PELI BIOTHERMAL™

Supporting Patient-Centric Sample Collection Programs: Enabling reliable, temperature-controlled shipping for decentralized healthcare

As healthcare delivery continues to evolve, patient-centric models such as home-based sample collection and decentralized clinical trials are becoming increasingly common. While these approaches are designed to improve accessibility and participation, they also introduce new challenges in maintaining temperature control outside traditional clinical environments. Ensuring sample integrity in these settings requires cold chain solutions that are not only reliable, but also simple to deploy at the point of collection.

No cold storage

Complex setup

Time pressure

Variable conditions

The Challenge

While patient-centric collection models improve accessibility, they introduce new complexities in maintaining cold chain integrity outside controlled environments. Unlike traditional clinical settings, home or remote collection points often lack the infrastructure, equipment, and trained personnel required for conventional temperature-controlled shipping.

As a result, organizations must navigate several key challenges:

- Limited access to conditioning infrastructure
  - Pre-conditioned packaging, gel packs, or cold storage are not readily available in decentralized settings
- Complex packout requirements
  - Traditional cold chain solutions often require multiple preparation steps, increasing the risk of user error
- Time-sensitive handling constraints
  - Delays between sample collection and shipment can impact temperature stability and sample viability
- Inconsistent handling environments
  - Variability in ambient conditions and user experience can affect overall shipment reliability

Without a simplified and reliable approach, these challenges can lead to compromised samples, operational inefficiencies, and reduced confidence in decentralized programs.

Addressing these challenges requires a cold chain approach designed specifically for decentralized environments — one that prioritizes simplicity, reliability, and ease of use at the point of collection.

The Solution

To support decentralized and patient-centric collection programs, cold chain solutions must be simple, reliable, and ready to use without specialized infrastructure.

NanoCool™ utilizes evaporative cooling technology, with select configurations incorporating phase change materials (PCM), designed to deliver 2–8°C temperature control for short-duration shipments — without the need for preconditioning or external power.

Its push-button activation enables immediate use at the point of collection, supporting:

- Push-button activation — ready instantly, no setup required.
- Simplified training requirements for patients or healthcare providers
- Designed for reliable performance across varied environments

This simplified approach helps reduce operational burden while maintaining the thermal protection required for sensitive biological samples.

No preconditioning. No external power.
Ready when you are.

By integrating simplified, ready-to-use cold chain solutions into patient-centric programs, organizations can address key barriers in decentralized healthcare — improving reliability, reducing operational burden, and enabling more consistent outcomes across diverse collection environments.

The Impact

- Improve patient participation and compliance
  - Patient-centric programs depend on ease of use. Simplified packaging reduces complexity at the point of collection, helping ensure samples are prepared and shipped correctly — supporting completion rates and overall program effectiveness

- Maintain sample integrity across decentralized environments
  - Designed to support the stability of biological samples from collection through delivery, even when handled outside traditional clinical settings. This helps preserve sample quality throughout transit

- Reduce operational complexity at the point of collection
  - Organizations can streamline decentralized collection workflows by eliminating preparation steps that traditionally require trained staff or specialized equipment — helping reduce error rates, supporting operational cost reduction, and enabling faster, more confident sample dispatch at the point of collection.
- Enable scalable and repeatable decentralized workflows
  - Standardized, easy-to-deploy solutions support the expansion of remote trials and home-based healthcare programs, allowing organizations to scale patient-centric models with greater consistency and confidence

Supporting the Future of Decentralized Healthcare

As healthcare continues to evolve toward more accessible and patient-centric models, the role of cold chain logistics is becoming increasingly critical. Decentralized approaches — including home-based sample collection and remote clinical trials — require solutions that can perform reliably beyond traditional clinical environments.

Enabling these models at scale depends on cold chain systems that balance performance, simplicity, and consistency, ensuring that sample integrity is maintained without adding complexity to the collection process.

NanoCool™ supports this shift by providing a practical and efficient approach to temperature control for short-duration shipments, helping ensure that critical samples are transported safely and reliably — wherever collection takes place.

About NanoCool™

NanoCool™ is a compact, single-use temperature-controlled shipper designed for short-duration shipments within the 2–8°C range. Utilizing evaporative cooling technology, with select configurations incorporating phase change materials (PCM), it delivers consistent thermal performance without the need for preconditioning, making it well-suited for time-sensitive and decentralized applications.

NanoCool™ Universal & Cooling Systems

Understanding NanoCool™ System Configurations

NanoCool™ solutions are available in different configurations to support a range of shipment needs within decentralized and time-sensitive environments. Selecting the appropriate system depends on factors such as duration, thermal requirements, and operational preferences.

NanoCool™ Universal Systems

NanoCool™ Universal Systems combine evaporative cooling with phase change materials (PCM) to provide extended thermal protection and additional temperature buffering.

Best suited for:

- Shipments requiring longer duration performance.
- Lanes with greater temperature variability.
- Programs needing added thermal stability and protection.

NanoCool™ Cooling Systems

NanoCool™ Cooling Systems utilize evaporative cooling technology only, offering a lightweight and efficient solution for shorter-duration shipments.

Best suited for:

- Short-duration, time-sensitive shipments.
- Controlled or predictable shipping lanes.
- Programs prioritizing simplicity and speed of deployment.

For More Information

To learn more about Peli BioThermal solutions or to discuss your specific cold chain requirements, please contact your regional team or visit our website.

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