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CAMbank: Urine Collection (v1)

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Protocol status: Working

We use this protocol and it's working

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Abstract

This protocol describes the standardized collection of urine samples in both crude and nucleic acid-conditioned formats for molecular, biochemical, and metabolomic analyses. Participants void into sterile specimen containers, from which urine is processed within hours of collection. Two types of aliquots are prepared: (1) **crude urine**, stored directly at -80°C , and (2) **conditioned urine**, prepared by adding Zymo Urine Conditioning Buffer (UCB) prior to freezing to stabilize nucleic acids. Samples were aliquoted into 1 mL–15 mL tubes to minimize freeze–thaw cycles and shipped on dry ice to the Cornell Aerospace Medicine Biobank (CAMbank) for long-term storage at -80°C . This dual-format approach supports a broad range of downstream assays, including viral reactivation monitoring, hormone profiling (e.g., cortisol), mineral and electrolyte analysis, proteomics, telomere length measurement, and targeted or untargeted metabolomics. The method ensures sample integrity across diverse storage and transport conditions and aligns with the Space Omics and Medical Atlas (SOMA) initiative's goal to standardize biospecimen handling for cross-mission comparability and astronaut health assessment.

Attachments



[Zymo Urine Condition...](#)

345KB



Materials

SAMCO Wide-Mouth Bio-Tite 120mL (13-711-56)

Zymo Research Urine Conditioning Buffer 140.0 mL (D3061-1-140)

ThermoFisher Matrix 2D Screw Tubes 1.0 mL (3741-WP1D-BR)

Sterile nitrile gloves

70% Ethanol in a spray bottle

VWR KimWipes

Cryogenic Freezer



Preparation

- 1 Verify that all necessary materials are available and urine cups are sterile-sealed.

Sample Collection (Research Subject)

- 2 Verify that the urine cup is sterile-sealed.
- 3 The research subject collects a urine sample using SAMCO Wide-Mouth Bio-Tite containers.
- 4 The research subject ensures that the urine cup is tightly sealed.
- 5 The research subject marks the following information:

Subject ID (ex: C####)
Date of Collection (MM-DD-YYYY)
Time of Collection (HH:MM AM:PM)
- 6 The research subject stores the urine at +4°C until sample handoff to the research team.

Sample Processing (Research Team)

- 7 The sample is transferred to the research team.
- 8 Put on nitrile gloves to ensure sterile handling of the samples.
- 9 Verify that the collection tube is properly sealed and has not leaked.



- 10 Sterilize the outside of the container with 70% ethanol and wipe down with a KimWipe.
- 11 Shake the urine sample in the specimen container gently to mix and re-suspend particles that may have settled at the bottom of the container.
- 12 Working in a laminar flow hood, transfer half the urine to a conical tube.
- 13 Add Zymo Research Urine Conditioning Buffer to the collected samples according to the manufacturer's recommendations.
- 14 Aliquot 1mL of conditioned urine into each of the ThermoFisher Matrix 2D Screw Tubes. *Collection timepoints with large urine volumes may be stored in 15mL conical tubes once 1mL aliquot racks are filled. Conical tubes must be assigned a unique identifier (which are already pre-labeled on the Matrix 2D tubes).*
- 15 Repeat the aliquoting process for the crude urine (urine that did not receive the Zymo Urine Conditioning Buffer).

Storage

- 16 Place the collection tubes in a cryogenic freezer box.
- 17 Store at -80°C.

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