

Agilent Analytical Studio Reviewer Maximizes Efficiency in Early Drug Discovery

Case Study

A Major Pharmaceutical Company Customer Success Story

With 200 medicinal chemists producing thousands of candidate compounds per week, a certain major pharmaceutical company relies on high-throughput LC/MS analyses to determine whether the correct compounds are synthesized. Scientists there have been using Agilent 6100 Series Single Quadrupole LC/MS Systems along with Agilent Easy Access software for high-throughput walk-up analyses of synthesis products. They recently found that Agilent Analytical Studio Reviewer (ASR) further increased their productivity, by enabling efficient, customizable data review and reporting.

This is one of the largest pharmaceutical companies in Japan, with a focus on developing drugs in the therapeutic categories of urology, immunology and infectious diseases, oncology, neuroscience, diabetes mellitus complications, and metabolic diseases. Their Drug Discovery Research Department creates innovative and reliable pharmaceutical products from the following sources:

- Small molecule chemical compounds
- Natural products produced by fermentation
- Antibodies

The department is quick to adopt promising new technologies and research areas that will maximize research output. Within this framework, the Medicinal Chemistry Department develops candidate compounds and performs early stage research on scale-up synthesis. Researchers also perform difficult syntheses of metabolites for quantitative studies in early drug discovery.



Agilent Technologies

The department currently uses four Agilent 6100 Single Quadrupole LC/MS Systems for high-throughput qualitative analyses of small molecules from initial screening through to candidate selection. The systems include Agilent 1290 Infinity LCs, which operate at pressures up to 1200 bar and provide fast analyses with excellent data quality. The laboratory uses alternating column regeneration for even greater sample throughput. Agilent Multimode Sources add to the productivity by delivering simultaneous electrospray and atmospheric pressure chemical ionization. Agilent Easy Access and ASR provide a simplified user interface that makes it easy for chemists to run the LC/MS systems and analyze the data to confirm correct synthesis of target compounds.

Agilent LC/MS Configuration for the Analysis of Synthesis Products at a Major Pharmaceutical Company

- 1290 Infinity Pump (main-pump and column regeneration pump)
- 1290 Infinity LC Injector HTS/HTC
- Thermostatted column compartment with 2-position/10-port valve for alternating column regeneration
- 1290 Infinity Diode Array Detector
- 1200 Series Evaporative Light Scattering Detector (ELSD)
- 6150 Single Quadrupole LC/MS System with Multimode Source

Greater Productivity from Rapid Data Review

To complete the LC/MS solution, the Medicinal Chemistry Department needed a software package for accurate, high-throughput data review. Since Agilent ASR can export PDF reports and was demonstrated to be successful in the customer laboratory, this company acquired 200 licenses for use by their chemists.

ASR is conveniently installed at each chemist's desk, which allows scientists to perform data review whenever it fits best into their busy work schedules. Laboratory personnel appreciate the intuitive and flexible user interface.

ASR allows the medicinal chemists to view chromatograms and spectra from multiple detectors, including ELSD and third-party detectors. They can quickly review both the purity of their synthesized compounds and the purity of individual chromatographic peaks. This information is easily uploaded to data management systems, such as Agilent OpenLAB Electronic Content Manager, where it can be accessed for later review.

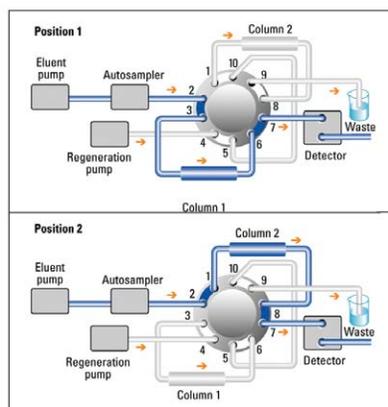


Figure 1. This Agilent equipment configuration typically provides analyses with run times of three minutes, and is similar to the setup described here.

Flexible Electronic Reports Speed the Process

The Medicinal Chemistry Department has benefited from the ability to automatically generate user-configurable reports as PDFs, which are stored in user-defined folders. Using the Agilent Easy Access software, scientists are able to receive their ASR reports directly by email. The PDF is also easily archived for future use.

Medicinal chemists at this company particularly like the reporting flexibility provided by ASR software. Even though their walk-up LC/MS systems are configured with a variety of detectors, each scientist knows which detector gives the most useful results for a particular class of synthetic products. Scientists can define exactly which detector signals to include in their PDF reports, as well as the order in which the resulting chromatograms are displayed (Figure 2).

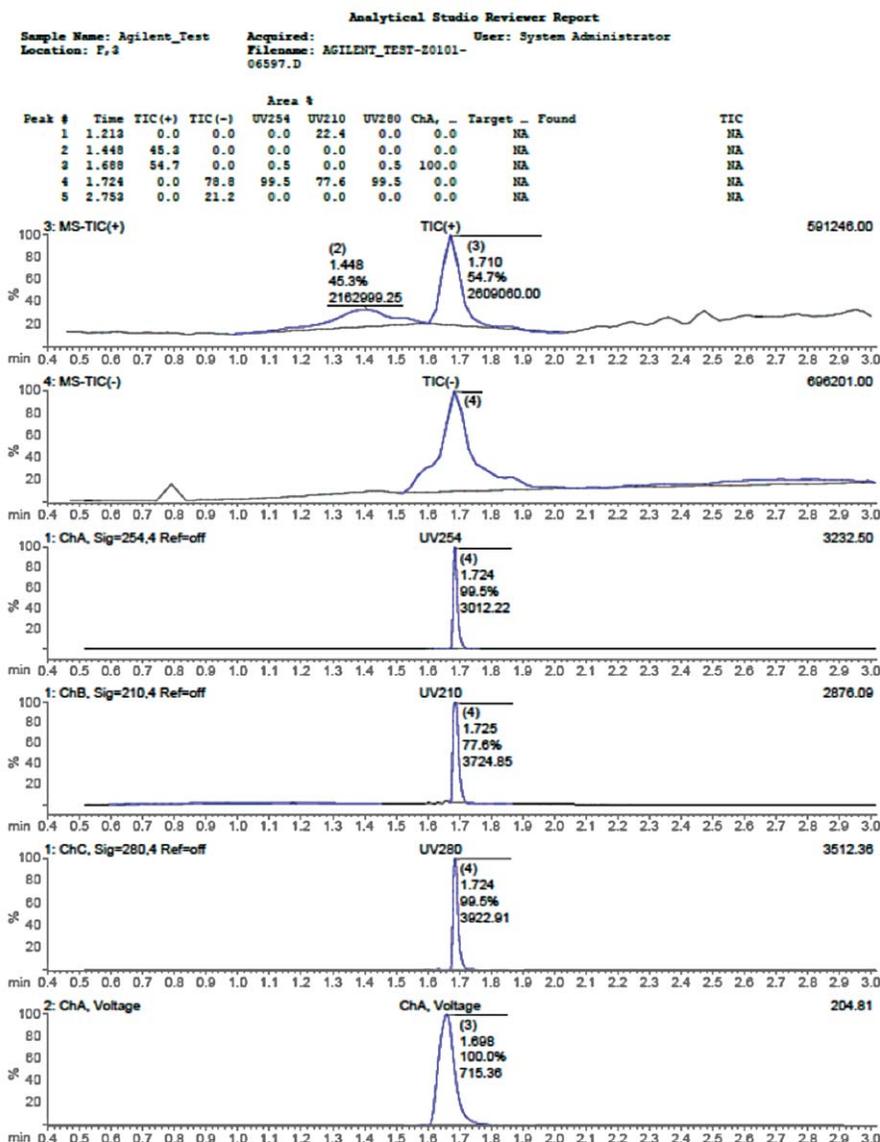


Figure 2. Medicinal chemists like this report format, where they can select the chromatograms to display and the order in which they appear. This particular report includes (top to bottom) positive mode MS spectrum, negative mode MS spectrum, UV chromatogram at three wavelengths, and ELSD trace.

Figure 3 shows the MS spectra that correspond to the report shown in Figure 2. Chemists can define how many MS spectra to display in each report, which allows them to generate spectra for both the main synthesized compound and minor impurities that may give insights on how to improve synthesis procedures.

Greater Efficiencies for Drug Discovery

Agilent Analytical Studio Reviewer is accelerating the drug discovery process at a major pharmaceutical company. Medicinal chemists can conveniently review LC/MS results directly from their desktop PCs. They do not have to be at the LC/MS instrument to see their results, which saves time and avoids data review conflicts. Scientists can select the specific chromatograms they wish to review, including signals from ELSD and third-party detectors. They can easily generate PDF reports that contain exactly the information they need to make rapid decisions about the next synthesis steps.

The Medicinal Chemistry Department recently added Agilent Easy Access for 20 of their Agilent HPLC systems. This department is very pleased with the Agilent walk-up solution provided by Easy Access and ASR. The systems are very robust, working 24 hours/day and 365 days/year. Agilent also provides system support to ensure maximum up time. The department has trained six key chemists to use the walk-up solution and they in turn have trained the other 194 chemists in the

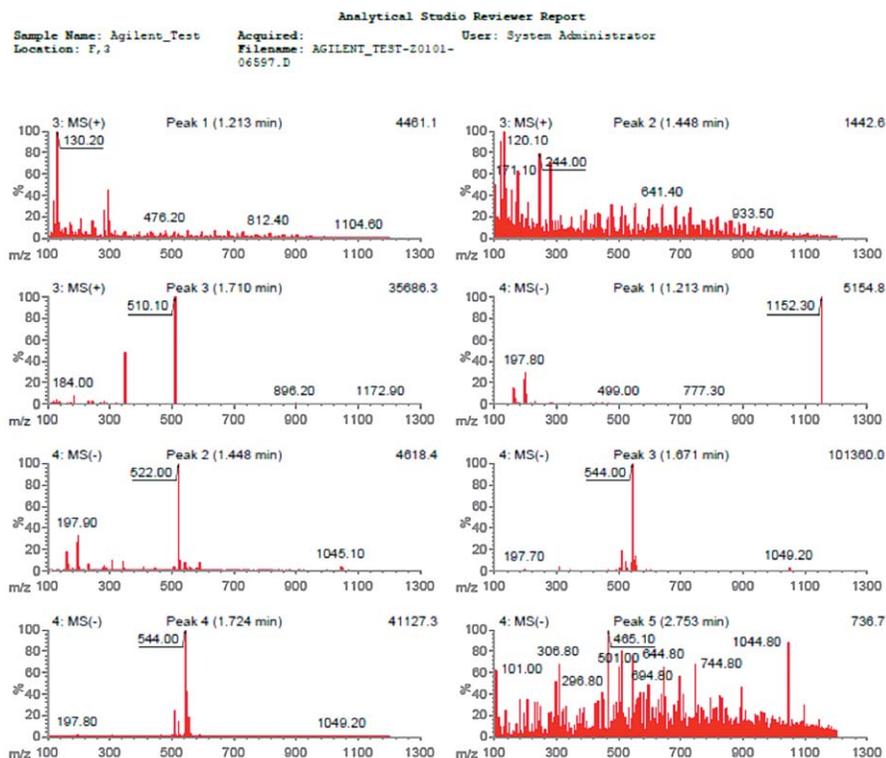


Figure 3. Using ASR, the number of reported spectra is user configurable, so scientists can also display spectra for minor reaction byproducts.

department. All users are especially pleased that ASR allows them to review data at their personal computer and that they do not have to print paper reports, resulting in dramatically improved laboratory productivity. Given the department's current success with the Agilent solution for walk-up LC/MS analysis and data review, the Medicinal Chemistry Department is moving forward with plans to add additional Agilent 6100 Series Single Quadrupole LC/MS systems.

www.agilent.com/chem/QQQ

For Research Use Only. Not for use in diagnostic procedures.

Information, descriptions, and specifications in this publication are subject to change without notice.

© Agilent Technologies, Inc. 2011
 Published in the U.S.A. September 30, 2011
 5990-9034EN