Banking, tracking, and sharing of materials

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Have you ever looked for that one sample—cell line, plasmid, oligo, or reagent—only to find it unlabeled, misplaced, degraded, or missing entirely? Losing track of materials wastes time, duplicates effort, and can set projects back by weeks or months.
Most of what follows is light: a handful of conventions you set once and let do the work: fixed identifiers, labels that point to the inventory instead of carrying detail, indexed boxes, a quick line in the log when something moves. None of it asks much in the moment, and each piece pays back the next time someone needs to find, share, or trust a sample. Skip them and the cost hides in plain sight: half an hour here, a vial thawed twice there, the irreplaceable sample no one can locate when it matters.

This is a bench card. Full protocol available online.

Procedures

›› ***Setting up the inventory system***

(1.) *Critical:* Let the inventory issue identifiers as consecutive numbers with a material-type prefix. When the system hands out the next free number, no one accidentally picks a used one.

(2.) Prioritize putting the identifier on the label, nothing else matters more. With no room for much detail, the inventory becomes the natural place to look and to update.

(3.) Keep the inventory simple enough that adding an entry is faster than skipping it. Back it up and keep distributed copies; losing the inventory is far more expensive than preventing that loss.

(4.) *Optional:* For large inventories, barcode vials or boxes to speed up handling.

(5.) Index every storage box and maintain digital box maps. Number boxes consecutively.

> ***Quality assurance:*** Audit box maps periodically and resolve mismatches immediately. Protect high-value stocks. Use locked boxes or controlled access for irreplaceable or sensitive materials, and track who has access.

(6.) Agree on what “validated” means for each material type before adding it to the inventory. For example, mycoplasma-negative cell lines, sequence-confirmed plasmids, spectroscopically pure compounds.

›› **General procedure:** ***Banking a new material***

(1.) Pull the next identifier from the inventory.

(2.) Label the tube or container in water-resistant ink or on a cryo-safe label. Frozen plastic doesn’t hold ink or stickers well.

(3.) Record all required metadata in the shared inventory at the time of banking. At a minimum: plate/well ID, vector, host, passage, selection conditions, date, phenotype notes, and analysis method.

(4.) Prepare multiple vials or aliquots whenever feasible, while the material is healthy and not after it has aged or been stressed. Store at least one in a backup location such as a separate freezer, with a collaborator, or in a repository.

(5.) Place the vials into indexed cryoboxes or storage racks and update the digital box map immediately.

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Banking of continuously renewable materials

(1.) Maintain at least one backup aliquot for each material under long-term storage conditions. Keep prior batches for at least two years to enable troubleshooting and reproducibility checks.

(2.) Withdraw a sample from the remaining working stock for your experiments.

(3.) When renewing a stock, assign a new identifier and validate its quality before adding it to the inventory.

Banking of cell lines

(1.) Prepare stocks for the master cell bank from early-passage, validated cultures. The master bank is never thawed except to produce working stocks. 🕮

(2.) From the master bank, expand working cell banks for routine use. Store each working bank separately from the master so that a single freezer failure does not lose both. 🕮

(3.) *Critical:* Validate each working batch for identity (STR profile), absence of contamination (mycoplasma testing), and phenotype before banking.

(4.) Thaw and expand one vial from the working cell bank for your experiments.

Banking of limited, single-batch materials

(1.) Record the total initial quantity at banking and a “critical low” threshold in the inventory. 🕮

(2.) Aliquot into single-use vials where possible to avoid freeze-thaw cycles and contamination.

(3.) Update the inventory after each use to reflect the exact remaining amount. Flag the record when the critical low threshold is reached.

(4.) At depletion, mark the record as exhausted and archive it for traceability.

›› **General procedure:** ***Retrieving and using a banked material***

(1.) Locate the vial in the inventory database and verify its identifier before retrieval.

(2.) Log the user, date, and purpose of retrieval in the inventory system.

(3.) After use, return the vial if still viable, or update the inventory to mark it as depleted or disposed.

> ***Critical:*** Never return thawed cell lines or degraded reagents to long-term storage. ⬅

›› ***Disposal and retirement of stocks***

(1.) When a material is depleted, contaminated, fails validation, or is no longer needed, mark it as “retired” in the inventory database; log the date and the reason for disposal. Do not erase the record.

(2.) Physically remove the vial(s) from storage and dispose of them following the appropriate biosafety or chemical-waste disposal protocol.

›› *Material sharing and chain-of-custody*

(1.) When transferring any material to another person, lab, or collaborator, record the stock identifier, recipient, date, and purpose in the inventory database.

(2.) Where applicable, ensure that a Material Transfer Agreement (MTA) or other legal document is in place before the transfer.

> ***Critical:*** Do not share materials subject to export control, clinical privacy, or other restrictions without prior approval.

(3.) Shipment of hazardous or biological materials may need to be reviewed by EHS. For BSL-2 materials, confirm that the recipient has appropriate facilities and training.

🕮 Notes (available online)