Agilent Case Study: Panagiotis Manesiotis, PhD

Principles Put into Practice

University Students Gain Hands-on Experience with Agilent Instruments

Over the past four years, Dr. Panagiotis Manesiotis has been teaching a growing number of young scientists how compounds can be separated into their component parts—how even trace elements can be detected and quantified—as part of a postgraduate course in pharmaceutical analysis that he developed and teaches at Queen's University Belfast.

Now, his students are putting the principles of separation science into practice in a new laboratory equipped with state-of-the-art instruments from Agilent.

"To maximize student hands-on experience, we formed a strategic partnership with Agilent to equip our new lab and to participate in the delivery of the course," Manesiotis explains.

Acquiring the confidence to troubleshoot

The new lab features 18 brand new Agilent instruments, including a variety of gas and liquid chromatographs and mass spectrometers as well as infrared, fluorescence, and ultraviolet spectroscopy systems.

Manesiotis notes that Agilent scientists and engineers based in the UK provide expert training on instrumentation, troubleshooting, and latest trends in analytical science—and that students will have access to online training from Agilent as well.

He says that the program is a response to growing demand for analytical chemists and pharmaceutical analysts in Ireland, which has become a global hub for pharmaceutical production with 9 out of the 10 biggest global pharmaceutical companies having a base on the island.

"As part of the agreement, Agilent will visit every year for preventative maintenance, and when that happens we will have workshops and seminars where students will be invited to talk to the engineers and experience the process of opening an instrument, maintaining the detectors, changing lamps, tubing, columns, and so on," Manesiotis says.

"These practical skills have started to disappear from the market as classes have been focusing on theory due to a lack of funding and equipment. Less and less frequently, people are confident enough to open an instrument and troubleshoot it, which means that even a small leak or a fluctuation in the detector signal—which could be fixed in a few minutes by a semi-experienced user—can cause a commercial laboratory a few days of downtime and lost productivity."

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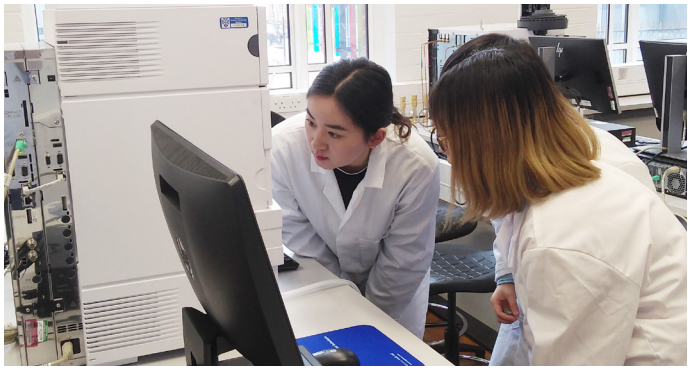
Like having private lessons

With a vastly improved student/instrument ratio, the response from students this year has been phenomenal, with some saying these are the best laboratory classes they've ever had.

"With no more than two students per analytical instrument working with a demonstrator, it has been almost like having private lessons on each instrument. That's 8 to 16 hours of hands-on training on method development, calibration, identification, and quantification," Manesiotis reports.

"One of the interesting things we've observed is that when we let all the students in the laboratory for the first time, and tell them to open the instruments, see what's inside, and operate it themselves, there's a sense of apprehension at the beginning. They are really cautious as they don't want to break anything. It takes a couple of prompts from the demonstrator to get them to actually start doing things. But as soon as they realize you can't really break an instrument—not easily anyway—then they begin to build their confidence.

"After the first hours of familiarization and getting to know the software and hardware, they are able to operate instruments independently, and very quickly the demonstrator takes a back seat in the training session. They can go through the steps we have done in class about the theory of method development. By the end of the second four-hour session, they are able to develop a solid analytical separation method. Because they had time in front of the instrument, they were able to do 10 or 15 iterations to optimize their methods—with just a few prompts from their demonstrator. They really enjoyed it and made the most of it."



A lot of "Wow!" moments

Manesiotis points out that one of the reasons the university chose Agilent was because the instruments are robust and straightforward to maintain.

"You can open all instruments from the front and you can easily access the main parts of them, which often is not the case with other manufacturers," he says. "Also, there is very good training material, both in print and online, including a large library of video demonstrations and troubleshooting guides. That's very important if you want to give material to students to study it themselves and then apply what they learn."

Manesiotis has used Agilent solutions, in both industry and academia, for more than 15 years, but admits he was a little apprehensive when he learned that many of the new chromatography systems included new software.

"I was tasked with teaching a lot of people how to use an instrument with software I hadn't seen or used before," he recalls. "Turns out, OpenLab is a fantastic environment to work with. It is so much simpler, requiring far fewer clicks to get where you want to go. It's also a lot more stable and trustworthy. Visually, it's more modern and appeals to students who are used to looking at beautiful displays like the graphics they see on smartphones and tablets. There were a lot of 'Wow!' moments when students realized this software that looks so polished actually operates an analytical instrument. They weren't expecting something so modern and clean and that definitely contributed to the overall learning experience."

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