

PuraMatrix™ Characteristics & Comparison

Scaffold Properties

PuraMatrix™ is a homogeneous ECM analog with defined sequence.

Characteristics	PuraMatrix™ Synthetic ECM	Natural ECM	Synthetic Scaffold	PuraMatrix™ Advantages
Composition	Patented 16 mer peptide in 0.5-1.0% w/v	Collagen, Fibronectin, Cadaver tissue, Basement membranes	PLA, PLGA, carbon fiber, calcium phosphate	Animal-free, reproducible cell culture & cell signaling.
Fiber Size:	7 – 10nm Diameter	5 – 10 nm Diameter	10,000 – 100,000 nm Looks 2D relative to cell	Approximates in vivo ECM nano-scale
Pore Size:	50 – 200 nm	50 – 400 nm	20,000 – 1x10 ⁶ nm	Encapsulates like ECM
Water Content:	99.5 – 99.9%	80 – 97%	60 – 80%	Better hydration & nutrient diffusion
Mechanical Strength	Low to mid, cells can migrate within it	Low to mid	Mid to High	More rapid ingrowth, breakdown

PuraMatrix™ Characteristics & Comparison

Cell Encapsulation & Handling

PuraMatrix™ is stable, injectable and customizable.

Characteristics	PuraMatrix™ Synthetic ECM	Natural ECM	Synthetic Scaffold	PuraMatrix™ Advantages
Scaffold Formation	Fibers and gel form around cells with simple addition of culture media or injection <i>in vivo</i>	Require refrigeration or complex processing	Preformed scaffolds touch to seed with cells.	Superior encapsulation allows cells to create own microenvironments and surrounding ECM.
Combination with Bioactives	Bioactives, ECM proteins can be added for tailored reproducible 3D culture	Inconsistent levels of proteins & GF	Yes, but not true microenvironments	Enables consistent, defined ECM microenvironments
Allows Cell attachment, Migration, Angiogenesis	Yes, enables anchorage dependent cell culture	Yes	Yes to a certain degree	Allows cell-cell interactions, migration and invasion assays
Sterilization	Pre-gelled filter sterilization <i>in situ</i>	Often not possible.	No gamma, often limited to ethylene oxide	Able to use filter sterilization
Injectable	Yes, will not swell beyond injected volume	Yes when chilled	No	Injectable along with cells, yet gel forms upon introduction <i>in vivo</i>
Clinical Cell Culture	Sterility and injectability enables closed system culture for bioproduction and clinical cell expansion	Animal components discouraged by FDA	Often hard to sterilize via gamma irradiation	Sterile with injectability and easy handling
Stability	Shelf stable at room temperature and across broad temperature range for at least 2 years	Natural product requires refrigeration with short shelf life	Shelf stable only while dry	Ideal stability independent of water content

PuraMatrix™ Characteristics & Comparison

Cell Recovery & Analysis

PuraMatrix™ is compatible with both research and clinical application.

Item	PuraMatrix™ Synthetic ECM	Natural ECM	Synthetic Scaffold	PuraMatrix™ Advantages
Microscopy	Transparent	Often cloudy	Often opaque	Easy visualization
Cell Recovery	Spin cells out, wash, replate or re-encapsulate	Trypsin, collagenase	Hard to recover cells without disruption	Easy cell recovery
Molecular biology	Protein monomer simple to distinguish	Composition creates background	Not compatible	Straightforward Westerns, Southern, northern
Closed System Recovery	Compatible	Sometimes	Not compatible	Requirement for clinical and bioproduction applications.

PuraMatrix™ Characteristics & Comparison

Biocompatibility

PuraMatrix™ has superior biocompatibility in vivo.

Items	PuraMatrix™ Synthetic ECM	Natural ECM	Synthetic Scaffold	PuraMatrix™ Advantages
Non-immunogenic	No discernable antibodies, foreign body response, chronic inflammation	More immune response and inflammation	Foreign body response, scarring, acidic breakdown	Superior in direct comparison studies
Biodegradable	Yes, rapid	Yes	Yes	More rapid, less material
Swelling	No by injection	No	Sometimes yes	Injection volume can be regulated
Proliferation	Weak gel & cell migration allow rapid proliferation	Undefined cell signaling	Large structure inhibits proliferation	More rapid proliferation