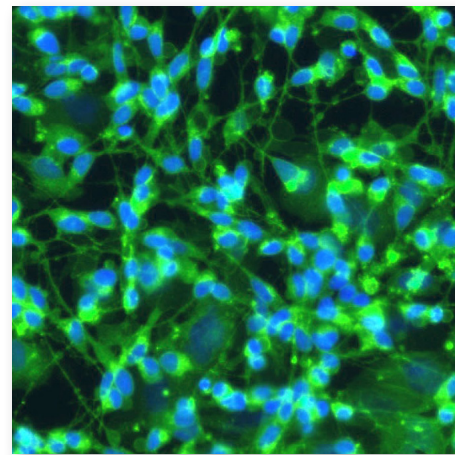


HuGENTRA™

A human placenta-derived, collagen-rich, growth factor-containing extracellular matrix (ECM) preparation for 2D and 3D cell culture applications



HuGentra is a fully human, complex ECM derived from human placentas that provides a natural structural support scaffold for cell attachment and growth as well as an enhanced growth factor-rich environment to support cell activity *in vitro*. HuGentra is approximately 50% bulk collagens, with 40% collagen I and 7% collagen IV, and 0.5% laminin. HuGentra further contains TGF- α , epidermal growth factor, insulin-like growth factor, fibroblast growth factor, vascular endothelial growth factor, and other growth factors naturally present in placental tissues.

Growth Factor*	Concentration Range	Average Concentration
EG-VEGF	0.37-1.31 ng/mL	0.80 ng/mL
IGF-1	0.48-0.84 ng/mL	0.66 ng/mL
growth hormone (GH)	0.13-0.24 ng/mL	0.19 ng/mL
FGF-7	0.08-0.17 ng/mL	0.12 ng/mL
TGF- α	19.5-36.4 pg/mL	27.6 pg/mL
EGF	14.3-26.8 pg/mL	19.9 pg/mL

*as determined by external testing service using GLP-compliant multiplex ELISA platform (data on file at LifeNet Health; ES-17-097)

HuGentra is produced under state-of-the-art conditions from quality tissues using well documented and reproducible standards for tissue recovery:

- Fully consented, donated, human placentas obtained by cesarean section following uneventful, full-term pregnancies.
- Extensive medical record review and exclusion of tissue from donors with pre-existing conditions including cancers, blood diseases, immune system disorders, sexually transmitted diseases, neurodegenerative diseases and others.
- Extensive pre-processing donor tissue screening including assays for infectious agents e.g. HIV, Hepatitis B and C, Syphilis, and HTLV.

This ECM is not approved for therapeutic or diagnostic use.
HuGentra is a unique complex collagen-based matrix material for
in vitro research applications only.
Uses of HuGentra are exemplified in figures 1 and 2 (see page 2).

HuGentra is produced using LifeNet Health's proprietary decellularization process that is specifically designed to omit harsh, protein-denaturing conditions.

Features and Benefits include:

- Low lot-to-lot variability in characteristics and performance
- Suitable for use as a supplemental media
- Suitable for use in conventional 2D and scaffold-based 3D cell culture application and as hydrogels in the culture of cells, microtissues and cell aggregates
- Fully human, animal-component free, not tumor derived
- A sterile, phenol red-free, ready to use solution
- Maintains cellular activities of an extensive list of cell types, including established cell lines, primary cells, and stem cell populations

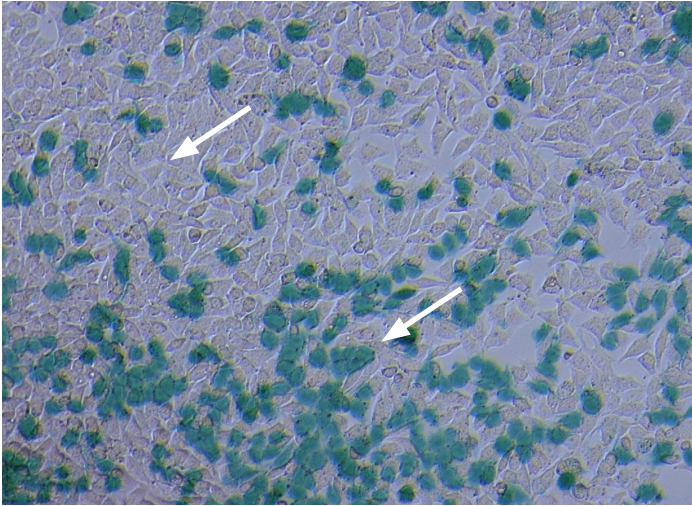


Figure 1: HuGentra supports the bioactivity of human liver hepatocellular carcinoma cells: Light microscopic view of HepG2 liver hepatocellular carcinoma cells grown on a thin layer of HuGentra hydrogel. Cells capable of indocyanine green uptake are stained green (white arrows).

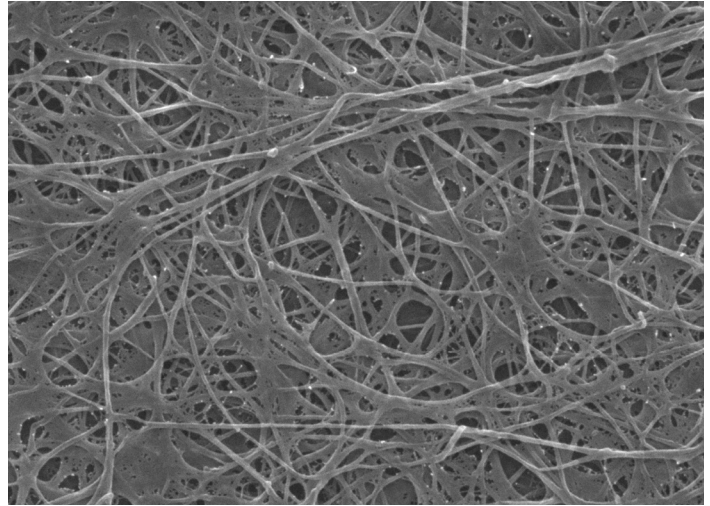


Figure 2: HuGentra supports the differentiation of human neuroblastoma cells: Fluorescence microscopic view of SH-SY5Y human neuroblastoma cells grown on a thin layer HuGentra hydrogel following induced neuronal differentiation for three days in the presence of retinoic acid. Cells were stained using a Neurite Outgrowth Staining Kit labelling cellular membranes green. Cells were counterstained with DAPI labeling nuclei blue.

HuGentra is a unique complex collagen-based matrix material for *in vitro* applications. The appropriate hydrogel conditions (i.e. gel concentration, stiffness, and matrix volume) and hydrogel formats (i.e. thin coating, thin gel, thick gels) are application dependent. Handling and dispensing of HuGentra does not require the use of pre-chilled pipette tips or plastic ware. However, it is recommended to use pre-chilled solutions to prepare working solutions and work on ice to prevent early gelation. High HuGentra concentrations are viscous and may adhere to plastic surfaces during pipetting. The use of a positive displacement pipette or syringe for accurate pipetting is recommended. Very low concentrations of HuGentra working solutions will form a weaker or fragile gel that is likely to detach from tissue culture plastic. To optimize HuGentra performance, the use of smaller diameter, multi-well plates (e.g. 96- or 384-well plates) or the use of collagen-precoated culture-ware is recommended.

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