CELL CULTURE GUIDE | SEPTEMBER 2025

MAXIMIZING YOUR LAB'S WATER QUALITY

CAPTIVATE BIO

10 Tips from Captivate Bio

Water is the most versatile and universally used solvent in laboratory workflows, therefore ensuring its purity is key to successful experiments. While most labs incorporate water purification systems as a quality safety net, researchers cannot only rely on this measure to protect their water from external contaminants. As water is collected and used, it's in constant contact with surfaces, air, and ingredients, which can introduce contaminants, including bacteria, fungi, microbes, and more.

Here we share ten tips to maximize the quality of your lab's water:

1 Train staff on best practices

Quality begins with cleanliness and knowledge. To avoid contaminating water outlets and containers, educate staff on the correct water use protocols and the importance of using proper water quality for specific applications. Establish Standard Operating Procedures (SOP's) and review annually to update protocols as needed. Good laboratory (GLP) practices start with the thorough washing and cleaning of hands with soap and water, and always wearing new, disposable gloves. Continue with clean habits throughout your workflow, changing gloves often and washing hands as needed. Never reuse gloves or pipette tips.

2 Decontaminate work surfaces, containers and tools

Avoid cross contamination by disinfecting workspace with lab approved cleaning agent, ahead of setting up experiment. If appropriate, cover work area with sterile, disposable bench top coverings, and throw out post use. Doublecheck clean glassware and tools for residual detergents and rinse each with pure water prior to using. Dedicate specific vessels for water use only and keep separate from other glassware.

3 Maintain and monitor equipment

Prolong equipment life and optimize efficiency with routine equipment checkups. Review equipment and instruments' manufacturer's instructions and follow maintenance and service guides. Set up schedules and keep logbooks for changing water system filters, replacing cartridges, and running water conductivity and TOC tests to optimize water filtration system.

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4 Keep an eye on Water baths and CO2 incubators

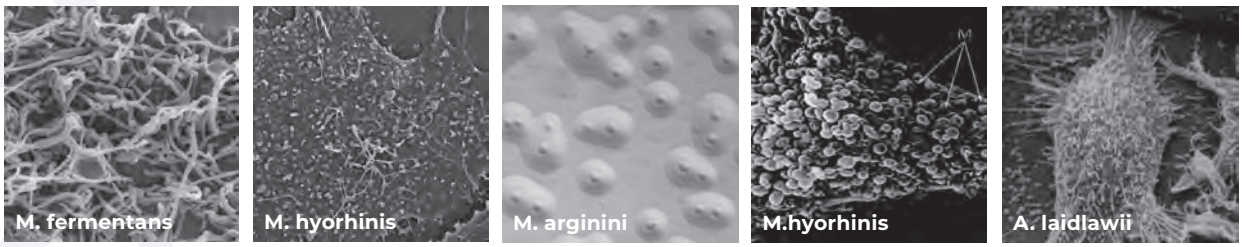
Wet and humid spaces are breeding grounds for bacterial, fungal, and microbial growth, making water baths and incubators, the perfect environment for proliferating various contaminants. Routinely clean these units with disinfectants, set up with ultra-pure, distilled, or de-ionized water, and add preventative solutions to keep water in systems clear of unwanted microbes. For researchers working in CO2 incubators, **Captivate Bio's CAPTiCLEAN™** is a highly active, non-volatile, non-corrosive, and non-toxic treatment for maintaining water quality for up to 6 weeks when added to your water pan.

5 Screen all incoming cell lines for mycoplasma

Mycoplasma are one of the most common, yet elusive, contaminants of mammalian cell cultures. As the smallest known free-living organism, mycoplasma is a pervasive, parasitic species of highly infectious bacteria that are estimated to contaminate between 15-35% of all continuous cell cultures worldwide. Examining incoming cell lines for mycoplasma and using test kits like the **EZ-PCR™ Mycoplasma Detection Kit** is critical. These kits are effective in detecting over 90 different species and by monitoring your cell lines in shared lab spaces, you can rule out contamination that may be interfering with your experiments.

95% OF CONTAMINATED CELL CULTURES ARE PRIMARILY MADE UP OF ONLY **6 SPECIES**

- M. orale (human)
- M. fermentans (human)
- M. hyorhinis (swine)
- M. hominis (human)
- M. arginini (bovine)
- A. laidlawii (bovine)



6 Never use tap water in workflows

Tap water is not considered safe for sensitive laboratory use, especially for experiments that require precision or sterile conditions. Tap water contains a variety of microorganisms, chemicals and minerals which can interfere with downstream applications. It's important to use sterile, distilled water, deionized water, or ultra-pure water to ensure accuracy and reliability.

7 Establish a safe site for your water purification system

Be sure to choose a safe and protected location for water purification devices. Be mindful of lab traffic, air conditioning units, heating vents, equipment fans, and other lab elements that could introduce contaminants into the system's environment. Always follow manufacturer's electrical and drainage installation requirements and capacity guidance on usage

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8 Flush contaminants away

Do not allow purification systems to idle and buildup contaminants. Flush purification system daily to avoid periods of inactivity, reduce system inefficiency and prevent stagnant water.

9 Use appropriate tubing and avoid bubbles in water collection

Avoid plastic tubing because it can breakdown over time and leach contaminants. Instead for general lab water purification, choose tubing manufactured from low density Polyethylene (LDPE) and linear low-density Polyethylene (LLDPE), given their non-contaminating properties. For Ultrapure water, always look for tubing that meets FDA, NSF, and USP standards. Limit air contamination by avoiding bubbles during water collection. Simply tilt collection container and allow water to flow gently down the side. Be careful to avoid splashes and over filling.

10 Never store water for laboratory purposes

Stored water is stagnant water, which can result in contamination because water that does not flow or circulate becomes susceptible to endotoxins, and other impurities. If storage is necessary, use non-porous, or non-reactive containers, such as glass, stainless steel or High-Density Polyethylene (HDPE) Plastic.

References

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