amsbio

For over 20 years

Your partner for Life Science

Products & services

↓

Wide range of animal, human and synthetic

Extra-Cellular Matrices (ECMs)

ECMs range and products

1/ Extra-Cellular Matrices

2/ Basement Membrane Extract (BME) and specialized proteins

3/ Specialized proteins chemically defined

4/ 3D culture

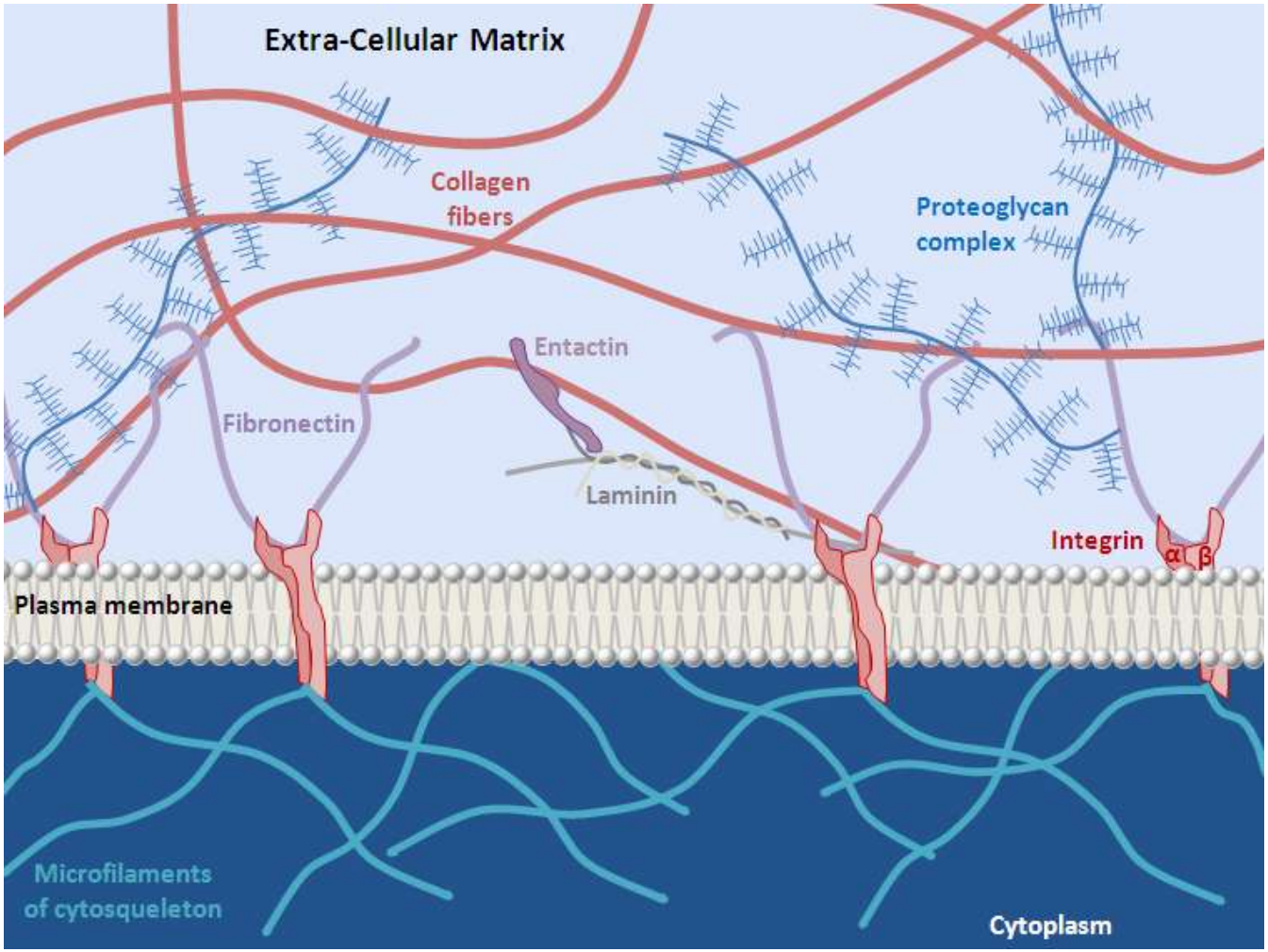
5/ Stem Cell Research

6/ Related products

What is the Extra-Cellular Matrix (ECM)?

Living environment of the cells

- Collagen
- Fibronectin
- Laminin
- Entactin
- Proteoglycans
- Glycosaminoglycans
- Vitronectin
- Elastin
- Fibrillin
- ...



Key functions of Extra-Cellular Matrix

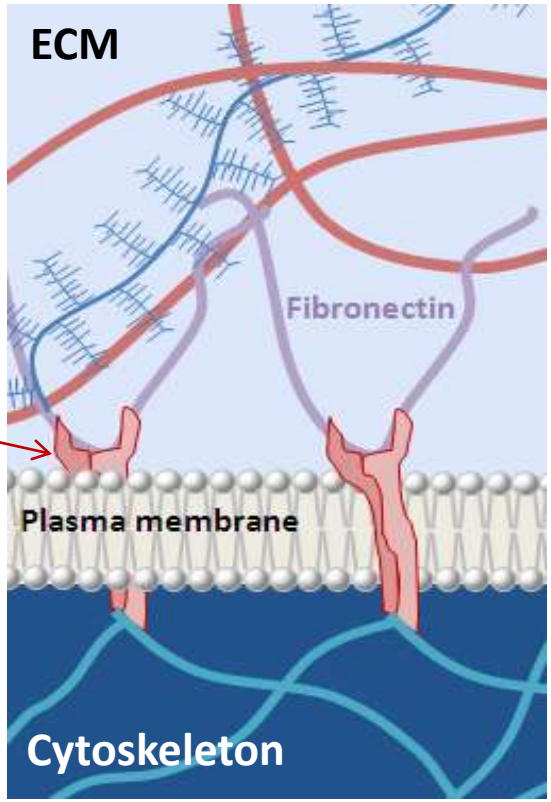
- **Mechanical support** for cells and tissues
- Influences cell development, movement and differentiation
- Reservoir for extracellular signaling molecules
- **Coordinates cellular functions** through signaling

with specific cellular adhesion receptors = **Integrins**

transmit mechanical stimuli

from the Extra-Cellular Matrix

to the cytoskeleton



Why use Extracellular Matrices?

Adhesion

Migration

Invasion

3D culture

Cell Growth and Differentiation

Angiogenesis / tube formation

Vascular permeability

Metabolism / Toxicology Studies

→

Cell Therapy Research

Regenerative Medicine

Wound Healing

Stem Cell Biology

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Basement Membranes

- Continuous layers of specialized Extra-Cellular Matrix
- **Separates two different tissue types**
- Interface between endothelial, epithelial, muscle or neuronal cells and their adjacent stroma
- **Promotes and maintains cell differentiation**
- Major **barriers** to cell invasion
- Storage depot for growth factors

BME (Basement Membrane Extract)

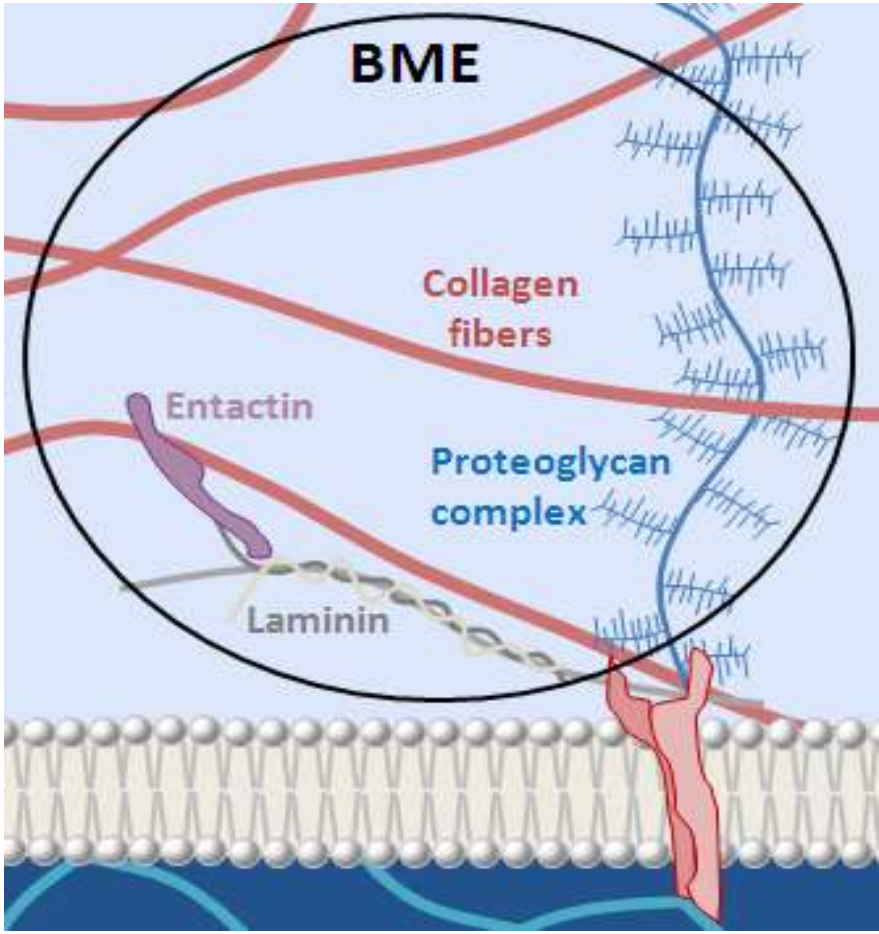
Mouse EHS sarcoma

↓

Complex

(mainly laminin, collagen IV, entactin and heparan sulfate proteoglycan).

~ Matrigel



- **Promotes and maintains specific phenotypes** in cell culture
- Shown to work on a variety of normal and cancer cells

  ↳ Primary epithelial cells, smooth muscle cells…

Multipurpose Cultrex® BME

- Qualified for angiogenesis, tumorigenicity assays, migration, growth, differentiation and neurite outgrowth assays.

- Sterility tested *(following USP XXIV chapter 71 sterility test)* and is negative for mycoplasma.

Available ⟶ reduced or non-reduced in growth factors
with phenol red or without
from 12-18 mg/ml
Also in trial sizes

! BME lots can be reserved for your research requirements !

PathClear™ BME

For work requiring **BME free from viruses, bacteria and mycoplasma** (*in vivo* murine research work) ⟶ Cultrex BME **PathClear™**

- Additionally tested by PCR : **Clear of 31 pathogens and viruses** (including LDEV)
- Each lot is rigorously qualified in biological performance assays

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For use in applications requiring **higher protein concentrations** (*in vivo* angiogenesis assays and tumorigenicity assays)

⟶ Cultrex High Protein Concentration **BME HC20+™** , PathClear™

- Lot-to-lot consistency and controlled protein concentrations (> 20 mg/ml)

Cultrex™ Specialty Proteins

For more defined culture systems

→ Wide range of **purified extracellular matrix proteins** for cell attachment

↓

Mimic the *in vivo* environment

Maximize cellular activity

- Collagen I (Rat or Bovine origins)
- Collagen IV (Mouse origin)
- Fibronectin (Bovine origin)
- Laminin (Mouse origin)
- Vitronectin (Bovine origin)
- Poly-L-lysine (synthetic compound)

Differences in the composition of the extracellular matrix depending on the **tissue** and **species source** :

- Alterations in the **tumor microenvironment**
- The normal human cellular response may be impacted by **mouse-specific proteins**

For xeno-free culture conditions (Regulatory issues)

Human placenta
↓
purification
↓
BME

Human plasma
↓
purification
↓
Fibronectin, Vitronectin

Laminin in development

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MAPTrix systems

For cell attachment, spreading and growth

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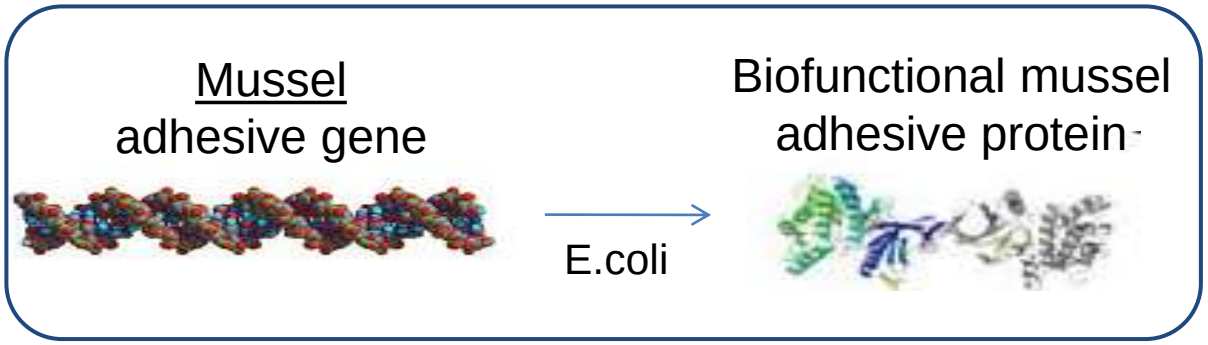
Simplify the manipulation of biological samples for a number of *in vitro* techniques

(in situ hybridization, immunoassays, establishing primary cells in culture…)



- ✓ Chemically Defined
- ✓ **Animal-Free**
- ✓ **No species specificity**
- ✓ **Adhere to USP guidelines**

✓ Low endotoxin and no E.coli derived protein

✓ Tested negative for bacteria, fungi and 209 species of mycoplasma

The mussel adhesive protein confers biocompatible adhesion to a **wide variety of surfaces**

↳ plastic, glass, metal and biological materials

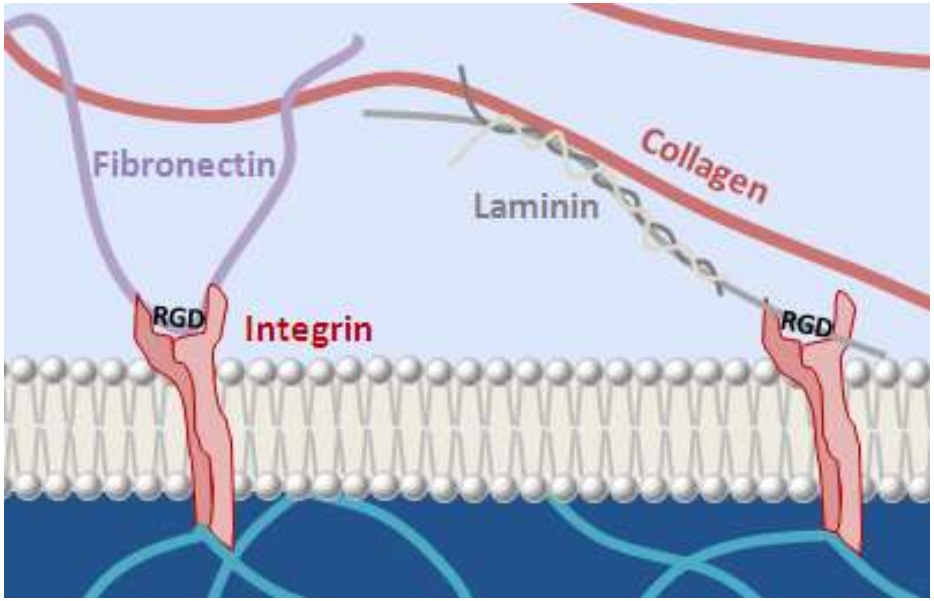
Biofunctional surfaces

Cell adhesion to ECM ligands is primarily mediated by **integrins**

Arg-Gly-Asp (RGD) recognition motif

↓

present in many ECM proteins



Mimic the extracellular matrix, bind adhesion receptors and promote cell adhesion

Biofunctional surfaces

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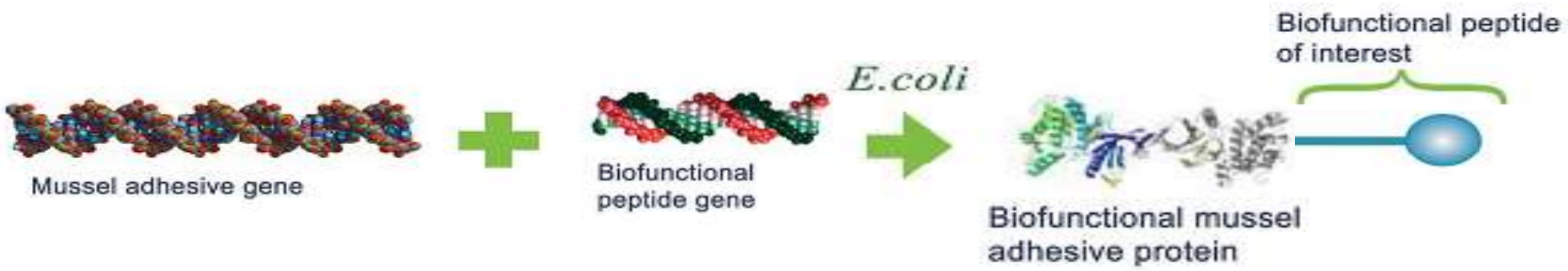
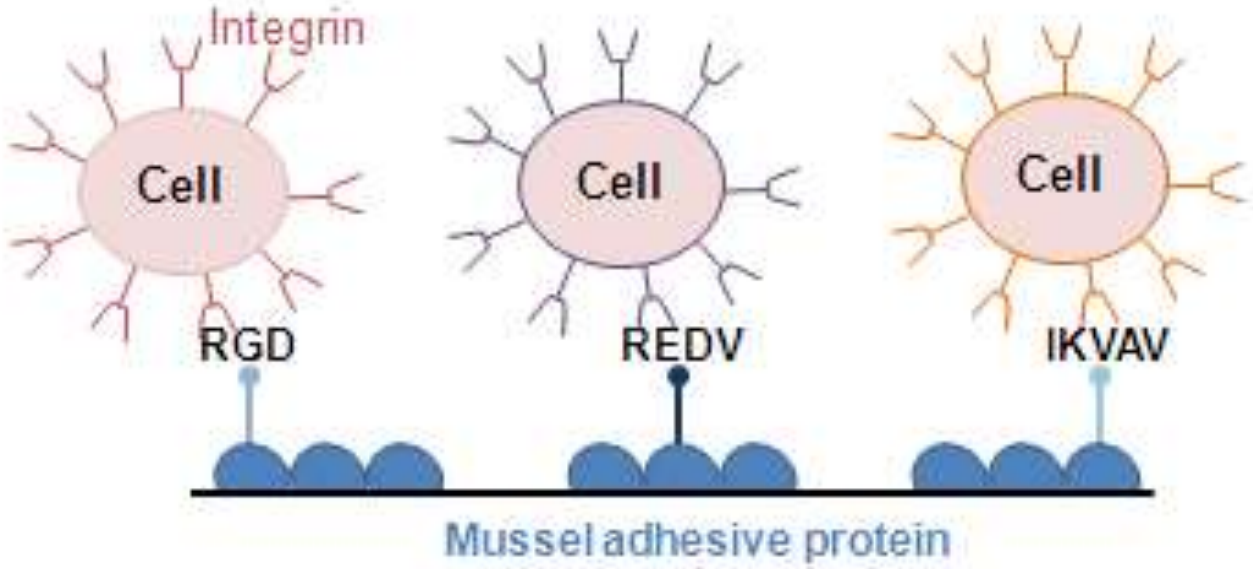
Immobilization of short peptides / synthetic materials



MAPTrix Recombinant Matrices



- **Simple**
- **Convenient**
- Highly **reproducible**
- **Lot-to-lot consistency**
- **Soluble**

In a variety of buffers (including water)

Under a wide range of pH (pH= 2.0 - 9.5)

MAPTrix®- **Fibronectin**	**10** recognition motifs (GRGDSP, REDV…)
MAPTrix®- **Collagen**	**9** motifs (Type I and IV derived)
MAPTrix®- **Laminin**	**9** motifs (IKVAV, YIGSR…)
MAPTrix®- **Vitronectin**	**2** motifs (KKQRFRHRNRKGYRSQ…)

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2D vs 3D cultures

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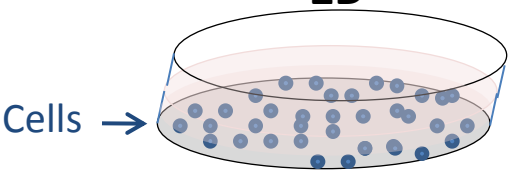
2D

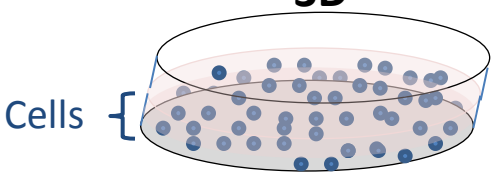


altered

↓

Morphology, function, proliferation, gene expression…

3D



Recapitulate the tissue microenvironment

~ in vivo

↓

Structure (apical/basal polarity), function, biological and biochemical characteristics

Major **variables** associated with 3D culture

- Cell type
- Cell seeding density
- Composition of cell culture medium
- Time of culture
- Thickness, stiffness and **composition of 3D matrices**

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Reconstituted basement membranes / purified proteins / synthetic peptides

3D cell culture Matrices

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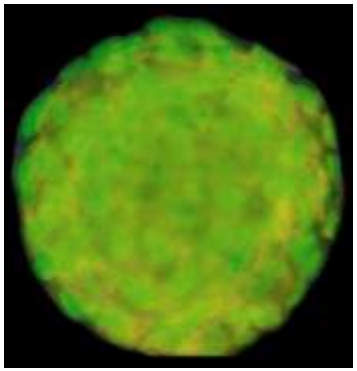
• Animal products :

Cultrex® 3-D BME (No Phenol Red, Reduced Growth Factor)

Cultrex® 3-D Laminin

Cultrex® 3-D Collagen I



Lot tested with supporting data ⟶ Cell Polarity, Proliferation, Morphology...

• Synthetic 3D reagents :

MAPTrix™ ECM + MAPTrix™ Link = (PEG)

MAPTrix® Hygel- Laminin (4 motifs)

MAPTrix® Hygel- Fibronectin (3 motifs)

MAPTrix® Hygel- Collagen (2 motifs)

MAPTrix® Hygel- Vitronectin (2 motifs)

❖ **No animal** derived components

❖ Easily **engineer the elasticity and/or the pore size** of the hydrogel by adjusting the concentration of MAPTrix™ ECM or MAPTrix™ Linker

❖ Modular : a single MAPTrix™ ECM / a combination of MAPTrix™ ECM products

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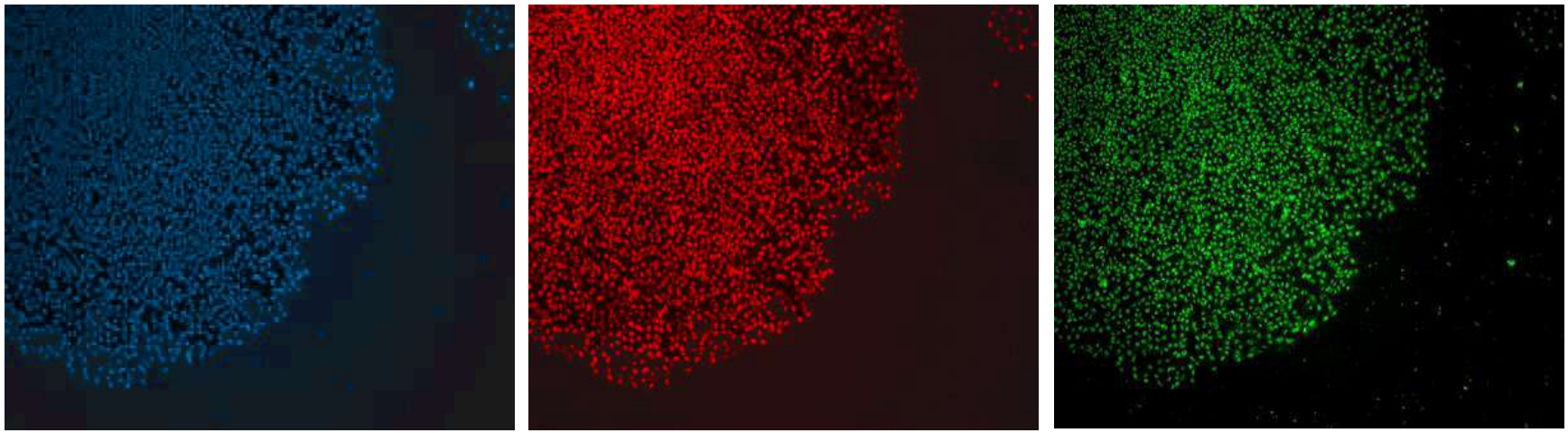
1/ Keep undifferentiated

Cultrex Basement Membrane Extract (BME), PathClear®, **Stem Cell Qualified**

H9 human embryonic stem cells*
after four passages in **Cultrex Stem Cell Qualified BME**

Immunostaining



DAPI

non-differentiated stem cell markers

Oct-4

Nanog

*Angel M, Yanik MF (2010) PLoS ONE
Innate Immune Suppression Enables Frequent Transfection with RNA Encoding Reprogramming Proteins.
Images courtesy of the Yanik lab, **MIT** *www.rle.mit.edu/bbn*

Mesenchymal Stem Cells (MSC) —cultured with specific growth factors→ Adipocytes, Chondrocytes, Osteoblasts...

2/ Promote differentiation

ECM may be capable of inducing **growth factor-like signaling**

Mesenchymal Stem Cells —2 months *in vivo* culture; MAPTrix™ Collagen mimetic, GPKGAAGEPGKP (derived from collagen α1)→ Adipocytes

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Wide range of kits (*in vitro* / *in vivo*)

- **Adhesion** - CultreCoat assays - 24 and 96 wells

  BME, Collagen I, Collagen IV, Laminin I, Vitronectin, Fibronectin, uncoated

- **Migration** - ORIS kits - 24, 96 and 384 wells

  BME, Laminin, Collagen I, tri-coated, uncoated

- **Invasion** - Cultrex and ORIS kits - 24 and 96 wells

  BME (≠ concentrations), Laminin, Collagen I, Collagen IV

- **Proliferation** - Cultrex 3D culture assays - 96 wells

  BME, Laminin, Collagen I and without matrix

- **Cell Harvesting** - Cultrex 3D Culture Kit (20 tests)

- **Angiogenesis** - DIVAA *in vivo* angiogenesis kits

  Cultrex *in vivo* Tube Formation

  Cultrex Endothelial Cell Invasion

Happy customers

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NOVARTIS

UCL University College London

Pfizer

cnrs

AstraZeneca

CANCER RESEARCH UK

MAX-PLANCK-GESELLSCHAFT

sanofi aventis

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