BioLamina
REVOLUTIONIZING CELL CULTURE

NEURAL CELL CULTURE

IMITATE THE NATURAL CELL-MATRIX INTERACTIONS FOR IMPROVED CELL FUNCTIONALITY

BioLamina offers chemically defined and animal origin-free laminin cell culture matrices, Biolaminin™ matrices, that allow you to imitate the natural, cell-specific cell-matrix interaction. Through their interaction with specific cellular receptors, laminins trigger the authentic cellular responses, leading to improved cell functionality.

Laminin is the major glycoprotein component of the extracellular matrix, crucial for the modulation of cellular responses like, anchorage, survival, proliferation, migration, organization, and specialization.

Read more about different applications for our Biolaminins

Blood-Brain Barrier
Capillary endothelial cells, astrocytes & pericytes
LN521, LN211, LN111

Neural Stem Cells
Self-renewing, multipotent cells in the brain
LN521

Cortical & Hippocampal Neurons
Glutamatergic projection neurons
LN521, LN111, LN411, LN211

Astrocytes
Astrocytic glia cells in the CNS
LN521, LN411, LN211, LN111

Microglia
Immune cells of the brain
LN521, LN511, LN421, LN411

Interneurons
Inhibitory, neuromodulatory & excitatory
LN521, LN411, LN421, LN211

OPCs & Mature Oligodendrocytes
Myelating glia cells in CNS
LN211, LN411

Dopaminergic Cells
Mature mesDA neurons & progenitors
LN521, **LN111**

Motor Neurons
Efferent cells innervating muscles
LN411, LN421, LN211

Sensory Neurons
Afferent cell bodies in ganglia
LN511, LN411, LN211, LN111

Schwann cells
Myelating glia cells in PNS
LN211, LN411

MAIN ADVANTAGES OF USING BIOLAMININS

- Defined and animal origin-free substrates for clinical compliance
- Biologically relevant cell culture matrices
- Authentic cellular phenotypes in culture
- Enhanced cell maturation, polarization and organization
- Increased yield of relevant cells
- High lot-to-lot consistency for standardised experiments
- Flexible culture system and easy to control
- Scientifically validated in high-quality publication

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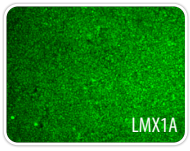
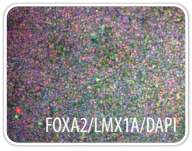
HIGHLIGHTED BIOLAMININ APPLICATIONS

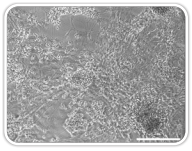
LN111 generates high yield of clinically compliant dopaminergic neurons

Human recombinant Biolaminin 111 LN (LN111) supports efficient, robust, GMP compliant differentiation of a homogenous population of hPSC-derived dopaminergic (DA) progenitor cells. Compared to embryoid bodies (EB)-based protocols, the yield of DA progenitors is >40x on LN111. Starting from a single 6-well plate of hESCs DA progenitor cells can be produced in a scale suitable for clinical production. Publication by Kirkeby et al., Cell Stem Cell, 2016.

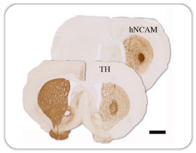




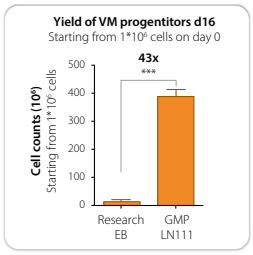
The hESC derived DA progenitor cells homogenously express the predictive markers FoxA2 (red) and Lmx1a (green).



Terminal differentiation of DA neurons at day 44 in vitro.



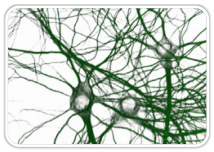
TH⁺ and hNCAM⁺ staining in unilateral 6-OHDA lesioned nude rat, 27 weeks after transplantation with 300,000 DA cells. Scale bar = 1.5mm

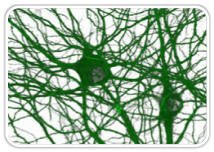


43-fold increase in yield of DA progenitors from human ES cells differentiated on LN111, compared to research grade EB-based protocols.

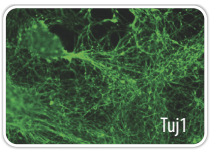
Cortical neurons

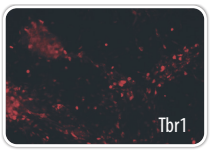
Biolaminin substrates support both maintenance of primary cortical neurons and efficient differentiation of hESC into post-mitotic cortical projection neurons.

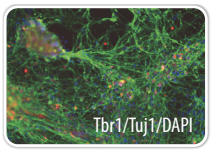




Primary cortical neurons (MAP2+) cultured for 21 days on Biolaminin and with different stiffness. Courtesy Dr. Julia Abele, Leibniz-Institut für Neurobiologie, Germany.



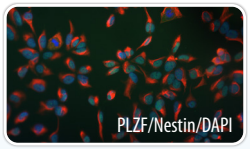




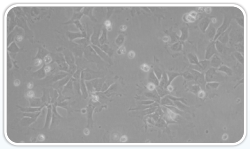
hESC-derived cortical neurons co-express Tuj1, indicative of neuronal cells, and Tbr1, specific to fully differentiated cortical neurons. Courtesy Dr. Tilo Kunath, University of Edinburgh, Scottland, UK.

Neural stem cells

Efficient and robust iPSC reprogramming on Biolaminin 521 LN (LN521) and subsequent neural induction and long term expansion of neuroepithelial stem (NES) cells. Courtesy Dr. Anna Falk, Karolinska Institutet, Sweden.



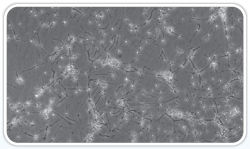
Healthy control NES cells express highly levels of Nestin (red) and low levels of PLZF (green). Blue is DAPI.



iPSC -derived NES cells.

Oligodendrocytes

Oligodendrocytes and oligodendrocyte progenitor cells (OPCs) show good attachment and morphology on Biolaminin 211 LN substrates. Courtesy Dr. Jonathan Niclis in Steven A. Goldman lab, Univ. of Copenhagen, Denmark.



Sorted CD140+ OPCs cultured on Biolaminin 211.

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DA neurons:
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- Generation of high-purity human ventral midbrain dopaminergic progenitors for in vitro maturation and intracerebral transplantation. Nolbrant *et al.*, Nature Protocols, 2017
- Neurons From Human Pluripotent Stem Cells Under Xeno-Free Conditions Restore Motor Deficits in Parkinsonian Rodents. Niclis *et al.*, Stem cells transl med., 2016

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