ATELERIX ENVIRONMENTAL RESPONSIBILITY STATEMENT

Atelerix develops preservation technologies intended to make the storage, transport and use of fresh biological materials simpler, more resilient and less resource-intensive.

Many biological workflows depend on energy-intensive ultra-low-temperature freezing and storage, specialised packaging, time-critical logistics or repeat shipments when samples do not arrive in a usable condition. Atelerix seeks to reduce these burdens by enabling cells, tissues and other biological materials to remain viable during transport and storage without automatically relying on ultra-low-temperature infrastructure.

Our approach to environmental responsibility is based on five principles.

1 Scientific integrity comes first

A lower-impact method is only valuable when it preserves the biological quality required for its intended application. We evaluate our technologies against relevant measures such as viability, recovery, phenotype, function and reproducibility.

2 Avoid unnecessary temperature control

We aim to reduce dependence on energy-intensive refrigeration, frozen transport and temperature-controlled packaging where these are not scientifically necessary. The appropriate conditions depend on the biological material and the validated workflow.

3 Reduce transport-related waste and failure

Failed shipments waste more than packaging. They can also waste biological material, laboratory time, reagents, transport capacity and the energy already invested in producing the sample. By extending viable transport windows, we aim to reduce time pressure and improve resilience to delays.

4 Support distributed and collaborative science

More robust transportation can help laboratories exchange biological materials across greater distances, centralise specialist analyses and broaden access to advanced models without requiring every organisation to recreate the same capabilities locally.

5 Measure before making claims

We are developing a more structured approach to environmental measurement across our products and operations. Where complete lifecycle data are not yet available, we will clearly distinguish measured results, modelled estimates and assumptions. We will avoid unsupported claims and continually improve the evidence behind our environmental communications.

Atelerix recognises that preservation technology is only one part of a laboratory's environmental impact. We are committed to working with customers, suppliers and sustainability specialists to improve our understanding of product footprints, packaging, transport, procurement and end-of-life considerations.

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o2h discovery

REAL-WORLD CELL TRANSPORT CASE STUDY

6,874 KM. A TEN-DAY JOURNEY. MULTIPLE CELL LINES READY FOR USE ON ARRIVAL.

How o2h used CytoStor™ to support the transfer of cell lines from the UK to Ahmedabad during an extreme heat event

Overview

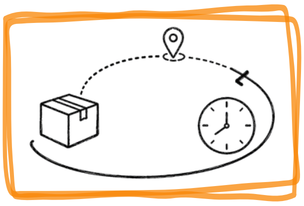
o2h needed to transfer multiple cell lines from its UK laboratory to a sister site in Ahmedabad, India. The team selected CytoStor™ to support ambient transport as an alternative to a conventional dry-ice shipment, with the aim of reducing transport cost while maintaining cell quality during the international journey.

The shipment subsequently encountered an extreme heat event and a customs delay, extending transit to approximately ten days. The cells were successfully recovered at destination and used to reproduce the required assay.

Key outcomes

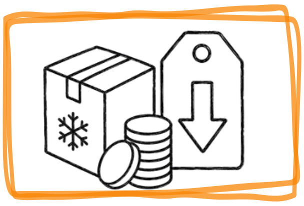
6,874 KM

UK to Ahmedabad, India



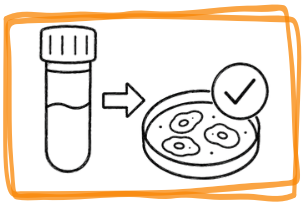
~10 DAYS

Around twice the anticipated transit time



~82% LOWER COST

Approximately £320 versus an estimated £1,750



SUCCESSFUL RECOVERY

Cells used to reproduce the required assay

The challenge

o2h required multiple cell lines to be transferred between laboratories and remain suitable for experimental use on arrival.

The planned journey already involved a long international route and customs clearance. During transit, severe heat and a border delay extended the journey from fewer than five days to approximately ten days.

The preservation approach therefore needed to provide sufficient resilience to accommodate conditions substantially more demanding than originally anticipated.

REAL-WORLD CELL TRANSPORT CASE STUDY

The challenge

For this shipment, the challenge was particularly demanding:

- A journey of almost 7,000 km
- An expected transit time of fewer than five days
- A customs delay that extended transit to approximately ten days
- An extreme heat event, with reported temperatures above 40°C
- A requirement for the cells to remain suitable for immediate experimental use

The approach

Four vials containing multiple cell lines were prepared using CytoStor™ and shipped from the UK to o2h's sister laboratory in Ahmedabad.

CytoStor™ was used to preserve the cell lines for transport at ambient temperature, allowing the material to be shipped without freezing or refrigerated transport. This avoided the need for a conventional dry-ice shipping format and the associated recovery from cryopreservation.

The result

The cell lines were successfully recovered at the Ahmedabad laboratory, with little observed loss of viability. They were placed into immediate use and the receiving team successfully reproduced the required assay.

The extended viable transport window helped protect the scientific outcome despite the prolonged and disrupted journey.

Financial comparison

The CytoStor-based route was reported to cost approximately £320, compared with an estimated £1,750 for conventional dry-ice transport.

	Estimated dry-ice route	CYTOSTOR™ route
Number of vials	4	4
Reported or estimated shipment cost	£1,750	£320
Approximate cost per vial	£437.50	£80.00
Total saving		**£1,430**
Percentage saving		**81.70%**

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REAL-WORLD CELL TRANSPORT CASE STUDY

TRANSPARENT SCENARIO MODELLING

How we estimated the potential transport carbon saving

What was known

The original case-study information provides the following confirmed or reported inputs:

Input	Value
Shipment route	UK to Ahmedabad, India
Distance used	6,874 km
Biological material	Multiple cell lines
Number of vials	Four vials containing multiple cell lines
CytoStor shipment cost	Approximately £320
Estimated dry-ice shipment cost	Approximately £1,750
Expected transit time	Fewer than 5 days
Actual transit time	Approximately 10 days
Reported conditions	Heatwave and customs delay
Recovery outcome	Cell lines recovered with little observed viability loss
Functional outcome	Required assay successfully reproduced

The available records do not include gross shipment weight, dry-ice quantity, packaging composition or courier-specific freight data. The carbon comparison is therefore presented as a transparent scenario estimate rather than a verified product carbon footprint.

The calculation method

Transport emissions are commonly estimated using:

Shipment mass × transport distance × emission factor

Expressed mathematically:

$$\text{Estimated emissions} = \text{mass in tonnes} \times \text{distance in kilometres} \times \text{kg } CO_2e \text{ per tonne-kilometre}$$

The UK Government publishes annual greenhouse-gas conversion factors for organisational reporting. These allow activity data such as freight weight and distance to be converted into estimated greenhouse-gas emissions. The appropriate 2026 air-freight factor should be selected from the full government dataset once the courier route and service type are confirmed.

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TRANSPARENT SCENARIO MODELLING

How we estimated the potential transport carbon saving

Step 1: Estimate the shipment weights

Both transport scenarios are modelled using the same four-vial biological shipment. The principal difference is the assumed temperature-control and packaging system.

Component	Dry-ice route	CytoStor route
Biological contents	Four vials	Four vials
Shipping condition	Dry-ice shipping format	Ambient shipping format
Packaging	Larger insulated shipper	Atelerix CRT shipping box
Handling	Dangerous-goods provisions	No dry-ice handling requirements
Assumed gross weight	25 kg	5 kg

Until actual courier records are available, the following central assumptions provide an illustrative comparison:

Packaging used in the o2h shipment

The CytoStor shipment used an Atelerix controlled room-temperature shipping box designed to support ambient transport without dry ice or active refrigeration.

By avoiding a conventional dry-ice shipping format, the shipment reduced the need for refrigerant, specialist dangerous-goods handling and the larger insulated packaging typically associated with frozen transport.

Scenario input	Estimated weight
Dry-ice shipment	25 kg
CytoStor shipment	5 kg
Difference	20 kg
Estimated weight reduction	80%

Step 2: Convert kilograms to tonnes

Dry-ice scenario

25 kg÷1,000=0.025 tonnes

CYTOSTOR™ scenario

5 kg÷1,000=0.005 tonnes

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Step 3: Calculate freight activity

Dry-ice scenario

0.025 tonnes×6,874 km=171.85 tonne-km

CYTOSTOR™ scenario

0.005 tonnes×6,874 km=34.37 tonne-km

Difference

171.85−34.37=137.48 tonne-km

Under these assumptions, the CytoStor route generates approximately 80% less freight activity because the modelled gross shipment weight is 80% lower.

Step 4: Apply an illustrative freight factor

The central scenario uses an illustrative air-freight factor of:

0.60 kg CO_2e per tonne-kilometre

This factor is illustrative and should be replaced with the applicable value from the UK Government conversion-factor dataset once the courier route and service type are confirmed. The finished case study should use the applicable value from the UK Government's 2026 conversion-factor workbook, selected according to whether the freight travelled on a dedicated cargo aircraft, passenger service or an average air-freight service. The government methodology distinguishes among these forms of air freight.

Estimated dry-ice transport emissions

171.85 tkm×0.60=103.11 kg CO_2e

Estimated CytoStor transport emissions

34.37 tkm×0.60=20.62 kg CO_2e

Indicative transport saving

103.11−20.62=82.49 kg CO_2e

Indicative percentage reduction

82.49÷103.11×100=80%

Central estimate

Central scenario: approximately 82 kg CO_2e lower transport emissions

An indicative **80% reduction** in weight-based air-freight emissions, based on assumed shipment weights.

Central assumptions:

- 25 kg dry-ice shipment
- 5 kg ambient CytoStor shipment
- 6,874 km transport distance
- 0.60 kg CO_2e per tonne-kilometre

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TRANSPARENT SCENARIO MODELLING

How we estimated the potential transport carbon saving

Sensitivity analysis

Because confirmed packed weights were unavailable, three shipment-weight scenarios were modelled to show a plausible range.

Scenario	Dry-ice weight	CytoStor weight	Dry-ice estimate	CytoStor estimate	Indicative reduction
Conservative	15 kg	8 kg	61.9 kg CO_2e	33.0 kg CO_2e	47%
Central	25 kg	5 kg	103.1 kg CO_2e	20.6 kg CO_2e	80%
Upper	35 kg	3 kg	144.4 kg CO_2e	12.4 kg CO_2e	91%

Supporting calculations

Conservative scenario

$0.015 \times 6{,}874 \times 0.60 = 61.9$ kg CO_2e

$0.008 \times 6{,}874 \times 0.60 = 33.0$ kg CO_2e

Upper scenario

$0.035 \times 6{,}874 \times 0.60 = 144.4$ kg CO_2e

$0.003 \times 6{,}874 \times 0.60 = 12.4$ kg CO_2e

What the estimate includes

- Assumed gross shipment weight
- Stated transport distance
- Illustrative air-freight emission factor

What the estimate does not yet include

- Manufacture of CytoStor, the Atelerix CRT shipping box and the dry-ice packaging comparator
- Production and delivery of dry ice
- Road collection and final-mile delivery
- Indirect courier routing
- Disposal and end-of-life impacts
- Avoided repeat shipments or replacement cell production

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TRANSPARENT SCENARIO MODELLING

How we estimated the potential transport carbon saving

The impact of avoiding shipment failure

A failed biological shipment can create impacts well beyond the loss of the original package.

It may require:

- Replacement cell culture and preparation
- Additional plastics, media and reagents
- Repeated staff activity
- A second international shipment
- Further dry ice, packaging and temperature-control materials
- Delays at both the sending and receiving laboratories

In the central scenario, one repeat dry-ice shipment would add approximately 103 kg CO_2e in weight-based air-freight emissions alone.

103.11 kg CO_2e

in further weight-based air-freight emissions alone, before accounting for the laboratory resources needed to recreate the samples.

This should be presented as an illustrative avoided-risk scenario, not as a confirmed saving, because there is no evidence that the alternative shipment would definitely have failed.

Evidence classification

Recorded	Calculated	Assumed
Journey and destination	£1,430 estimated cost saving	Gross package weights
Four vials shipped	81.7% estimated cost reduction	Dry-ice quantity
Shipment costs	Cost per vial	Air-freight service type
Approximate transit time	Freight tonne-kilometres	Freight conversion factor
Heatwave and border delay	Scenario-based CO_2e estimates	Packaging composition
Biological and assay outcome		Potential repeat-shipment impact

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REAL-WORLD CELL TRANSPORT CASE STUDY

TRANSPARENT SCENARIO MODELLING

How we estimated the potential transport carbon saving

A more resilient route to lower-impact cell transport

This case demonstrates how preservation choice can influence the environmental and operational performance of laboratory logistics.

Under the modelled shipment-weight scenarios, the CytoStor route could reduce weight-based air-freight emissions by approximately 47–91%, with a central estimate of 80%.

These figures remain estimates until packed weights and courier routing are confirmed. Even so, the case illustrates how shipment weight, resilience and failure prevention can be considered together when assessing more sustainable ways to move living biological materials.

The o2h shipment also used Atelerix's controlled room-temperature packaging format, avoiding the dry ice and specialist handling requirements associated with the modelled frozen comparator.

About Atelerix

Atelerix develops preservation technologies that support the storage and transport of fresh biological materials. By extending viable transport windows, our products help laboratories simplify logistics, reduce time pressure and improve access to cells, tissues and advanced biological models.

In this case, CytoStor™ was used to support the ambient preservation and transport of multiple cell lines. Appropriate conditions and preservation durations depend on the cell type, workflow and validated intended use

Calculation disclaimer

Carbon figures shown are scenario-based estimates developed from the information currently available. They are not a verified lifecycle assessment or audited product carbon footprint. Final figures should be recalculated using confirmed packed shipment weights, actual routing and the applicable UK Government greenhouse-gas conversion factor.