LABORATORY FOR HEALTH, OMICS AND PATHWAY EXPLORATION

Microbial Culture Media, Colony Isolation, Purification and Preservation

Method reference for culture-media selection, streak-plate and spread-plate concepts, purity assessment and stock-culture documentation.

DOCUMENT	VERSION	ISSUED
HOPE-PR-01	1.0	09 November 2026

HOPE Lab member reference: This method is among the approaches commonly used in relevant HOPE Lab research and student training. This document is maintained for convenient access by HOPE Lab members and students; it must be used alongside supervisor guidance and current institutionally approved procedures.

Use and responsibility: This document is a student reference, not an institutional authorization or a universally validated SOP. It does not replace supervisor instruction, current standards, local risk assessment, institutional approval, equipment-specific validation or applicable safety procedures. Anyone outside HOPE Lab who consults or adapts this material must independently assess its suitability, obtain any required approvals, validate the method for their own setting, and assume responsibility for its application and interpretation. HOPE Lab makes no guarantee of fitness for third-party use and accepts no responsibility for external implementation or outcomes to the extent permitted by applicable law.

Safety boundary: No live-culture procedure, incubation setting, media recipe or organism-recovery instruction is provided here. Those operational details must be supplied through approved, supervisor-led institutional SOPs.

Purpose and scope

This reference distinguishes the roles of microbiological culture media, primary isolation, colony purification and culture preservation. It is an educational method-selection and quality-documentation guide; it is not a bench SOP and does not provide operational growth conditions or instructions for handling unknown organisms.

Method concepts

Method	What it is used for	Key interpretation
Culture media selection	Choosing a defined or complex medium that is appropriate for the documented organism, research question and analytical endpoint.	Record full formulation, manufacturer or preparation source, lot, pH specification and quality status.
Streak-plate isolation	A surface-isolation approach intended to separate cells spatially so that discrete colonies may be evaluated.	A colony is not proof of purity or identity; purity requires appropriate confirmatory checks.
Spread-plate enumeration	A surface-distribution approach used in validated workflows for viable-count estimation or evaluation of prepared dilutions.	Report the countable range and dilution scheme only as specified in the approved SOP; retain raw counts.
Colony purification	Repeated single-colony selection within an approved workflow to obtain a culture with consistent observable and confirmatory characteristics.	Assess purity by suitable microscopy, phenotype and/or molecular identity checks as appropriate.
Culture preservation	Maintaining authenticated reference stocks under a validated short- or long-term preservation system.	Track strain identity, provenance, passage history, storage conditions and post-recovery checks.

Materials and documentation categories

- Authenticated, documented organisms approved for the facility and activity; do not use unknown environmental or clinical material in teaching activities.
- Institutionally approved media and quality-control records, including formulation or product information and lot traceability.
- Validated equipment and containment arrangements specified by the laboratory risk assessment and approved SOP.
- Unique strain identifiers, source records, passage history, purity records and preservation/recovery logs.

Quality controls and decision points

Control / check	Purpose
Medium sterility check	Detects contamination attributable to the medium or handling process; acceptance criteria belong in the local SOP.
Growth-promotion / performance control	Confirms that the medium supports the intended performance for an authenticated reference organism.
Identity and purity check	Confirms that the culture record remains consistent with the intended organism and is not a mixed culture.
Preservation recovery check	Documents that an archived stock retains the required identity and performance after recovery.

Workflow overview (non-operational)

The supervised workflow normally proceeds through documented organism approval and risk assessment; selection of a validated medium; media quality review; selection of an isolation or enumeration approach; purity and identity confirmation; assignment of a unique culture record; and preservation under the institutionally approved system. The sequence, conditions, acceptance limits and waste handling must come from the current local SOP.

Important scope limits

ASM teaching-laboratory guidance emphasizes risk assessment, training, stock-culture traceability and containment. Use authenticated organisms approved for the facility. This guide does not authorize environmental sampling, unknown-organism cultivation, clinical isolate handling or independent microbiological work.

References and further reading

1. American Society for Microbiology. ASM Guidelines for Biosafety in Teaching Laboratories (2020). https://asm.org/guideline/asm-guidelines-for-biosafety-in-teaching-laboratories

2. American Society for Microbiology. Biosafety Guidelines Appendix. https://asm.org/ASM/media/Education/Biosafety-Guidelines-Appendix.pdf

3. Use the current institutionally approved media preparation, culture isolation, purification and preservation SOPs; record the version and approval date in study records.

Document status: Version 1.0. This reference should be checked against current literature, institutional requirements and the approved local method before use.