lab water wise toolkit

Prevent water contamination derailing your experiments

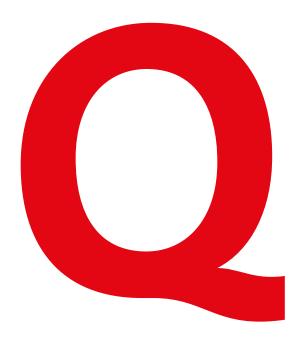
DEDICATED TO DISCOVERY



Your interactive ·

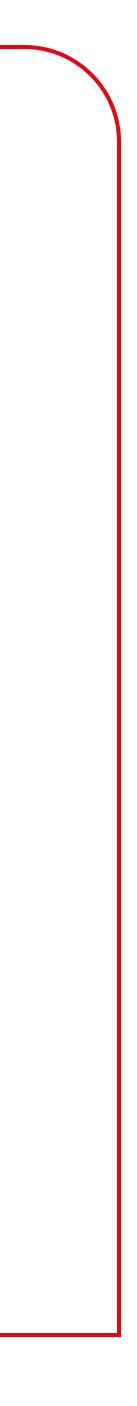
To experience full interactivity you may need to update Adobe Acrobat. **Download here.**

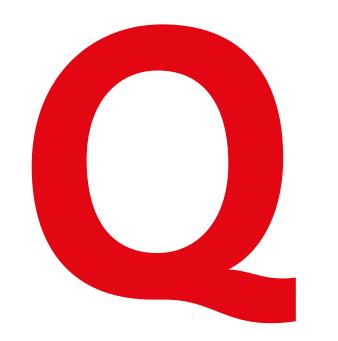
need



How much does lab water contamination cost?

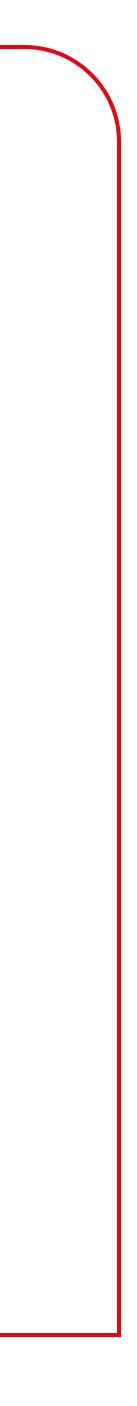
Click below to guess the number of **billions of US dollars per year** spent on research that cannot be replicated [Fredmann et al.]





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

Tools

Toolkit menu

Knowledge

*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:

Lab water types

ASTM International defines three different types of lab water*. **Use our wheel** to learn about each.





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 trouble shooter Having problems?

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

MOLECULAR BIOLOGY:

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

HPLC:

MOLECULAR BIOLOGY:



Glass cleaning Water selector

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



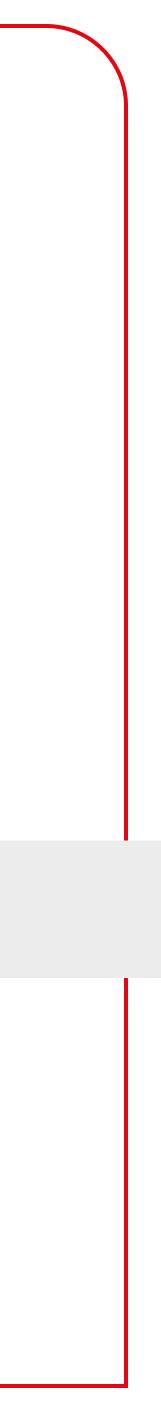


Discover the PURELAB® QUEST

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

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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 Nabulsi, 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

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Erica Tennenhouse, How Water Contaminants Impact Lab Analyse, Lab Manager, December 11, 2018

https://www.labmanager.com/product-focus/2018/12/how-water-contaminants-impactlab-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/keychallenges-and-pain-points-in-the-global-laboratory-market-291108

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Marvin C. McMaster, LC/MS: A Practical User's Guide, Wiley, August 2005, ISBN: 978-0-471-65531-2

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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-inthe-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%)
- Unplanned downtime (67%)

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

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-

Instrument downtime due to scheduled maintenance (73%) Method transfer/validation of new instruments (64%) Time for training laboratory technicians (40%)

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.

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