Molecular Spectroscopy Trends and Advances: A market perspective

Gwyneth Astles, International Labmate Email: gwyneth@intlabmate.com

Agilent, a major provider of spectroscopy instrumentation, has key facilities worldwide specialising in different methods and applications. During a recent visit to its research and development centre based at the Harwell Campus Oxford, Geoff Winkett (Vice President and General Manager, Molecular Spectroscopy) and Michel van den Berge (Associate Vice President, Molecular Spectroscopy), provided an insight into its UK operations.

Left: Geoff Winkett (Vice President and General Manager, Molecular Spectroscopy)
Right: Michel van den Berge (Associate *Vice President, Molecular Spectroscopy)*

Opened in 2019, this hub is Agilent's Global Headquarters for Raman Spectroscopy; employing over 70 people and still recruiting; this is the biggest site for the company in the UK. As an acclaimed centre for science and innovation, the Harwell Campus is an ideal location for collaborations with leading academics and thought leaders, as well as other technology companies.

Key to the development of Agilent's spectroscopy presence in the UK was the strategic acquisition of Cobalt Light Systems in 2017; a former STFC Rutherford Appleton Laboratory spin-out. This provided a strong expertise and portfolio in Raman Spectroscopy and the opportunity for Agilent to invest in a major R&D facility. The company's second Molecular Spectroscopy major site from an R&D perspective is based in Melbourne, Australia.

Which markets is the facility geared for?

The main focus for our molecular spectroscopy portfolio including our Raman instrumentation is pharma and biopharma market, supporting R&D, QA/QC and production. We also sell into the more general laboratory space, including environmental applications such as microplastics, high end materials, academia and energy & chemical. The third segment we address is field detection encompassing handheld instruments addressing the detection of narcotics and explosives amongst other items, plus aviation security through liquid scanning equipment.

What would you say is your flagship product?

We have a number of flagship products, one of which is the Agilent Cary 3500 UV-Vis Spectrophotometer. This product has a strong presence in pharma and biopharma. It is a R&D and QA/QC tool to essentially help our customers, get their products to market quicker whilst ensuring compliance with government regulations.

A second flagship product, the Vaya handheld Raman spectrometer, introduced 2 years ago, is used for the identification of raw materials in pharma and biopharma warehouse facilities and provides essential analysis to validate that they correctly match the labeling on the package.

One benefit of using this handheld product on incoming packaged materials was highlighted: With our instrument customers don't need to open the container & take a sample of the material, they simply use the Vaya to scan through the container, take the measurement and confirm whether the contents agree with the labelling.

The significant time savings that our instrument provides consequently enables our customers to improve their production efficiency and get their product to market quicker.

What sort of global penetration does it have and do you currently receive more business from one continent in particular?

Our molecular spectroscopy products are sold worldwide to customers in a variety of end markets. Markets such as pharma/biopharma are growing very strongly, and we expect this trend to continue in years to come. Traditionally the US & Europe tended to be the largest, however countries like China & other emerging nations are growing quickly and driving a true global opportunity. Given the considerable investment that we had made in this space both through M&A, and organic R&D we are really pleased with the traction that our solutions are getting. This is a significant opportunity for Agilent, and we very much look forward to this trend continuing going forward.

How do you see your technology developing in the future?

Compliance requirements particularly around data security is an area that is developing rapidly and one that our solutions must keep up to date with. The solutions that we provide to the market have to take this need into account and provide capabilities such as access controls, audit trails, e-signatures etc. We have invested heavily in this area as demonstrated by the recent release of new Cary 3500 UV-Vis Spectrophotometer software which provides a server-based solution for compliance. The changing nature of this environment means that we will continue to invest to ensure our customers can have a peace of mind when buying our instrumentation.

Do you see any other potential test areas for this equipment?

There are always expanding areas, and one of the largest opportunities is in biopharma as that market continues its strong growth trajectory. There have been predictions that this market may become larger than small molecule pharma or traditional pharma, and molecular spectroscopy has a significant role to play in supporting companies in this space. We have solutions today that address some of these needs and will continue to expand our solutions here going forward.

Are there any current issues affecting Production?

From a production perspective, like many others, we are grappling with the supply chain crunch across the world. Fortunately, Agilent has a worldwide presence with supply chain expertise in many countries that is ensuring we can still meet our customer delivery requirements.

Do you participate in schemes for small businesses that couldn't afford your technology to access it, or become a research partner and work with you?

We have a lot of relationships with academic institutions around the world. For example, Agilent has a 'Thought Leader Program' where we will invest in a resident expert, in a particular area and provide the equipment and funding to help further their research and work with us. For example, in the spectroscopy sector one of our Agilent Thought Leaders is a highly valued doctor in Austria with experience around quantum cascade lasers (QCL). As this is a key technology that's resident in one of our products, Agilent has made a big investment to support his programme.

The award and subsequent relationship are beneficial to both parties. We give him the tools he needs to advance his technology and study, but it also gives us inside access to ground breaking research.

After the interview I was taken to the R&D laboratories for a demonstration of some of the key molecular spectroscopy instruments. On display were the 8700 LDIR chemical imaging system, the Agilent Cary 3500 UV-Vis Spectrophotometer, the Agilent TRS100 Raman System and the award-winning Agilent Vaya Raman Raw Material ID Verification System. Scientific staff members were on hand to answer any questions regarding the different analytical instrumentation on view and their function in product development and testing.

The enthusiasm of the staff throughout my visit was testament to how much investment Agilent have put into their staff, new instrumentation and training. The development of the site and facilities demonstrates that Agilent are determined to hold and develop further their market position.