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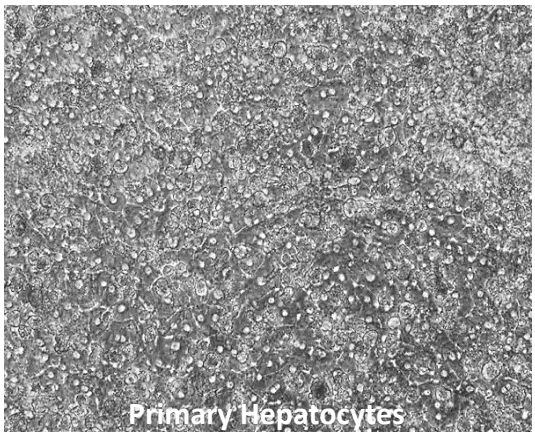
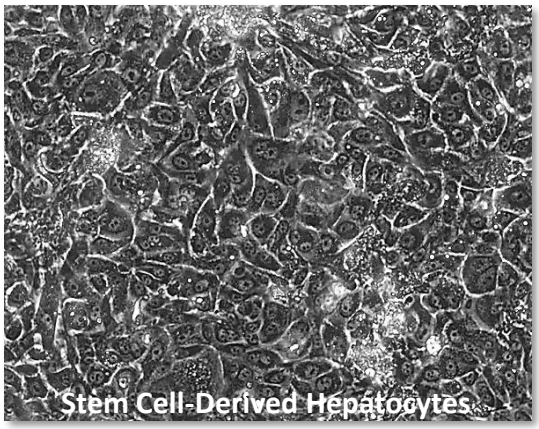
Hepatic Model System on Liver Biomatrix
Your Hepatocyte Solution

Vesta Bio's Hepatic Model System includes hormonally defined media, Kubota's Stem Cell Growth medium for growth of stem/progenitor cells from endodermal lineage, Kubota's Hepatoblast Growth Medium for growth of hepatoblasts, Hepatic Differentiation medium for differentiation of stem/progenitor cells into hepatocytes and Hepatocyte Culture medium for maintenance of mature hepatocytes. Stem cells committed to the endodermal and hepatic lineage plated on our proprietary Liver Biomatrix rapidly differentiate into hepatocytes. Primary and stem cell-derived hepatocytes maintain metabolic functions longer when plated on Biomatrix compared to collagen I and maintained in Hepatocyte Culture Medium.

Human Hepatocytes





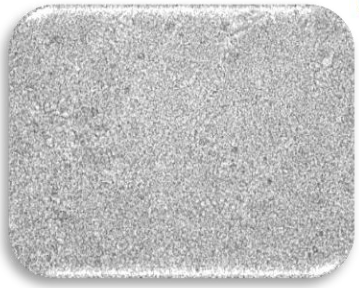
Human hepatocytes on Biomatrix in Hepatocyte Maintenance Media

Hepatic Model System

- Kubota's Stem Cell Growth Media
- Kubota's Hepatoblast Growth Media
- Hepatic Differentiation Media
- Hepatocyte Culture Media
- Liver Biomatrix
  - Isolated from decellularized liver tissue
  - Liver matrix biochemistry retained
  - Matrix scaffold reduced to µm sized particles in suspension
  - Matrix particle suspension coated onto multi-well plates
- Fresh & cryopreserved hepatocytes attach to Biomatrix within 10 minutes
- Fresh & cryopreserved hepatocytes plated onto Biomatrix sustain function & morphology longer than on Collagen I
- Stem/Progenitor cells differentiate into hepatocytes in a few days

Liver Biomatrix

Vesta's Biomatrix is a novel new biomatrix isolated from decellularized liver tissue. The Vesta proprietary process retains the liver matrix biochemistry leaving the matrix scaffold intact. Following the decellulariziation process, the matrix scaffold is reduced to µm sized particles in suspension which is coated onto multi-well plates. Biomatrix coated plates provide the ultimate microenvironment for maintaining functional hepatocytes longer than on collagen I.



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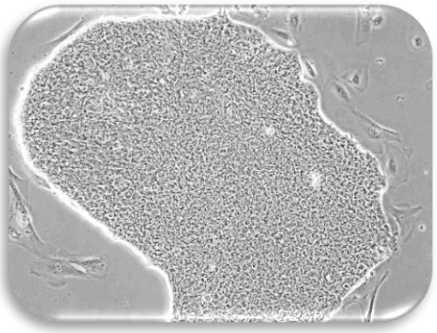
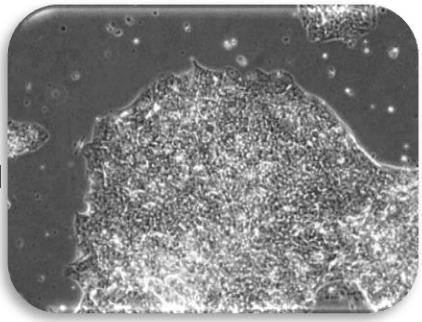


Kubota's Stem Cell Growth Medium

Consists of a basal medium and a frozen hormonally defined serum-free supplement required for the optimal growth of human endodermal lineage stem/progenitor cells such as biliary tree stem cells and hepatic stem cells derived from any source such as iPS, ES Cell, Mesenchymal Stem Cells, Liver, etc.

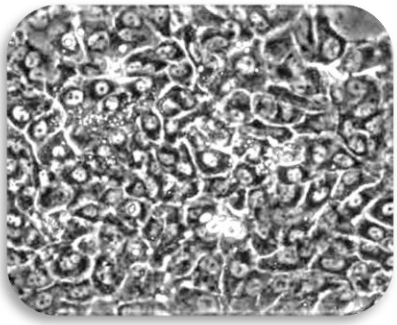


Kubota's Hepatoblast Growth Medium

Consists of a basal medium and frozen hormonally defined serum-free supplements required for the optimal growth of human hepatoblasts.

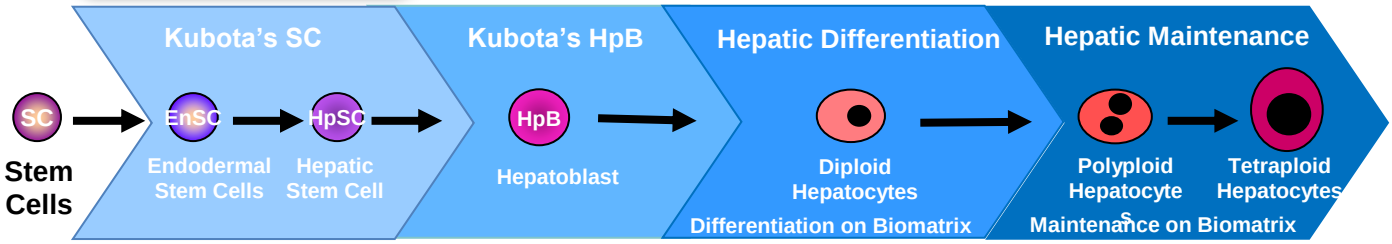
Hepatic Differentiation Medium

Consists of a basal medium and frozen hormonally defined supplements required for the optimal differentiation of endodermal lineage cells into hepatocytes. When combined, the medium is complete and ready for use. When human endodermal lineage stem cells derived from any source are cultured in Hepatic Differentiation Medium on Biomatrix they differentiate into mature hepatocytes in a few days without the need for exogenous growth factors.



Hepatocyte Culture Medium

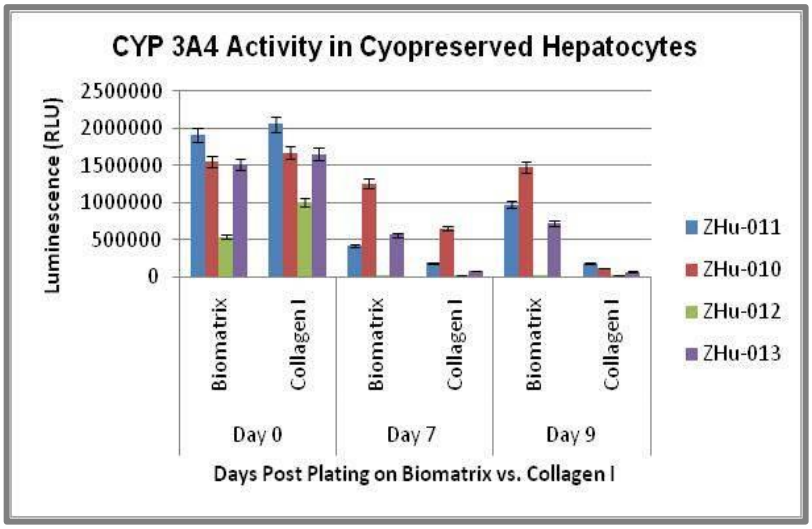
Hepatocyte serum-free maintenance medium consists of a basal medium and frozen hormonally defined supplements required for the optimal maintenance of mature hepatocytes plated on Biomatrix. Metabolic function can be maintained longer compared to collagen I.



Cryopreserved Hepatocytes Sustain Metabolism on Biomatrix Better than on Collagen I

Cryopreserved human hepatocytes from 4 donor lots that are used for plated metabolism and suspension metabolism sustain CYP 3A4 activity better when plated on Liver Biomatrix compared to collagen I.

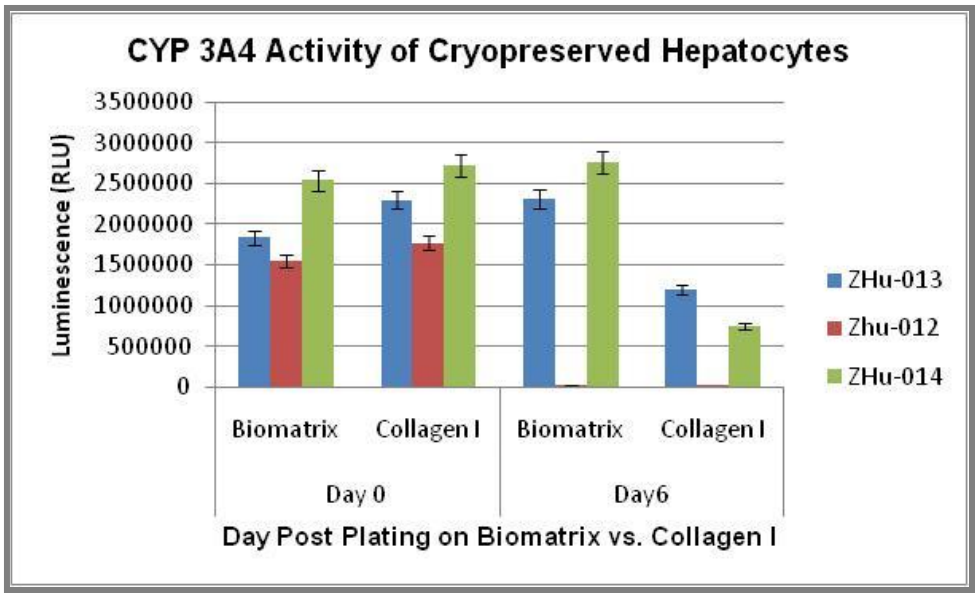
Both attach to Biomatrix within 10 minutes in serum-free Hepatocyte Culture Medium and remain attached throughout the culture period.



Plateable Metabolism
- ZHu-011
- ZHu-010

Suspension Metabolism
- ZHu-012
- ZHu-013

Suspension Metabolism Donor Lots



CYP 3A4 activity is sustained in cryopreserved human hepatocytes from 3 donor lots used for suspension metabolism plated on Biomatrix compared to collagen I. Suspension hepatocytes remain attached to Biomatrix.

P450-Glo™ CYP3A4-IPA Assay from Promega

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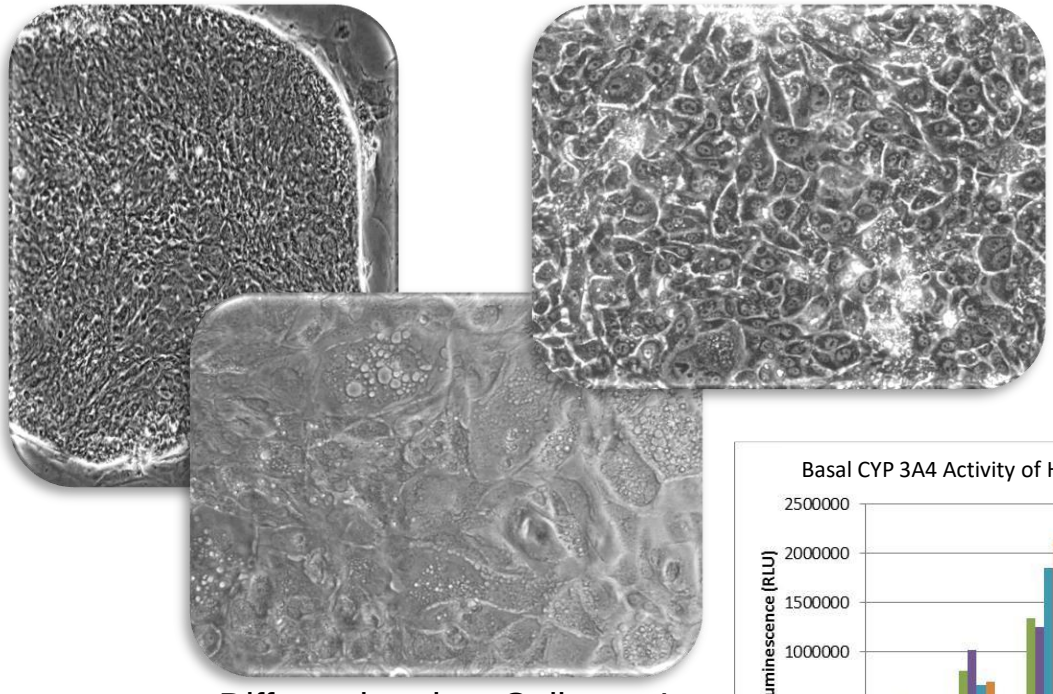
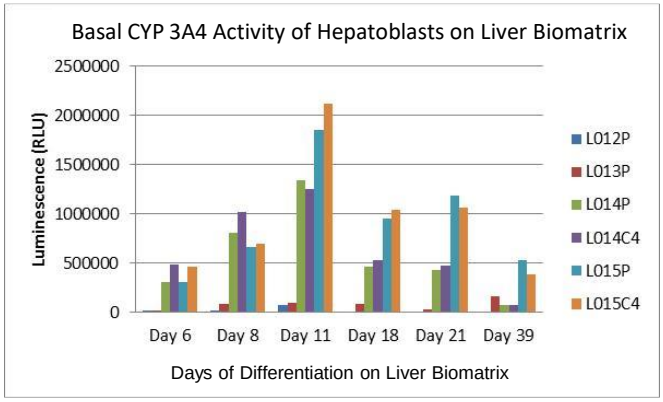
Hepatic Stem/Progenitors Differentiate Rapidly on Biomatrix

Stem Cell Colony

Differentiated on Liver Biomatrix



Differentiated on Collagen I



Hepatic stem/progenitor cells (HSPCs) grown in Kubota's Stem Cell Growth Medium were plated onto Liver Biomatrix in Kubota's Hepatoblast Growth Medium then fed Hepatic Differentiation Medium the next day where they rapidly differentiated into hepatocytes with CYP 3A4 activity and were maintained in Hepatocyte Culture medium.

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