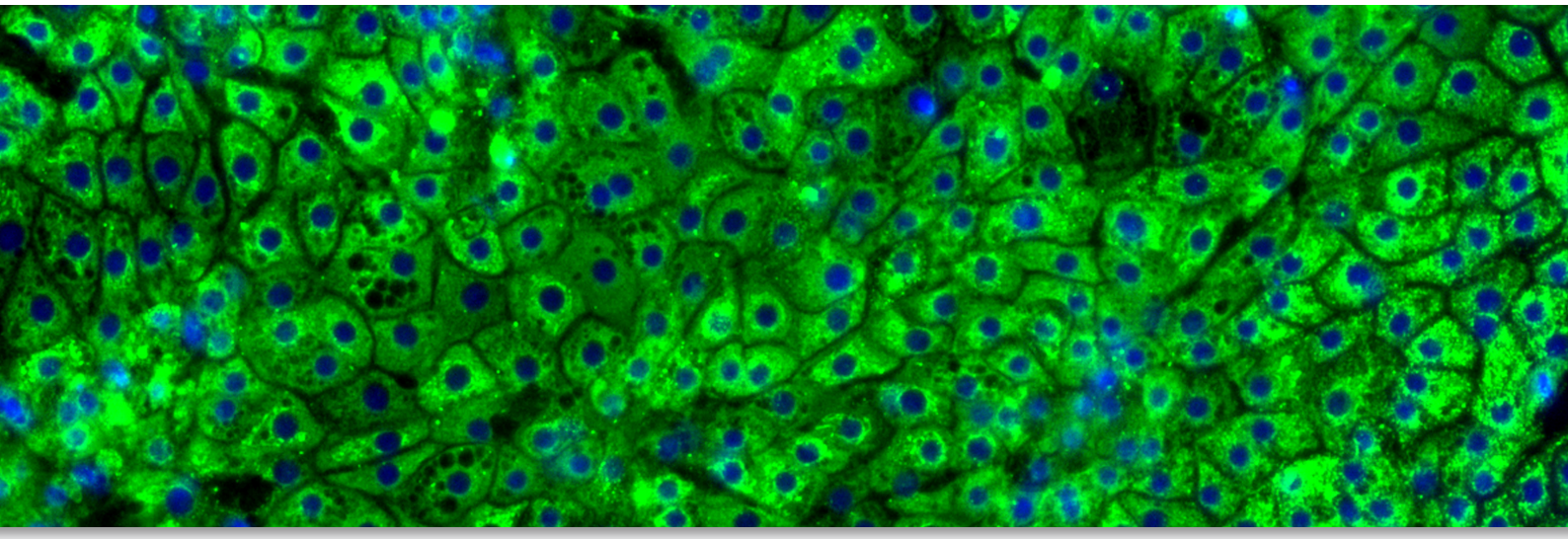
BioLamina
REVOLUTIONIZING CELL CULTURE

APPLICATION NOTE 010

HEPATIC DIFFERENTIATION

ON HUMAN RECOMBINANT LN521 AND LN111



LN521 AND LN111 SUPPORT HEPATIC PROGENITOR EXPANSION AND STEM CELL DERIVED HEPATOCYTE DIFFERENTIATION AND SELF-ORGANIZATION

The liver is a highly structured organ with multiple functions. It contains several different laminin isoforms that play an important role in development, liver tissue homeostasis, organization, and regeneration. Human ES cells differentiated on human recombinant laminin cell culture substrates Biolaminin 521 LN (LN521) and Biolaminin 111 LN (LN111) demonstrate efficient hepatocyte maturation and functional cell organization with significant improvements in cell function and stability of phenotype.

LN111 support efficient expansion and maintenance of a homogenous population of human PSC-derived hepatoblast-like cells. Since pluripotent stem cells cannot survive and self-renew on LN111, residual, undifferentiated cells are effectively eliminated from the differentiated hepatocyte-like cell population by the matrix itself. Hepatic differentiation efficiency and homogeneity are increased when the LN111 purified hepatoblasts are further differentiated on LN111 towards hepatocytes.

FEATURES AND SPECIFICATIONS:

- **Defined and animal origin-free (primary level) substrate**
- **LN521 and LN111 have a significant effect on hepatocyte P450 enzyme metabolic activity**
- **Hepatocyte phenotype and homogeneity is improved and stabilized by the laminin matrices**
- **Laminin cultured cells arrange them-selves in lobule like structures, express MRP1 and MRP2 and are capable of biliary efflux**
- **Efficient expansion and maintenance of hPSC- derived hepatoblasts for more than 15 passages on LN111**
- **Undifferentiated cells are effectively eliminated from the differentiated hepatoblast population by the LN111 matrix**
- **Hepatoblast also had the capacity to proliferate clonally on LN111**
- **Scientifically proven**
- **For research use only**

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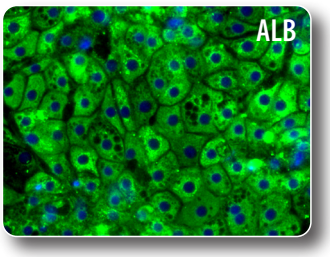
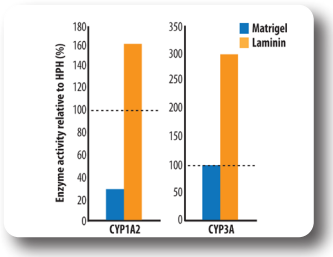
more information online

A SIGNIFICANT ADVANCE IN METABOLIC ACTIVITY ON BIOLAMININ COMPARED TO HUMAN PRIMARY HEPATOCYTES AND CELLS CULTURED ON MATRIGEL

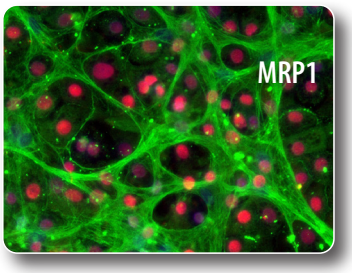
Human ES cell differentiation on LN521 and LN111 generate a high ratio of hepatocyte-like cells positively stained for Albumin, CYP2D6, and CYP3A and show a significant increase in P450 metabolic enzyme activity compared to cells on Matrigel or 48 h post-plated human primary hepatocytes (dotted line, mean of 2).





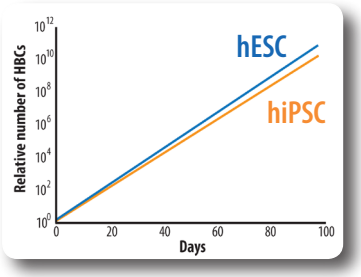
FUNCTIONAL CELL ORGANIZATION ON LN521 AND LN111

The laminin cultured hESC-derived hepatocyte-like cells are arranged in lobule-like structures, reminiscent of regenerating liver. The cells exhibit vast networks of highly organized hepatocytes which express MRP1 and MRP2 and are capable of biliary efflux. The P450 enzyme activities are likely linked to the functional cell organization.



EFFICIENTLY EXPANSION AND MAINTENANCE OF HEPATOBLASTS ON LN111

The LN111 matrix is optimal for expansion (>15 passages) and maintenance of homogenous populations of hPSC-derived hepatoblast-like cells (HBCs), capable of differentiating into both hepatic and biliary lineages. The HBCs bind to the laminin matrix via integrin receptor a6B1. Residual, undifferentiated cells are effectively eliminated by the matrix itself. hESC-derived HBCs also has the potential to proliferate clonally on LN111.



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