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Replica-Plating Pattern Interpretation

Practical 18 - Biological teaching-data practical

Aim

To interpret replica-plating position patterns in supplied teaching images.

Principle

Replica comparison preserves spatial relationships so growth patterns can be compared across defined media. A missing position can reflect a phenotype or a transfer failure; controls distinguish these possibilities.

Materials and Requirements

- Approved nonpathogenic teaching system or supplied anonymised dataset
- Laboratory risk assessment, controls and raw-data worksheet
- Approved method or teaching-data pack and a dated record sheet

Procedure

1. Define the preparation or dataset, study question and method version. Record identities, units and the criteria to be used before examining the outcome.
2. Use supplied images or a certified benign teaching demonstration, with no unknown-organism or resistance-enrichment exercise.
3. Label the master positions and align orientation marks on every image.
4. Compare nonselective transfer controls with the stated test conditions and score growth consistently.
5. Identify candidate phenotype patterns and list confirmatory evidence rather than assigning genotype from one missing spot.
6. Retain the original observations and calculations. State deviations, missing information and the limits of the conclusion; do not replace measured values with expected results.

Observations and Record

Enter actual measurements or the supplied teaching data. Record the method, material identity, conditions and units.

Preparation / control	Condition / method	Raw observation	Calculated / interpreted result
Negative / vehicle control	Specify	Record	Evaluate
Positive / reference control	Specify	Record	Evaluate
Test replicates	Specify	Record	Calculate

Calculations

- Transfer recovery (%) = master positions recovered on the nonselective replica / master positions assessed x 100

Worked Example

Illustrative 48 of 50 master positions grow on the nonselective replica: transfer recovery = 96%.

The two missing positions cannot be interpreted as a test-medium phenotype without further evidence.

Result and Interpretation

- Deliver an aligned position map, control assessment and evidence-limited phenotype table.
- Report biological and technical replication separately and explain control performance.

Precautions

- Use only the approved biological system, containment and decontamination procedure.
- A teaching dataset does not authorise live animal, human-tissue or unknown-organism work.
- Keep original images and observations; avoid selecting only favourable fields or bands.

Viva Questions and Answers

Why preserve orientation?

It links the same original position across images.

Why use a nonselective replica?

It checks transfer success.

Does absent growth prove a mutation?

Transfer and growth controls plus confirmation are needed.

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