

IN THE LOOP

CONTAMINATION CONTROL IS A CHAIN

Your CO_2 Incubator Is at the Center. Every Link Matters.

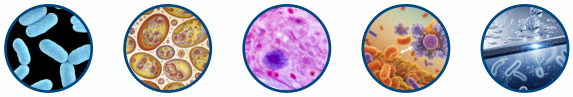
ESCO LIFESCIENCES

Contamination control doesn't begin when your cell cultures enter the incubator, and it doesn't end when they come out.
From aseptic handling to chamber maintenance and post-incubation practices, every step contributes to reliable cell culture. **Your CO_2 incubator is at the heart of this workflow, but even the most advanced incubator cannot compensate for a broken link.**



KNOW YOUR CONTAMINANTS

Different contaminants require different detection and prevention strategies.



Bacteria | Yeast | Fungi | Mycoplasma | Contamination

- **Bacteria:** May cause rapid changes in culture appearance, medium clarity, or pH.
- **Yeast:** May appear as budding cells or rounded particles, depending on the species.
- **Fungi:** May develop filamentous growth or spores
- **Mycoplasma:** Often goes undetected under routine microscopy and may affect cell behavior without obvious signs.
- **Cross-contamination:** Occurs when one cell line is contaminated or replaced by another cell population.

Note: *Visual appearance alone cannot reliably identify or exclude contamination. Use appropriate detection methods when contamination is suspected.*

TRACE THE SOURCE

Contamination can be introduced before cultures even enter the incubator—or arise from inadequate handling and maintenance practices.

BEFORE INCUBATION | The Chain of Handling

- Contaminated cell cultures, media, or reagents
- Improper pipetting and accidental contact with non-sterile surfaces
- Contaminated vessel exteriors or poorly secured vessel closures
- Inadequate labeling and cell-line mix-ups

DURING INCUBATION | Handling and Environmental Factors

- Contaminated vessels introduced into the chamber
- Frequent or unnecessary door openings
- Spills, residue, or inadequate chamber cleaning
- Contaminated water pans or humidification components, where applicable
- Shared equipment and poor laboratory housekeeping

Remember: *Your incubator cannot compensate for contaminated cultures, compromised aseptic technique, or improperly managed reagents.*

PREVENT CONTAMINATION AT EVERY STEP

A. Maintain Aseptic Technique

- Disinfect gloves when required by your laboratory's procedures, and replace contaminated gloves.
- Avoid touching sterile materials with non-sterile gloves or equipment.
- Use proper pipetting techniques and sterile consumables.
- Minimize unnecessary movements, talking, and interruptions while handling open cultures.
- Prepare and label cultures correctly inside the appropriate containment equipment.

B. Prepare Your CO_2 Incubator Correctly

- Follow the recommended temperature and CO_2 setpoints for your specific cells and culture medium.
- Maintain humidification according to the incubator's instructions for use (IFU).
- Minimize unnecessary door openings to reduce environmental disturbances.
- Clean spills promptly and use cleaning agents compatible with the incubator.
- Follow the specified cleaning, decontamination, or sterilization procedure for your particular model.

C. Establish Consistent Laboratory Practices

- Maintain clear sample identification and traceability.
- Control shared reagents, equipment, and consumables.
- Document cleaning, maintenance, and decontamination activities
- Train personnel to follow consistent contamination-control procedures.

SUSPECT CONTAMINATION? ACT PROMPTLY.

STOP. ISOLATE. INVESTIGATE.

- **Stop work:** Secure the affected culture and avoid actions that could spread contamination.
- **Quarantine:** Isolate affected and potentially exposed cultures according to laboratory procedures.
- **Notify:** Label affected materials appropriately and inform the responsible laboratory, biosafety, or quality personnel.
- **Trace:** Review shared reagents, equipment, incubators, handling activities, cell lines, and relevant dates.
- **Resolve:** Determine the appropriate disposal, cleaning, decontamination, and restart procedures under an approved plan.
- **Verify:** Confirm that the source has been addressed before resuming routine work.

WHEN ONE LINK FAILS, THE ENTIRE WORKFLOW IS AT RISK.

Contamination control requires more than a clean incubator. It requires consistent practices before, during, and after incubation.



References:
1] ATCC, Mycoplasma Contamination: https://www.atcc.org/the-science/authentication/mycoplasma-contamination
[2] ICLAC, Human Cell Line Authentication: https://iclac.org/resources/human-cell-line-authentication/
[3] WHO, Laboratory Biosafety Manual, 4th ed.: https://www.who.int/publications/i/item/9789240011311

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