

CUSTOMER TESTIMONIAL

# Keeping your community safe

How the University of Leipzig support  
the important work of police and  
prosecutors through DNA analysis



UNIVERSITÄT  
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Forensic scientists rely on ultrapure water from the PURELAB® Quest

# Advancing genetic technologies

Researchers at the University of Leipzig carry out forensic DNA analyses to provide evidence to support the police and public prosecutors in criminal cases. Thanks to huge advances in genetic technologies and data analysis, scientists can now obtain DNA profiles from even just a few skin cells left behind at a crime scene.



## Forensic scientists recommend the ELGA PURELAB® Quest

“ We can fully recommend the PURELAB® Quest from ELGA. The system is small, easy to use, reliable and the water meets our quality requirements.”

Dr Jeanett Edelmann, Head of the Forensic Genetics Department



Since DNA analysis was first introduced into the courtroom more than thirty years ago, it has revolutionized criminal investigations. Although this type of evidence alone is not enough to secure a conviction, DNA profiling is now a gold standard in forensic science. Today, investigators can retrieve profiles from the even tiniest amounts of evidence. This improved sensitivity, combined with advances in data analysis, has even made it possible to identify and distinguish multiple individuals from the DNA in a mixed sample.

### Ultrapure water is a critical reagent for forensic laboratories

Scientists at the Institute of Legal Medicine use a variety of genetic analyses to provide evidence to support criminal cases. For example, they may carry out genetic profiling to help identify a suspect or to uncover the identity of a dead body. They also carry out work to validate new forensic DNA detection systems.

They rely on a consistent supply of high-quality ultrapure water to perform a range of immunological and/or molecular biology techniques including:

- DNA extraction from sample from trace materials
- Detecting different human body secretions in trace materials
- Separating different cell types from human blood
- Multiplex PCR analysis - for unknown forensic mixed traces in the stochastic<sup>1</sup> range
- Real-time PCR for quantifying DNA
- DNA sequencing

The forensic scientists will often work with only trace amounts of DNA, which may be of poor quality because of degradation and/

or contain chemicals that can inhibit their reactions. They may be working right at the boundaries of detection limits - and this increased sensitivity can result in a greater potential for contamination that will affect the reliability of their results.

The researchers use ultrapure water to prepare their analysis equipment and for making all sample and buffer solutions for their experiments.

“Water quality is crucial for all our laboratory activities,” says Dr Jeanett Edelmann, Head of the Forensic Genetics Department.

“We need to work in a meticulously clean and standardized manner to reduce the risk of contamination - and to increase the chance of achieving reliable, reproducible results from evidence samples that may contain traces of poor-quality DNA.”

### A consistent and reliable supply of ultrapure water

An ELGA PURELAB® Quest laboratory water purification system, which is attached directly to a sink tap, provides the forensic scientists with a reliable and convenient supply of ultrapure water (18.2 MΩ).

This meets the scientists' daily requirements of around five litres of high-quality water per day that they use in their experiments.

“We find the PURELAB® Quest is reliable and the water is suitable for all of our applications,” says Jeanett.

“The system requires little space and we find it simple and easy to operate - the display information is very understandable.”

The laboratory previously used a Millipore laboratory water purification system that required a separate pre-filter rather than running directly off tap water.

“We had issues with its reliability due to problems with an upstream filter,” explains Jeanett.

“We also regularly had to change the consumables and so it had very high annual running costs.”

### Key features of the PURELAB® Quest

- Generates high-quality ultrapure, pure & ro water directly from the tap
- Competitively priced with a low running cost

- Multiple water quality sensors & inbuilt periodic recirculation to constantly monitor & guarantee water purity
- Compact design for minimal lab space
- Simple plug and play installation

- Fast flow rate for quicker reagent preparation
- Uses reclaimed materials for minimal environmental footprint

<sup>1</sup> Stochastic (random) variation is a fundamental physical law of the PCR amplification process when examining low amounts of DNA - it means that amplifying the same DNA sample twice can result in a different result.

## Get in touch today

With more than 80 years' experience, ELGA is dedicated to solely pioneering water purification systems. We are absolute specialists in the engineering, service and support of water purification systems. Dedicated to research and innovative product and solution design, we work closely with leading laboratory instrument companies to customize and develop solutions for specific requirements.

By choosing ELGA, you will work with one of our representatives who will help you to select the best in-house water purification system for your laboratory. To find out more about how we can help you, please visit our website: [www.elgalabwater.com](http://www.elgalabwater.com) or contact your local ELGA representatives.

# Dedicated to Discovery

[info@elgalabwater.com](mailto:info@elgalabwater.com) / [www.elgalabwater.com](http://www.elgalabwater.com)

ELGA Labwater are specialists in the engineering, service & support of water purification systems.

Unrivalled product design has achieved international recognition and awards.

Worldwide technical service teams support science & healthcare globally with specialist expertise.

Global digital performance monitoring from Hubgrade ensures laboratory work is uninterrupted.

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**Elga Global Operations Centre.**

tel: +44 (0) 203 567 7300

fax: +44 (0) 203 567 7205



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