

TRANSFORMING THE STORAGE AND SHIPMENT OF TISSUES, IN VITRO MODELS & CELL THERAPIES USING ATELERIX'S HYDROGELS

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PURPOSE

The procurement of high quality fresh tissue is crucial for driving drug discovery to replicate the disease-specific, physiologically relevant state necessary to assess new drugs. Tissue must be collected from the point of surgery and delivered to the point of processing within 24 hours resulting in a very inflexible supply chain with geographical restrictions, high resource, and significant wastage.

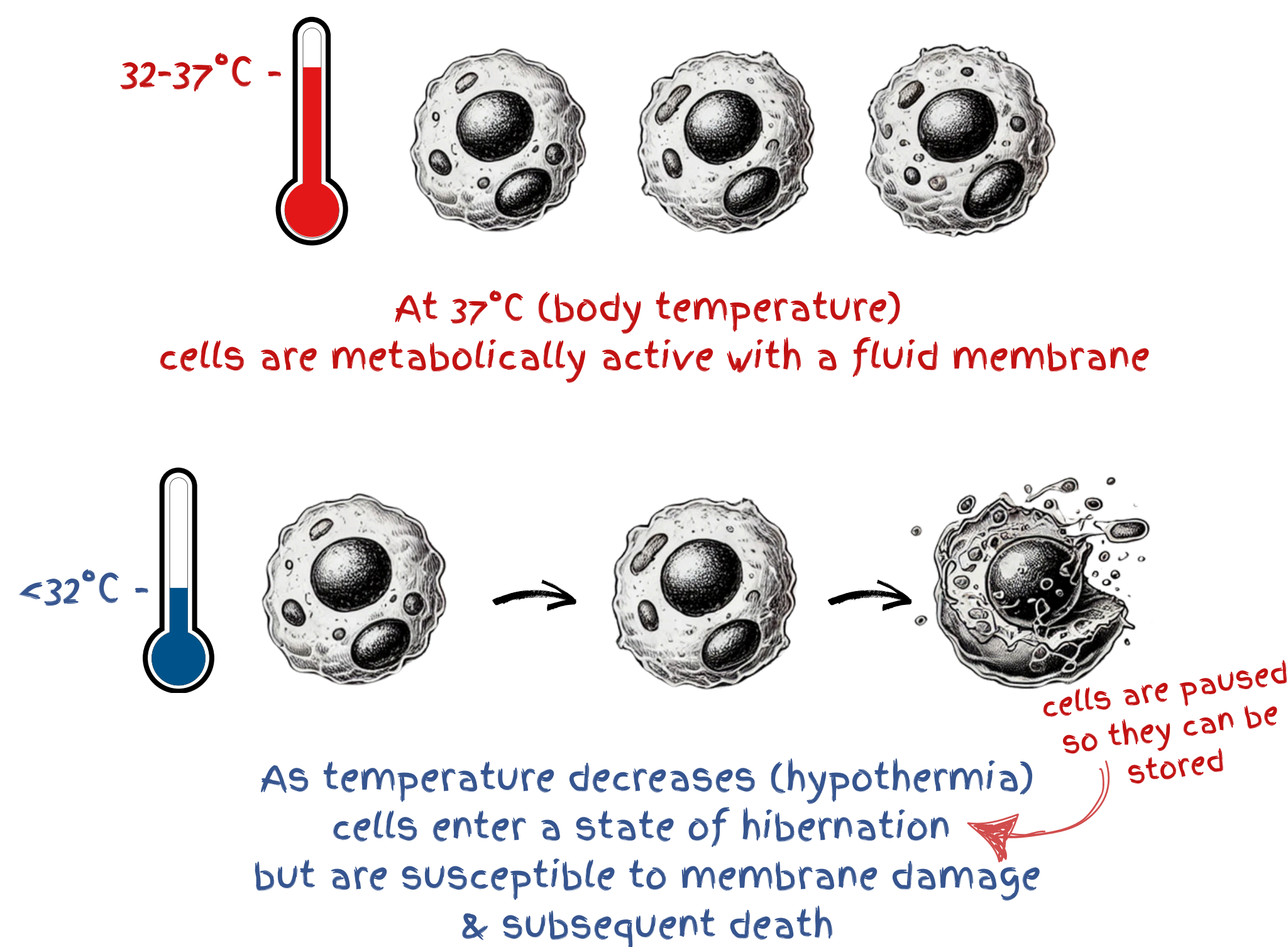
Tissues, including cancer tissues, are often the starting material for advanced *in vitro* models alongside iPSC (induced Pluripotent Stem Cell)-derived cells, and primary cell lines. Advanced cell models, including organoids are often difficult and time-consuming to culture resulting in high failure rates and delayed projects. The complexity of tissues and advanced cell models make them very difficult to freeze.

Stem cell therapies offer a treatment for a number of different diseases but storage and distribution remains a major hurdle in their success, especially for accessibility in remote areas.

Aterlix addresses these challenges by offering room temperature stabilisation of biosamples, retaining viability, phenotype, and function.

APPROACH

The problem with hypothermic preservation

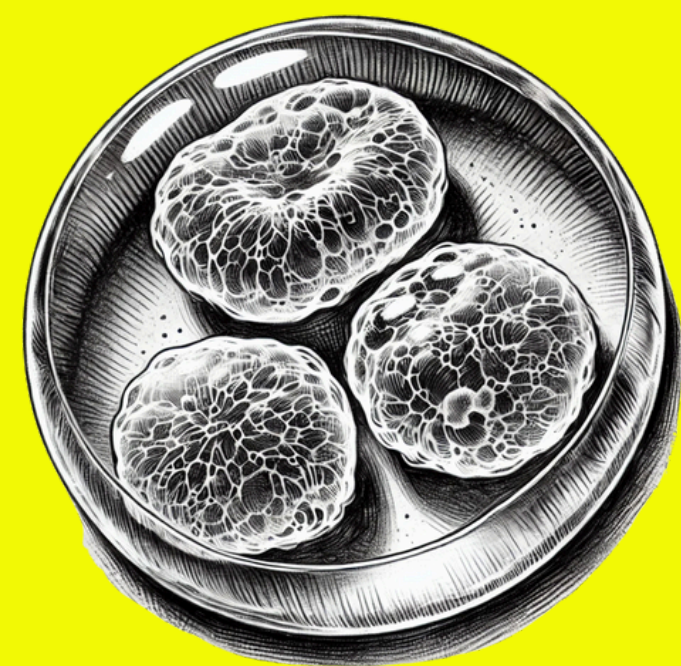


Our approach...

Our alginate hydrogels stabilise cell membrane integrity allowing samples to be held at room or refrigerated temperatures for extended periods

works on anything with a lipid membrane!

7 quick & easy-to-use products available depending on your sample type



Fresh cells, cell models, tissues, bloods & viruses can be stored for up to 2 weeks without the need to freeze



INCREASING THE FLEXIBILITY OF LIVE TISSUE ACQUISITION

Currently...



The user is notified that surgery is being scheduled for resection.



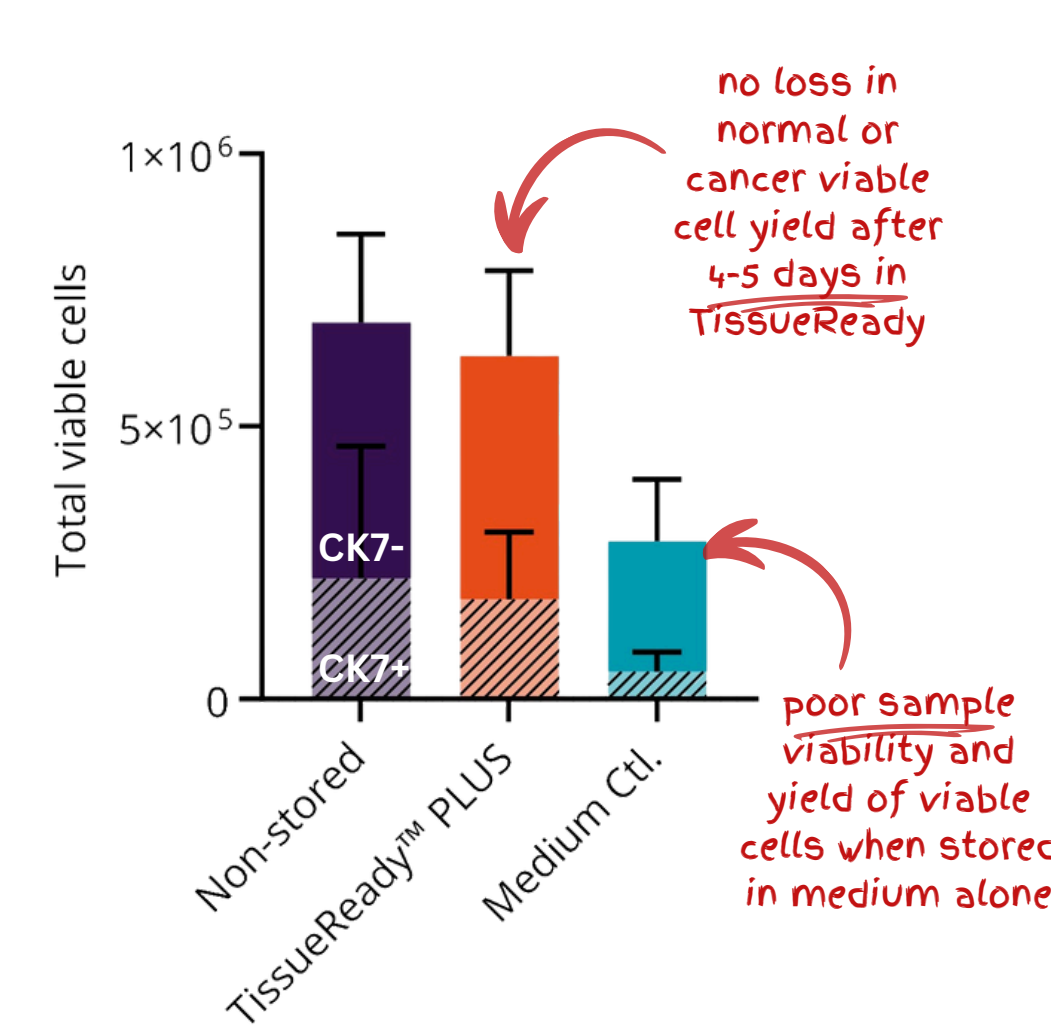
Couriers must be rapidly coordinated to collect and deliver the tissue **within 24 hours**.



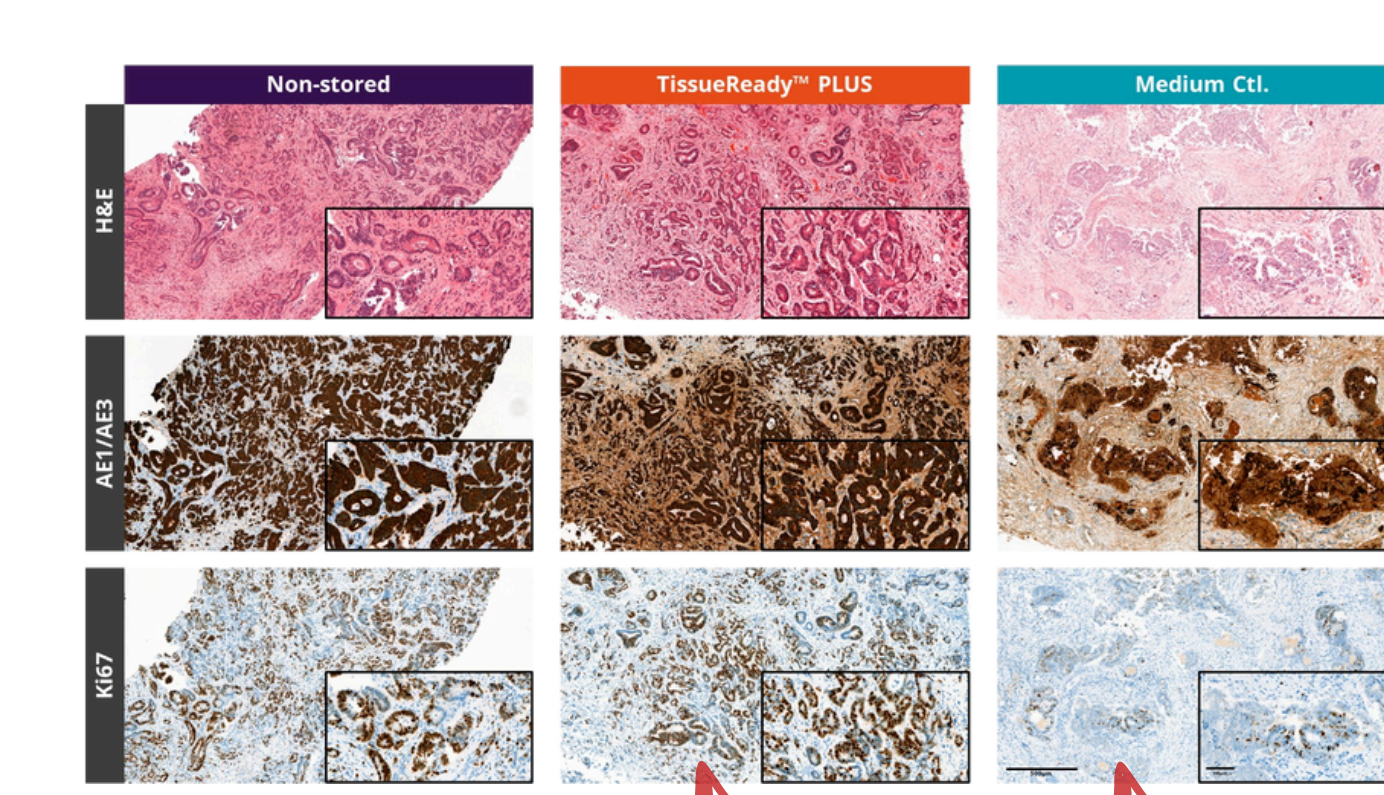
Tissue must be used immediately on arrival - **no flexibility, high resource, high wastage**.

Extend fresh shelf life to up to 5 days with **TISSUEREADY™ PLUS**

a Preserve Viability & Phenotype (Oesophageal Cancer)



b Preserve Histological Integrity (Liver Cancer)



The effect of TissueReady™ PLUS on Cancer Tissue preservation. Cancer tissues were shipped in either TissueReady™ PLUS or DMEM for up to 5 days at room temperature. **a:** Cells were dissociated after 4-5 days and viable cell yield was calculated by trypan blue exclusion. Cytochrome-7 staining was used to quantify the number of cancer (positive) and normal (negative) cells. **b:** Histological assessment of samples was carried out after 2 days' storage at room temperature. Samples were fixed, paraffin embedded and sectioned before being stained for H&E, immunohistochemical markers - AE1/AE3 (cytokeratin cocktail) and Ki67 (proliferation marker). n = 3.

This study was conducted in collaboration with The Royal Victoria Infirmary, NovoPath BioBank (NHS), and Rare Cancer Group (University of Sheffield).

ENABLING THE DISTRIBUTION OF MATURE 3D IN VITRO MODELS

Currently...



Disease-specific cells are often shipped with specialised plates & media.



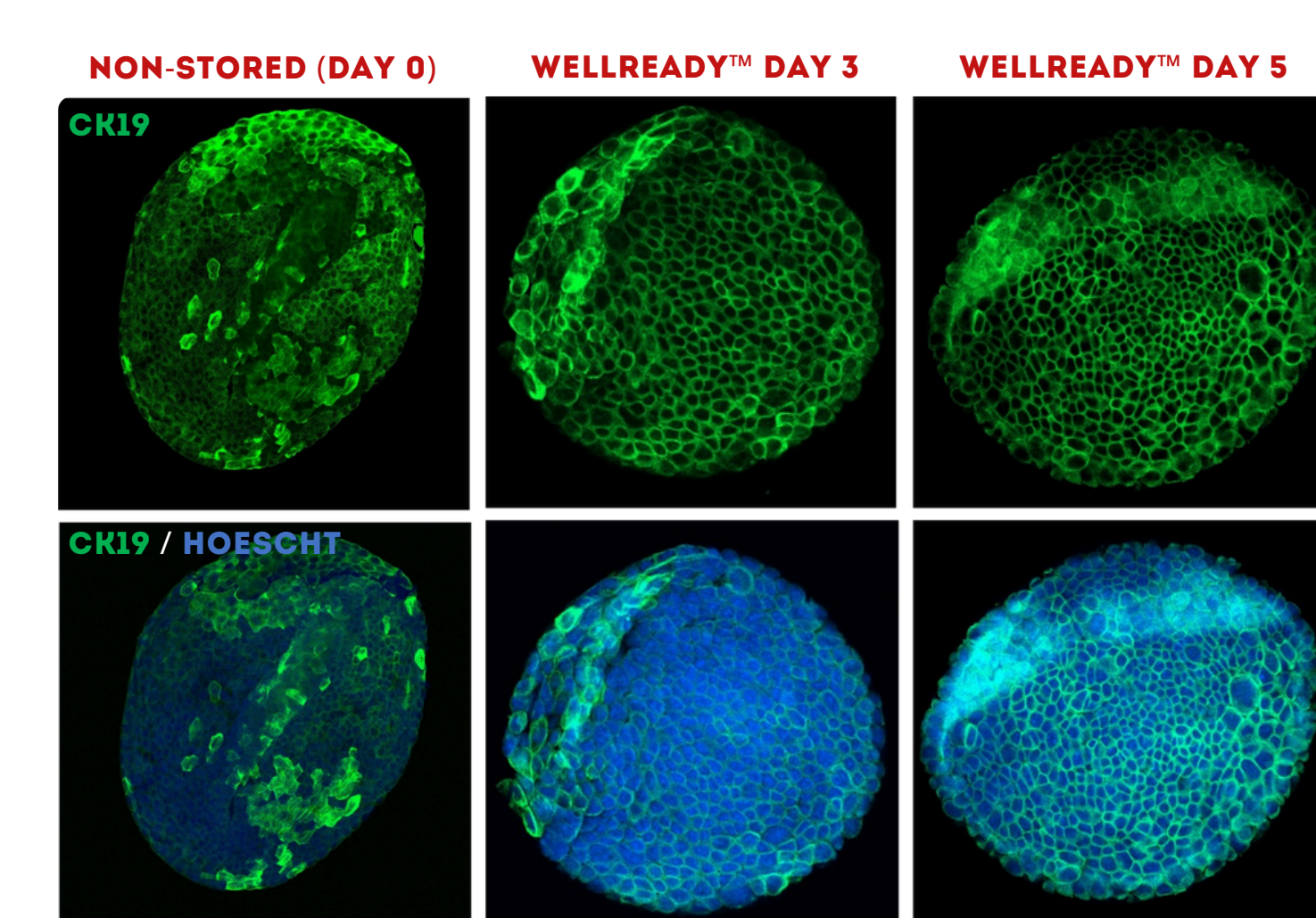
Complex protocols & long cell culture time are required for a mature, functional model.



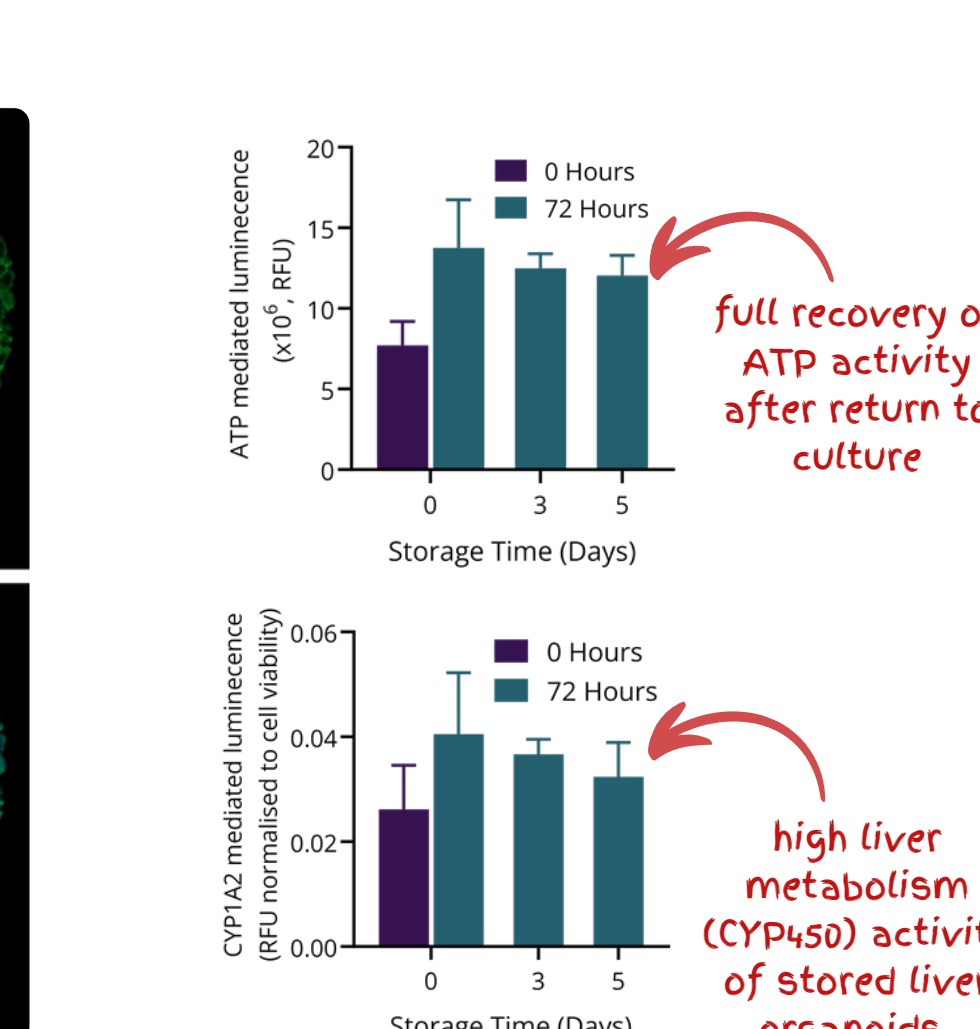
Complexity and time means **high resource, high failure rate, delays to projects**.

Send assay-ready 3D models with **WELLREADY™** & **TISSUEREADY™**

a Preserve Organoid Structure & Phenotype (Liver Organoids)



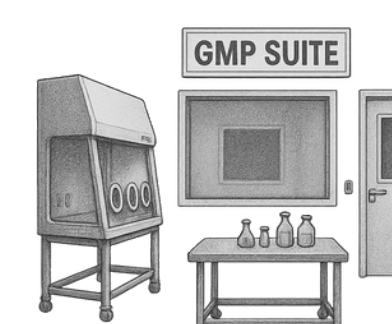
b Preserve Viability & Function (Liver Organoids)



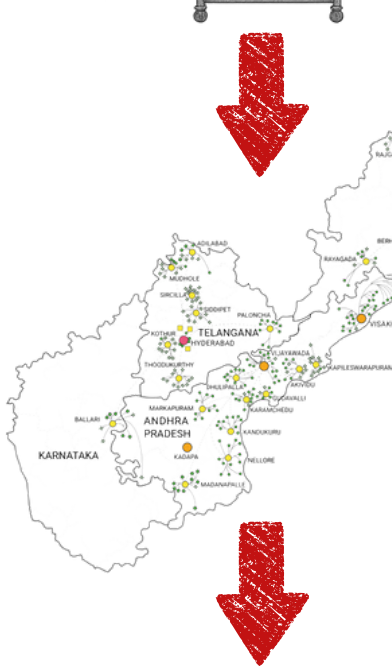
The effect of WellReady™ on Liver Organoid preservation. Liver organoids were preserved at 20°C for 5 days using WellReady™. Following preservation, the organoids were released from WellReady™ and returned to culture for 72 hours before carrying out assays. Organoids were returned to culture overnight and fixed, and stained for the hepatocyte cholangiocyte marker - Cytokeratin-19 (CK19, green) and Hoechst nuclear stain (blue) (a). Cell viability assessed using the CellTitre-Glo® (b, top). Functional activity assessed by measuring Cytochrome P450 1A2 activity using the P450-Glo™ CYP1A2 Assay (c, bottom). Legend indicates post release culture periods. n = 3.

INCREASING THE ACCESSIBILITY OF STEM CELL THERAPIES

A case study in India...



A limbal stem/stromal cell therapy for **corneal blindness** had a fresh shelf life of **8 hours**.



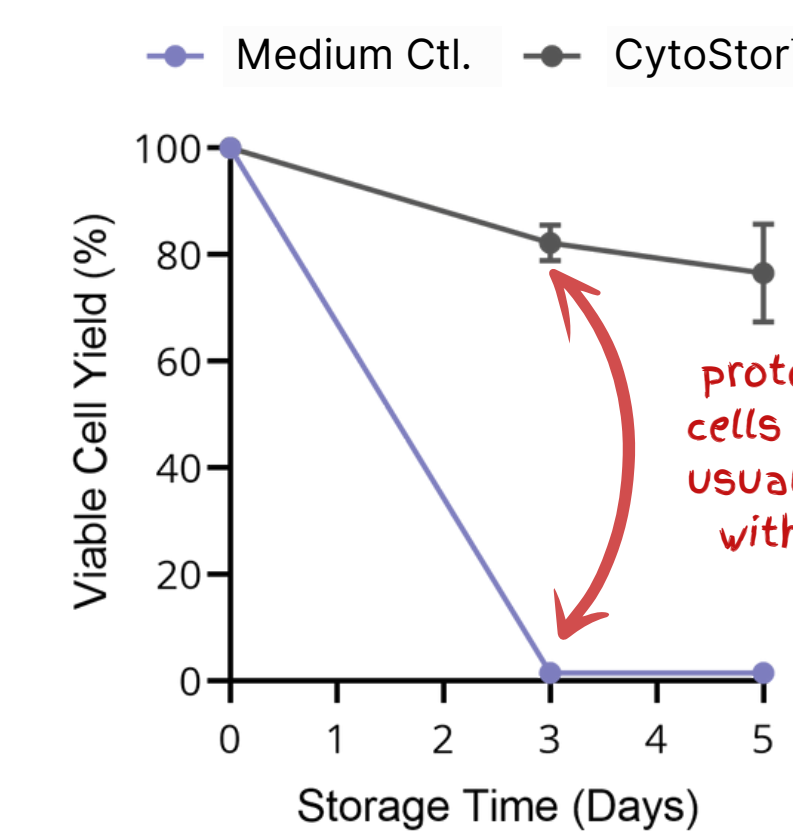
Limited cryo-infrastructure made it impossible to distribute to **LVPEI's 308** eye care centres.



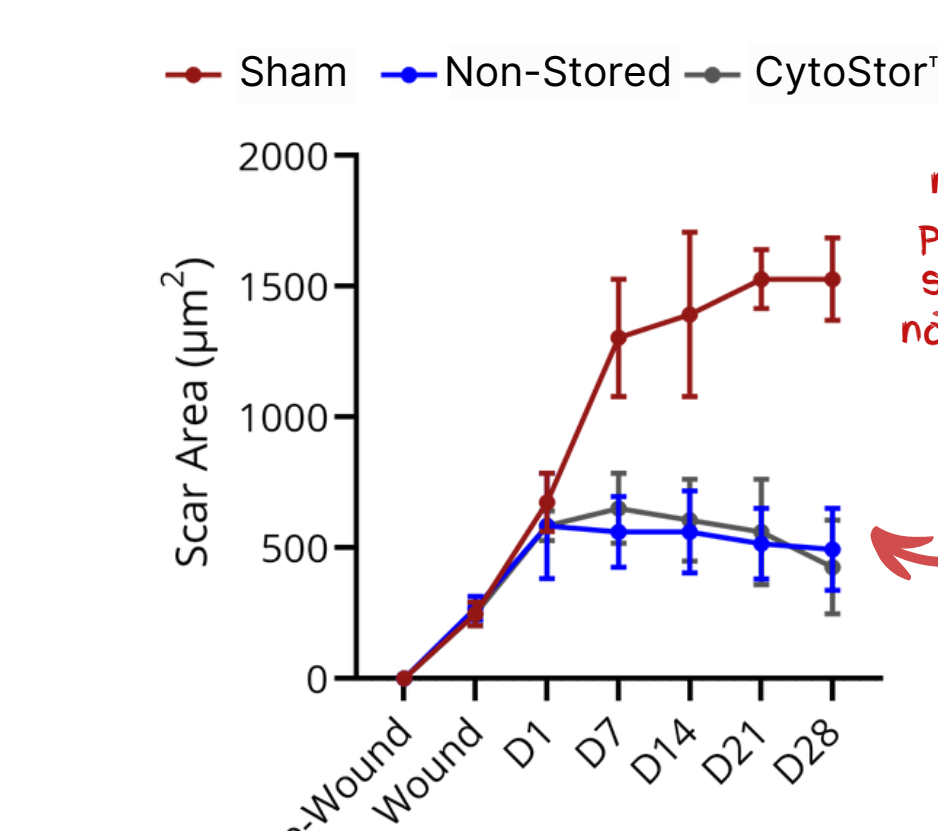
Patients unable to travel to centre of excellence can't get treated - **limited equityability**.

Cryo-free shipping of LMSCs for ocular therapy with **CYTOSTOR™**

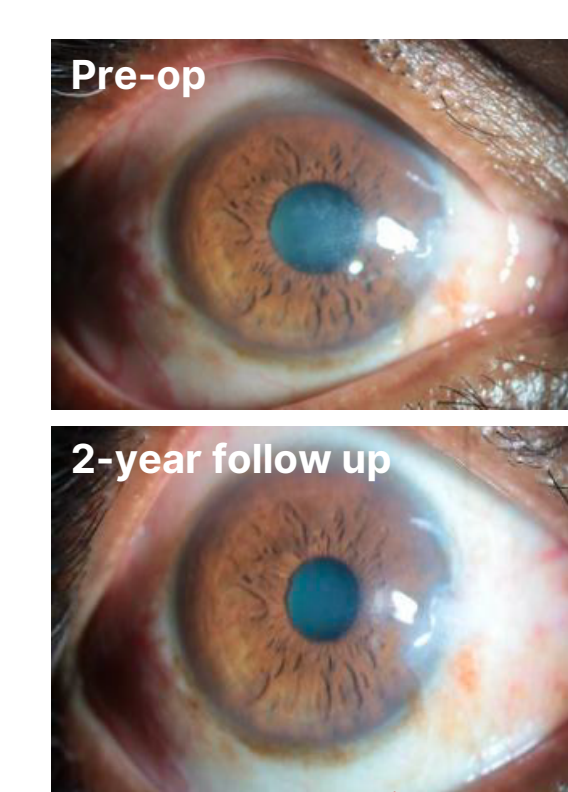
a Preserve Viability & Phenotype (PoC in vitro Studies)



b Preserve Wound Healing Function (Pre-clinical in vivo Studies)



c Reduce Corneal Scarring (Phase I clinical trial)



significantly recover visual acuity in patients with corneal pathologies

Preservation Limbal Stromal Mesenchymal Stem/Stromal Cells (LMSCs) for the treatment of ocular surface disorders. LMSCs were stored at room temperature for 3-5 days before assessing viable cell recovery by Trypan Blue exclusion, n = 3. (a). Corneal injury was induced in mouse models by surface debridement before the application of fresh LMSCs or LMSCs stored for 3-5 days at room temperature, n = 8. (b). 2-year follow up of a first-in-man clinical trial applying LMSCs to the debrided cornea of mixed ocular surface pathologies after room-temperature storage for 24 hours, n = 20 (c). a: Data adapted from Damala, M. et al. Sci Rep 9, 16950 (2019). b: Data adapted from Damala, M. et al. Cells, 12, 876 (2023). c: Data adapted from Basu, S. and Singh, V. (2025) [ARVO conference poster].

SUMMARY

Aterlix's technology overcomes many of the challenges associated with storage and distribution of cellular products and viruses through extending fresh shelf life.

Our approach is cryo-free, hassle-free, cuts costs of shipment by up to 10x whilst being kind to the environment!