

# The Mycetoma Research Center

## Biobank

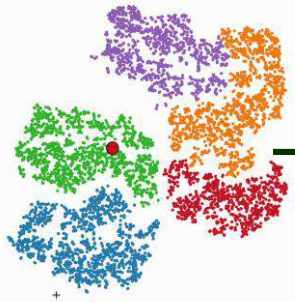
## Samples Storage

## Standard Operating Procedures



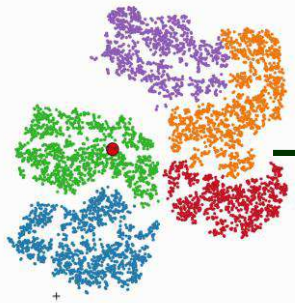
The Mycetoma Research Center  
University of Khartoum  
WHO Collaborating Center  
on Mycetoma & Skin NTDs

# Background



**This SOP ensures the safe, organised, and consistent storage of various biological and environmental samples, to maintain the integrity of the samples which are critical for scientific research.**





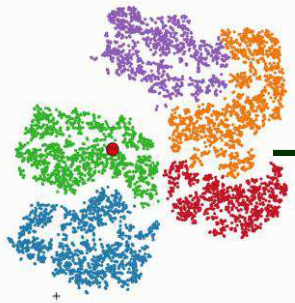
# Purpose

**This SOP outlines the procedures for the storage of biological and environmental samples at the Mycetoma Research Center Biobank, including blood, serum, plasma, tissues, DNA, urine, saliva, grains, environmental samples and others.**

**The purpose is to ensure consistency, safety, and integrity of stored samples for research purposes.**



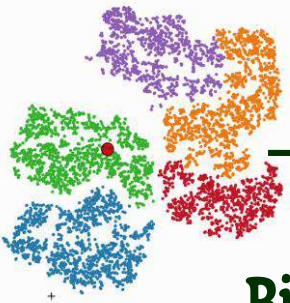




# Scope

**This SOP applies to all personnel involved in the collection, processing, and storage of biological and environmental samples within the Mycetoma Research Center Biobank.**





# Responsibilities



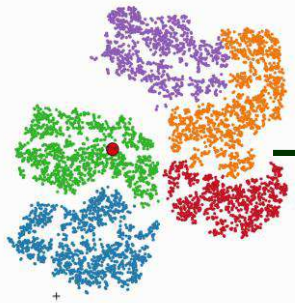
## Biobank Personnel

Responsible for the proper handling, labeling, and storage of samples according to this SOP.

## Principal Investigators

Responsible for ensuring that samples are collected, transported, and stored in accordance with this SOP.



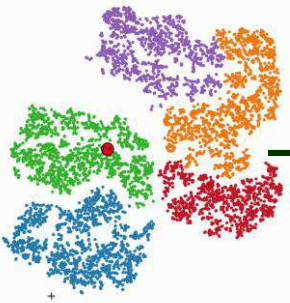


# Responsibilities

## Laboratory Technicians

Assist in sample processing and ensure that storage conditions are maintained.

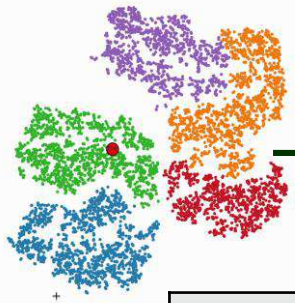




# Definitions



<b>Blood</b>	<b>Whole blood collected from human subjects or animals.</b>
<b>Serum</b>	<b>The liquid portion of blood obtained after clotting.</b>
<b>Plasma</b>	<b>The liquid component of blood that remains when clotting is prevented.</b>
<b>Tissues</b>	<b>Human or animal tissues collected for research purposes.</b>
<b>DNA</b>	<b>Genomic material extracted from biological samples.</b>

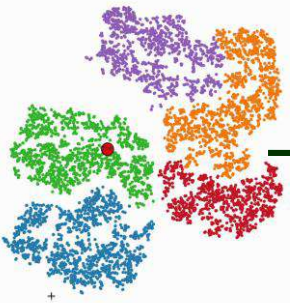


# Definitions



<b>Urine</b>	<b>Waste fluid produced by the kidneys, collected for various analyses.</b>
<b>Saliva</b>	<b>Oral fluid collected for non-invasive biomarker research.</b>
<b>Environmental Samples</b>	<b>Samples collected from the surrounding environment, including soil, water, environment, others.</b>
<b>Grains</b>	<b>Collected from mycetomas infected tissues or open sinuses.</b>





# Procedures For Sample Storage – Blood



## Sample Collection

Collect in EDTA or heparin tubes.

## Processing

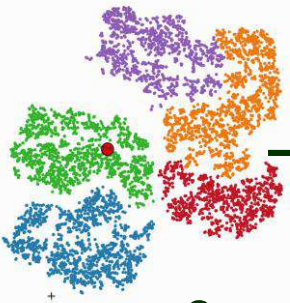
If not used immediately, centrifuge to separate plasma.

## Storage Conditions

Whole Blood: Store at 4°C for up to 48 hours. For long-term storage, freeze at -80°C.

Aliquoted Plasma: Store at -80°C in cryovials.





# Procedures For Sample Storage – Serum



## Sample Collection

Collect blood in serum separator tubes (SST).

## Processing

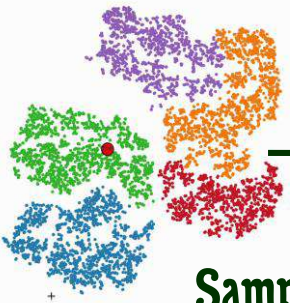
Allow blood to clot at room temperature for 30–60 minutes, then centrifuge to collect serum.

## Storage Conditions

Short-Term: Store at 4°C for up to 48 hours.

Long-Term: Aliquot and freeze at -80°C.





# Procedures For Sample Storage – Plasma



## Sample Collection

Collect in anticoagulant-treated tubes (e.g., EDTA).

## Processing

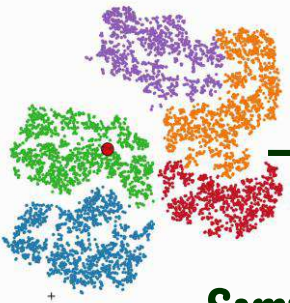
Centrifuge within 30 minutes of collection to separate plasma from cells.

## Storage Conditions

Short-Term: Store at 4°C for up to 24 hours.

Long-Term: Store at -80°C in cryovials.





# Procedures For Sample Storage – Tissue



## Sample Collection

Collect fresh or preserved tissue samples.

## Processing

Depending on research requirements, snap-freeze in liquid nitrogen or fix in formalin.

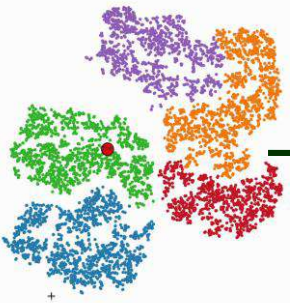
## Storage Conditions

Fresh/Frozen Tissues: Store at  $-80^{\circ}\text{C}$ .

Formalin-Fixed Tissues: Store at room temperature in formalin or paraffin blocks.







# Procedures For Sample Storage – DNA



## Sample Collection

Extract DNA from blood, tissue, or other biological samples.

## Processing

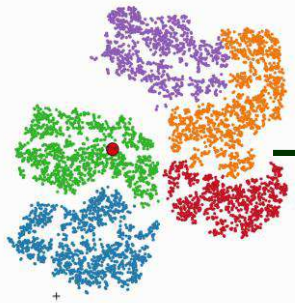
Quantify and assess DNA integrity.

## Storage Conditions

Short-Term: Store DNA at 4°C.

Long-Term: Store at -20°C or -80°C for high molecular weight DNA.





# Procedures For Sample Storage – Urine



## Sample Collection

Collect in sterile containers.

## Processing

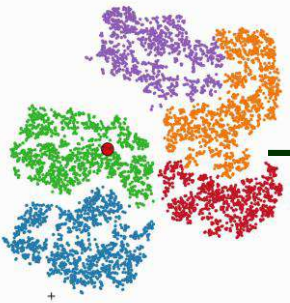
Centrifuge if needed to remove debris or cells.

## Storage Conditions

Short-Term: Store at 4°C for up to 24 hours.

Long-Term: Aliquot and store at -80°C.





# Procedures For Sample Storage – Saliva



## Sample Collection

Collect using sterile, non-invasive collection kits.

## Processing

Centrifuge to separate any particulates.

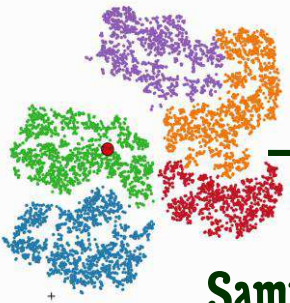
## Storage Conditions

Short-Term: Store at 4°C for up to 48 hours.

Long-Term: Aliquot and freeze at -80°C.







## Procedures For Sample Storage – Environment Samples



### Sample Collection

Collect environmental samples such as soil, water, or air particulates in sterile containers.

### Processing

Depending on sample type, process immediately or store for later analysis.

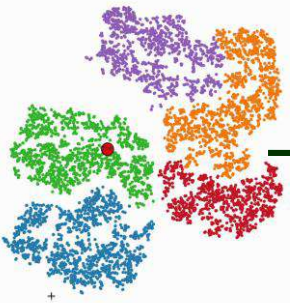
### Storage Conditions

Soil/Water: Store at 4°C for short-term or freeze at -20°C for long-term.

Air Samples: Store filters in sealed containers at -20°C.





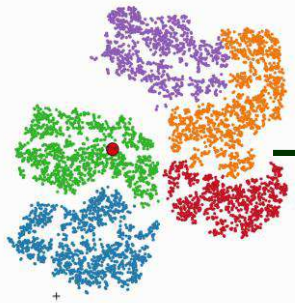


# Labeling

## 1. Assigning Unique Identifiers

- Assign a unique Biobank ID number to each mycetoma grain sample.
- Each cryogenic vial should be labeled with the following information:
  - Unique Biobank ID
  - Date of collection
  - Sample type (e.g., grain, DNA, RNA, etc.)
  - Storage conditions (e.g.,  $-80^{\circ}\text{C}$  or liquid nitrogen)





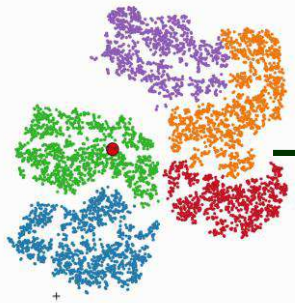
# Labeling

## 2. Barcoding

Use barcoding for efficient tracking and retrieval of samples if possible.

Ensure all barcodes are scanned into the electronic database and cross-referenced with the physical label.





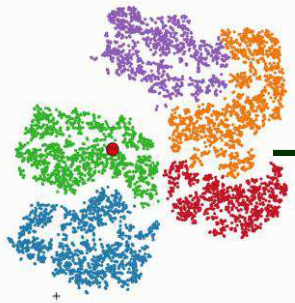
# Sample Tracking

## Biobank Database

Enter all relevant information (subject ID, sample type, collection date, storage location) into the Biobank's electronic database.







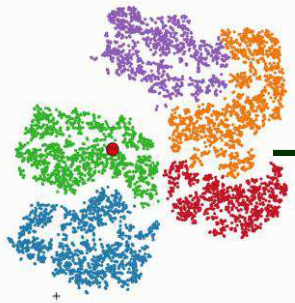
# Sample Tracking

## Barcoding

Assign a unique barcode to each sample for easy tracking and retrieval.







## Documentation

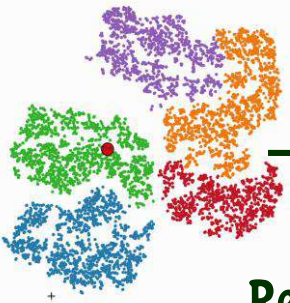
### 1. Data Entry

Record all necessary information in the

Biobank database, including:

- Patient demographics  
(with confidentiality maintained)
- Collection date and site
- Sample type and condition
- Storage location
- Aliquot number and volume





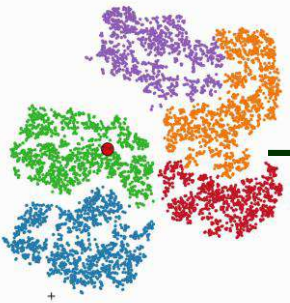
## Record Keeping

Maintain detailed logs of all samples processed and stored, including any deviations from standard procedures.

## Incident Reporting

Report any freezer failures, sample degradation, or handling issues immediately.





# Quality Control

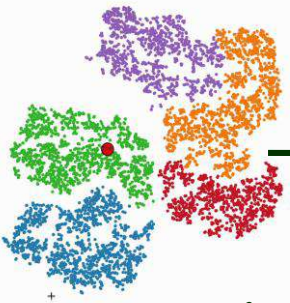
## Temperature Monitoring

All freezers and refrigerators must be equipped with temperature monitoring systems to ensure consistent storage conditions.

## Periodic Audits

Conduct routine checks on sample integrity and storage conditions every 3–6 months.



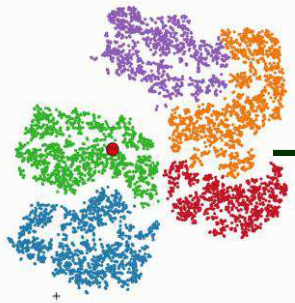


## 1. Personal Protective Equipment (PPE)

- All personnel handling Mycetoma grains must wear appropriate PPE, including gloves, lab coats, and cryogenic gloves when working with  $-80^{\circ}\text{C}$  freezers or liquid nitrogen.

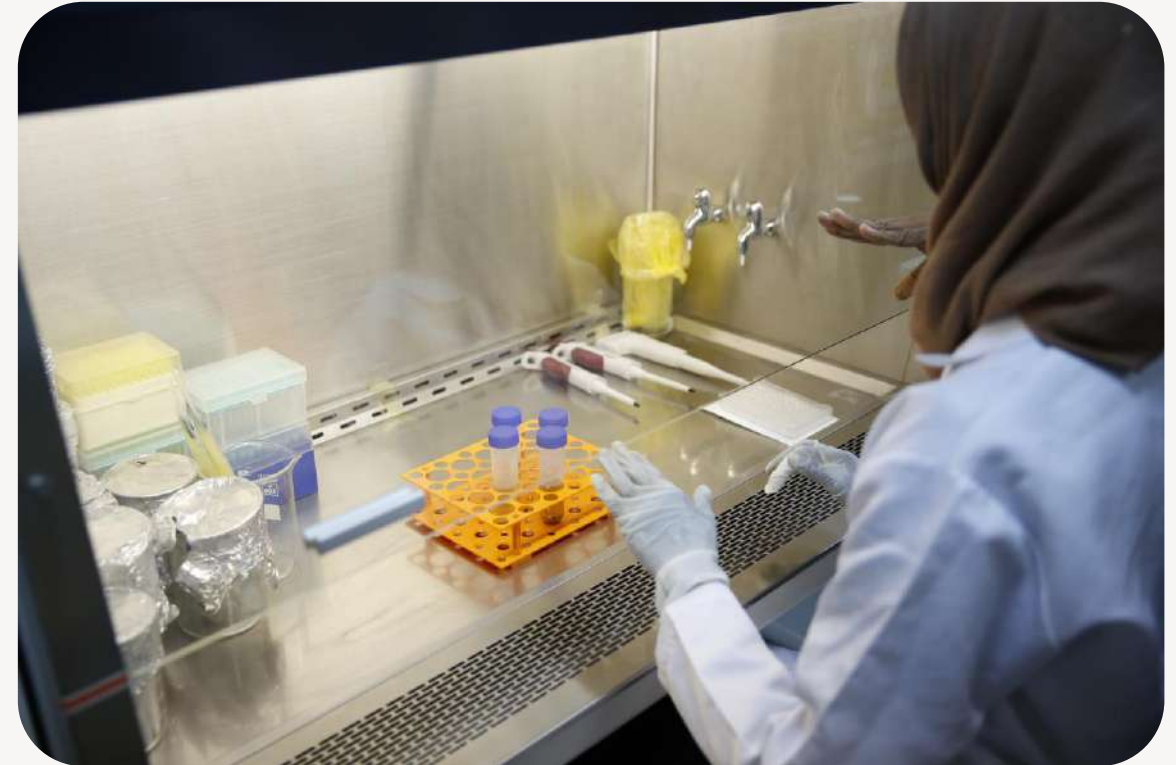


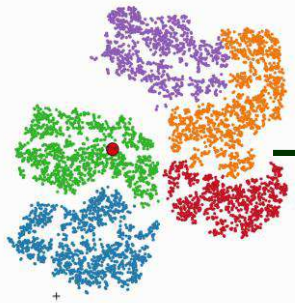




## 2. Biosafety Cabinet

All sample processing steps should be conducted in a biosafety cabinet (Class II) to prevent contamination.

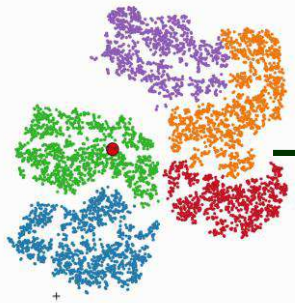




## 3. Hazardous Waste

Dispose of any biological waste, including contaminated media and consumables, in accordance with institutional biosafety protocols.





# Sample Retrieval and Usage

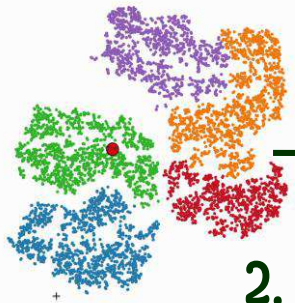


## 1. Requesting Samples

Researchers must submit a formal request and approval must be granted by the Biobank Manager before samples are accessed.







# Sample Retrieval and Usage

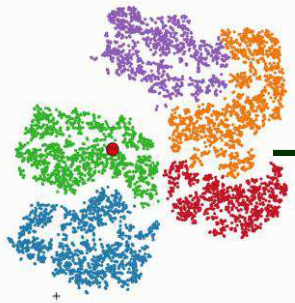
## 2. Thawing Samples

When retrieving samples, follow a controlled thawing process:

- Remove cryovials from liquid nitrogen or  $-80^{\circ}\text{C}$  freezer.
- Thaw at room temperature or in a  $37^{\circ}\text{C}$  water bath for a short duration (if needed).
- Record the date and time of thawing in the database.



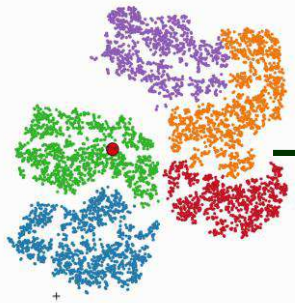




## Return of Unused Samples

If any portion of the sample is unused, it should be returned to the Biobank and stored under appropriate conditions.



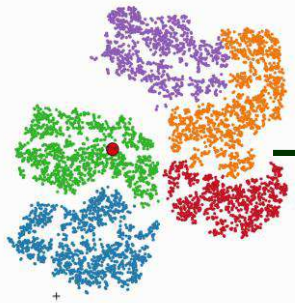


# Disposal of Samples

## 1. Expired Samples

If samples reach their defined shelf-life or are deemed no longer usable, they should be disposed of according to the Biobank's waste management protocols.





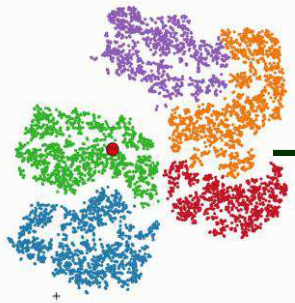
# Disposal of Samples

## 2. Documentation of Disposal

- Ensure that disposal of samples is documented and records are updated in the Biobank database.







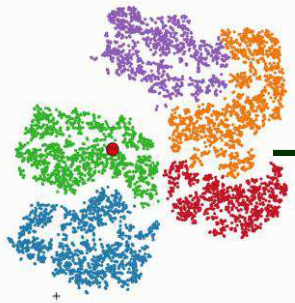
# Audit and Review

## Annual Audit

1. Conduct annual audits of the biobank storage facilities, including an inventory check to ensure compliance with the SOP.







# Audit and Review

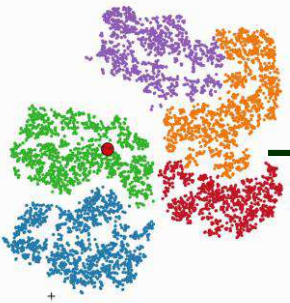


## 2. Review of SOP

- This SOP should be reviewed annually and updated as needed to reflect changes in technology or research requirements.



# References



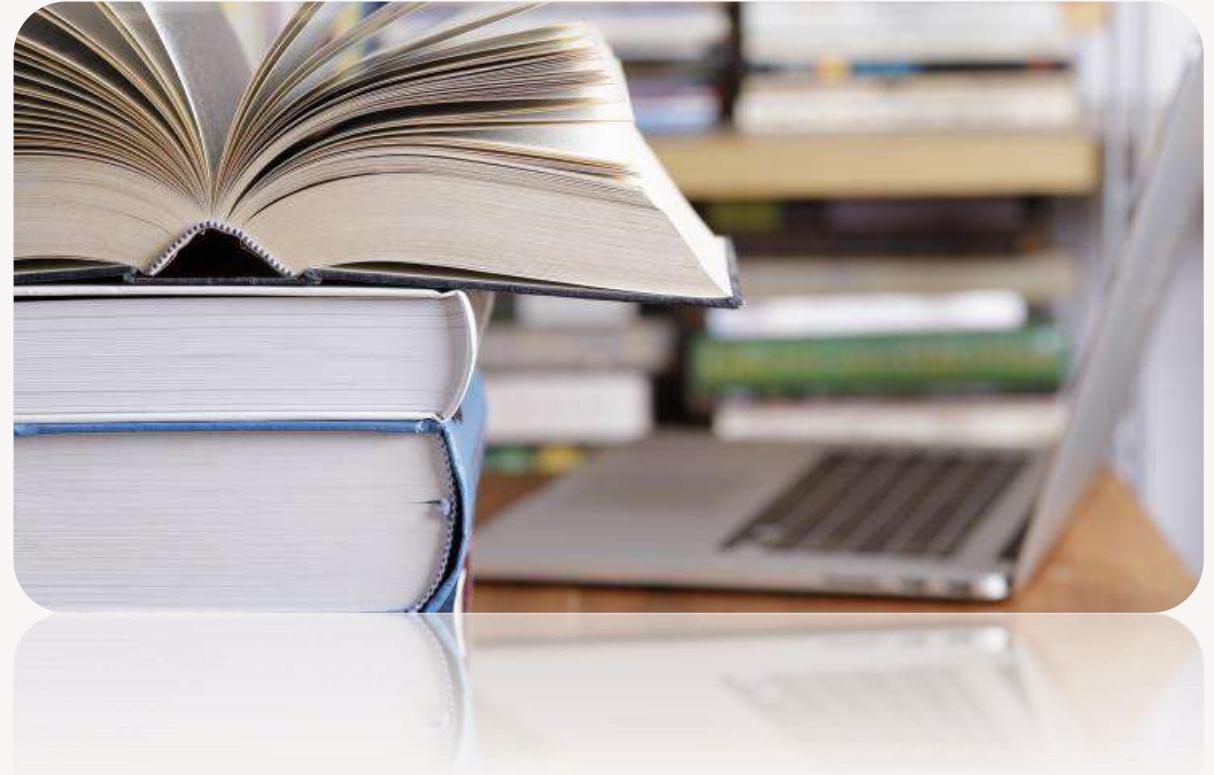
## **WHO Guidelines for Biobanking**

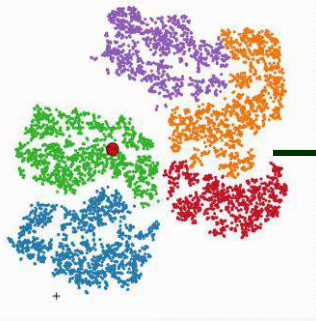
<https://www.iarc.who.int/branches-nme-lsb-research/>

**Bayot ML, Limaiem F. Biosafety Guidelines.**  
StatPearls Publishing; 2024 Jan.

<https://www.ncbi.nlm.nih.gov/books/NBK537210/>

## **Mycetoma Research Center Biobank Guide**





# Approval



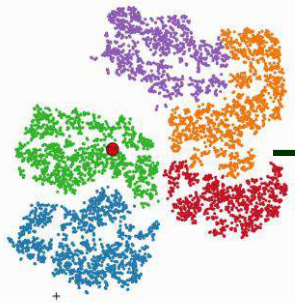
**This SOP is approved by the Mycetoma Research Center Director and must be adhered to by all relevant personnel.**

<b>Miss Nema Ahmed EL Faki</b>	<b>Research Assistant</b>	<i>Nema</i>
<b>Dr Abdulla Osman</b>	<b>Senior Researcher</b>	<i>abdella</i>
<b>Prof Fahal</b>	<b>MRC Director</b>	<i>Fahal</i>

**Effective Date 11 April 2023**

**Version: 1.0**

**Next Review Date: 11 April 2025**



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## Samples Storage

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