Biocompare
The Buyer's Guide for Life Scientists

Bench Tips

Sponsored by: MycoFog®

AS PREVIOUSLY PUBLISHED ON BIOCOMPARE.COM

By Emma Mason

Tips for Laboratory Incubator Decontamination and Contamination Prevention

Laboratory incubators have an essential role in supporting the growth of cell, bacterial, and plant cultures. However, the warm, humid environment they provide can also harbor microbial contamination, potentially compromising the integrity of scientific research. This article shares tips for preventing microbial contamination, including how to implement an effective cleaning and decontamination strategy for your laboratory incubator. It also highlights some of the tools that have been developed to streamline the decontamination process.

Sources of microbial contamination

Microbial contaminants such as bacteria (including mycoplasma), fungi, and spores can be introduced into laboratory incubators from multiple different sources. These include contaminated media, growth supplements, and seed cultures, as well as cell culture vessels, instruments, and personnel. Once within the incubator chamber, microbial contaminants can thrive and spread, potentially risking the accuracy and validity of experimental results.

Preventing microbial contamination

The use of **proper aseptic technique** when handling cell cultures is critical to avoid microbial contamination. This includes wearing appropriate personal protective equipment (PPE); wiping down the workstation, equipment, and gloves with, for example, 70% alcohol before passaging or plating cells; and only uncovering sterile containers or pipettes when you are ready to use them. Additionally, whenever possible, you should wipe the outsides of cell culture vessels with 70% alcohol before placing them in the incubator.

It is also important to **isolate potentially contaminated cell lines and practice strict quarantine measures.** If microbial contamination is suspected, the culture should either be destroyed by autoclaving or moved to a dedicated quarantine incubator until the problem is resolved. Resolution could be a negative test result for contamination or, in the case of ***Mycoplasma*** contamination where there is no alternative source of cells, could involve treatment with fluoroquinolone antibiotics.[1] Newly obtained cell lines should always be quarantined for testing before being integrated into the laboratory.

Other ways of preventing microbial contamination include ensuring laboratory incubators are placed on an elevated base and positioned as far away as possible from doors and ventilation ducts to limit the transmission of microbial contaminants from the floor or air. It is also recommended that you perform **regular testing** to ensure early detection

and prompt elimination of contamination sources. This is especially crucial for identifying *Mycoplasma,* which are invisible to the naked eye and do not cause turbidity in the culture medium.

Incubator cleaning and decontamination

Just because a laboratory incubator looks clean does not mean that it is—in order to safeguard precious cultures, it is vital that you carry out regular cleaning and decontamination. The first step in this process is to transfer all culture vessels to another incubator. Shelves, trays, and support hardware should then be thoroughly hand-wiped with a laboratory detergent such as Alconox® to remove any accumulated dirt and grime.

After the incubator has been cleaned, it should be disinfected using heat, ultraviolet (UV) light, paracetic acid (PAA), or hydrogen peroxide (H_2O_2). These methods have varying degrees of efficacy, so make sure to identify an approach that best meets the needs of your laboratory. Critically, you should always ensure that the decontamination cycle is allowed to run to completion; ending the cycle early could lead to microbial contamination continuing to thrive.

To improve the utility of hydrogen peroxide decontamination, which is highly effective but requires handling a toxic reagent, MycoFog® Biodecontamination Foggers represent a safe and easy-to-use option. Once loaded with MycoFog® Biodecontamination Reagent (a proprietary measured H_2O_2 formulation that should be size-matched to both the fogger and the incubator), the rechargeable fogger is simply placed inside the incubator and a 12-second delayed start (for extra user protection) is initiated. Cycles run for 180–300 minutes with auto-shutoff.

For confirmation that your decontamination cycle has been successful, you may wish to consider using biological indicators (BIs), such as MycoFog® Biological Indicators. These are self-contained vials of *Geobacillus stearothermophilus* spores in media, intended to be placed at key locations throughout the incubator. At the end of the decontamination cycle, the BIs are processed and incubated along with a control that has not been exposed to the cycle, whereby a lack of color change after 24 hours is indicative of spore killing.

Whichever cleaning and decontamination strategy you decide to use, consistency is key. Establishing a periodic maintenance schedule—which is ideally repeated at least once per month and includes regular replacement of filters, inspection of seals, and calibration of temperature and humidity controls—will help to prevent microbial build up and contamination issues, as well as ensure proper functioning and longevity of your laboratory incubator.

The MycoFog® system is an easy to use, hands free method of disinfecting tissue culture incubators for all biological contamination. To learn more, visit https://mycofog.com/decontamination-procedures/

Reference

1. Uphoff CC, Denkmann SA, Drexler HG. Treatment of mycoplasma contamination in cell cultures with Plasmocin. J Biomed Biotechnol. 2012;2012:267678. doi:10.1155/2012/267678

About the Author

Emma Mason

Emma Mason is the founder and director of Cambridge Technical Content Ltd, based in the U.K. Since graduating with a bachelor's degree in biology from the University of Kent at Canterbury in 2000, she has gained extensive experience developing and running immunoassays within companies including Millennium Pharmaceuticals, AstraZeneca and Cellzome. She now produces a wide range of scientific content, including regular features for Biocompare.