BioLamina
REVOLUTIONIZING CELL CULTURE

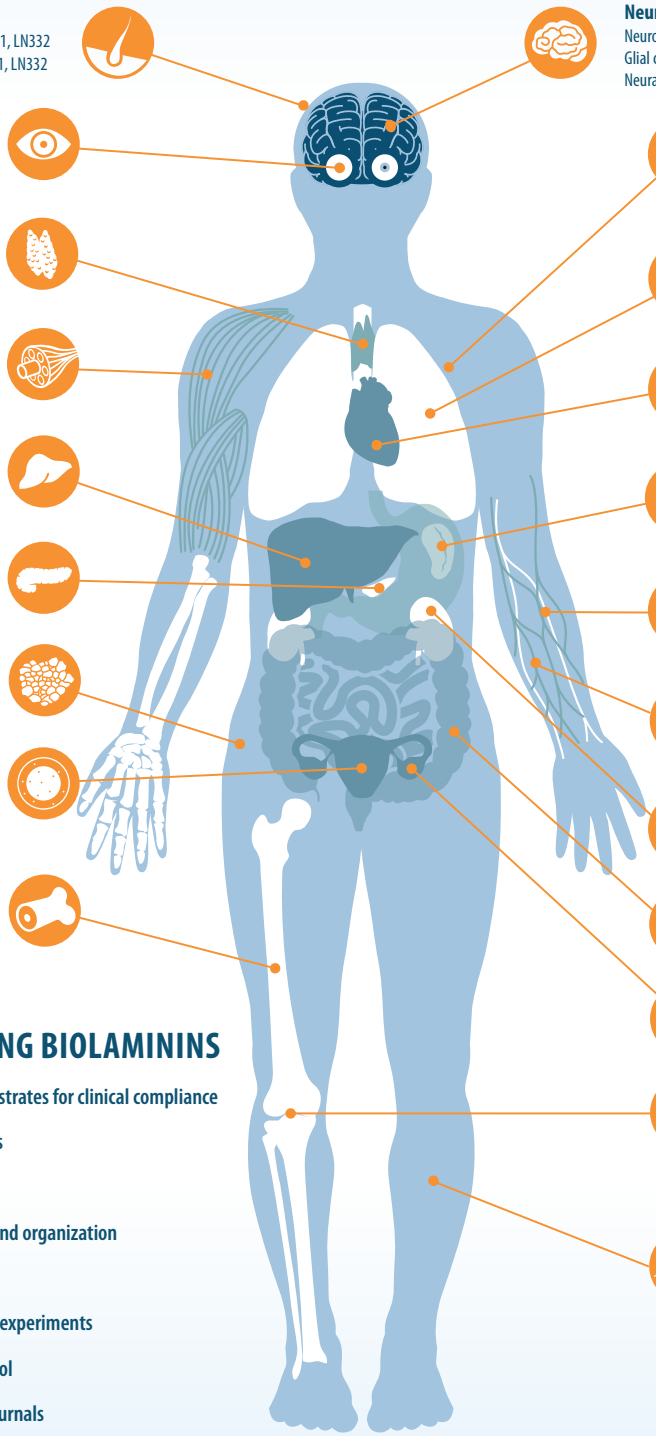
TISSUE SPECIFIC CELL CULTURE MATRICES

IMITATE THE NATRURAL CELL-MATRIX INTERACTIONS FOR IMPROVED CELL FUNCTIONALITY

BioLamina's chemically defined and animal component-free laminin cell culture matrices, Biolaminin™ matrices, allow you to imitate the natural cell-matrix interaction in vitro. Laminins are key components of the extracellular matrix. Through their interactions with specific receptors, laminins trigger the authentic cellular responses, pivotal for cell anchorage, survival, proliferation, migration, organization and specialization, leading to improved cell functionality.

Read more about different cell applications for our Biolaminins

WE OFFER AN EXPANSIVE PORTFOLIO OF RECOMBINANT LAMININ PROTEINS FOR A VARIETY OF APPLICATIONS, INCLUDING RELIABLE EXPANSION OF PLURIPOTENT CELLS AND DIFFERENTIATION AND MAINTENANCE OF SPECIALIZED CELL TYPES



Epithelial Cells
Hair follicle stem cells - LN511, LN332
Keratinocytes - LN521, LN511, LN332

Ocular Cells
Retinal pigmented epithelial cells - **LN521**, LN511, LN332
Human corneal endothelial cells - **LN521**, LN511
Photoreceptors - LN332, LN532, LN432

Thymus Gland Cells
Thymocytes & T cells - LN411, LN332, LN211

Muscle Cells
Myogenic stem cells & progenitors - **LN521**
Myocytes - LN211, LN521, LN221, LN511

Hepatic Cells
Hepatocytes - **LN521**, LN411, LN111, LN221
Cholangiocytes - LN521, LN411, LN111, LN221

Pancreatic Cells
Insulin producing cells - **LN521**, LN511, LN421, LN411
Primary pancreatic islet cells - **LN521**, LN511, LN411

Fat Cells
Adipocytes - LN411

Pluripotent Stem Cells
Derivation and expansion of hESC - **LN521**
Reprogramming and expansion of iPSC - **LN521**
hESC and iPSC clonal culture - **LN521**

Mesenchymal Stem Cells
Expansion of MSC - **LN521**, LN511, LN421, LN411

Neural Cells
Neurons - LN521, LN211, LN111, LN511 LN411, LN421
Glial cells - LN521, LN211, LN111, LN411
Neural stem cells - LN521, LN511, LN111

Mammary Gland Cells
Mammary epithelial cells - LN521, LN511, LN111

Pulmonary Cells
Bronchial epithelial cells - LN521, LN511, , LN411, LN111

Cardiac Cells
Cardiomyocytes - **LN521**, **LN211**, LN511, LN221

Splenic Cells
Splenic Endothelial Cells -LN521
Mesothelial cells - LN521

Endothelial Cells
Vascular endothelial cells - LN521, LN421, LN411, LN511
Retinal endothelial cells - LN521, LN421, LN411, LN511

Hematopoietic Stem Cells & Blood Cells
Maintenance of HSC - LN521, LN511, LN421, LN411
Megacaryocytes - LN521

Renal Cells
Glomerular endothelial cells - LN521, LN411, LN111
Tubular epithelial cells - LN521, LN511
Podocytes - LN521, LN511
Mesangial cells - LN421

Intestinal Cells
Intestinal epithelial cell - LN511, LN521, LN111

Reproductive System
Ovary - LN521
Testis - LN211, LN221

Bone & Cartilage Cells
Bone - LN521
Cartilage - LN521, LN421

Cancer Stem Cells
Glioblastoma - LN521
Breast cancer - LN511

MAIN ADVANTAGES OF USING BIOLAMININS

- Defined and animal component-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
- No lot-to-lot variability for standardised experiments
- Flexible culture system and easy to control
- Scientifically validated in high-impact journals

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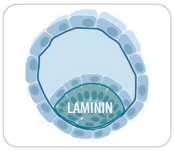
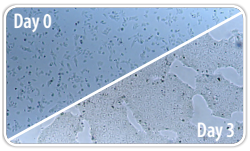
HIGHLIGHTED BIOLAMININ APPLICATIONS

Robust self-renewal of high quality hPSCs on the Biolaminin 521 stem cell matrix

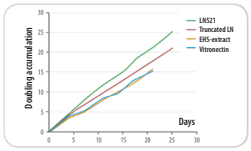
Laminin 521 is a key cell adhesion protein of the natural stem cell niche. The Biolaminin 521 (LN521) substrate supports efficient expansion at low densities of single-cell plated human pluripotent stem cells (hPSCs) under defined and animal component-free conditions. LN521 is compatible with any medium and support weekend-free feeding. Importantly, the cells behave predictably, are homogenously pluripotent and karyotypically stable.



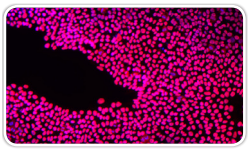
LN521 is naturally expressed and secreted by hPSCs in the inner cell mass of the embryo.



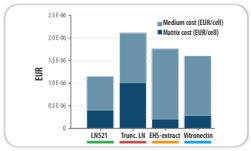
hPSCs can be seeded as single cells without ROCKi (day 0), grown as a homogenous monolayer (day 3) and can be cultured to high confluence without spontaneous differentiation.



hPSCs propagate faster on LN521 compared to other feeder-free matrices.



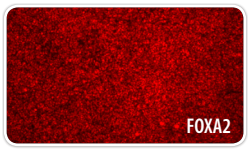
The hPSCs remain pluripotent (Oct4+; pink) and show no areas of differentiation (only DAPI staining; blue).

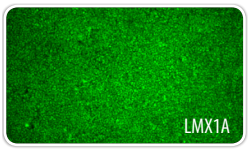


Due to faster growth rate and higher cell yield, the total cost per cell and passage is lowest for LN521 compared to other feeder-free matrices.

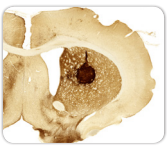
LN111 generates high yield of clinically compliant dopaminergic neurons

Biolaminin 111 (LN111) supports efficient, 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.

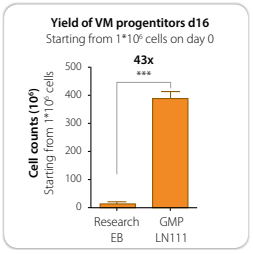




The DA progenitors homogenously express the predictive markers FoxA2 (red) and Lmx1a (green).



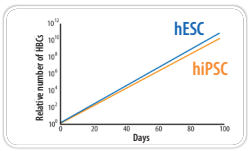
The cells become TH+ neurons at the site of transplantation in rats.



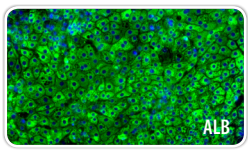
43-fold increase in yield of DA progenitors from human ES cells differentiated on LN111, compared to research grade EB-based protocols.

LN521 and LN111 support hPSC derived hepatocyte differentiation and self-organization

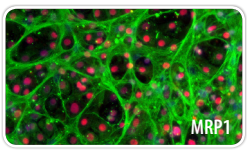
Human ES cells differentiated on Biolaminin 521 (LN521) and 111 (LN111) demonstrate efficient hepatocyte maturation and cell organization with significant improvements in cell function and stability of phenotype. The cells form canalicular-like structures, express multidrug resistance protein 1 (MRP1) and 2 (MRP2) and are capable of biliary efflux. The cell organization is coherent with the enhanced cellular function.



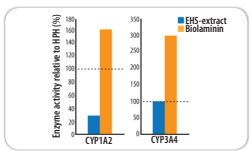
Efficient clonal expansion and maintenance of hESC and hiPSC derived hepatoblast-like cells (HBCs).



High ratio of hepatocyte-like cells express albumin (ALB; green).



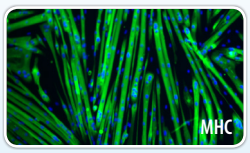
The cells are highly organized and express transporter protein MRP1 (green).



Large increase in P450 metabolic enzyme activity compared to cells on Engelbreth-Holm-Swarm (EHS) mouse sarcoma extract or human primary hepatocytes (HPH; dotted line).

LN521 maintains differentiation potential of satellite cell-derived myoblasts during long-term culture

Biolaminin 521 (LN521) supports superior muscle cell performance in vitro by dramatically improving muscle cell proliferation and differentiation performance, with larger myotubes and higher amounts of nuclei per myotube. Importantly, LN521 supports more consistent and reliable differentiation over long-term culture, and without altering the traditional Pax7/MyoD paradigm.



The cells form myotubes after 8 passages on LN521. Myosin heavy chain expression (MHC; green).

REFERENCES:

hPSC:
- Clonal culturing of human embryonic stem cells on laminin-521/E-cadherin matrix in defined and xeno-free environment. Rodin *et al.*, Nat Commun., 2014
- Monolayer culturing and cloning of human pluripotent stem cells on laminin-521 based matrices under xeno-free and chemically defined conditions. Rodin *et al.*, Nat Prot., 2014

DA neurons:
- Predictive Markers Guide Differentiation to Improve Graft Outcome in Clinical Translation of hESC-Based Therapy for Parkinson's Disease. Kirkeby *et al.*, Cell Stem Cell, 2016
- Neurons From Human Pluripotent Stem Cells Under Xeno-Free Conditions Restore Motor Deficits in Parkinsonian Rodents. Niclis *et al.*, Stem cells transl med., 2016

Hepatocytes
- Recombinant Laminins Drive the Differentiation and Self-Organization of hESC-Derived Hepatocytes. Cameron *et al.*, Stem Cell Reports, 2015
- Long-Term Self-Renewal of Human ES/iPS-Derived Hepatoblast-like Cells on Human Laminin 111-Coated Dishes, Takayama *et al.*, Cell Stem Cell Reports, 2013

Skeletal muscle:
- Laminin 521 maintains differentiation potential of mouse and human satellite cell-derived myoblasts during long-term culture expansion. Penton *et al.*, Skeletal Muscle, 2016

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