



Agilent Case Study: Fiona Regan, PhD

Is It Safe?

Agilent backs researcher's grand objective: clean water

As a chemistry professor, Fiona Regan worries about the impact of chemicals entering the water supply and the broader ecosystem. As director of the Water Institute at Dublin City University, she is in a position to do something about it.

Founded in 2015, the Water Institute is a cross-faculty initiative that aspires to address water resource problems on a national and even global level. It aims to do so through research, education, and innovation in water science, technology, management, and governance.

Regan is particularly interested in what researchers call “emerging chemicals of concern”—the ones where we don’t yet fully understand how they may impact the environment and public health.

She is also interested in changing people’s attitudes toward the use of chemicals. “Ultimately, I would like to change the way chemicals are made and distributed and treated,” she says.

Regan calls this her “very big and grand goal,” and she has enlisted the help of Agilent.

“Over the years, we have been working on emerging chemicals of concern and their occurrence in surface waters arising from wastewater treatment plants,” she says. “The project that enabled us to engage with Agilent is one that is looking at phthalate occurrence and impacts on human health.”

Phthalates are a family of chemicals that are often added in plastics to make them more flexible and durable. They are also used in hairspray, nail polish, and other consumer products.

What better partner for the investigation than a maker of innovative analytical instruments? That, Regan says, was always part of the institute’s strategy.



Fiona Regan, PhD

Professor of Chemistry at
Dublin City University
Director of the DCU Water Institute
Dublin, Ireland

"The idea here is that we want to build our analytical capability around emerging chemicals of concern and develop tools for improved monitoring," Regan says. "For us, it seems obvious to partner with instrument manufacturers that can deliver technologies to meet the challenges of sample matrix and concentration arising with these new chemical groups."

The fact that these chemicals appear at low concentrations poses a significant analytical challenge. What's more, the 11 different phthalate compounds under investigation comprise two distinct groups: monosesters and diesters.

"The aim of course would be to have a single separation, but the nature of the analytes poses a challenge to this objective," Regan says.

Using advanced technology and data analytics in a multidisciplinary research environment, the institute is collaborating with industry partners like Agilent who share a common goal of improving human health.

Not that Agilent's involvement is totally altruistic.

"Agilent also has an interest in developing reliable methods for quantifying phthalate levels in matrices, including drinking water sources and wastewater, using both direct injection and online SPE [solid-phase extraction] methodologies," Regan says.

Indeed, Agilent will have access to the methods that Regan and her team develop and validate using one of the company's **triple quadrupole LC/MS systems**. Customers will then be able to run those methods to detect phthalates in a variety of matrices using Agilent systems.

"The primary focus of the work is to concentrate on optimizing the sample preparation and sample introduction, providing an accurate and robust solution that can cope with challenging sample types. The method may utilize the two external valves, providing the flexibility for laboratories to use either direct injection (for less complex matrices) or **online SPE** during the same sample sequence," Regan explains.

"Collaborating with Agilent will help us to achieve our vision, while opening opportunities for early stage researchers to learn new and emerging techniques and interact with excellent service providers. Overall, it means we can deliver on our projects in a timely fashion, publish our data, learn new ways of sample handling, and advance the state of the art."

Regan notes that the expertise of researchers from various disciplines at Dublin City University—supplemented by an outstanding support team from Agilent—will empower the Water Institute to develop new analytical technologies, covering sample preparation, miniaturized lab-on-a-chip systems, miniature separation systems, materials for filtering, columns, and so on.

"I am excited about collaborating with the best and delivering research with impact, helping to drive innovation and provide new analytical approaches to grand challenges," she says.

Learn more

www.agilent.com/en/academia

For Research Use Only. Not for use in diagnostic procedures.
This information is subject to change without notice.

© Agilent Technologies, Inc. 2018
Published in the USA, December 4, 2018
5994-0433EN