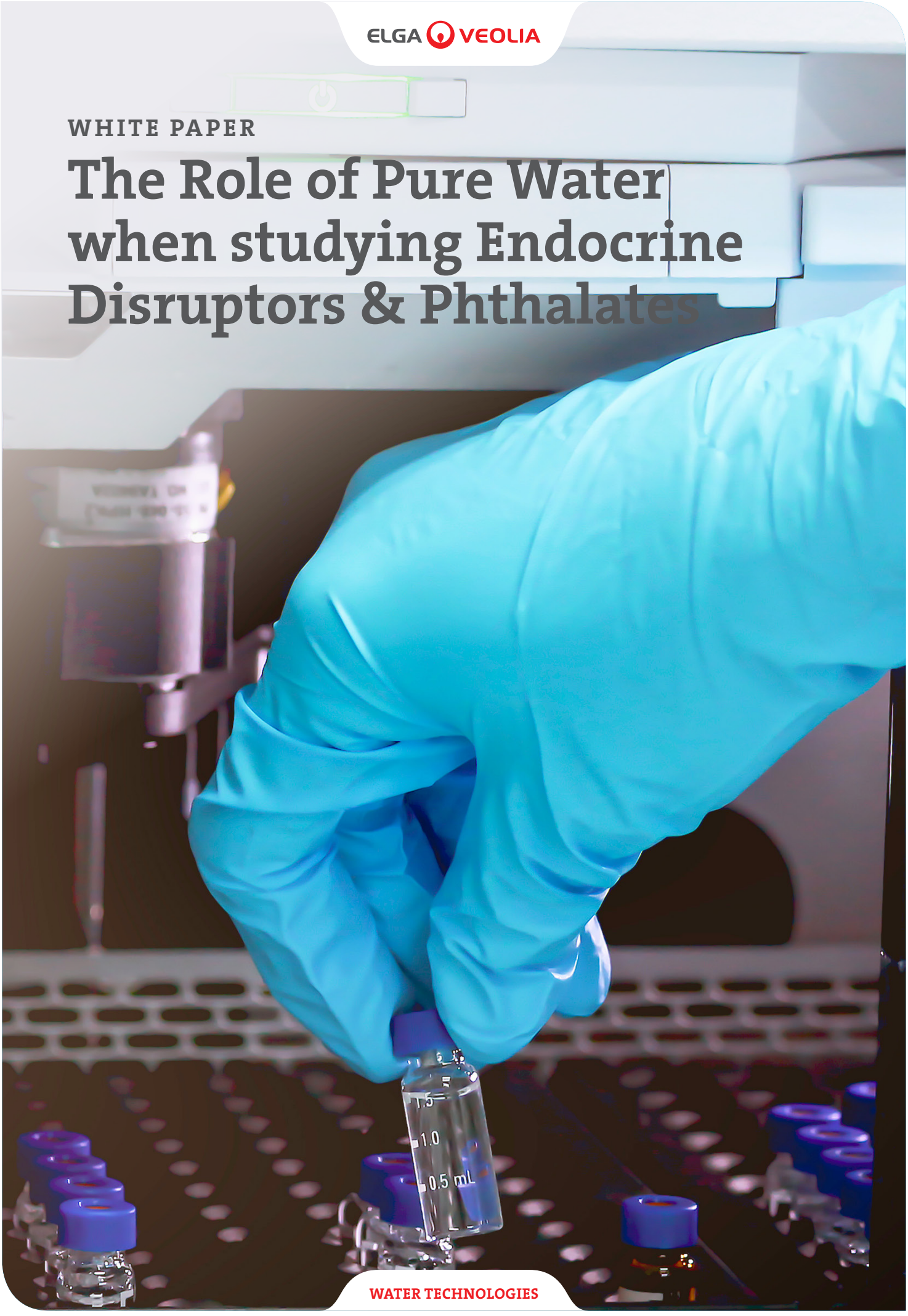
ELGA VEOLIA

WHITE PAPER

The Role of Pure Water when studying Endocrine Disruptors & Phthalates



WATER TECHNOLOGIES

Background

Endocrine disrupting compounds (EDCs) affect the endocrine system by imitating or interfering with the body's hormones. The health effects of EDCs are wide ranging and vary from problems with cognitive development and the triggering of cancer to physical developmental complications. Even very low levels can induce chronic effects, making their toxicological assessment particularly difficult.

Controlling water purity for improved sensitivity and selectivity

EDCs are widespread contaminants, and include pesticides, pharmaceuticals, monomers and additives used in the manufacturing of plastics and synthetic hormones. Recent legislation concerning the monitoring of these compounds has created the need for fast, reliable and highly sensitive techniques for quantification of trace levels of EDCs in the environment.

HPLC and LC-MS techniques are widely used for these analyses. Pure water is critical, as this solvent is commonly used for both sample preparation and analysis. Water is required for sample pre-treatment, such as solid phase extraction, as well as for the preparation of eluents, reagent blanks and standards.

Impurities present in the water may seriously affect sensitivity and selectivity, leading to increases in background noise and drift, and producing extra or enlarged peaks.

Long term build-up of particulates and bacteria within the system can also block the column, pump and filters over time, requiring increased maintenance. Additionally, any water used also needs to be free of EDCs to ensure accurate results. A lack of control over the purity of the water used in EDC analyses can therefore lead to inconsistent parameters that affect test predictability and make it impossible to reproduce results, costing labs time and money.

Reducing water impurities and improving results

The ELGA PURELAB® Chorus range* employs a series of purification technologies – such as dual-wavelength UV light, ion exchange (IX) and microfiltration – to effectively remove the major types of impurities from feed water that might otherwise interfere with trace HPLC and LC-MS analyses.

This ensures the absence of sample contamination due to impurities in the water, including ions, organics and bacteria, and stops degradation of standards and blanks that could affect calibration, and the reliability and accuracy of results. The quality of the water is guaranteed to the very last drop, and this gives users confidence that each assay is consistent and so are the results. Each system is simple and easy to use, reducing time spent on training and minimizing the risk of error while fitting seamlessly into any lab.

Additionally, the PURELAB Chorus range is compliant with most national and international regulatory standards, providing full visibility and ease of data management for auditing purposes.

Analyzing EDCs in water from a PURELAB Chorus system

A PURELAB Chorus 1 ANR was operated over two weeks, dispensing 25 l per day before taking samples for analysis. Samples were analyzed for bisphenol A (BPA), nonylphenol and other analytes, with the results shown in Table 1. All the EDCs monitored were below the detection limits, demonstrating the efficacy and reliability of the system in producing pure water.

Table 1:

EDC measured	Concentration found (ppt)
BPA	<5
Butyl benzyl phthalate	<5
Diethyl phthalate	<25
Dimethyl phthalate	<35
Di-n-butyl phthalate	<25
Nonylphenol	<25

Conclusion

Elements and compounds present in purified water may have detrimental effects on trace analyses, particularly if they interact with the samples, active media or system components. The PURELAB Chorus range produces purified water that is extremely low in all types of impurities. This makes these systems highly suitable for the determination of trace EDCs in the environment and elsewhere, meeting the demands for high sensitivity and accurate results.

*The PURELAB Chorus range offers a variety of different water purification systems, from the Chorus 1 that is used for the most critical and sensitive applications through to the Chorus 3, which is ideally suited for general purpose applications in your laboratory. The range is now available with an innovative free standing Dispenser that maximizes space and improves lab efficiency. Additionally, Hubgrade, ELGA's digital platform, works alongside any system to monitor equipment performance, ensuring laboratory work continues uninterrupted.

ELGA VEOLIA

Dedicated to Discovery

info@elgalabwater.com/www.elgalabwater.com

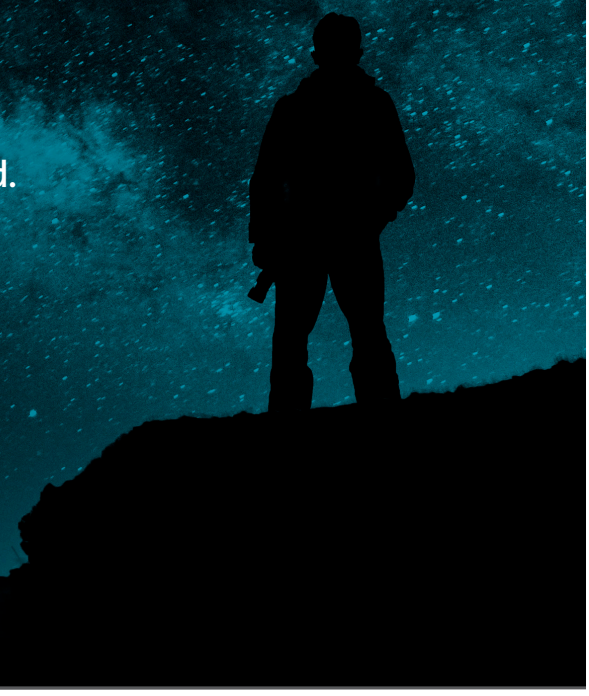
ELGA Labwater are specialists in the engineering, service & support of water purification systems.

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.

A global supply chain supports clients from regional centres on every continent.



To find your nearest ELGA representative, go to www.elgalabwater.com and select your country for contact details.

Elga Global Operations Centre.
tel: +44 (0) 203 567 7300
fax: +44 (0) 203 567 7205

2nd PLACE GIT INNOVATIONS AWARD 2010

reddot design award winner 2011

GOOD DESIGN AWARD 2014

Design Award Gold 2015 TBO

Hubgrade

OVER 70 INTERNATIONAL PATENTS