

Corning® PuraMatrix™ Peptide Hydrogel

A novel synthetic matrix ideal for creating optimized 3D cell culture environments

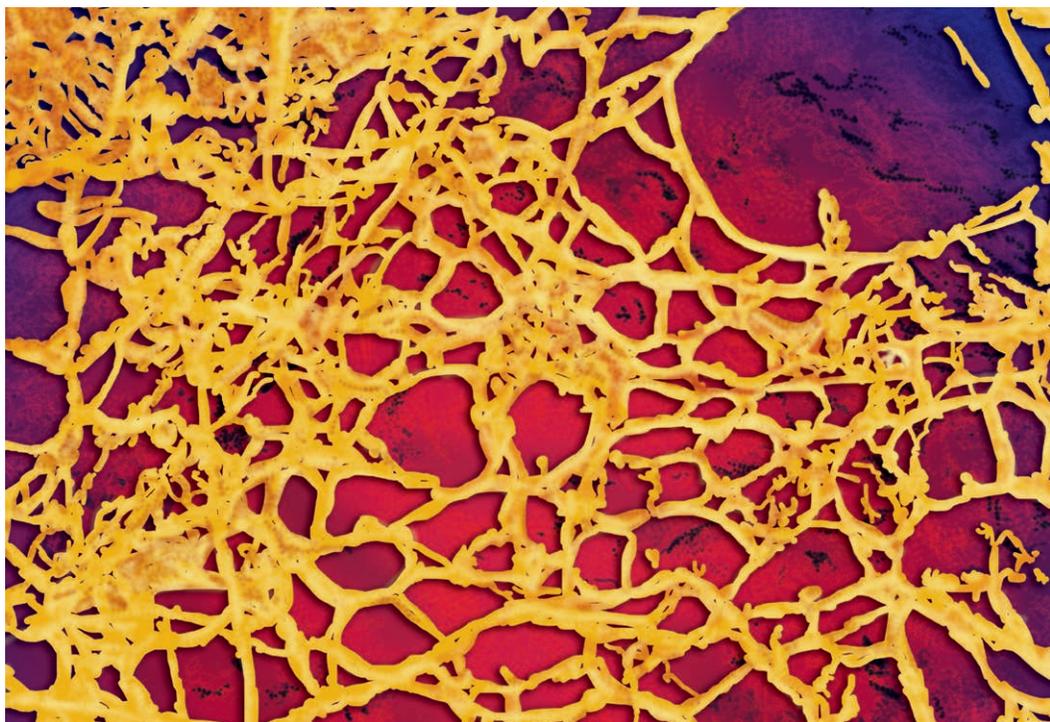


Figure 1: Electron micrograph of Corning PuraMatrix Peptide Hydrogel.

Corning PuraMatrix Peptide Hydrogel is a synthetic matrix that is used to create defined three-dimensional (3D) micro-environments for a variety of cell culture experiments. To achieve optimal cell growth and differentiation, it is necessary to determine the appropriate mixture of this material and bioactive molecules (e.g., growth factors, extracellular matrix (ECM) proteins, and/or other molecules). Corning PuraMatrix Peptide Hydrogel consists of standard amino acids (1% w/v) and 99% water. Under physiological conditions, the peptide component self-assembles into a 3D hydrogel that exhibits a nanometer scale fibrous structure (Figure 1). The hydrogel is readily formed in a Falcon® Cell Culture Dish, Plate, or Filter Permeable Support.

Corning PuraMatrix Peptide Hydrogel has been shown to promote the differentiation of hepatocyte progenitor cells,¹ rat pheochromocytoma cells (PC12),² hippocampal neurons,³ and endothelial cells.⁴ Studies have also demonstrated that Corning PuraMatrix Peptide Hydrogel supports the attachment of a variety of primary (e.g., neuronal, fibroblast, keratinocyte) and transformed (e.g., MG-63, SH-SY5Y, HEK293, NIH3T3) cell types.^{5,6} Other potential applications include stem cell proliferation, tumor cell migration and invasion, angiogenesis assays, and *in vivo* analyses of tissue regeneration.

Application Focus

Differentiation of Hepatocyte Progenitor Cells¹

Rat hepatocyte progenitor cells (Lig-8⁷) were encapsulated in Corning PuraMatrix Peptide Hydrogel and cultured overnight in defined medium at 37°C. Samples were then used for bromodioxuridine (BrdU) uptake and *in situ* immunofluorescence analyses. As shown in Figure 2, Lig-8 cells form spheroid colonies when cultured within the 3D hydrogel and express the hepatocyte markers CCAAT/enhancer binding protein α (C/EBP α) and cytochrome P450 1A1/1A2 (CYP1A1/1A2) in a manner that is independent of cellular mitotic activity. Therefore, while some cells are proliferating, the entire colony exhibits differentiation potential.

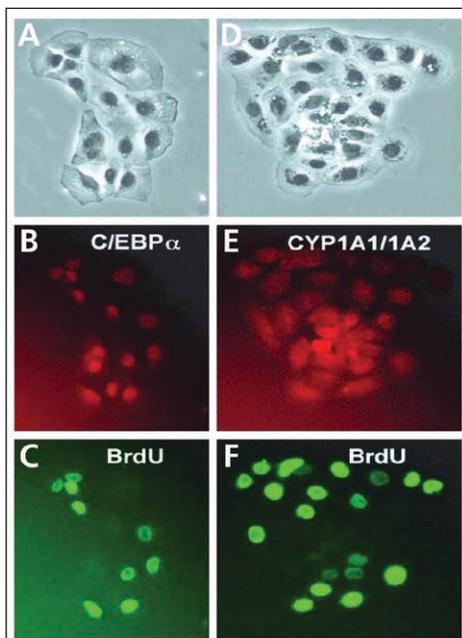


Figure 2. Lig-8 cells cultured in Corning PuraMatrix Peptide Hydrogel. All cells in spheroid colonies, arrested or not, undergo differentiation. Spheroids were isolated, transferred to adherent cultures, and incubated with BrdU for 24 hours.

- (A) spheroid colony (phase contrast)
 - (B) same optical layer as A immunostained for C/EBP α (red)
 - (C) same optical layer as A immunostained for BrdU (green)
 - (D) spheroid colony (phase contrast)
 - (E) same optical layer as D immunostained for CYP1A1/1A2 (red)
 - (F) same optical layer as D immunostained for BrdU
- Data provided by 3-D Matrix, Inc. and originally described in Reference 1.

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Corning® PuraMatrix™ Peptide Hydrogel

Features and Benefits

Purified Synthetic Peptide Composition (1% w/v)	Highly defined material that promotes cell attachment
3D Hydrogel Structure	Assembles into fibrous structure with average pore size of 50-200 nm
Easy Handling	Easily mixed with cells and/or bioactive molecules (e.g., growth factors) prior to gelation; injectable for <i>in vivo</i> studies
Transparent Hydrogel	Samples are readily visualized using standard staining methodologies and microscopy
Established Protocols	3D cell encapsulation cultures; surface plating of adherent cells on microporous membrane permeable supports and microplates; cell recovery for sub-culturing or biochemical analyses; <i>in vivo</i> injection

Characteristics

- Peptide sequence promotes cell attachment, but does not activate RGD-dependent integrin signaling
- In the presence of salt-containing solution, the peptide component of Corning PuraMatrix Peptide Hydrogel self-assembles and forms a transparent 3D hydrogel
- Biocompatible; devoid of animal-derived material and pathogens

Technical Specifications

- 1% solution (w/v) of purified synthetic peptide
- Packaged material exhibits pH = 2-4
- Quality Control:
 - Tested and found negative for bacteria, fungi, and mycoplasma
 - Cell viability ≥ 80% based on cytotoxicity analysis of NIH3T3 fibroblasts
 - Identity confirmed using Mass Spectrometry
 - Demonstration of fiber formation using a self-assembly assay

Ordering Information

Cat. No.	Description	Qty.
354250	Corning PuraMatrix Peptide Hydrogel	5 ml

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