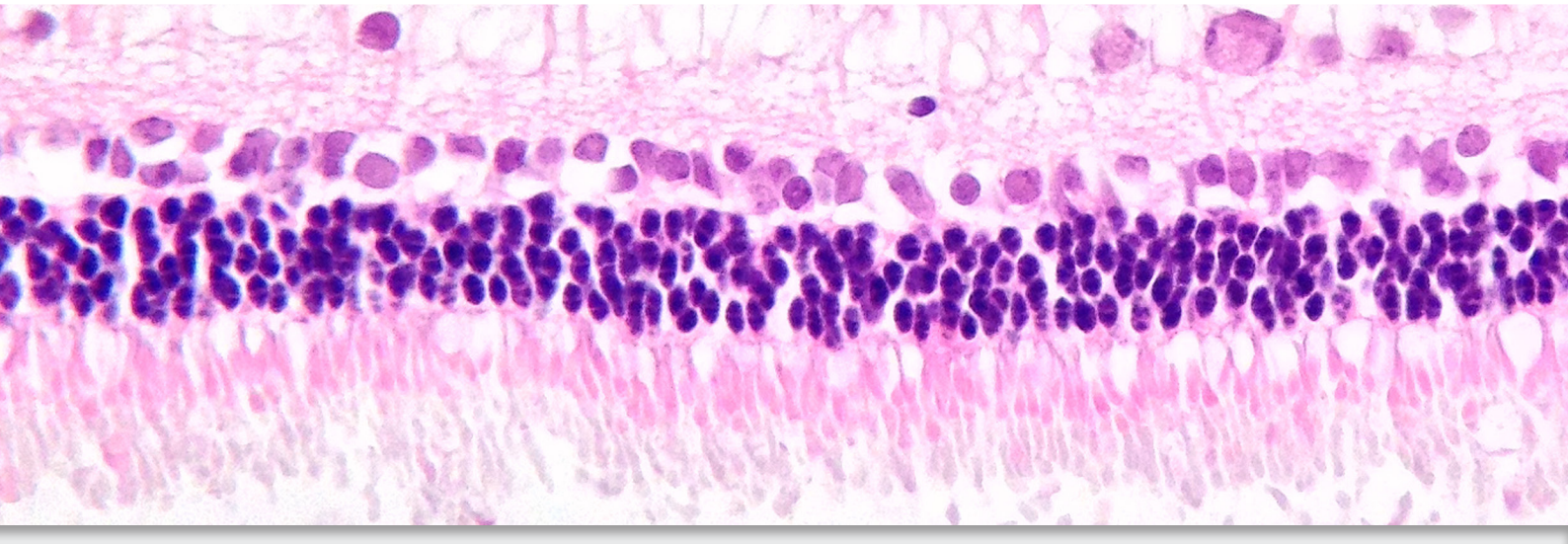
BioLamina
REVOLUTIONIZING CELL CULTURE

APPLICATION NOTE 011

RPE DIFFERENTIATION

ON BIOLAMININ 521 CELL CULTURE SUBSTRATE



LN521 SUPPORTS EFFECTIVE DIFFERENTIATION OF CLINICALLY COMPLIANT HESC-DERIVED RPE CELLS

Retinal pigment epithelial (RPE) cells form a pigmented, monolayer of polarized cells that constitutes the outer neurosensory retina, overlying and nourishing retinal visual cells.

Age-related macular degeneration (AMD) is one of the most common causes of vision loss in developed countries. In early dry AMD, the RPE cells become dysfunctional, and in end-stage disease, RPE and photoreceptors degenerates. Stem cell-derived RPE transplants may hold great promise for cell replacement therapy.

The human recombinant laminin cell culture substrate Biolaminin 521 LN (LN521) supports effective differentiation of clinically compliant pluripotent stem cell-derived RPE cells. Differentiated cells exhibit native RPE characteristics, including morphology, marker expression, monolayer integrity, pigmentation, and polarization. Human embryonic stem cell (hESC)-derived RPE cells transplanted in suspension in a large-eyed disease model, functionally integrate as a polarized, cell monolayer with phagocytic and photoreceptor rescue capacity.

FEATURES AND SPECIFICATIONS:

- **Defined and animal origin-free (primary level) substrate**
- **Differentiation method for generation of clinically compliant hESC-RPE**
- **LN521 supports high seeding efficiency and cell migration**
- **LN521 cultured hESC-RPE cells exhibit native characteristics including morphology, marker expression, monolayer integrity, pigmentation, polarization, and phagocytic activity**
- **Cells transplanted in suspension in a large-eyed animal model incorporate as a nicely polarized monolayer**
- **Transplanted cells show long-term, in vivo functionality, including phagocytic activity and photoreceptor rescue**
- **Scientifically proven**
- **For research use only**

Direct link to laminin information online

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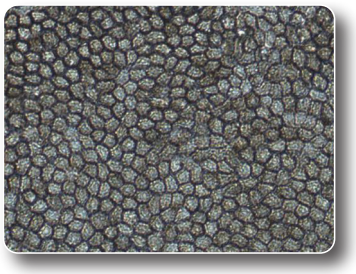
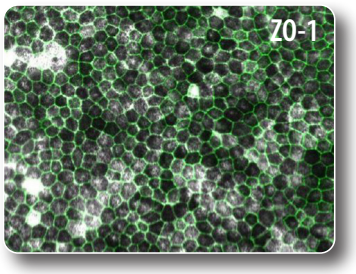
MORPHOLOGY AND MARKER EXPRESSION OF LN521 CULTURED HESC-RPE CELLS

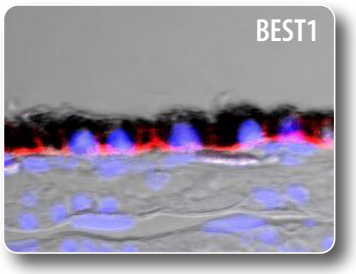
Human ES cells were cultured on LN521 until confluence and manually scraped into embryoid bodies in a medium without bFGF. This culture method robustly promotes the formation of pigmented structures resembling optical vesicles. Pigmented structures were manually cut out, dissociated into single cells and plated back onto LN521. LN521 support high plating efficiency and cell migration, allowing the cells to rapidly form a uniform monolayer while progressively maturing into homogenous pigmented hexagonal cells. (Plaza Reyes et al., 2015).



A bright-field image of hESC-RPE cells cultured on human recombinant LN521. The cells are mature and highly pigmented, displaying a hexagonal morphology.



The expression of RPE marker zonula occludens protein-1 (ZO-1, green) by immunostaining. Cell nuclei counterstained with DAPI (blue).



An immunohistochemical expression of basolateral RPE marker Bestrophin1 (BEST1, red) show that the hESC-RPE cells are polarized. Cell nuclei counterstained with DAPI (blue).

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REFERENCES

Plaza Reyes A., Petrus-Reurer S., Antonsson L., Stenfelt S., Bartuma H., Panula S., Mader T., Douagi I., Andre´ H., Hovatta O., Lanner F., Kvanta A. Xeno-Free and Defined Human Embryonic Stem Cell-Derived Retinal Pigment Epithelial Cells Functionally Integrate in a Large-Eyed Preclinical Model. Stem Cell Reports, 2015

Balasubramani M., Schreiber E.M., Candiello J., Balasubramani G.K., Kurtz J., Halfter W. Molecular interactions in the retinal basement membrane system: A proteomic approach. Matrix biology, 2010

Aisenbrey S., Zhang M., Bacher D., Yee J., Brunken W.J., Hunter D.D. Retinal Pigment Epithelial Cells Synthesize Laminins, Including Laminin 5, and Adhere to Them through a3- and a6-Containing Integrins. Invest Ophthalmol Vis Sci., 2006

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