BIOSPECIMEN TRACKING RECORD

SYNAPSE BIOLOGICAL REPOSITORY SYSTEM (SBRS)

ISO 20387 Compliance Standard | Research Use Only

RECORD IDENTIFIER
BTR-2026-X8921

Specimen Type: PBMC & Blood Plasma

1 Primary Specimen Metadata

Donor ID:	DN-7721-04B	**Collection Date:**	2026-03-12 07:15
Specimen ID:	SPC-2026-A109	**Processing Date:**	2026-03-12 11:30
Biospecimen Type:	Whole Blood (Peripheral)	**Site of Origin:**	Synapse Clinical Center
Primary Vol/Qty:	10.0 mL	**Initial Temp:**	4.0°C (Cold Chain Verified)
Lead Investigator:	Dr. Evelyn Vance	**Affiliation:**	Vertex Research Institute
Project Name:	Bio-markers of Immune Response	**Funding Agency:**	Apex Health Foundation

Donor Consent & Ethical Compliance

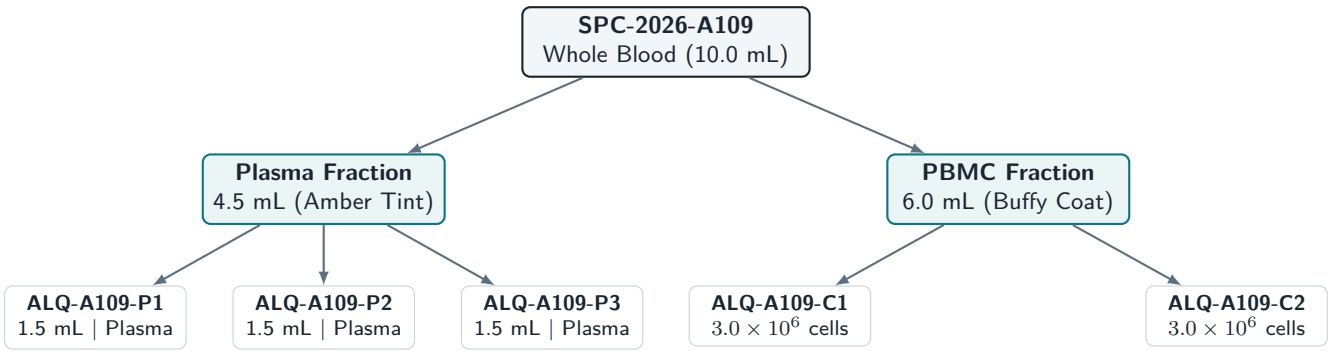
Donor consent has been validated through the Synapse Institutional Review Board (IRB-2025-A7). The following flags represent the scope of authorized uses under the signed Informed Consent Form (ICF-Rev2025):

General Biomedical Research:	CONSENT GRANTED	**Genetic Analysis (WGS/WES):**	CONSENT GRANTED
Commercial Development:	RESTRICTED	**Donor Re-contact Authorized:**	CONSENT GRANTED
Oncology Studies Only:	RESTRICTED	**External Distribution (MTA):**	RESTRICTED

Instruction for Researchers: Any request for sample sharing outside the Synapse network requires a Material Transfer Agreement (MTA) and amendment of IRB-2025-A7. Do not distribute aliquots to commercial entities.

2 Aliquot Genealogy & Lineage

The primary specimen (SPC-2026-A109) was processed via density gradient centrifugation into secondary fractions (Plasma and PBMC), which were subsequently sub-aliquoted into tertiary cryovials. The diagram below illustrates the complete lineage and volume distribution of all derived aliquots.



2.1 Aliquot Registry & Status

The biobank uses a 2D barcode matrix tracking system. Current volumes and physical states are detailed in the inventory table below:

Aliquot ID	Sample Type	Quantity	Concentration	Viability	Status	Current Use
ALQ-A109-P1	Blood Plasma	1.5 mL	N/A	N/A	AVAILABLE	General Study Control
ALQ-A109-P2	Blood Plasma	1.5 mL	N/A	N/A	AVAILABLE	Backup Storage
ALQ-A109-P3	Blood Plasma	0.5 mL	N/A	N/A	DEPLETED	Mass Spec Analysis
ALQ-A109-C1	PBMCs (Cryo)	3.0×10^6	1.5×10^6/mL	94.2%	RESERVED	Reserved: Genomics
ALQ-A109-C2	PBMCs (Cryo)	3.0×10^6	1.5×10^6/mL	93.8%	AVAILABLE	CyTOF Validation

3 Storage Location History

All specimens are stored under continuous telemetry monitoring. The history of physical locations and environmental transitions is documented below.

3.1 Current Active Storage Coordinates

Primary Vault:	Vault 4 (Cryo-Center)	**Rack Position:**	Rack R-12, Column B
Storage Unit:	Freezer LN-24 (Vapor Phase)	**Box Identifier:**	Box BX-PBMC-109
Nominal Temp:	-196°C (Cryogenic)	**Grid Position:**	Coordinates E-08 (Cryovial)

3.2 Location and Custody Chronology

The following log lists the complete environmental history of the specimen from initial collection to its current location:

Date/Time	Storage Facility / Unit	Nominal Temp	State	Verified By	Action / Notes
2026-03-12 07:15	Clinical Site 1 | Transport Box	4.0°C	Liquid	S. Jenkins	Sample collected and sealed
2026-03-12 11:30	Synapse Lab 2 | Wet Bench	20.0°C	Liquid	H. Patel	Aliquoting & Centrifugation
2026-03-12 13:00	Lab 2 | Controlled Rate Freezer	Variable	Freezing	H. Patel	Controlled freezing to -80°C
2026-03-13 09:00	Vault 4 | Vapor phase LN2 (LN-24)	-196°C	Solid	M. Sterling	Permanent vault transfer
2026-05-18 10:15	Vault 4 | Dry Ice Transport Box	-78.5°C	Solid	A. Vance	Temporary transfer for Mass Spec
2026-05-18 11:45	Vault 4 | Vapor phase LN2 (LN-24)	-196°C	Solid	M. Sterling	Return of remaining aliquots

Cryogenic Handling Warning

Cryovials stored in the vapor phase of liquid nitrogen present an explosion hazard if liquid nitrogen has penetrated the vial seal. Wear full face shield, cryogenic gloves, and protective apron during retrieval. Perform all warming steps inside the designated biological safety cabinet (BSC-04).

4 Withdrawal Handling & Processing Log

To maintain sample integrity, the standard operating procedure (SOP-BTR-402) for specimen withdrawal must be executed without deviations. High-priority checks are outlined below.

4.1 Standard Operating Procedure for Specimen Thawing

1. **Verification:** Cross-reference the 2D barcode on the cryovial with the SBRS database to verify the donor ID and active research consent.
2. **Cold-Chain Maintenance:** Transport vials from Vault 4 using dry ice transport carts ($-78.5°C$). Do not expose vials to ambient temperatures during transport.
3. **Thawing Protocol (for PBMCs):** Immerse the lower half of the cryovial in a $37.0°C$ water bath for approximately 75–90 seconds. Gently swirl. Remove from the water bath immediately when a tiny ice crystal remains to prevent heat damage.
4. **Washing:** Dilute the thawed cell suspension dropwise with pre-warmed RPMI-1640 medium containing 10% FBS and $100\,\mu g\,mL^{-1}$ DNase I. Centrifuge at $300 \times g$ for 10 minutes.
5. **Volume Log:** Record the exact volume and cell count immediately after centrifugation. Update the SBRS database.

4.2 Withdrawal and Re-entry Transactions

Each transaction involving sample retrieval, processing, or depletion must be logged below:

Date / Time	Aliquot ID	Vol Out	Temp Out	Authorized Requestor	Purpose / Destination
2026-05-18 10:15	ALQ-A109-P3	1.0 mL	-78.5°C	Dr. Evelyn Vance	Mass Spec Proteomics
2026-06-02 14:00	ALQ-A109-C1	0.0 mL	N/A	Dr. Evelyn Vance	Audit/Visual Verification
2026-07-15 08:30	ALQ-A109-P1	0.5 mL	-78.5°C	Dr. Marcus Sterling	Cytokine Profiling Run 1
2026-07-22 13:45	ALQ-A109-C2	1.0 vial	-196°C	Dr. Evelyn Vance	Sent to Vertex Genomics Lab

5 Quality Control & Custody Authorization

Before final release or long-term archiving, the specimen must be certified against quality standards established under ISO 20387 [1].

5.1 Quality Control Metrics

The following table summarizes the quality control values obtained during the initial processing and subsequent thaws:

Parameter	Target Metric	Observed Value	Status	Test Method
Total Cell Yield	$\geq 5.0 \times 10^6$	6.0×10^6	✔ QC PASS	Cell Counter
Post-Thaw Viability	$\geq 90.0\%$	94.2%	✔ QC PASS	Trypan Blue
DNA Integrity Number (DIN)	≥ 7.0	8.4	✔ QC PASS	TapeStation
Mycoplasma Screen	Negative	Negative	✔ QC PASS	PCR Assay
Endotoxin Level	< 0.1 EU/mL	< 0.05 EU/mL	✔ QC PASS	LAL Assay

5.2 Custody Signatures and Approvals

By signing below, the operating technicians and laboratory manager verify that the records, storage conditions, and consent status flags have been checked and comply with regulatory protocols [2, 3]:

Dr. Marcus Sterling
Biospecimen Custodian, Synapse Repository
Date: _____

Dr. Evelyn Vance
Lead Project Investigator, Vertex Institute
Date: _____

Dr. Arthur Pendelton
Quality Director, Vertex Laboratories
Date: _____

Sophia Calloway
Senior Ethics Advisor, Vertex IRB
Date: _____

References

[1] International Organization for Standardization. Iso 20387:2018 biotechnology — biobanking — general requirements for biobanking. *Geneva: ISO*, 2018.

[2] Board of Directors ISBER. Best practices: Recommendations for biorepositories. *Biopreservation and Biobanking*, 16(1):1–95, 2018.

[3] National Cancer Institute. National cancer institute best practices for biospecimen resources. *National Institutes of Health*, pages 1–60, 2016.