

Ultra-Low Freezer Inventory Log

❄ Freezer FRZ-ULT-07 | 🌡 -80 °C Mechanical Chest Freezer | 🧬 Vertex Genomic Cohort (VGC-24)

Freezer ID
FRZ-ULT-07

Location
Bldg. 4, Rm. B-118

Custodian
Priya Chandran, Biorepository Manager

Record Period
Jan 2025 – Jul 2026

Manufacturer / Model
Nimbus ColdCore ULT-750

Set Point
-80 °C (±3 °C alarm band)

Backup Power
UPS + emergency generator, 10 min transfer

Principal Investigator
Dr. Elena Marsh

-  Overview
-  Rack Map
-  Box Detail
-  Sample Inventory
-  Temperature Log
-  SOP & Standards

Rev.	Description	Date
A	Freezer commissioned; log opened at VGC-24 cohort launch	11 Feb 2025
B	Rack layout re-mapped after 4-shelf rack replacement	03 Nov 2025
C	Current revision – reflects inventory and audits through Jul 2026	28 Jul 2026

1 Freezer Overview & Scope

This log tracks every biospecimen held in Freezer **FRZ-ULT-07**, a -80°C mechanical chest freezer operated by the Vertex Institute for Genomic Medicine Biorepository Core in support of the Vertex Genomic Cohort (VGC-24). It records rack- and box-level storage location, sample-level metadata, temperature and maintenance history, and the custody procedures that govern check-in, withdrawal, and disposal. The freezer holds four racks of 24 boxes each (9×9 position boxes, 2 mL cryovial format), a nominal capacity of 7,776 vial positions, of which 4,881 are currently occupied. Rack 1 is fully detailed in this document as the representative example; Racks 2–4 follow an identical box-slot numbering scheme and are indexed in the Biorepository LIMS under the same freezer ID.

Sample storage locations and box contents in this log are colour-coded by specimen type, consistent across the rack map, the box-level position map, and the sample inventory table:

Nucleic Acids (DNA / RNA / cfDNA)

Plasma / Serum

Cell Suspensions (PBMC / Cell Lines)

Tissue (FFPE / Frozen Biopsy)

Reagents / Controls

Vacant

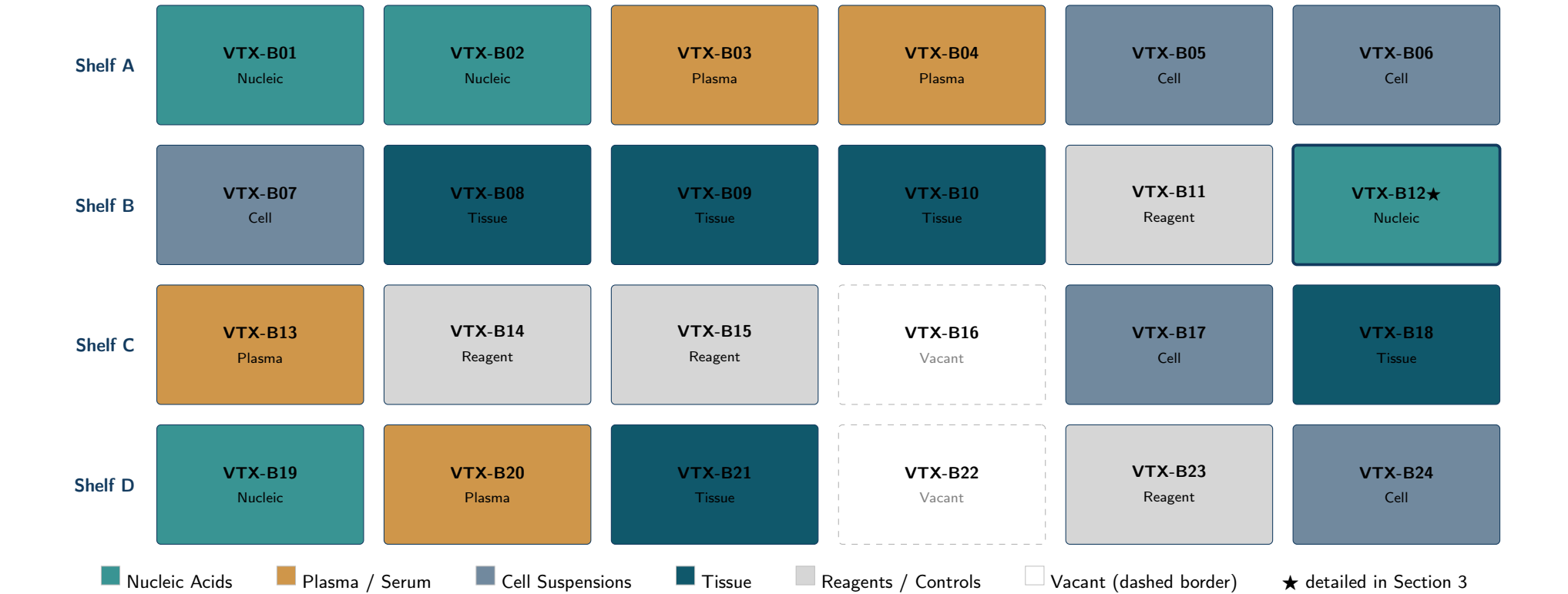
Position

Field	Value
Freezer ID	FRZ-ULT-07
Location	Building 4, Room B-118, Biorepository Core, restricted-access (badge + PIN)
Manufacturer / Model / Serial	Nimbus ColdCore ULT-750 – S/N NX-CC750-22841
Installed / Commissioned	03 Dec 2024 / 11 Feb 2025
Set Point / Alarm Band	-80°C nominal; high-temperature alarm at $\geq -70^{\circ}\text{C}$ sustained 15 min
Capacity	4 racks $\times$ 24 boxes $\times$ 81 positions = 7,776 vial positions (2 mL cryovial)
Current Occupancy	4,881 / 7,776 positions (62.8%), audited 21 Jul 2026
Principal Investigator	Dr. Elena Marsh, Vertex Institute for Genomic Medicine
Biorepository Manager (Custodian)	Priya Chandran
Monitoring System	Nimbus SentryLog wireless probes, 5-minute logging interval, SMS + voice-call escalation on excursion
Backup Power	Facility UPS (15 min bridge) + emergency generator, automatic transfer within 10 s

SCOPE This log covers freezer-, rack-, box-, and position-level inventory for Rack 1 (Boxes VTX-B01–B24) together with the full temperature and maintenance history for FRZ-ULT-07. It is maintained under the Biorepository Core’s Standard Operating Procedures (International Society for Biological and Environmental Repositories, 2023; National Institutes of Health, 2016) and is reviewed at each quarterly biorepository audit.

2 Rack & Box Location Map – Rack 1

Rack 1 holds four shelves (A–D, top to bottom), each fitted with six box slots, for a total of 24 boxes per rack (VTX-B01 through VTX-B24). Box VTX-B12, outlined in bold below, is detailed position-by-position in Section 3. Two slots are held vacant as reserved growth capacity for incoming VGC-24 accessions.



DOOR-OPEN POLICY Limit lid-open time to under 60 seconds per retrieval. Pull the entire box, close the lid, then search for the required vial on the bench – never search for a vial with the freezer lid open, per the excursion-prevention rule in Section 6.

3 Box-Level Position Map – VTX-B12

Box VTX-B12 (Shelf B, Slot 6) is a 9 × 9 cardboard cryobox holding nucleic-acid extracts and a working panel of quality-control aliquots for the VGC-24 cohort. Rows are lettered A–I (front to back), columns numbered 1–9 (left to right). 51 of 81 positions are occupied; the occupied wells are colour-coded by specimen type using the same legend as Section 2.

	1	2	3	4	5	6	7	8	9
A									
B									
C									
D									
E									
F									
G									
H									
I									

Field	Value
Box ID	VTX-B12
Rack / Shelf / Slot	Rack 1 / Shelf B / Slot 6
Box Type	Nunc 9×9 cardboard cryobox, colour-coded lid
Format	2 mL internal-thread cryovial, 81 positions
Occupancy	51 / 81 (63.0%)
Rows A–B	RNA extract panel, PAXgene whole blood, RIN ≥ 7.5
Row C–D	Plasma aliquots (EDTA), 500 µL working volume
Row E	PBMC viability control vials (Vertex QC panel)
Row F	FFPE-adjacent frozen biopsy punches
Row G (cols 1–3)	RT-qPCR master mix aliquots, lot-controlled
Row H	Reserved – unassigned capacity
Row I (cols 1–2)	gDNA extraction blanks (no-template controls)
Last Physical Audit	21 Jul 2026, by Priya Chandran
Next Scheduled Audit	20 Oct 2026

4 Sample Inventory

The table below lists representative holdings across Rack 1, drawn from the boxes mapped in Section 2. The full 4,881-record inventory is maintained in the Biorepository LIMS under freezer FRZ-ULT-07; this excerpt covers the 24 positions most recently checked in or withdrawn, and is refreshed at every quarterly audit.

Position	Sample ID	Description	Type	Vol/Qty	Date Frozen	F/T Cyc.	Stored By
B01-A1	VGC24-0142-RNA01	Whole-blood RNA extract, PAXgene tube, RIN 8.9	Nucleic	45 µL	14 Mar 2025	0	T. Rivera
B01-A2	VGC24-0142-DNA01	Genomic DNA extract, buffy coat, A260/280 1.87	Nucleic	60 µL	14 Mar 2025	0	T. Rivera
B01-B4	VGC24-0087-cfDNA1	Cell-free DNA, plasma-derived, Qubit 4.2 ng/µL	Nucleic	30 µL	22 Apr 2025	1	S. Okonkwo
B02-C1	VGC24-0203-RNA02	PBMC total RNA, RIN 9.1, DNase-treated	Nucleic	40 µL	09 May 2025	0	T. Rivera
B02-D7	VGC24-0203-gDNA1	Genomic DNA, saliva-derived (Oragene kit)	Nucleic	55 µL	09 May 2025	0	P. Chandran
B03-A3	VGC24-0087-PL01	Plasma aliquot, EDTA, single spin	Plasma	500 µL	22 Apr 2025	0	S. Okonkwo
B03-A4	VGC24-0087-PL02	Plasma aliquot, EDTA, single spin	Plasma	500 µL	22 Apr 2025	0	S. Okonkwo
B04-B2	VGC24-0311-SR01	Serum aliquot, clot-activator tube	Plasma	450 µL	30 Jun 2025	0	T. Rivera
B04-B3	VGC24-0311-SR02	Serum aliquot, clot-activator tube	Plasma	450 µL	30 Jun 2025	0	T. Rivera
B05-A1	VGC24-0142-PBMC1	PBMC pellet, Ficoll-isolated, 8×10^6 cells	Cell	1.0 mL	14 Mar 2025	0	T. Rivera
B05-A2	VGC24-0142-PBMC2	PBMC pellet, Ficoll-isolated, 8×10^6 cells	Cell	1.0 mL	14 Mar 2025	0	T. Rivera
B06-C5	VGC24-CTRL-HEK01	HEK293T reference cell line, passage 14	Cell	5×10^6 cells	02 Feb 2025	0	P. Chandran
B07-D2	VGC24-0203-PBMC1	PBMC viability control, 92% post-thaw viability	Cell	1.0 mL	09 May 2025	0	S. Okonkwo
B08-A6	VGC24-0311-FFPE1	FFPE tumour-adjacent tissue block, 5 µm curls	Tissue	3 curls	30 Jun 2025	0	T. Rivera
B08-A7	VGC24-0311-BX01	Frozen core biopsy punch, OCT-embedded	Tissue	1 punch	30 Jun 2025	0	T. Rivera
B09-B3	VGC24-0421-BX02	Frozen core biopsy punch, OCT-embedded	Tissue	1 punch	18 Aug 2025	0	S. Okonkwo

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Position	Sample ID	Description	Type	Vol/Qty	Date Frozen	F/T Cyc.	Stored By
B09-B4	VGC24-0421-FFPE2	FFPE tumour-adjacent tissue block, 5 µm curls	Tissue	3 curls	18 Aug 2025	0	S. Okonkwo
B10-C8	VGC24-0512-BX03	Frozen skin biopsy punch, OCT-embedded	Tissue	1 punch	05 Oct 2025	0	T. Rivera
B11-A1	VGC24-MMX-RTQ07	RT-qPCR master mix aliquot, Lot NX-4471	Reagent	200 µL	12 Jan 2026	0	P. Chandran
B11-A2	VGC24-MMX-RTQ08	RT-qPCR master mix aliquot, Lot NX-4471	Reagent	200 µL	12 Jan 2026	0	P. Chandran
B12-G1	VGC24-CTRL-NTC03	No-template control, gDNA extraction blank	Reagent	50 µL	12 Jan 2026	0	P. Chandran
B13-D4	VGC24-0512-PL03	Plasma aliquot, EDTA, double spin	Plasma	500 µL	05 Oct 2025	0	T. Rivera
B17-B6	VGC24-0421-PBMC3	PBMC pellet, Ficoll-isolated, 6×10^6 cells	Cell	1.0 mL	18 Aug 2025	1	S. Okonkwo
B23-C2	VGC24-MMX-ENZ02	Restriction enzyme aliquot, Lot NX-2290, working stock	Reagent	25 µL	26 Feb 2026	0	P. Chandran

FREEZE-THAW LIMIT Nucleic-acid and plasma aliquots are retired from analytical use after 3 freeze-thaw cycles; cycle counts above are updated at every withdrawal event in the LIMS check-out form (Section 6).

5 Temperature Monitoring & Maintenance Log

5.1 Continuous Monitoring Summary

FRZ-ULT-07 is monitored continuously by a Nimbus SentryLog wireless probe logging at 5-minute intervals, with a manual spot-check performed and initialled at each door-open event. The table below summarises the manual spot-checks for the current quarter; the full continuous trace is archived in the SentryLog portal under asset tag NX-SL-0714.

Date	Time	Temp.	Alarm Status	Notes	Init.
02 Jun 2026	08:14	−80.1 °C	✓ Normal	Routine spot-check	PC
09 Jun 2026	08:20	−79.8 °C	✓ Normal	Routine spot-check	TR
16 Jun 2026	08:11	−80.3 °C	✓ Normal	Routine spot-check	SO
23 Jun 2026	08:17	−79.6 °C	✓ Normal	Routine spot-check	PC
30 Jun 2026	14:52	−68.4 °C	ALARM	Power blip, generator transfer – see incident below	PC
30 Jun 2026	15:40	−79.1 °C	✓ Recovered	Confirmed recovery post-transfer	PC
07 Jul 2026	08:09	−80.0 °C	✓ Normal	Routine spot-check	TR
14 Jul 2026	08:22	−79.9 °C	✓ Normal	Routine spot-check	SO
21 Jul 2026	09:05	−80.2 °C	✓ Normal	Coincided with quarterly physical audit	PC
28 Jul 2026	08:16	−79.7 °C	✓ Normal	Routine spot-check	TR

5.2 Defrost & Maintenance Events

Date	Event	Performed By	Downtime
18 Aug 2025	Scheduled gasket inspection and door-seal replacement	Nimbus Field Service	45 min
12 Jan 2026	Condenser coil cleaning, annual PM visit	Nimbus Field Service	30 min
30 Jun 2026	Emergency generator transfer during grid power blip	Facilities Ops	4 min
15 Jul 2026	Firmware update to SentryLog probe controller	P. Chandran	0 min (no door open)

⚠ Temperature Excursion Incident – 30 Jun 2026

A facility grid power interruption at 14:52 triggered an SMS/voice alarm when the internal probe read −68.4 °C. Automatic transfer to the emergency generator completed within 10 seconds per design; the freezer recovered to set point by 15:40 (48-minute excursion, peak temperature −68.4 °C). No samples were flagged for quality review: the excursion duration and peak were below the 2-hour / −60 °C threshold defined in the Biorepository Core's temperature-excursion SOP. Logged as Deviation #DEV-2026-0031 and closed without corrective action beyond confirming UPS battery health at the next PM visit.

6 Standard Operating Procedures & Custody Rules

6.1 Sample Check-In

1. Confirm the sample label matches the LIMS accession record (participant code, sample type, collection date) before opening the freezer lid.

2. Select the destination box from the rack map (Section 2); pre-stage the vial rack on the bench so freezer door-open time is minimised.
3. Record position (Box-Row-Column), Sample ID, volume, and date frozen in the LIMS check-in form. This log's Section 4 is regenerated nightly from that record.
4. Return the box to its mapped slot immediately; do not leave boxes on intermediate shelves.
5. Two-person verification is required for irreplaceable specimens (primary tissue, founder cell lines) per International Society for Biological and Environmental Repositories (2023).

6.2 Sample Check-Out / Withdrawal

1. Retrieve the entire box, close the freezer lid, then locate the vial on the bench on a chill block or dry-ice tray.
2. Update the freeze-thaw cycle count in the LIMS withdrawal form for any vial that is not fully consumed and returned.
3. Aliquots at 3 freeze-thaw cycles are flagged **RETIRE** and routed to disposal per Section 6.4.
4. Log withdrawing investigator, purpose, and destination assay in the chain-of-custody field – required for all IRB-governed specimens (National Institutes of Health, 2016).

6.3 Power-Outage / High-Temperature Alarm Response

1. Acknowledge the SentryLog SMS/voice alarm within 15 minutes; escalate to the on-call Biorepository Manager if unacknowledged after 30 minutes.
2. Confirm generator transfer status; do not open the freezer lid to inspect contents during an active excursion.
3. If temperature exceeds -60°C for more than 2 hours, initiate the dry-shipper transfer protocol and notify the PI immediately.
4. File a deviation record (Section 5) for every alarm event regardless of outcome.

6.4 End-of-Study Disposal

1. Disposal requires written authorisation from the PI and confirmation that the specimen's consent terms and retention period have expired.
2. Retired specimens are removed from their box, logged as **DISPOSED** in the LIMS with date and witness initials, and the vacated position is marked available on the next rack-map revision.
3. Autoclave or biohazard-stream disposal follows the Biorepository Core's waste-handling SOP; disposal is never performed by a single operator acting alone.

6.5 Standards & References

This freezer's inventory, custody, and monitoring practices follow International Society for Biological and Environmental Repositories (2023) and National Institutes of Health (2016) for repository operations, Clinical and Laboratory Standards Institute (2010) for specimen handling, and are audited annually against the College of American Pathologists (2022) biorepository accreditation checklist.

Name	Role	Signature	Date
Priya Chandran	Biorepository Manager (Custodian)		
Dr. Elena Marsh	Principal Investigator		
Samuel Okonkwo	Quality Assurance Reviewer		

References

Clinical and Laboratory Standards Institute. Gp44-a4: Procedures for the handling and processing of blood specimens for common laboratory tests. Technical report, CLSI, 2010.

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