ATELERIX

Application Note

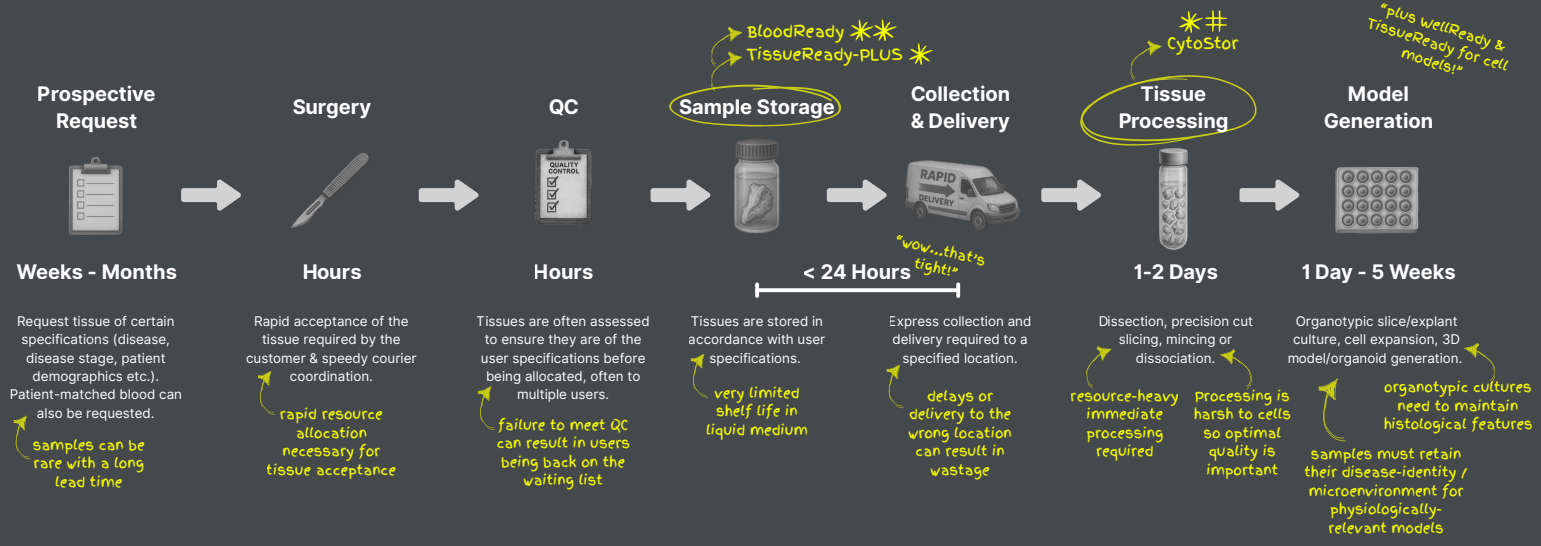
Fresh Tissues for the Generation of *In Vitro* Models

Introduction

The acquisition and transport of fresh human tissues impose stringent logistical and biological constraints that directly impact downstream model fidelity. High-specification samples remain scarce, must be accepted within hours of resection, and exhibit rapid viability and phenotypic decay when held in conventional liquid media, leaving a narrow window for QC, allocation, and delivery. These constraints frequently lead to sample loss, reduced cellular yield, and compromised microenvironmental integrity before processing can begin. **TissueReady™ PLUS addresses these limitations by extending ex vivo stability from <24 hours to up to 5 days**, preserving cell viability, tumour content, and histological and molecular features, thereby enabling more flexible coordination, reduced wastage, and improved reliability of primary tissue-derived model generation.

The Process Flow (below) summarises the tight, inflexible stages involved and how Atelerix's products can build in flexibility at multiple points in the process. This not only applies to the tissues themselves but also donor-patient matched blood and dissociated cells.

Process Flow



TISSUEREADY™ PLUS

- **Extend tissue storage time from 1 day to 5 days with TissueReady™ PLUS.**
- Increase flexibility in sample collection and resource allocation whilst reducing wastage of precious samples.
- Independently validated to yield >90% total viable cells and >80% cancer-positive cells from cancer resections.
- Cells can be propagated over multiple passages whilst maintaining identity.
- Histological integrity, IHC staining profile, RNA yield and ISH profile are preserved.

BLOODREADY™

- **Store accompanying patient-matched blood samples using BloodReady™.**
- Preserve all major leukocyte populations and granular subpopulations.
- Conserve unstable surface epitope presentation better than common fixation methods (great for flow cytometry).
- Isolate PBMCs with >90% viability and maintain competence in culture.

CYTOSTOR™

- **Ship or hold dissociated cells with CytoStor™.**
- Store dissociated cells ahead of cell model generation or ship dissociated cells cost-effectively.
- Tested successfully with ~35 different cell types / enveloped viruses.
- Preserves viability, phenotype & function for up to 2 weeks (depending on cell fragility).

N.B. Dissociated cells can also be frozen for long-term storage

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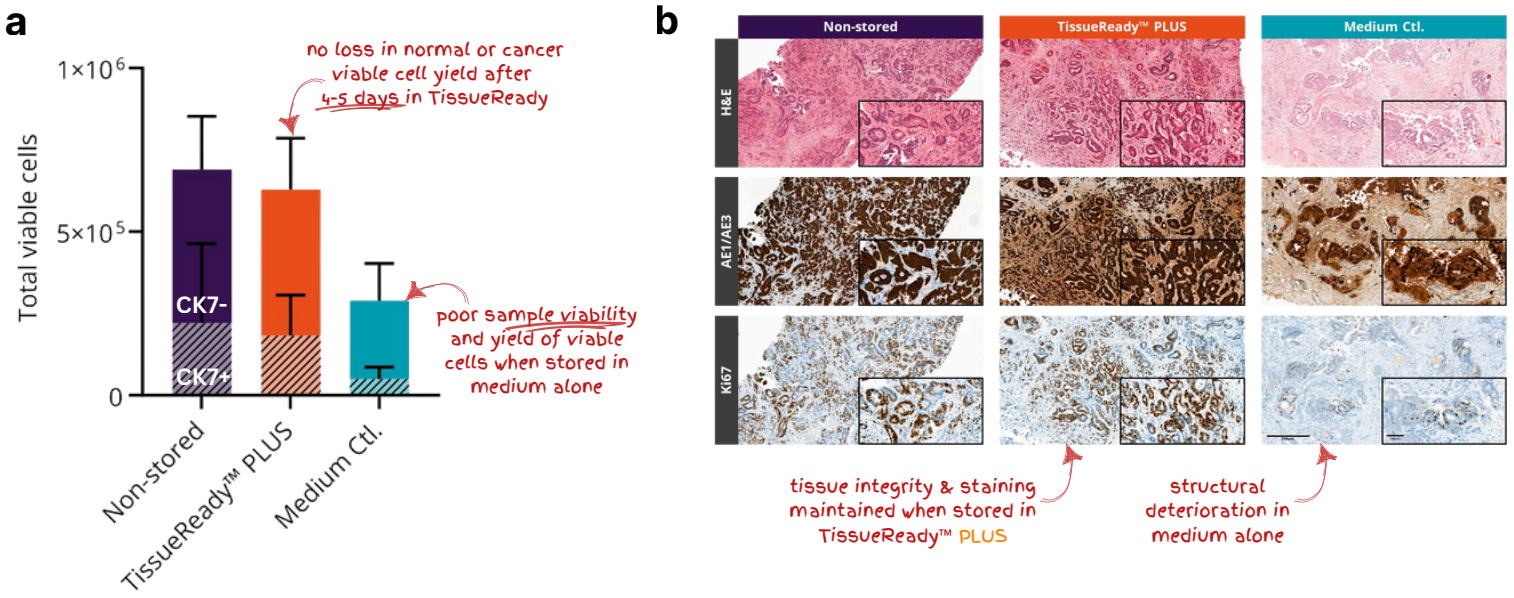
Methods

Cancer tissue was collected ethically from patients undergoing resection at the Royal Victoria Infirmary, Newcastle. Tissue samples were blinded before being stored in either TissueReady™ PLUS or Dulbecco's Modified Medium at room temperature for up to 5 days.

Samples intended for live cell dissociation were shipped to a specialist oncology research facility before being dissociated after 4-5 days. Non-stored samples were processed within 12 hours of collection. Isolated cells were expanded before being fixed and stained for Cytokeratin-7 to differentiate cancer cells from non-cancer cells. Samples intended for histopathological analysis were stored for 2-5 days at room temperature and processed for H&E, IHC (AE1/AE3 and Ki67) and in situ hybridisation (Chromosome 17/HER2) by a clinical pathology laboratory.

Featured Results



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. Cytokeratin-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 at room temperature. Samples were fixed, paraffin embedded and sectioned before being stained for H&E, AE1/AE3 (cytokeratin cocktail) and Ki67 (proliferation marker). n = 3.

Conclusions

TissueReady™ PLUS enhances the flexibility of fresh tissue acquisition & processing

After storage, users are able to:

- Isolate cells with no loss in viable recovery or change in phenotype
- Retain histological integrity and staining profile
- Maintain profile for molecular analysis

For the full White Paper, visit the **Resources** section of our website.