

CASE STUDY

Critical tests benefit from PURELAB® Option reliable pure water

Sheffield Children's Hospital,
Molecular Genetics Laboratory



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Critical tests benefit from PURELAB® Option reliable pure water

The Molecular Genetics laboratory at Sheffield Children's hospital handles over 9000 samples a year, carrying out over half a million tests, including DNA isolation, PCR, DNA sequencing and SNP analysis - meaning pure water is essential. To reduce maintenance and running costs, they switched to a PURELAB Option R-7 system, giving them confidence in their pure water as well as easier maintenance.



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Genetic testing given a boost by reliable pure water

Providing genetic testing services to a population group of more than 1.9 million, the Molecular Genetics laboratory at Sheffield Children's Hospital, UK, has grown substantially over the years since its inception in the 1960s. It currently handles approximately 9,000 samples a year, on which more than 0.5 million tests are carried out. Techniques (table 1) used in the lab include DNA isolation, PCR, DNA sequencing and SNP analysis, for which pure water is essential.

The laboratory operates within a technologically advancing field and, in order to keep up, its supply of pure water must be able to match changes in water usage and applications.

Dr Steve Evans, Laboratory Manager at the Molecular Genetics laboratory explains: “*That’s the exciting question: how do you move from 9,000 samples a year to 9,000 samples a fortnight? That’s what we’re looking for in the next two years.*”

Originally the Molecular Genetics laboratory used a traditional glass still to provide pure (distilled) water.

Dr Evans describes:

“The still required quite a lot of maintenance and also used a lot of peak rate energy. The (NHS) trust was interested in us moving away from that type of device, as it was obviously adding to the overall cost of running the hospital.”

The laboratory switched to the ELGA PURELAB Option-R7 system which was later upgraded to an R15 as water usage increased. In addition to cutting energy costs, this change also improved maintenance procedures while continuing to maintain the reliability of tests in the lab. *“We had to wash the still with acid, which is obviously a hazard, and it required a bit of skill to get the still working again. You also had to get rid of all the contaminants that were in the cleaning solutions – we were doing a lot of silver staining, and if you had any ions left in the water after the cleaning then you ended up with all sorts of weird coloured gels.”*

Common applications in the Molecular Genetic Laboratory:

- Electrophoresis
- PCR and real-time PCR
- DNA isolation
- DNA sequencing
- SNP analysis
- Microarrays
- Buffer and media preparation
- Glassware washing and rinsing
- Laboratory robotics
- Immunocytochemistry (Cytogenetics)
- Mammalian and bacterial cell culture (Cytogenetics)
- Histology (Cytogenetics)
- Karyotyping and FISH (fluorescence in situ hybridization)(Cytogenetics)

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Solution

DNA sequencing using a capillary system

An additional PURELAB Option-R7 was purchased for a recently installed robotics system, which requires significant amounts of pure water for recirculation during a tip-washing process. The laboratory also has a PURELAB UHQ unit, primarily installed to supply ultrapure water for DNA sequencing using a capillary system.

Ease of maintenance is of high importance in a busy laboratory. According to Dr Evans, “The PURELAB systems are incredibly maintenance-friendly. We used to do it ourselves and it was straightforward and easy”. As the laboratory size and work increased, Dr Evans moved on to one of ELGA Process Water’s maintenance service contracts: *“This has really made the whole thing run efficiently. I think it is advisable for anyone who is going to run a laboratory like this to undertake some sort of maintenance contract.”*



PURELAB Option-R 7/15. This system provides pure water on demand with a range of flow-rates suitable for many general molecular genetics applications.

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Conclusion

Confidence in water purity is essential

Confidence in water purity is essential so that there is no reliance on buying in bottled water.

Installing the PURELAB units was a success and efficiency was increased, delivering the positive outcome the client required. *“It is now routine, it’s not a specialist thing that you have to think about anymore. That’s another of the advantages that ELGA has provided – the products are specialist products, but you don’t think of them as such, just something that’s reliable and consistent that you just use.”*

In addition to maintenance services, Dr Evans has also found ELGA Process Water’s engineering support to be well provided. “Engineering support is very good over the phone. You can speak directly to an engineer and he’ll be able to tell you what the problem is and what you need to do. This also gives you a lot of confidence that you know your product.”

In some cases the results of tests carried out in the Molecular Genetics laboratory will have a direct and immediate effect on the management of a patient, and so it is essential that these time-critical cases are not delayed by any failure, including failures in water purity. This makes the ELGA systems a perfect choice for the lab. And having seen the systems in use in the Molecular Genetics laboratory, other groups in the building have followed suit and installed their own ELGA units.



PURELAB Option-R 7/15. Maintenance friendly and easy to use.

Dedicated to Discovery

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