

Your interactive

lab water wise toolkit

Prevent water contamination derailing your experiments

To experience full interactivity you may need to update Adobe Acrobat. [Download here.](#)

Q

How much does lab water contamination cost?

Click below to guess the number of **billions of US dollars per year** spent on research that cannot be replicated [Fredmann et al.]

Q

What are the other costs?

Click to reveal

Lab water contamination is **avoidable**

Water is a remarkable molecule. As a solvent, it can solubilize many polar substances, dissolve gases and stabilize colloidal particles.

Unfortunately, these abilities make water prone to accumulate impurities of various types, which can impact lab analyses at huge cost to all involved.

But lab water contamination is largely avoidable - if you know what you're up against, what to look for, and how to minimise risks in your area of work.

This toolkit will help you do exactly that. Please use and share it with your colleagues to stop water contamination in its tracks.

TEAM ELGA VEOLIA

Toolkit menu

Knowledge

Tools

HPLC

Molecular Biology

Glass cleaning

Lab water types

ASTM International defines three different types of lab water*.

Use our wheel to learn about each.

In use Which water type should I be using for...

*there is a fourth water standard defined by Type IV water that is used mainly as a water feed to produce the other types of water

HPLC:

MOLECULAR BIOLOGY:

GLASSWARE:

Water contamination types

There are **five major classes** of water contamination. All of these must be removed by the water treatment unit before water can be considered fit for high-performance applications.

Beware the blind spot

There are several **other sources of risk** to be aware of.

HPLC Water selector

Find out which water type to use - and why - for each of the following applications. Click a button below to **choose your application...**



HPLC:

MOLECULAR BIOLOGY:

GLASSWARE:

HPLC trouble shooter

Having problems?

Use this troubleshooter to **find the contaminate lurking** behind each of these commonly spotted lab problems.

Molecular Biology trouble shooter

Having problems?

Use this troubleshooter to **find the contaminate lurking** behind each of these commonly spotted lab problems.

Polymerase chain reaction (PCR)

Cell culture and media preparation

Immunocytochemistry and immunoassays

Buffer solutions

Microbial analysis

Glass cleaning Water selector

Find out which water to use for cleaning glassware for different purposes. Click a button below to **choose your application...**



HPLC:

MOLECULAR BIOLOGY:

GLASSWARE:

Discover the PURELAB[®] QUEST

Compact, economical and easy to use.
Laboratory water directly from a tap water input.



#QuestForMore

Tell us about your scientific quest using
this hashtag on Twitter or LinkedIn.

References

[ELGA VEOLIA 1]

Different Types of Pure Water For The Lab: What You Need to Know
<https://www.elgalabwater.com/blog/different-types-pure-water-lab-what-you-need-know>

[Nabusi et al.]

Rana Nabusi, Mousa A. Al-Abbadi, Review of The Impact of Water Quality on Reliable Laboratory Testing and Correlation with Purification Techniques, Laboratory Medicine, Volume 45, Issue 4, November 2014, Pages e159–e165, <https://doi.org/10.1309/LMLXNDOWNRJJ6U7X>

[Fredmann et al.]

Freedman LP, Cockburn IM, Simcoe TS (2015) The Economics of Reproducibility in Preclinical Research. PLoS Biol 13(6): e1002165.
<https://doi.org/10.1371/journal.pbio.1002165>

[Tennenhouse]

Erica Tennenhouse, How Water Contaminants Impact Lab Analyse, Lab Manager, December 11, 2018
<https://www.labmanager.com/product-focus/2018/12/how-water-contaminants-impact-lab-analyses>

[Agilent, 2017]

*Key Challenges and Pain Points in the Global Laboratory Market, 2017 Research commissioned by Agilent. Independent survey of 700 scientists across the laboratory employee spectrum. <https://www.technologynetworks.com/analysis/articles/key-challenges-and-pain-points-in-the-global-laboratory-market-291108>

[McMaster]

Marvin C. McMaster, LC/MS: A Practical User's Guide, Wiley, August 2005, ISBN: 978-0-471-65531-2
<https://www.wiley.com/en-us/LC+MS%3A+A+Practical+User%27s+Guide-p-9780471655312>

[Laboratory Network]

Figure 1 of Guideline "How to Get the Most Accurate and Reliable Data from HPLC using Ultrapure Water", <https://www.laboratorynetwork.com/doc/type-i-ultrapure-water-crucial-for-hplc-and-0001>

[Shah]

Shah N.J. (2019) Polymerase Chain Reaction. In: Raj G., Raveendran R. (eds) Introduction to Basics of Pharmacology and Toxicology. Springer, Singapore
https://link.springer.com/chapter/10.1007/978-981-32-9779-1_31
<https://www.technologynetworks.com/analysis/articles/key-challenges-and-pain-points-in-the-global-laboratory-market-291108>

Agilent commissioned Frost & Sullivan to carry out an independent survey of 700 scientists across the laboratory employee spectrum.

Top 5 factors limiting productivity

Respondents cited the following factors:

- Time consuming sample preparation (80%)
- Instrument downtime due to scheduled maintenance (73%)
- Unplanned downtime (67%)
- Method transfer/validation of new instruments (64%)
- Time for training laboratory technicians (40%)

Unexpected changes in pH

<https://www.nature.com/articles/s42003-019-0393-7>

Michl, J., Park, K.C. & Swietach, P. Evidence-based guidelines for controlling pH in mammalian live-cell culture systems. Commun Biol 2, 144 (2019). <https://doi.org/10.1038/s42003-019-0393-7>

Unexpected concentration of essential trace elements
<https://www.ncbi.nlm.nih.gov/pubmed/30117037>

Keenan et al.. In Vitro Cell Dev Biol Anim. 2018 Sep;54(8):555-558. doi: 10.1007/s11626-018-0285-z. Epub 2018 Aug 16.

Glassware cleaning for sensitive analytical techniques
Development of a Standardized Procedure for Cleaning Glass Apparatus in Analytical Laboratories. June 2011 Revista de Ciencias Farmaceuticas Basica e Aplicada 32(1)
Hudson C Polonini Hudson C Polonini LÍVIA DO NASCIMENTO GROSSI ANDERSON DE OLIVEIRA FERREIRAM A F Brandão