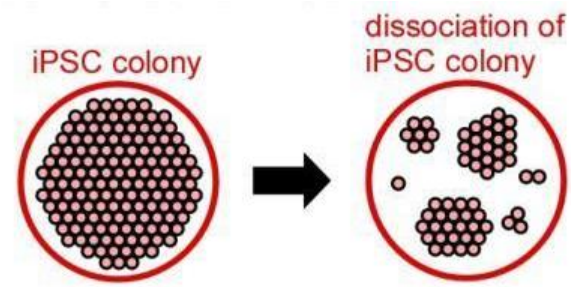
Advantages of iMatrix-511

- Efficient bulk proliferation
- Ideal for feeder-free cell culture
- Pre-mix method
- Superior adhesion

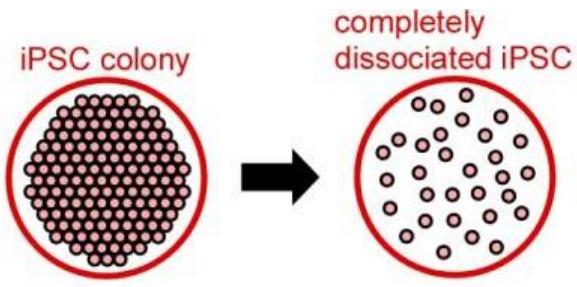
Efficient Bulk Proliferation

- Complete dissociation of iPSC colony results in extensive cell death
- Large aggregates causes spontaneous differentiation

Conventional Method



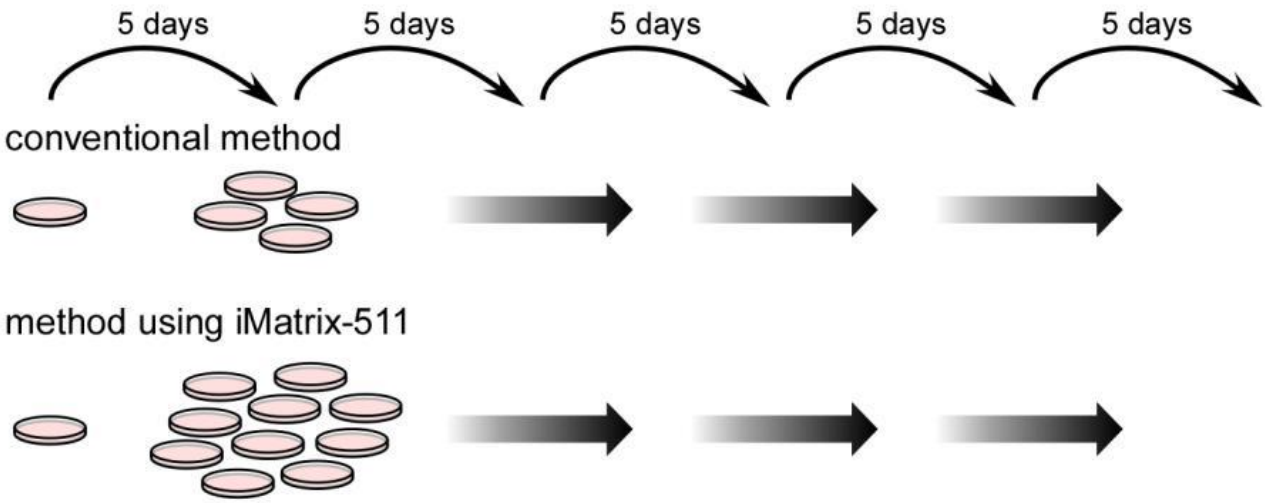
Method using iMatrix-511



Complete dissociation of iPSC colony avoids cell death

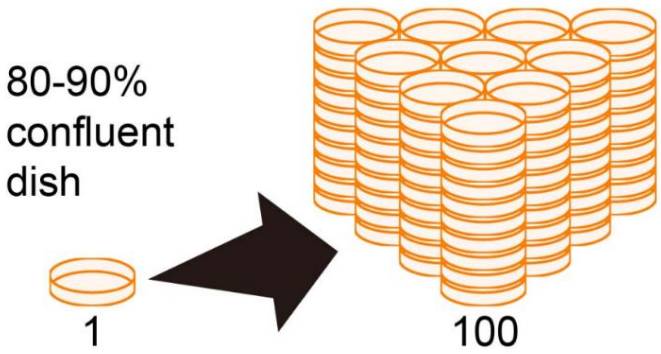
Efficient Bulk Proliferation

iMatrix-511 allowed a higher passaging ratio during subculture, which was approximately 1:100 compared with 1:4 for conventional method.



Split Ratio 1:100 with iMatrix-511

hESCs or hiPSCs	Doubling Time hrs	Fold Changes /passage
KhES1	28.34	131.23
1027B6	29.05	95.85
1027B3	29.37	112.31
987A3	26.00	156.73
987A7	28.09	133.50
1020A12	30.30	106.75
201B7	26.90	177.49
201B6	28.97	124.05
Average	**28.34**	**132.00**



- The hESCs and hiPSCs were efficiently passaged under the feeder-free system. We calculated the doubling times of the hESCs and hiPSCs and the fold change in the cell number in each passage.
- One confluent dish can be passaged into approximately 100 dishes. (Nakagawa *et al.*, 2014, *Scientific Reports* **4**, Article number: 3594)

Efficient Bulk Proliferation

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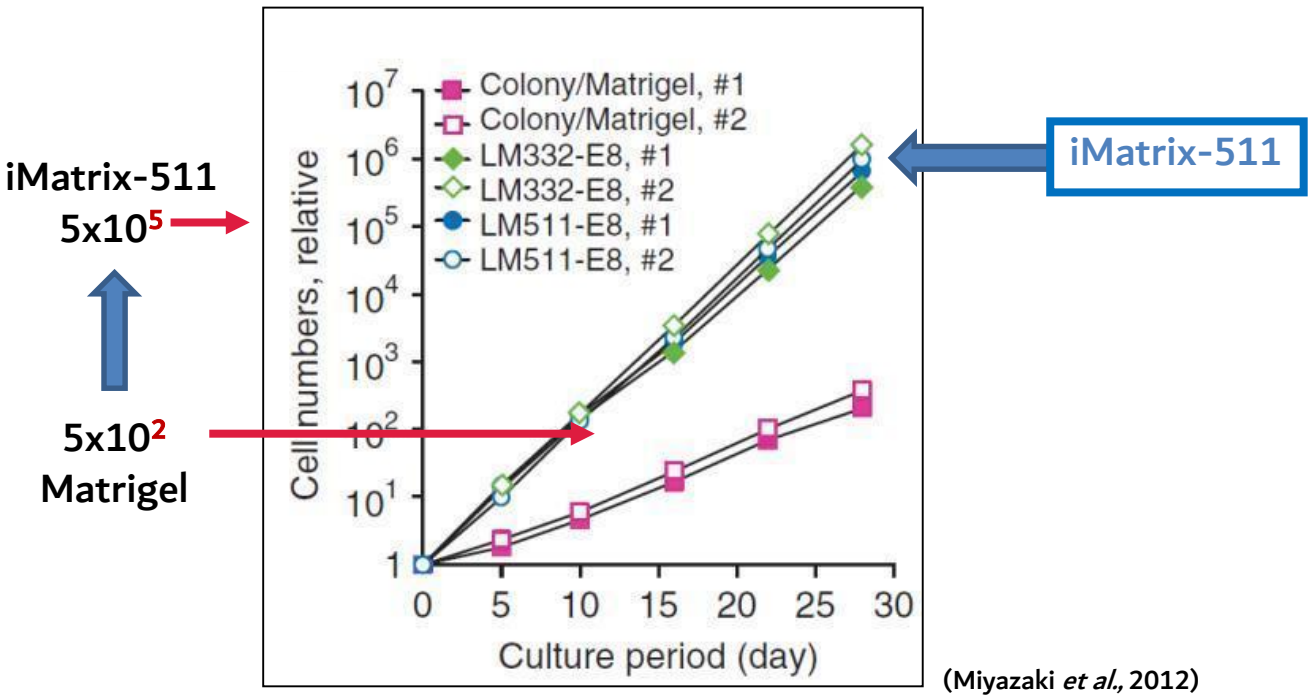
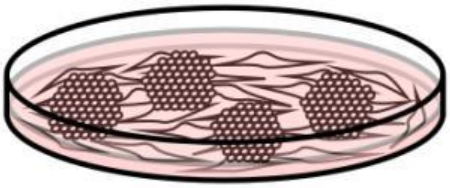


(Miyazaki *et al.*, 2012)

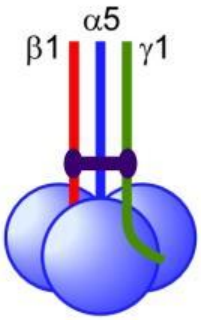
1,000-fold after one month culture

Safety and Quality Substrate



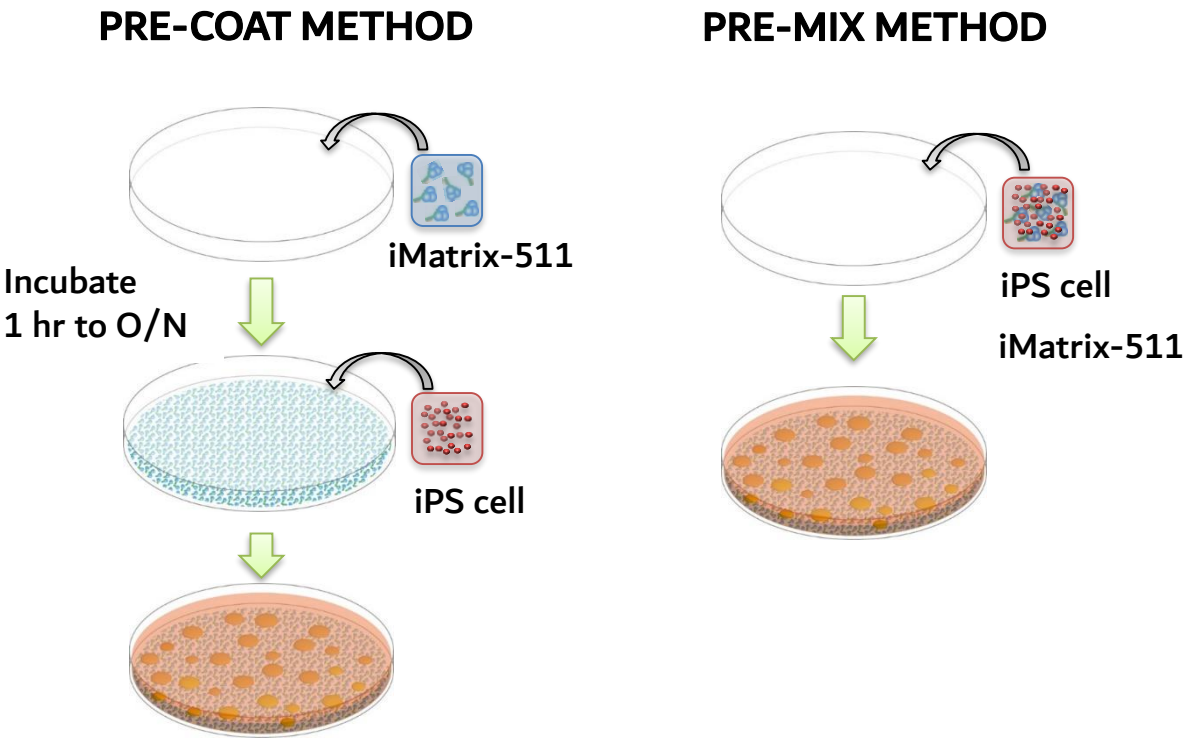
Feeder cells
(fibroblast cell derived from mouse)

Geltrex, Matrigel
(substrate derived from EHS mouse sarcoma cells)



Recombinant human Laminin 511-E8 fragment is made by CHO cell.

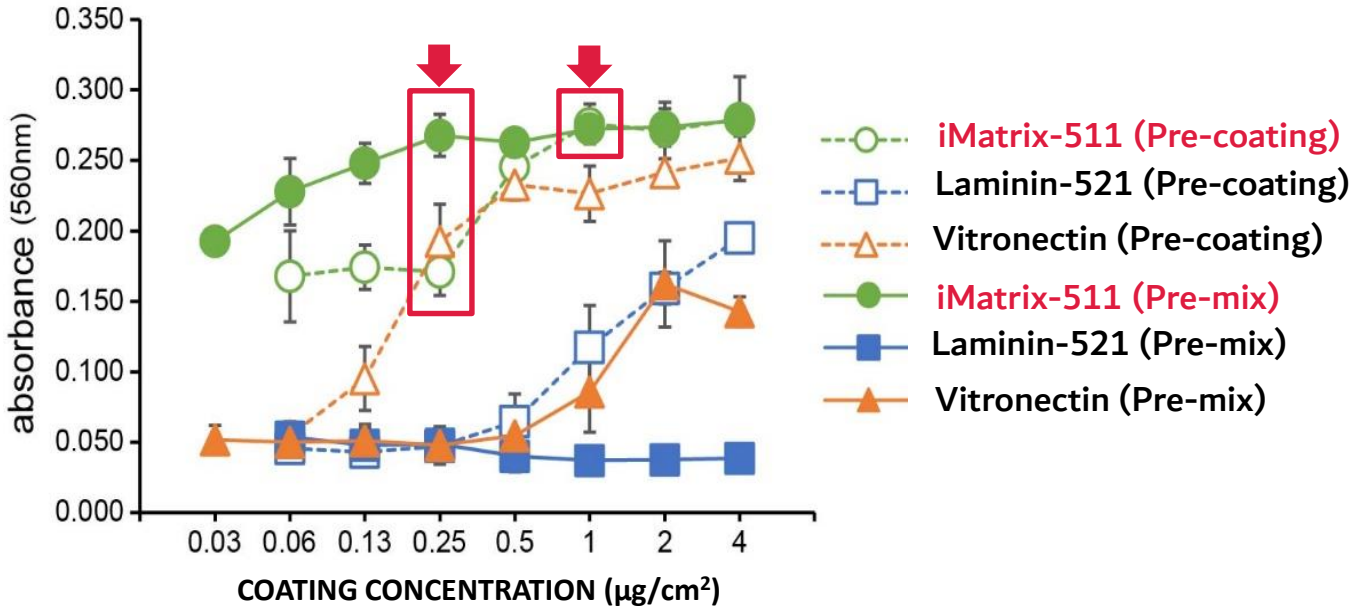
Pre-Mix Method



(Miyazaki et al., 2017)

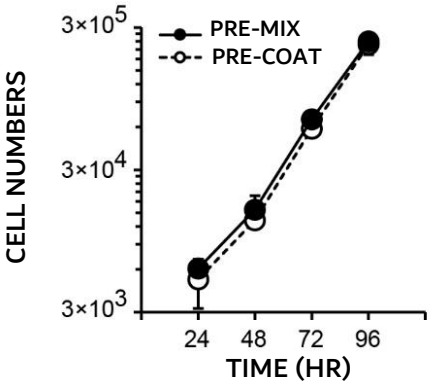
Pre-Mix Method

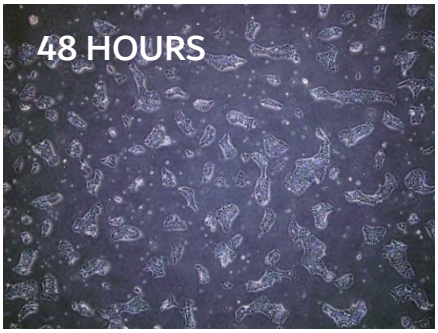
iMatrix-511 shows better adhesion activity using mix method, rather than the conventional pre-coating method.

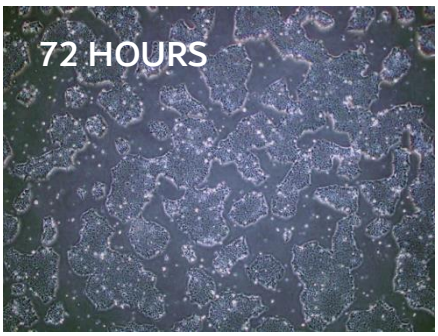


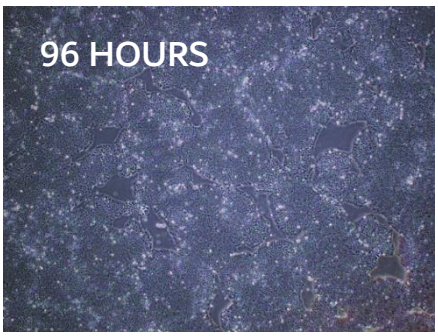
By mixing with iMatrix-511, PSC can be immediately pipetted into the fresh dishes.

iPS Cell Proliferation Efficiency and Cell Condition









(Miyazaki et al., 2017)

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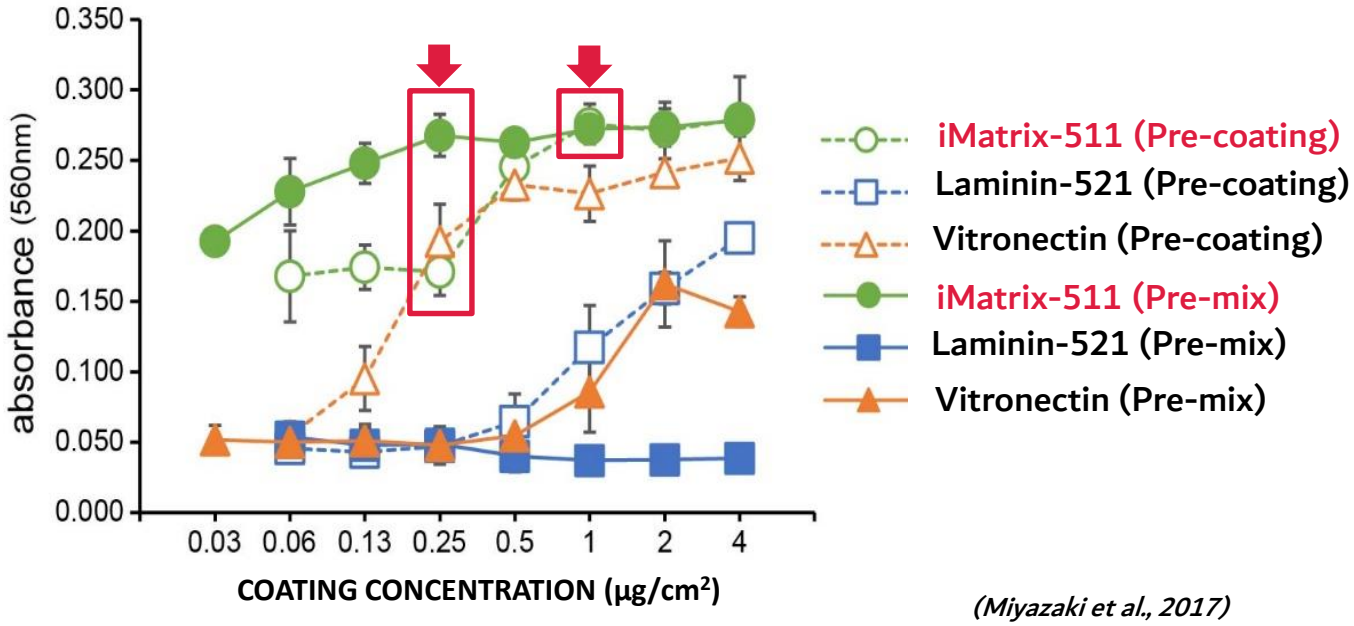


(Miyazaki et al., 2017)

By mixing with iMatrix-511, PSC can be immediately pipetted into the fresh dishes.

Advantages in EP/iPS Cell Culturing

No need to pre-coat

- Time saving
- Doesn't waste the coated dishes

Cost efficiency

- Necessary amount used, is a half compared to pre-coat method

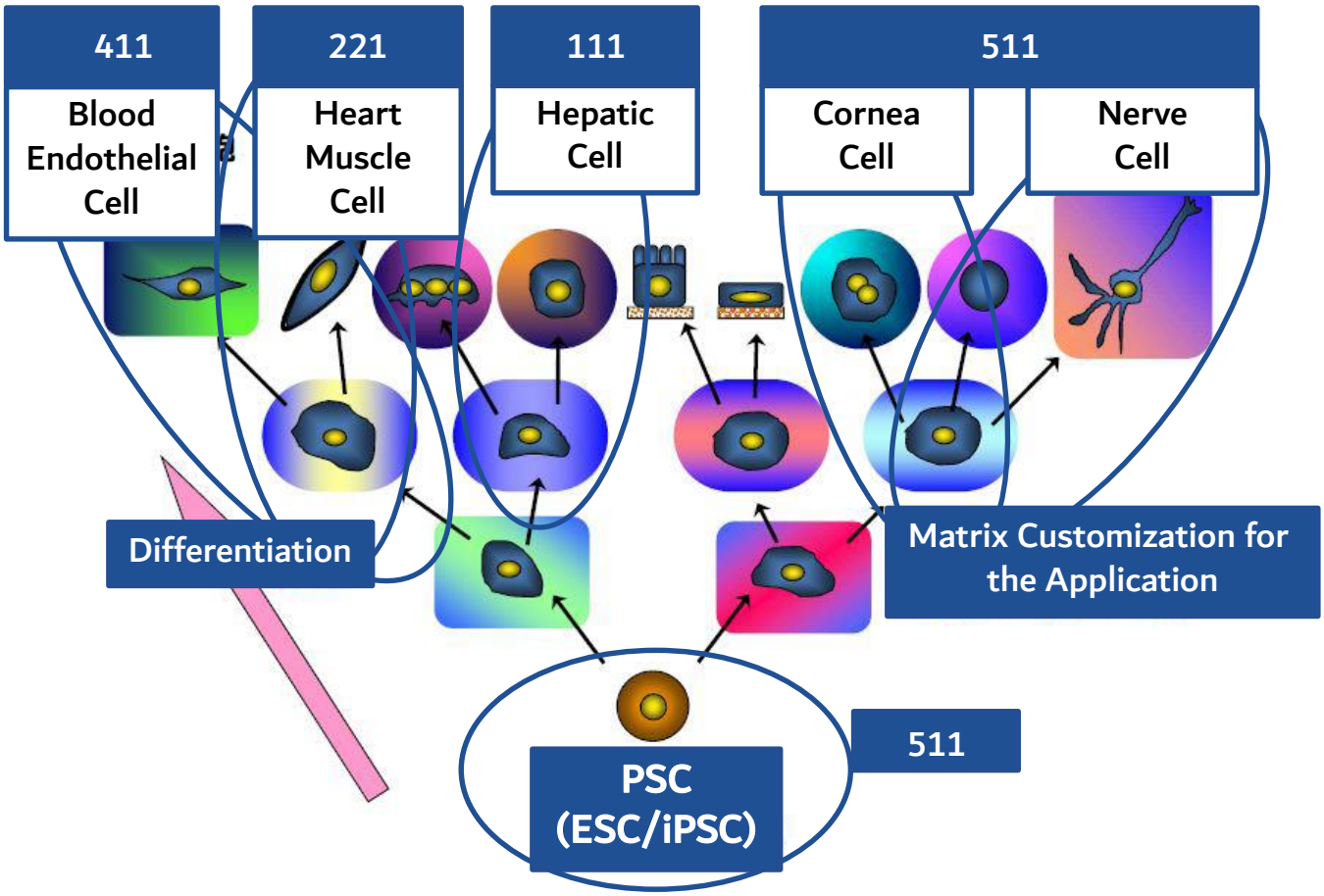
Single cell passaging

- No requirement for colony passaging by skilled technicians

Feeder-Free

- Easy for application in medical trials

Future of Laminin Isoforms Applications



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