gelomics
3D cell culture technologies

Life in 3D

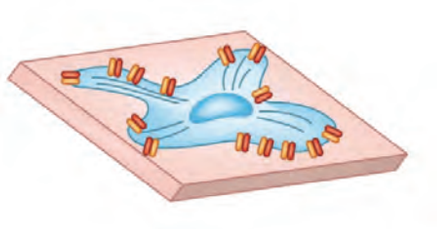
The next generation of cell culture

LunaGel™ 3D Tissue Culture System
Ready-to-use Photocrosslinkable Extracellular Matrix Kits for 3D Cell and Organoid Culture

Forced Phenotypes

The Problem with Current Cell Culture Systems

Tens of thousands of academic and industrial laboratories apply cell culture to study the biology of cells that regulate health and disease, to identify and develop new drugs, and even find ways to grow replacement tissues for implantation. But there is a major problem with the way cells are cultured in most laboratories. Cells are grown on flat, unphysiologically stiff materials such as polystyrene and glass, causing them to display aberrant behaviours: flattened shape, abnormal polarisation, altered response to pharmaceutical reagents, and general loss of phenotype. Although scientists agree that traditional cell culture methods fail to recapitulate the native cellular microenvronment, there is a lack of easy-to-use and widely applicable systems that are capable of recreating such environments in the laboratory while providing consistent properties from batch-to-batch.



Conventional 2D cell culture on plastic or glass surfaces leads to aberrant cellular phenotypes and misleading data [1]

LunaGel™ Extracellular Matrix Kits

Growing Tissues rather than just Cells

LunaGel™ is a photocrosslinkable hydrogel cell culture system that recreates the natural extracellular matrix (ECM) surrounding cells in the human body, allowing researchers to grow three-dimensional microscopic tissues, rather than just cells on plastic surfaces. The major components of LunaGel™ include native ECM proteins such as collagen type I, III, IV, and V, as well as connective tissue glycoproteins and proteoglycans. LunaGel™ retains the intrinsic cell-instructive bioactivity of natural ECMs, facilitating cell attachment, proliferation, differentiation, migration, and proteolytic degradation.

Tunable Extracellular Matrix
Vary light exposure duration to easily adjust matrix stiffness

Easy And Fast
Create 3D cell culture models in <15 mins

Consistent Quality
Our manufacturing and quality control procedures ensure consistent properties

Bioactive Motifs
LunaGel™ ECM contains cell-instructive motifs and attachments sites

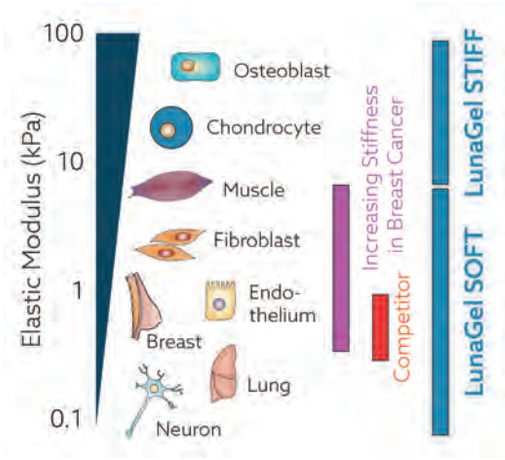
Proteolitic Degradability
Cells can cleave the LunaGel™ ECM

Biocompatibility
The LunaGel™ ECM is compatible with a large variety of cells types

To Each Their Own

ECM Stiffness Matters

All cells in the human body are exposed to mechanical forces which regulate cell function and tissue development and each cell type is specifically tuned to the mechanical properties of the tissue it resides in. Neuronal cells, for example, require a very soft matrix similar to brain tissue in order to thrive, while cartilage or bone cells require much stiffer environments[1]. The matrix properties of human tissues can also change with disease and in turn facilitate its progression.
For example, normal mammary epithelial cell growth, survival, differentiation and morphogenesis are well-supported by interaction with a soft matrix similar to normal breast tissue stiffness. Following transformation during breast cancer, however, the tissue becomes progressively stiffer[2] and tumour cells become significantly more contractile and hyper-responsive to matrix mechanical cues, ultimately driving epithelial to mesenchymal transition (EMT) and metastasis[3,4,5]. Evidently, the importance of matrix elasticity is increasingly being studied and ECM stiffness has been shown to regulate stem cell differentiation[1,6], cell migration[7], epithelial to mesenchymal transition (EMT)[3], the induction of malignant cancer phenotypes[8], cell spreading and adhesion[9], calcium signalling, and many more pathophysiological and physiological cellular events.



Cells are tuned to the material properties of their native matrix.

LunaGel™ uses

VISIBLE LIGHT POLYMERIZATION

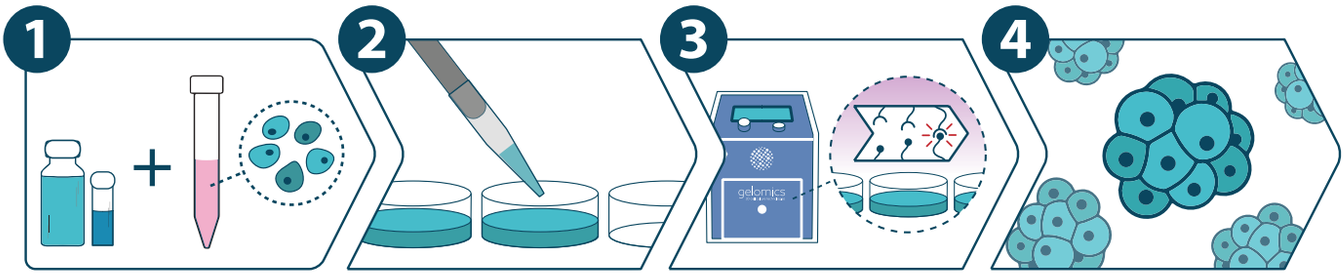
to create 3D cell culture models with physiological stiffness

The LunaCrosslinker™ enables cell-friendly photocrosslinking

How it works

Create Tuneable 3D Cell Culture Assays in a Matter of Minutes

Creating 3D cell culture models has never been simpler! A chemical modification allows the LunaGel™ ECM to be crosslinked by exposure to blue light in the LunaCrosslinker™, creating cell culture models that closely mimic natural microenvironments. LunaGel™ ECMs are available as low stiffness (0 - 6.5 kPa) and high stiffness (0 - 25 kPa) formulations, enabling researchers to easily replicate the mechanical properties of various tissue types in healthy and diseased states. The LunaGel™ hydrogel system is transparent, permeable, and compatible with standard imaging systems. ECM stiffness can be adjusted to by varying the light exposure duration in the LunaCrosslinker™ to replicate physiological conditions of different healthy and diseased tissues.



Add cells to LunaGel™ solution

Dispense

Photocrosslink in LunaCrosslinker™

Let the cells do the rest!

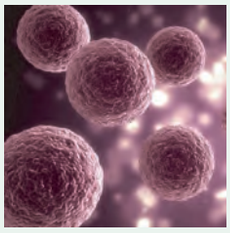
10 - 15 min

3 - 7 days

LunaGel™ Photocrosslinkable Extracellular Matrices in Action

Application Examples of LunaGel™

The applications of LunaGel™ are vast and span 3D cell culture, 3D biofabrication, high throughput manufacture and screening, drug delivery and many more. Below are just a few examples of what LunaGel™ ECM can be used for.

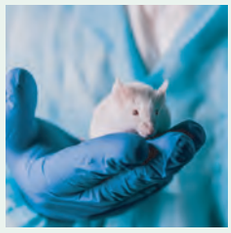


Photocrosslinkable ECM

3D Cell Culture
Organoid Culture
Tissue Engineering
Advanced Biomanufacturing

Automation Compatible

Automated Liquid Handling
High Throughput Screening
Migration Assays
Invasion Assays
Angiogenesis Assays



Animal Studies

Biocompatibility
Biodegradability
Controlled ECM for Cell Delivery

Controlling Matrix Stiffness by Light Exposure Duration

The LunaGel™ ECM offers unprecedented control over matrix stiffness covering a substantially larger range than any of the competitor products on the market. LunaGel™ ECMs employ a cell-friendly, rapid photocrosslinking process, allowing researchers to fine-tune the elastic modulus for different applications with just a few minutes of light exposure (Figure 1). Competitor products such as basement membrane extracts or collagen rely on lengthy thermal gelation for curing (30 – 60 min) and produce matrices with elastic modulus limited to < 1 kPa which are unphysiological for most common cell types.

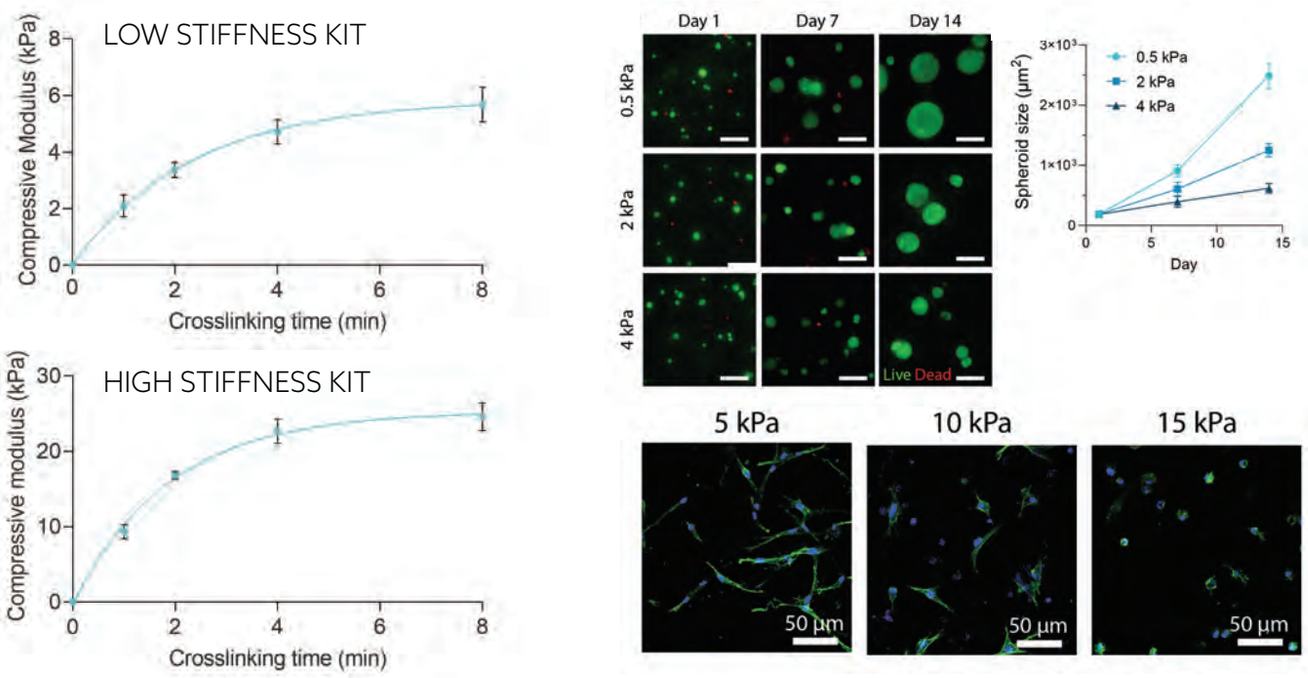


Figure 1: LunaGel™ Extracellular Matrices allow precise control over mechanical properties and cell response.

LunaGel™ (a) low and (c) high stiffness samples were crosslinked by exposure to visible light in the LunaCrosslinker™. Matrix stiffness regulates (b) MCF-7 Breast Cancer Spheroid growth and (d) human Mesenchymal Stem Cell morphology.

Cancer Spheroid/Organoid Culture

A number of recent high-impact papers have demonstrated that primary tumour growth, epithelial-to-mesenchymal transition (EMT), and metastasis are regulated by ECM stiffness. LunaGel™ is the ideal product to allow users to adjust the ECM stiffness according to our predefined protocols. LunaGel™ has been successfully used to culture a large variety of commonly used cancer cell lines derived from breast cancer (MCF-7, MDA-MB-231), prostate cancer (LNCaP, PC3), ovarian cancer (OV-MZ-6), liver cancer (HUH-7, C3A) and melanoma (SK-MEL-28, WM35). Below are some examples of microtumours formed by commonly used prostate and breast cancer cell lines (Figure 2).

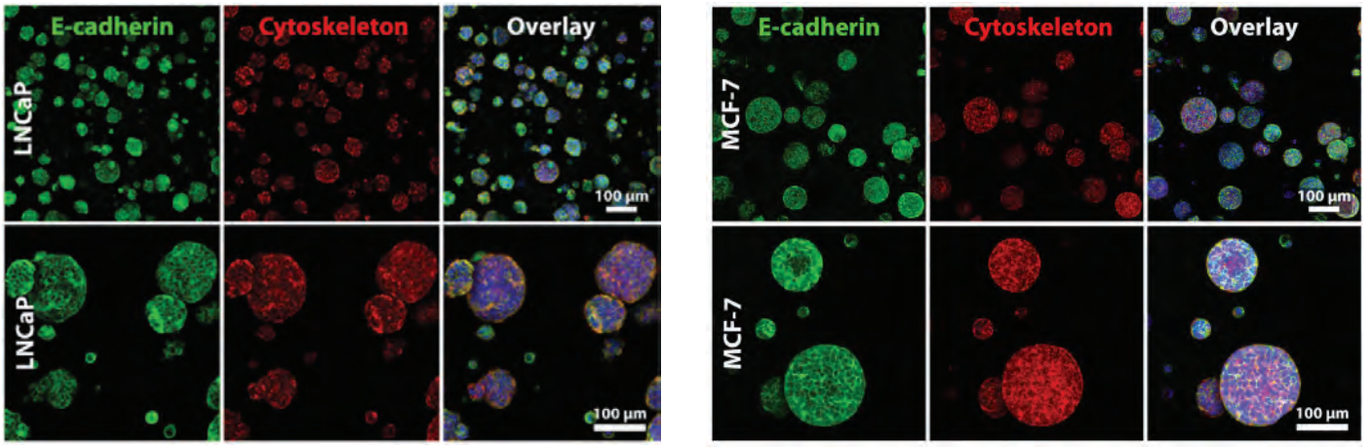


Figure 2: Representative images of cancer spheroids generated in LunaGel™ SOFT *(Meinert, et al, Prostate Cancer, 2018).*

(A) LNCaP prostate cancers cells and (B) MCF-7 breast cancer cells were encapsulated in LunaGel™ (3 kPa) and cultured under standard conditions for 14 days, followed by fixation with 4% PFA and immunofluorescence staining for E-Cadherin (green) and actin (red).

LunaGel™ ECMs are the ideal substrate to study EMT processes *in vitro*. The below images demonstrate that MDA-MB-231 breast cancer cell phenotypes are highly regulated by ECM stiffness. After 7 days of culture on LunaGel™ substrates replicating breast tissue in different states of pathology, it becomes apparent that cell invasiveness increased as a function of ECM stiffness, corroborating clinical data suggesting preferential occurrence of metastasis in breast cancer with higher tissues stiffness. A shift towards more migratory cell morphologies associated with metastasis (magnified inserts) was observed with increasing LunaGel™ ECM stiffness.

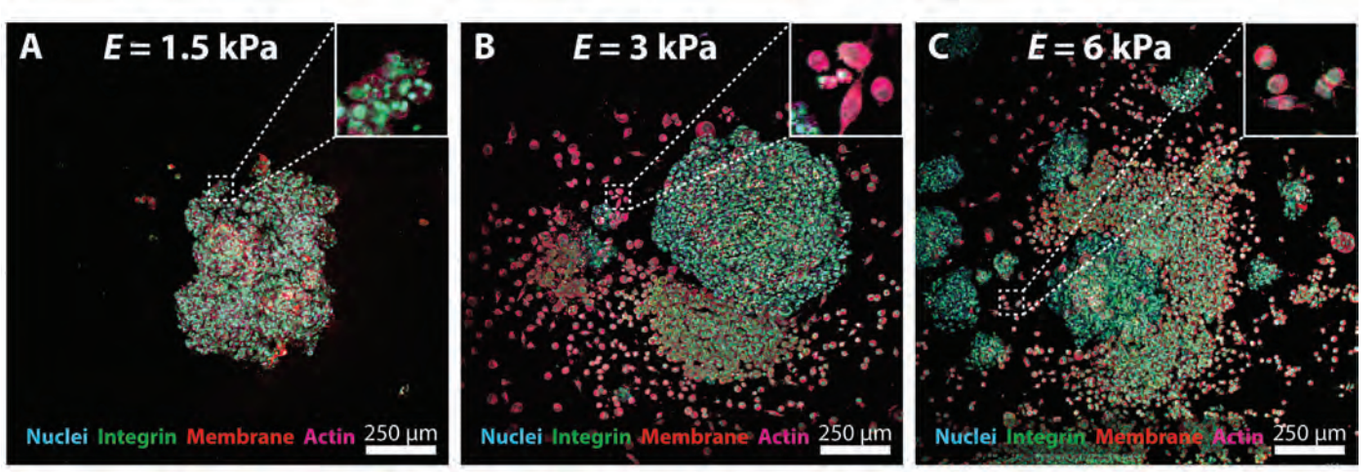


Figure 3: MDA-MB-231 breast cancer cell invasiveness increases with ECM stiffness.

MDA-MB-231 spheroids were cultured on LunaGel™ Bovine Gelatin - Low Stiffness ECM with compressive moduli of (A) 1.5 kPa, (B) 3 kPa, and (C) 6 kPa to mimic the mechanical properties of healthy breast tissue, as well as breast tissue with early stage and late stage cancer, respectively, for 7 days.

Inducing physiological gene expression patterns in human hepatoma-derived (C3A) cells

Liver cells express a variety of iron regulators including transferrin receptor (TFRs) and metallothioneins (MTs) *in vivo*. However, the expression of these genes is largely lost during *in vitro* 2D monolayer culture, limiting the value of current laboratory models. Figure 4 demonstrates that the expression of key marker genes including TFR1, TFR2, and MT2 is significantly higher in LunaGel™ ECM compared to monolayer and Matrigel culture (the current market leader in 3D cell culture products), showing that in LunaGelTM, the liver cells are better retaining their characteristic phenotype compared to Matrigel. Furthermore, it is demonstrated that the expression of these genes is regulated by ECM stiffness, suggesting that disrupted iron homeostasis *in vivo*, such as hemochromatosis which is often observed in hepatocellular carcinoma patients, may be induced by changes in the ECM properties during cancer progression.

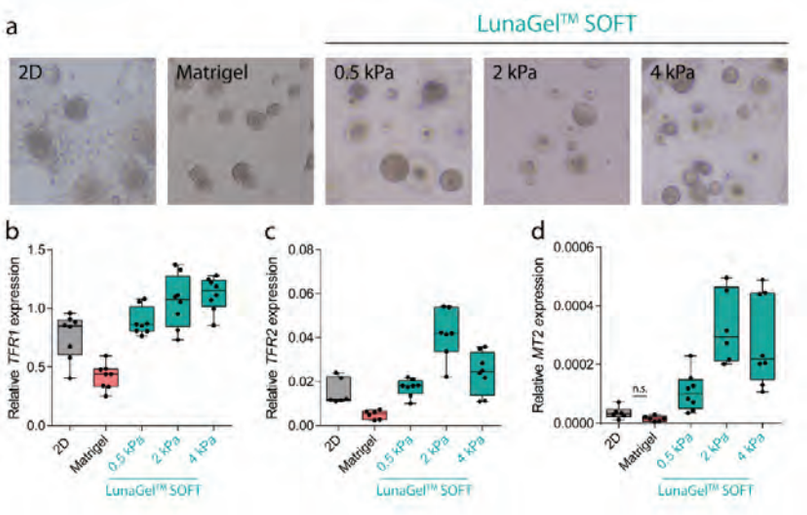


Figure 4: C3A liver cells cultured in LunaGel™ show varying levels of iron regulator gene expression depending on matrix stiffness

(a) Representative brightfield images of C3A cells after 6 days of culture in 2D monolayer, Matrigel, and LunaGel™ at varying ECM stiffness. Spheroids formed in LunaGel™ appear more regular and spherical compared to Matrigel. The expression of (b) TFR1, (c) TFR2, and (d) MT2 at day 6 was highest in LunaGel™ cultures and further regulated by ECM stiffness.

Investigating the effects of IGF-I:IGFBP-3:VN trimeric complexes on melanoma spheroid growth

The LunaGel™ ECM offers unprecedented control over matrix stiffness covering a substantially larger range than any of the competitor products on the market. LunaGel™ SOFT employs a cell-friendly, rapid photocrosslinking process, allowing researchers to fine-tune the elastic modulus between 0.1 and 10 kPa within just a few minutes of light exposure (Figure 1). Competitor products such as basement membrane extracts or collagen rely on lengthy thermal gelation for curing (30 – 60 min) and produce matrices with elastic modulus limited to < 1 kPa which are unphysiological for most common cell types.

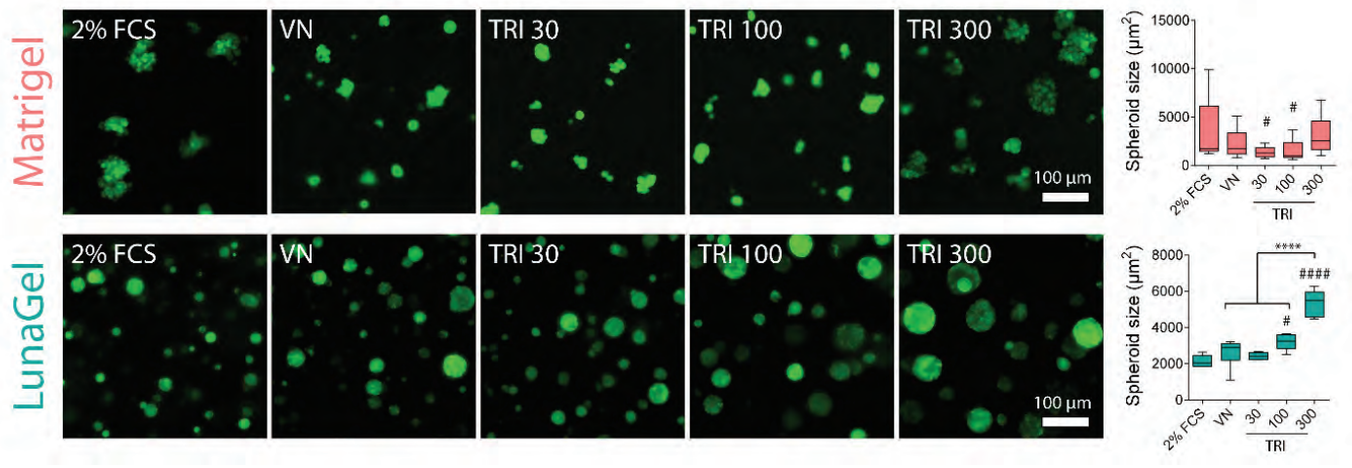


Figure 5: IGF-1:IGFBP-3:VN (TRI) complex stimulates the growth of melanoma spheroids in LunaGel™ ECM *(Murekatete, et al, Scientific Reports, 2018).*

SK-MEL-28 cells were seeded onto Matrigel™ or encapsulated in LunaGel™ (5 kPa). On day 14, cells were stained with FDA for visualisation and spheroid size assessment. TRI 30 = 1 ng/mL VN + 30 ng/mL IGF-I + 90 ng/mL IGFBP-3; TRI 100 = 1 ug/mL VN + 100 ng/mL IGF-I + 300 ng/mL IGFBP-3; TRI 300 = 1 µg/mL VN + 300 ng/mL IGF-I + 900 ng/mL IGFBP-3. n = 6 (2 technical repeats, 3 experimental repeats); # $p < 0.05$ compared to 2% FCS, #### $p < 0.0001$ compared to 2% FCS; **** $p < 0.0001$.

Drug Screening and Development – 2D vs 3D cell culture in LunaGel™

LunaGel™ ECM facilitates drug-response studies that are highly predictive of the *in vivo* situation. Below is an example of MCF-7 breast cancer spheroids subjected to a chemotherapeutic agent (Abraxane/human serum albumin-conjugated paclitaxel). While Abraxane treatment led to almost complete loss of viability in monolayer cultures, the metabolic response and viability of MCF-7 cells, a cell line derived from non-metastatic breast tumours, was more similar to *in vivo* responses when cultured in LunaGel™ (Gurski et al., 2010),(Hongisto et al., 2013) (Figure 6). Interestingly, Abraxane treatment of metastatic MDA-MB-231 breast cancer cells led to a substantially larger decrease in metabolic activity and viability, as well as a loss of metastatic cellular morphologies. The difference in cell response between MCF-7 and MDA-MB-231 cells may be related to the variances in growth and migration patterns. MCF-7 cells form tumour-like spheroids which may hinder the penetration of the drug to the cells in the spheroid core. MDA-MB-231, on the other hand, are metastatic and highly migratory, and hence often exist as single cells rather than cell clusters, in turn leading to higher drug efficiencies. Indeed, this finding is corroborated by clinical studies which clearly demonstrate more effective treatment of metastatic cancers with Abraxane compared to primary tumours, ultimately leading to the admission of Abraxane for metastatic breast cancer treatment. Ultimately, our data demonstrates the benefits of using LunaGel™ 3D assays over traditional monolayer cultures, which incorrectly predicted a high efficiency of Abraxane treatment on both, MCF-7 and MDA-MB-231 cells.

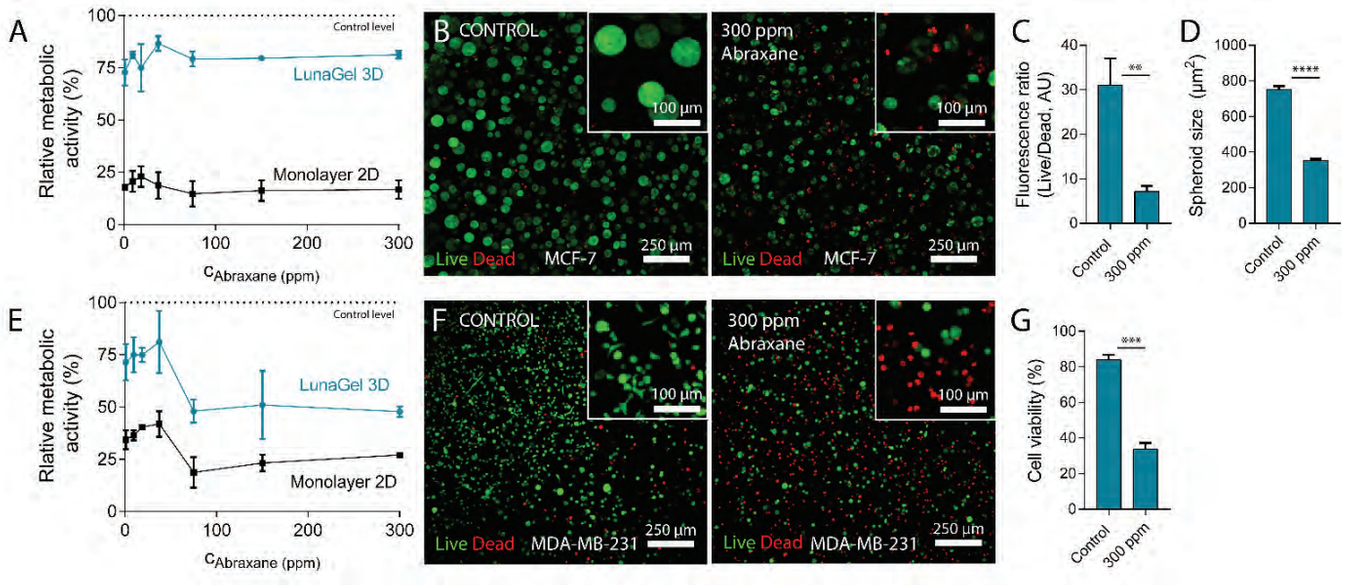


Figure 6: Response of MCF-7 and MDA-MB-231 breast cancer cells to Abraxane treatment.

Relative metabolic rate of (A) MCF-7 and (E) MDA-MB-231 breast cancer cells encapsulated in LunaGel™ SOFT and monolayer cultures following 3 days of treatment with varying concentrations of Abraxane (metabolic response of treated groups was normalised to untreated controls). Viability and spheroid/cell morphology of (B) MCF-7 and (F) MDA-MB-231 cells in untreated cultures (control) and following treatment with 300 ppm Abraxane. Quantification of (C) relative integrated fluorescence intensities (live/dead) and (D) spheroid size revealed cytotoxic effects of Abraxane treatment in embedded MCF-7 cultures. (G) Treatment of MDA-MB-231 cells reduced cell viability by > 50% compared to controls.

Drug Screening and Development – Automated Determination of IC50 Values of Anticancer Drugs

The IC50 is a quantitative measure that indicates how much of a particular inhibitory substance (e.g. drug) is needed to inhibit a given biological process or biological component by 50%. In this study, our collaborators have used automated liquid handling to produce LunaGel™ 3D cell culture samples with MDA-MB-231 breast cancer cells. The effect of paclitaxel, a chemotherapeutic agent, was studied using high-throughput screening approaches used in pharmaceutical industry. The ability to use LunaGel™ with high-throughput techniques is a clear advantage over other 3D cell culture platforms like Matrigel.

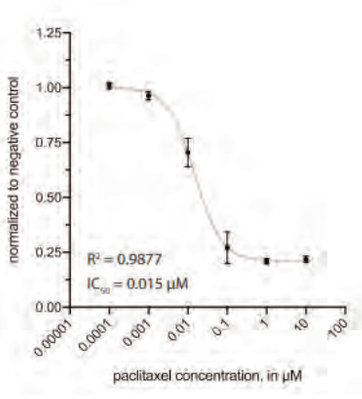


Figure 7. Determination of the IC50 of paclitaxel using LunaGel™ (Eggert, et al, unpublished data, 2020)

MDA-MB-231 breast cancer cells were cultured in LunaGel™ (5 kPa) for 7 days, and incubated with different concentrations of paclitaxel for 120 h. Metabolic activity was assessed using automated oxygen consumption measurements.

Cell Delivery/Animal Experiments

LunaGel™ products can also be used for *in vivo* implantation allowing the investigation of, for example, the effects of ECM stiffness on EMT and cancer metastasis. Figure 8 demonstrates that delivery of LunaGel™-embedded luciferase-labelled OV-MZ-6 ovarian cancer cells led to primary tumour formation and metastases in mice. Treatment with the drug Paclitaxel (similar to Abraxane) led to decreased tumour burden, and, in particular, reduced incidence of metastases, similar to the *in vitro* studies shown above.

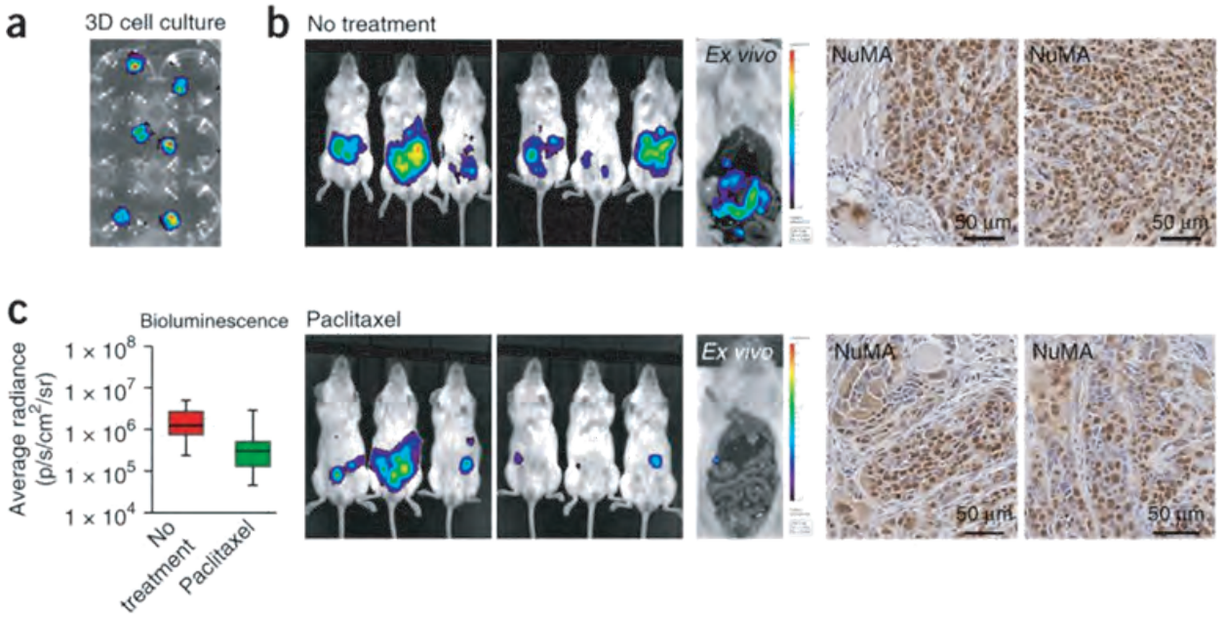


Figure 8: Application of LunaGel™ as cell delivery vehicle in an intraperitoneal animal model *(Loessner, et al, Nature Protocols, 2018)*.

(a) Luciferase-transduced ovarian cancer cells (OV-MZ-6) were encapsulated in LunaGel™ and bioluminescence indicative of spheroid formation was confirmed at day 14 of *in vitro* pre-culture. (b) Bioluminescence imaging confirmed substantial tumour formation 8 weeks following implantation and *ex vivo* imaging of the peritoneal organs indicated the presence of metastases. Human-derived tumour load was confirmed by positive staining for human-specific nuclear mitotic apparatus protein 1 (NuMA). (c) 4 weeks following implantation, mice were treated with intraperitoneal paclitaxel injections (10 mg/kg administered twice per week) over 4 weeks, leading to decreased tumour load and metastases.

Tube formation/angiogenesis assays

LunaGel™ ECM has successfully been applied for the *in vitro* generation of capillary-like networks formed by primary endothelial cells (human umbilical vein endothelial cells, HUVECs) and pericytes (primary human mesenchymal stem cells, MSCs) (Figure 9). In contrast to existing tube formation assays in Matrigel, capillary-like structures can be generated by embedded cells (true 3D environment), as opposed to seeding cells on top of the hydrogel, and in addition, are stable for much longer (up to 20 days compared to 1-2 days in Matrigel). When cultured in specialised microfluidic chips, LunaGel™-embedded HUVECs/MSCs form perfusable capillaries capable of replicating physiological blood flow conditions (Figure 9).

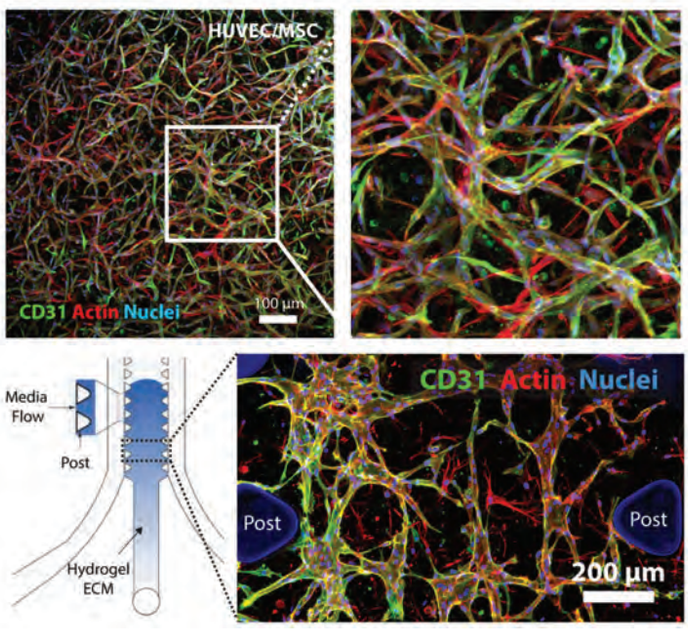


Figure 9: Capillary-like network formation of HUVECs and MSCs in LunaGel™ SOFT

(A) HUVECs and MSCs were cultured in LunaGel™ SOFT (0.8 kPa) in the presence of VEGF, SDF-1, and FGF-2, fixed with 4% PFA and stained for endothelial cell marker CD31 (green) and actin (red). (B) HUVEC/MSC cultured in LunaGel™ SOFT form perfusable capillary networks in microfluidic chips.

Engineering anisotropic muscle tissue

Myoblasts (C2C12) encapsulated in LunaGel™ form functional myotubes – microscopic muscle fibres that spontaneously start twitching as they mature. In this study, myoblasts suspended in LunaGel™ pre-cursor solutions were first patterned to form lines using standing ultrasound waves, followed by photocrosslinking of the LunaGel™ matrix. This process "locked" the cells in place, allowing them to form into highly aligned muscle fibres that express key markers of skeletal muscle tissue (Figure 10) and twitch, just like real muscles.

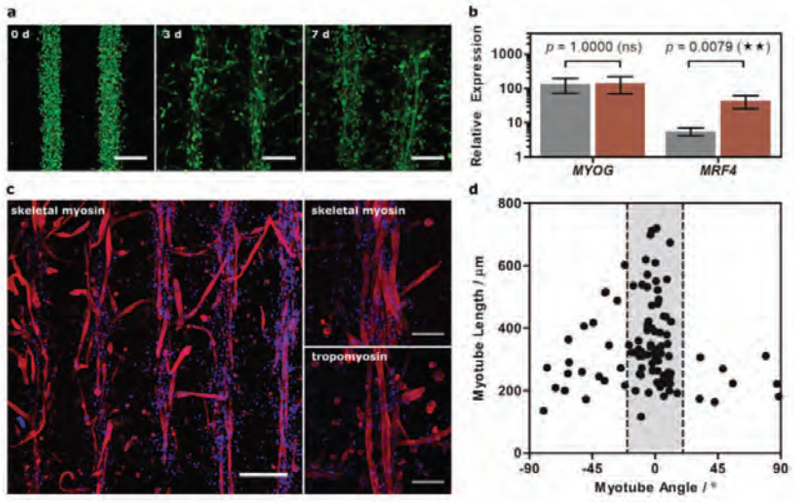


Figure 10: Engineered ultra-sound pat terned muscle tissue in LunaGel™ *(Armstrong, et al, Advanced Materials, 2018)*

(a) Confocal images of patterned myoblasts stained with Calcein over 7 days of culture. (b) Relative gene expression of skeletal muscle markers MYOG and MRF4 in unpatterned (grey) and patterned (red) tissues. (c) Immunostaining for skeletal muscle markers (red) and cell nuclei (blue) at day 7. (d) Myotube length as a function of orientation angle.

3D Bioprinting/Advanced Biomanufacturing

Bioprinting – the spatially controlled deposition of cells in so-called bioinks (hydrogels) using specialised 3D printing systems - is a hot topic in research. Bioprinting holds promise for the engineering of functional tissues and advanced 3D cell culture models. Below are some examples of LunaGel™ used as an advanced bioink for 3D printing.

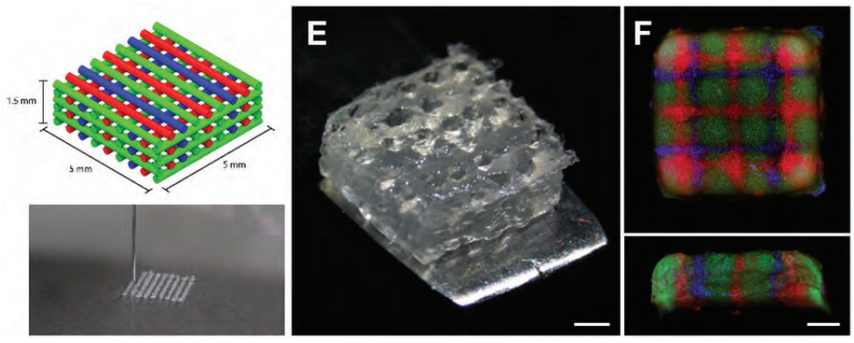


Figure 11: Bioprinting of LunaGel™ ECM.

LunaGel™ ECM was allowed to gelate at room temperature and extruded through a G20 needle using a Gesim BioScaffolder printing system.
To demonstrate the capability of precise deposition of multiple cell types in one print, fluorescent beads of different colours were embedded in the LunaGel™ matrix.

Bioprinting of cells embedded in LunaGel™, in this example human periodontal ligament fibroblasts, retains cell viability and facilitates the spreading, migration, and proliferation of embedded cells (Figure 12).

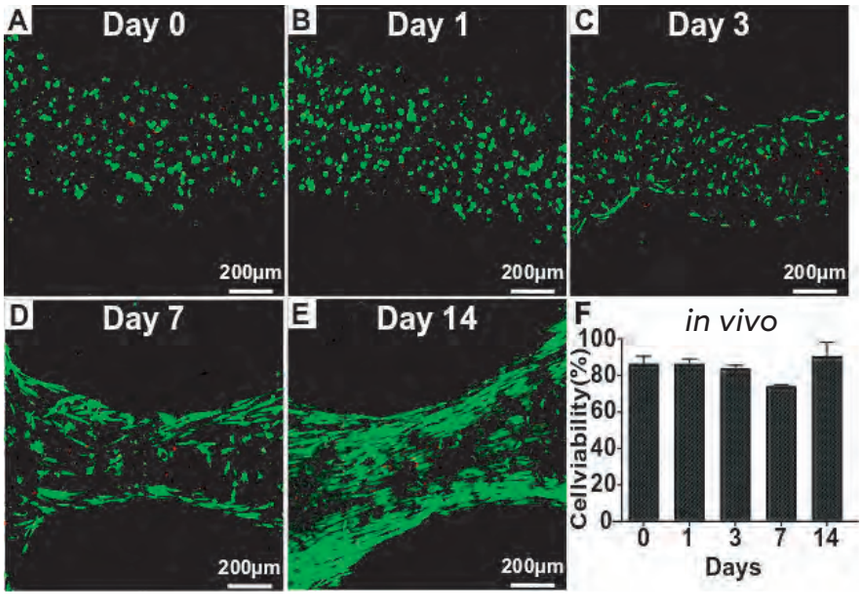


Figure 12: Bioprinting of human fibroblasts retains high cell viability and facilitates physiological cellular behaviour *(Raveendran, et al, Dental Materials, 2019)*

Human periodontal fibroblasts were resuspended in LunaGel™ ECM and printed using Gesim BioScaffolder. Living cells appear green, dead cells appear red.

REFERENCES

1. Engler, A. J., Sen, S., Sweeney, H. L. & Discher, D. E. Matrix Elasticity Directs Stem Cell Lineage Specification. Cell 126, 677–689 (2006).
2. Keely, P. & Nain, A. Capturing relevant extracellular matrices for investigating cell migration. F1000Research 4, 1408 (2015).
3. Wei, S. C. et al. Matrix stiffness drives epithelial-mesenchymal transition and tumour metastasis through a TWIST1-G3BP2 mechanotransduction pathway. Nat. Cell Biol. 17, 678–688 (2015).
4. Paszek, M. J. et al. Tensional homeostasis and the malignant phenotype. Cancer Cell 8, 241–254 (2005).
5. Liu, F. et al. Feedback amplification of fibrosis through matrix stiffening and COX-2 suppression. J. Cell Biol. 190, 693–706 (2010).
6. Wen, J. H. et al. Interplay of matrix stiffness and protein tethering in stem cell differentiation. Nat. Mater. 13, 979–987 (2014).
7. Zaman, M. H. et al. Migration of tumor cells in 3D matrices is governed by matrix stiffness along with cell-matrix adhesion and proteolysis. Proc. Natl. Acad. Sci. 103, 10889–10894 (2006).
8. Chaudhuri, O. et al. Extracellular matrix stiffness and composition jointly regulate the induction of malignant phenotypes in mammary epithelium. Nat. Mater. 13, 970–978 (2014).
9. Pelham, R. J. & Wang, Y. -l. Cell locomotion and focal adhesions are regulated by substrate flexibility. Proc. Natl. Acad. Sci. 94, 13661–13665 (1997).
10. Soofi, S. S., Last, J. A., Liliensiek, S. J., Nealey, P. F. & Murphy, C. J. The elastic modulus of MatrigelTM as determined by atomic force microscopy. J. Struct. Biol. 167, 216–219 (2009).
11. Gurski, L. a, Petrelli, N. J., Jia, X. & Farach-carson, M. C. 3D Matrices for Anti-Cancer Drug Testing and Development. Oncol. Issues 25, 20–25 (2010).
12. Hongisto, V. et al. High-Throughput 3D Screening Reveals Differences in Drug Sensitivities between Culture Models of JIMT1 Breast Cancer Cells. PLoS One 8, (2013).

LunaCrosslinker™

Visible Light Crosslinking System

SKU: 0004

The LunaCrosslinker™ is a visible light crosslinking system designed to cure LunaGel™ Photocrosslinkable Extracellular Matrices. High power LEDs facilitate rapid and cell-friendly crosslinking and the stiffness of LunaGel™ Matrices can be adjusted by simply changing the duration of photocrosslinking - easy!

Technical Specifications

Voltage: 12V
(Transformer included)

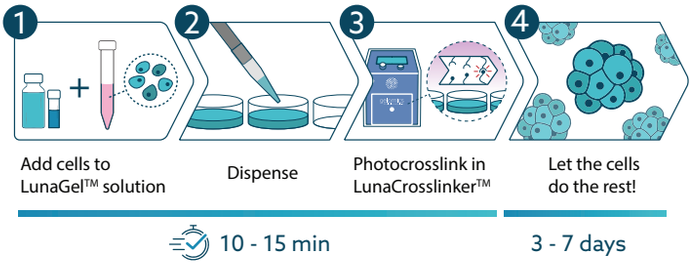
External Dimensions
(L x W x H):
155 mm x 230 mm x 230 mm

Light Intensity
at Curing Surface: ~ 9 mW/cm2

Create Tuneable 3D Cell Culture Assays in a Matter of Minutes

Creating 3D cell culture models has never been simpler! A chemical modification allows the LunaGel™ ECM to be crosslinked by exposure to blue light in the LunaCrosslinker™, creating cell culture models that closely mimic natural microenvironments. The LunaGel™ hydrogel system is transparent, permeable, and compatible with standard imaging systems. ECM stiffness can be adjusted to by varying the light exposure duration in the LunaCrosslinker™ to replicate physiological conditions of different healthy and diseased tissues.

The LunaCrosslinker™ is light and its small footprint makes it perfect to use in the tissue culture environment. Designed to work with standard tissue culture well plates.



LunaGel™
Photocrosslinkable Extracellular Matrix

	SKU	DETAILS
LunaGel™ - Hyaluronic Acid	0006	Low stiffness (0-6.5kPa), 10mL
LunaGel™ - Cold Water Fish Skin Gelatin	0007	Low stiffness (0-6.5kPa), 10mL
	0011	High stiffness (0-25kPa), 7.5mL
LunaGel™ - Porcine Skin Gelatin	0002	Low stiffness (0-6.5kPa), 10mL
	0012	High stiffness (0-25kPa), 7.5mL
LunaGel™ - Bovine Skin Gelatin	0019	Low stiffness (0-6.5kPa), 10mL
	0020	High stiffness (0-25kPa), 7.5mL
LunaGel™ - Bovine Bone Gelatin	0005	Low stiffness (0-6.5kPa), 10mL
	0009	High stiffness (0-25kPa), 7.5mL

Features
- No heating or cooling required
- Photocrosslinking technology allows highly controlled mechanical properties
- High Bioactivity (cell attachment, proteolytic degradation)
- Compatible with automated liquid handling

Kit Contents
- This kit contains enough LunaGel™ to create a total volume of 10 mL/7.5 mL hydrogel
- 5 mL LunaGel™ ECM (2x/1.5x solution, sterile)
- 5 vials of photoinitiator (freeze-dried, sterile)

Scan to request a free demo!

The major components of LunaGel™ include the ECM proteins collagen type I, III, IV, and V, as well as connective tissue glycoproteins and proteoglycans. LunaGel™ retains the intrinsic cell-instructive bioactivity of natural ECMs facilitating cell attachment, proliferation, differentiation, migration, and proteolytic degradation. LunaGel™'s unique photocrosslinking technology allows unprecedented control over matrix porosity and stiffness, allowing researchers to replicate the physicochemical properties of a variety of healthy and diseased tissues in 3D cell culture applications.

LunaGel™ ECM has been successfully used in a wide range of applications including cell attachment and proliferation, stem cell culture and differentiation, mechanotransduction assays, cancer spheroid assays, angiogenesis assays, 3D bioprinting, tissue engineering, and more.

LunaGel™ is supplied as a sterile solution with freeze-dried photoinitiator. Available as Low Stiffness (0 - 6.5 kPa) and High Stiffness kit (0 - 25 kPa). Reconstitute the photoinitiator in PBS, mix with LunaGel™ ECM and cells, and photocrosslink the solution using the LunaCrosslinker™ to form 3D cell culture models. By controlling the duration of light exposure you can produce hydrogels with a specified stiffness. Add your favourite culture media and you're culturing in 3D!

LunaGel™ X-Pure® GelMAPorcine Skin Gelatin

SKU: 0017
Low stiffness (0-6.5kPa), 10mL

SKU: 0018
High stiffness (0-25kPa), 7.5mL

LunaGel™ X-Pure® GelMA

Photocrosslinkable Extracellular Matrix

LunaGel™ X-Pure® GelMA is an ultrapure photocrosslinkable extracellular matrix that allows unprecedented control over matrix porosity and stiffness. Researchers can replicate the physicochemical properties of a variety of healthy and diseased tissues in a simple 3D cell culture format, utilising this ultrapure, highly consistent extracellular matrix material.

LunaGel™ X-Pure® GelMA Porcine Skin Gelatin creates optically transparent hydrogels which are stable at room temperature and compatible with standard imaging systems and bioassays. Importantly, X-Pure® GelMA is produced under GMP conditions, possessing ultra-low impurity levels and excellent batch-to-batch consistency, making it suitable for sensitive applications and translational research.

Viable cells, organoids, and spheroids cultured in gelatin based LunaGel™ ECMs can be easily harvested using a LunaGel™ Cell Recovery Kit.

LunaGel™ Cell Recovery Kit

SKU: 0015

Recovery of viable cells from LunaGel™ Matrices using the LunaGel™ Cell Recovery Kit

Some laboratory techniques require cells to be released from 3D cell culture hydrogel matrices for efficient processing and experimental analysis. The LunaGel™ Cell Recovery Kit is a fully optimised, ready-to-use solution containing an enzymatic lysis reagent and buffer that digests gelatin- and collagen-based hydrogels in < 1 hour of incubation at 37 °C. The product is used to recover viable cells, spheroids, or organoids from gelatin-based LunaGel™ Photocrosslinkable Extracellular Matrices for downstream applications such as re-seeding, nucleic acid extraction, flow cytometry, protein extraction, single-cell analysis, and many more.

The Gelomics® LunaGel™ Cell Recovery Kit contains 50 ml of Cell Recovery Buffer and an enzymatic Cell Recovery Reagent – sterile and ready-to-use.

	SKU	DETAILS
Cold Water Fish Skin Gelatin	0014	1g, lyophilized and sterile
Porcine Skin Gelatin	0013	1g, lyophilized and sterile
Bovine Skin Gelatin	0022	1g, lyophilized and sterile
Bovine Bone Gelatin	0010	1g, lyophilized and sterile

GelMA

is supplied as a sterile freeze-dried product. Reconstitute GelMA in PBS or HEPES buffer at the concentration to suit your application and mix it with a photoinitiator to make your hydrogels photocrosslinkable and stable at body temperature.

Due to its unmatched tuneability and bioactivity, GelMA is very popular as a biomaterial in tissue engineering, 3D bioprinting, and 3D cell culture applications. Can be used by itself, or blended with other materials to create your own individual printable extracellular matrix.

Appearance:
White to off-white freeze-dried material
Sterility: Sterile
Bloom: 300
Species: Porcine Skin (Type A, 300 bloom), Bovine Bone (Type B, 300 bloom), Bovine Skin (Type B, 225 bloom), Cold Water Fish Skin
Degree of methacrylation: 75 – 85%

www.gelomics.com | 1800 865 060
60 Musk Avenue Kelvin Grove, QLD Australia