

AB SCIEX 4500 SERIES MASS SPECTROMETERS



The new workhorse for LC/MS/MS

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AB SCIEX 4500 Series

The LC/MS/MS workhorse, intelligently re-engineered.

For research use only. Not for use in diagnostic procedures.

The AB SCIEX 4500 Series is next-generation technology from the leaders in mass spectrometry. Redesigned from the foundation of our industry standard triple quadrupole mass spectrometers, the 4500 Series introduces a new era of LC/MS/MS performance. An era defined by fast, precise quantitation and ultra-fast triple quadrupole scan speeds – an era that's ideal for UHPLC.

Fast LC demands short dwell times

With 1ms dwell times – the fastest dwell times of any mass spec in the industry – the 4500 complements UHPLC separations to screen for more compounds within a single experiment than ever before. And to maximize your capacity and deliver gold-standard quantitation every time, the powerful *Scheduled* MRM™ algorithm will automatically optimize your acquisition method. Now that's a workhorse, intelligently re-engineered.

The world's most sensitive ion trap

AB SCIEX has the only Triple Quads with optional Linear Accelerator™ Trap technology. The QTRAP® 4500 delivers up to 100-fold increase in full scan MS/MS sensitivity, to enable powerful workflows that will give you a new level of confidence in your data.

- No compromise qualitative analysis with the world's most sensitive ion trap
- Simultaneous quantitation and library searching using unique TripleTrap™ scanning
- Unique MRM³ quantitation for enhanced selectivity in complex matrices



Pushing the limits of mass spectrometry

AB SCIEX customers expect maximum uptime and a system that can easily handle the most difficult matrices. The 4500 Series fulfills those expectations – with new levels of dependability and consistency built into the system.

The Turbo V™ source and Curtain Gas™ interface set the benchmark for reliability. And the proven QJet® ion guide, eQ™ electronics, Qurved LINAC® collision cell, and AcQuRate™ pulse counting detector set new standards for system robustness.





Drive productivity

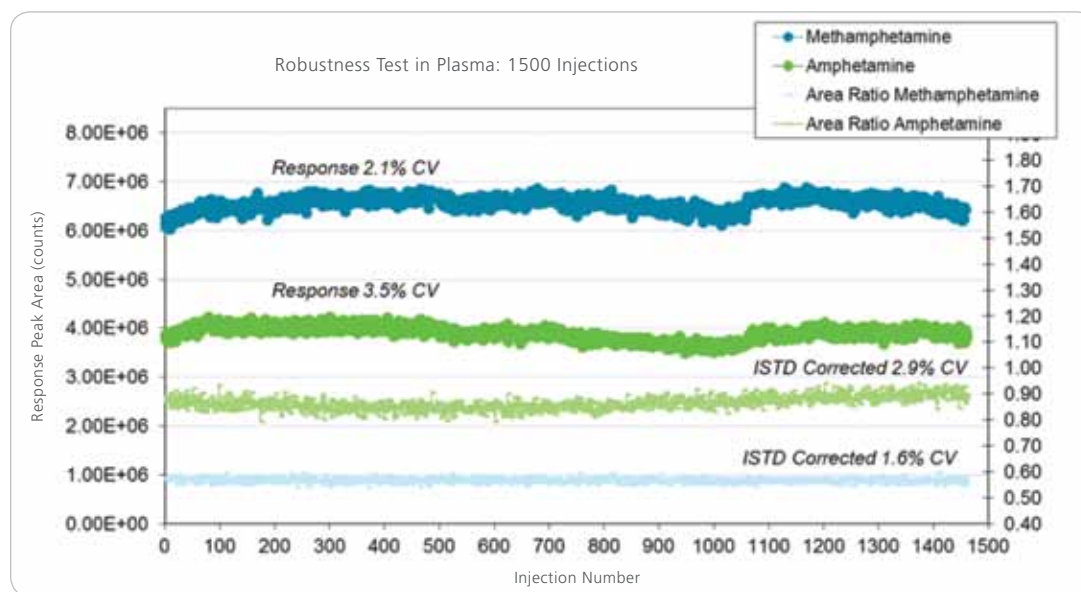
The Turbo V™ source provides high-sensitivity analysis over a wide range of flow rates with quick-change APCI and TurboIonSpray® probes. From 50 µL/min to 3 mL/min, the Turbo V Source is the perfect match for narrow bore, standard bore and UHPLC flow rates, delivering unprecedented desolvation and stability for even the toughest high-flow applications.

Ultimate sensitivity and simplicity

The patented QJet® ion guide improves ion containment and operates at high pressure, providing better collisional focusing to enhance ion transmission for ultimate sensitivity. The proven design also reduces the gas load, allowing the turbopump to run cooler in its ideal operating range. It all adds up to our most reliable system – and with tool-free maintenance, clean-up is simple and straightforward.

Nanoflow made easy

The NanoSpray® III ion source is an easy to assemble and disassemble nanoflow source that makes working with nanoflow chromatography easy while providing the highest sensitivity and stability. The NanoSpray III source supports regular and column-packed emitter tips for ultimate chromatographic flexibility. The new camera design allows clear spray visualization for simplified optimization. Fingertight fittings enable you to change tips quickly, so you are up and running in no time.



The excellent reproducibility for the peak area ratio of Methamphetamine and Amphetamine in human plasma shows the stability of the AcQuRate™ pulse counting detector for consistent quantification day after day, week after week, month after month.

The future path of LC/MS/MS quantitation

The AB SCIEX 4500™ Series brings together the latest hardware from the world's best selling triple quadrupole family, and adds next-generation, ultra-fast and sensitive Linear Accelerator™ Trap functionality. Delivering unmatched quantitative and qualitative analysis, the 4500 Series enables productive, time-saving workflows that simply cannot be done with other mass spectrometry systems.

Patented QJet® Ion Guide

Optimized design yields better ion containment and operates at high pressure, providing better collisional focusing to enhance ion transmission for improved sensitivity. The new design also lets the turbopump run cooler and in its ideal operating range.

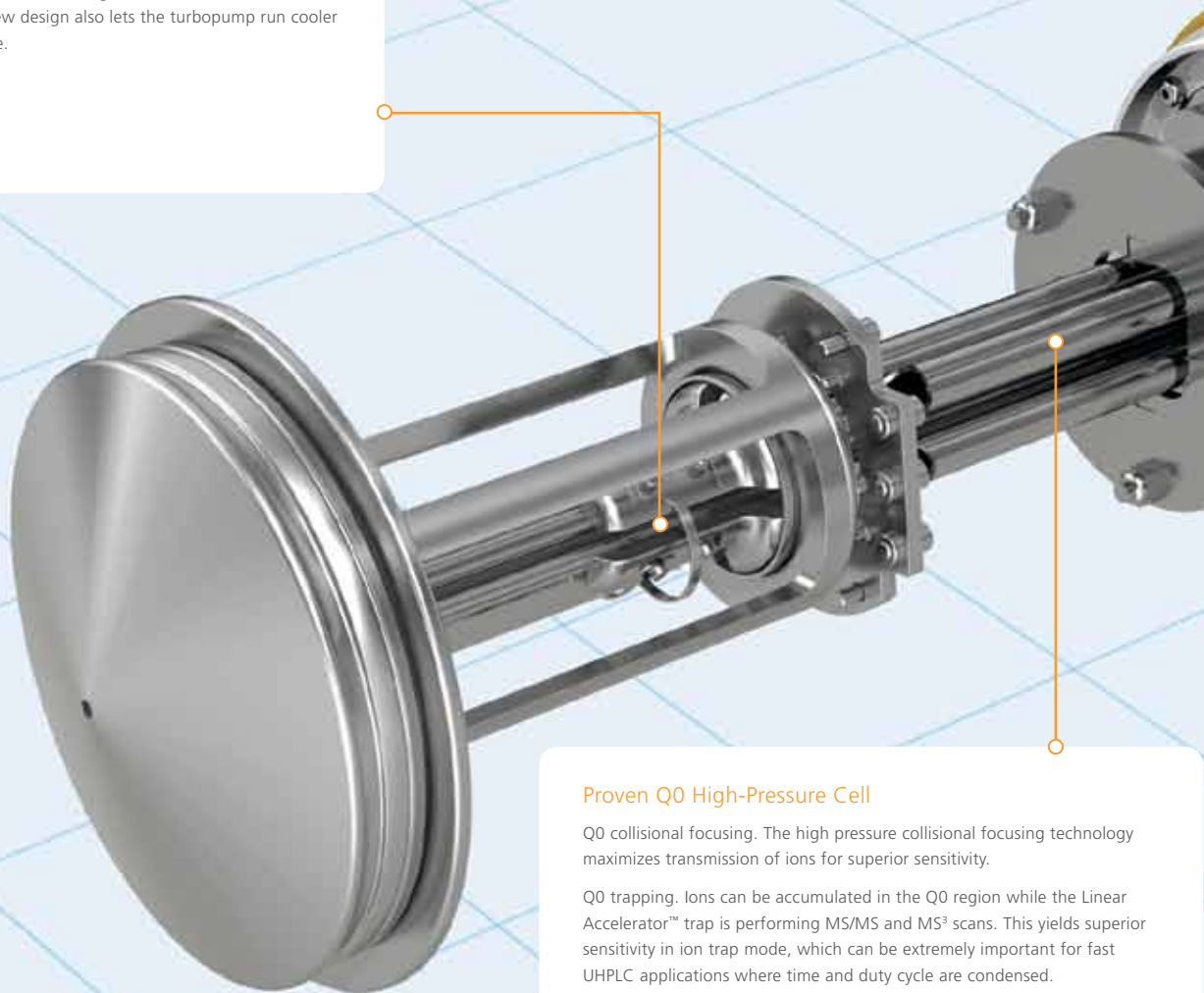
AcQuRate™ Pulse Counting Detector

The AcQuRate™ pulse counting detector combined with a pulse overlap correction algorithm, enabling more accurate and precise ion detection over a wide dynamic range. Operating at maximum gain all the time drives the detector into the digital domain, simplifying the elimination of electronic noise and guaranteeing maximum sensitivity with unparalleled accuracy and precision. The best gets even better.

Proven Q0 High-Pressure Cell

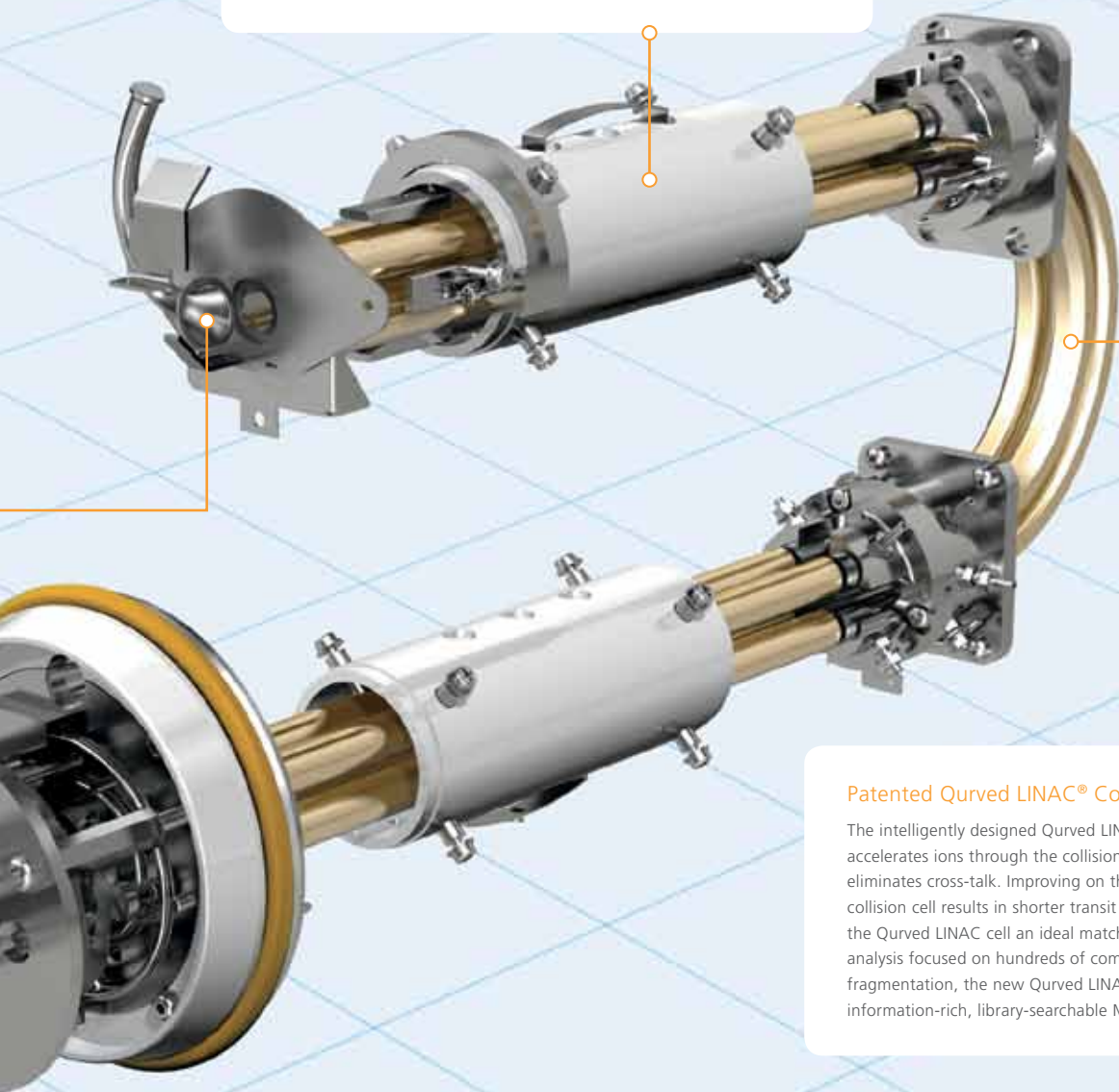
Q0 collisional focusing. The high pressure collisional focusing technology maximizes transmission of ions for superior sensitivity.

Q0 trapping. Ions can be accumulated in the Q0 region while the Linear Accelerator™ trap is performing MS/MS and MS³ scans. This yields superior sensitivity in ion trap mode, which can be extremely important for fast UHPLC applications where time and duty cycle are condensed.



Optional QTRAP® technology

Bringing LINAC® technology to the Q3 linear ion trap greatly improves the extraction efficiency to yield up to a 100 x gain in sensitivity in ion trap scan modes. Now take full advantage of the 20,000 Da/s scan speeds with full scan linear ion trap sensitivity 100X more sensitive than triple quad full scan experiments for greater confidence in qualitative workflows. Improved excitation efficiencies and reduced ion cooling and fragmentation times produce superior MS³ qualitative results and provide unprecedented selectivity for the most challenging analytical assays.



Patented Curved LINAC® Collision Cell

The intelligently designed Curved LINAC® high-pressure collision cell accelerates ions through the collision cell, increases speed of analysis and eliminates cross-talk. Improving on the performance of the legendary LINAC collision cell results in shorter transit times across the collision cell, making the Curved LINAC cell an ideal match for UHPLC and high throughput analysis focused on hundreds of compounds. With true collision-induced fragmentation, the new Curved LINAC collision cell generates reliable, information-rich, library-searchable MS/MS spectra time after time.

Fast eQ™ Electronics for Fast LC

Next-generation eQ™ electronics means polarity switching in 50 ms and scan speeds of 20,000 Da/s. Now, compounds with vastly different functional groups can be measured in a single pass. The new electronics also provide improved ion containment for better sensitivity and superior detector performance. Ultra-fast and ultra-stable instrumentation means you get the most out of your standard or fast LC to save time and accelerate your research.

The AB SCIEX Triple Quad™ 4500 System

Reliable, robust, definitive quant

For real-world commercial labs who need a fully integrated LC/MS/MS workhorse, they can trust, hour after hour, day after day.

The Triple Quad 4500 system is built to match the robustness and reliability established by the API 4000™ system and has been enhanced in performance across all critical parameters: sensitivity, dynamic range, linear ion trap performance, scan speed and footprint.

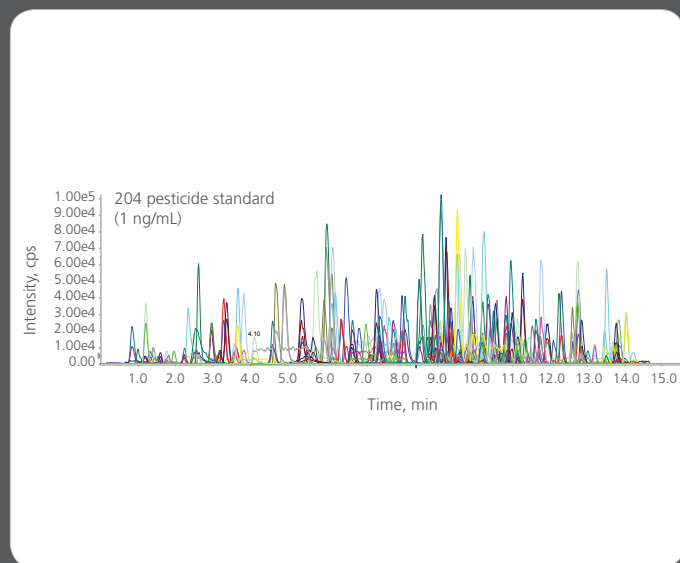
- Improve MRM sensitivity by 10X vs. competitive triple quads in the same class
- Optimize your integration with UHPLC strategies with scan speeds of up to 12,000 Da/sec and acquire more data points for a given UHPLC peak

- Improve your multi-day batch assay reproducibility with solid 0.1 Da mass stability over 24 hours
- Achieve 5 orders of dynamic range
- Screen more compounds with ultra-fast MRM cycle times with 1 millisecond dwell times



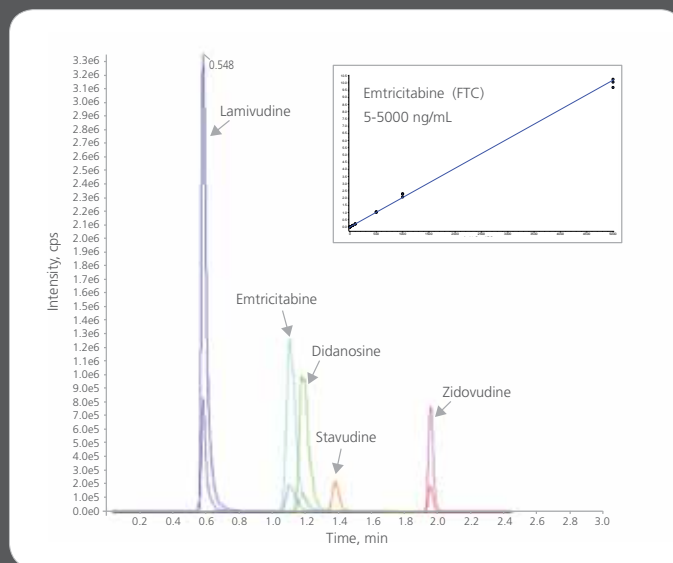
Robustness and performance for any application

Contaminant analysis



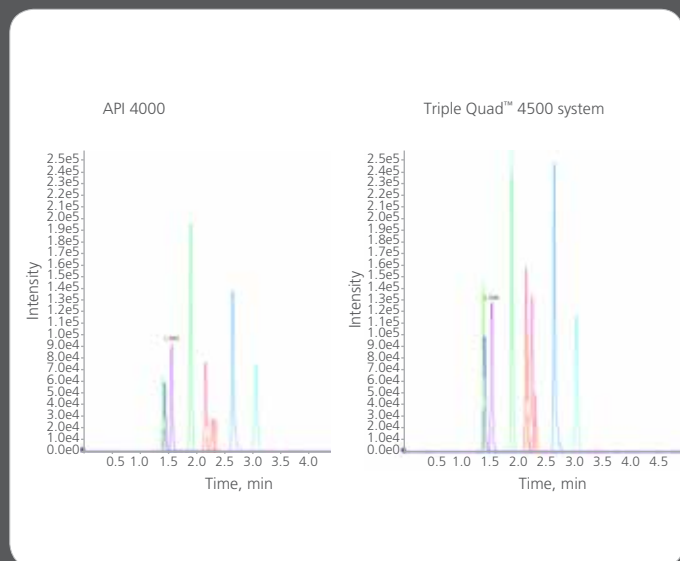
With the fastest dwell times of any LC/MS/MS the 4500 series is ideally suited for multi component contaminant analysis as these data demonstrate with the detection of over 200 pesticides at 1ng/mL. The faster electronics and the intelligent *Scheduled* MRM (sMRM), permits the screening of hundreds of pesticides in a UHPLC time scale.

Drug monitoring research



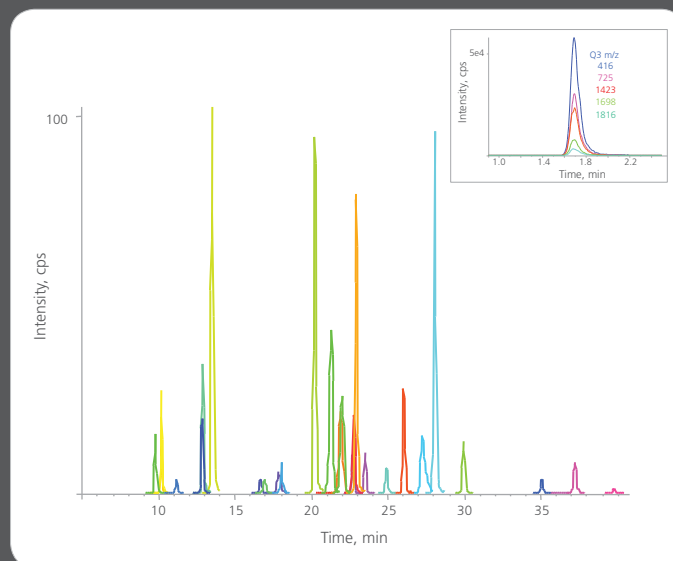
Superior quantitative performance for sensitive, accurate, and reliable analysis in antiretroviral drug research.

Drug discovery and development



Without compromising sensitivity, the Triple Quad 4500 system has improved in every category vs. the API 4000 including dynamic range, scan speed and footprint.

Peptide quantitation



Highly multiplexed peptide quantitation using the *Scheduled* MRM™ algorithm. 30 selected MRM transitions from a 4000 MRM assay of tryptic peptides. This experiment was run in replicate on an Eksigent 200 um ID chiPLC® column with peak area deviation < 10%. Insert: an example of multiple MRMs to a single peptide, showing selected fragment ion chromatograms.

Analyst method converter

Rapidly transfer your workflows

Developed a method? Let Analyst transfer it for you.

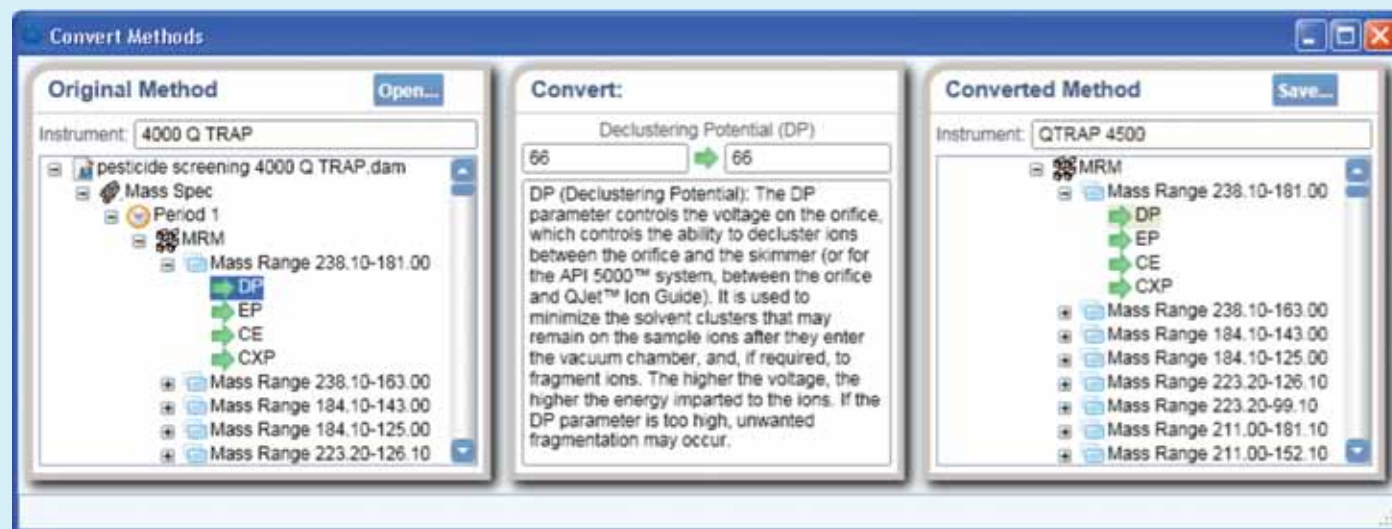
In moving from one mass spectrometry platform to another, AB SCIEX is conscious of the fact that customers need to consider the impact of method transfers on resources, timelines and data quality.

For this reason, AB SCIEX has created the Convert Methods Utility. This innovative tool takes pre-developed Analyst MS-methods established on the 3200, 4000, 5000 and even 5500 platforms and updates them instantly for use with the all new 4500 Series for seamless, accelerated integration.

Simply open your existing Analyst method and the Convert Methods Utility will update the method parameters for immediate use on the 4500 Series.



Let the workhorse do the work



The Convert Methods Utility interface. Simple, fast and automated conversion of MS/MS methods from existing AB SCIEX mass spec platforms to 4500 Series conditions within seconds.

One touch productivity

Take full advantage of all the speed and power of the 4500 Series. Powerful, workflow-driven software ties everything together to deliver a new benchmark in efficiency, throughput, and productivity. Industry-standard Analyst® Software utilizes the intelligent *Scheduled MRM™* algorithm to make the method setup of over 1000 analytes in a single LC analysis straightforward and simple while still generating exceptional quantitative and brilliant qualitative results.

Save time, without compromising

MRM data processing

MultiQuant™ Software is a powerful, easy-to-use package that processes MRM data for quantitative information. The software easily handles large data sets consisting of both large numbers of MRM transitions and study samples, with an emphasis on the requirements for processing protein/peptide quantitative workflows. Results can easily be exported to other software packages, or use the software's flexible reporting features to generate custom reports.



Simplified, preconfigured testing

Cliquid® Software pre-configured iMethod™ Applications and simplified user interface make it easier to perform routine food, environmental, forensics, and clinical research testing. With a simple four-step workflow, pre-configured methods, built-in system suitability tests, and automatic reports generated according to regulatory requirements, Cliquid Software both simplifies the use and accelerates the adoption of LC/MS/MS for routine testing.



Complete metabolite coverage

LightSight® Software simplifies analysis of complete metabolite coverage. Create expert-level acquisition methods in just a few simple steps using the automated method development tool. Or take advantage of customized glutathione screening to quickly identify potential reactive metabolites and significantly increase metabolite detection with targeted methods.



Instrument control, analysis, and reporting

The world's most commonly used LC/MS/MS instrument control software platform, Analyst® Software provides state-of-the-art functionality for instrument control, data analysis, and reporting. The latest version builds on this legacy by providing new features that enhance both performance and ease of use.



The AB SCIEX QTRAP® 4500 System

Unmatched simultaneous quantitative and qualitative analysis

TripleTrap™ scanning with the QTRAP® technology

QTRAP technology provides a new level of selectivity and confidence. Unique to AB SCIEX mass spec platforms, QTRAP Technology delivers a 100X increase in full scan sensitivity over basic triple quads, enhancing qualitative workflows while offering versatile advantages in simultaneous quantitation and library searching workflows.

Enhanced selectivity under challenging conditions

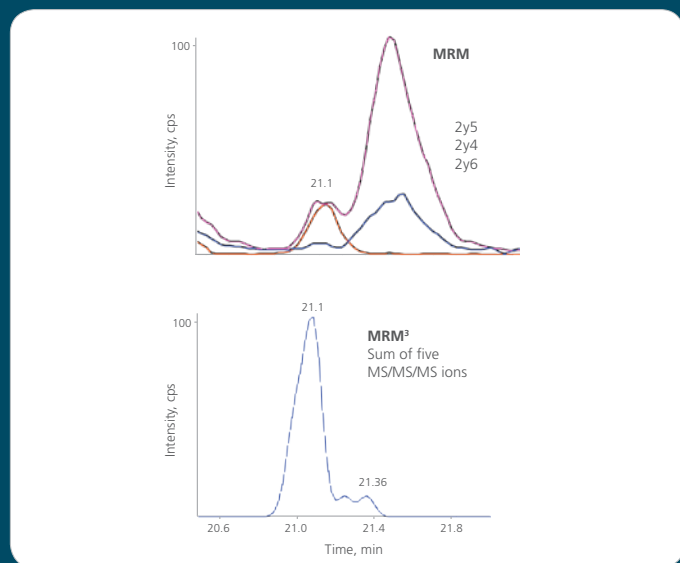
The MRM³ workflows enabled by the QTRAP 4500 system provide enhanced quantitative selectivity when high background or challenging co-eluting interferences make standard MRM quantitation difficult.

- Simultaneously quantitate MRMs and perform full scan library searches for non-targeted contaminants
- Achieve a 100X increase in full scan sensitivity over triple quads providing an enhanced level of confidence for forensic toxicology applications
- Boost selectivity with quantitative MRM³ workflows – and reduce the need for extensive sample cleanup or labor intensive chromatography methods
- Obtain comprehensive peptide sequence confirmation and simplify MRM assay development for peptide quantitation



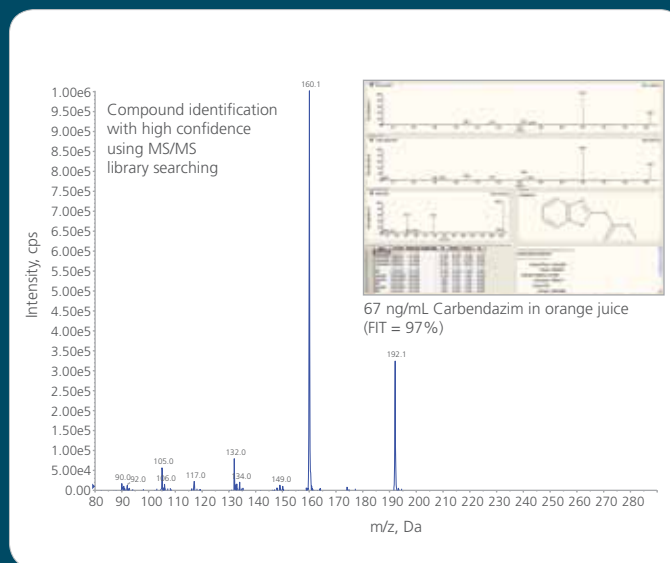
QTRAP[®] technology – unmatched versatility and confidence

MRM³—Enhanced selectivity



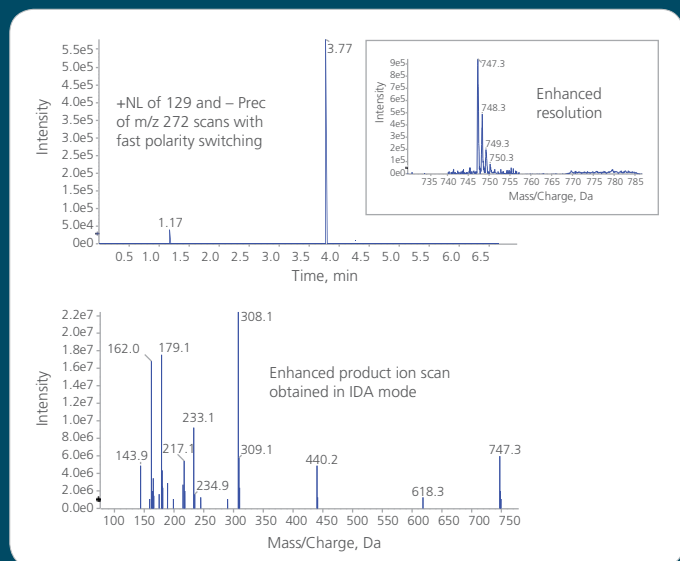
Quantitation of tryptic peptides in a complex matrix. Higher selectivity workflows such as MRM³ (bottom) can provide additional specificity for low level detection of compounds when high background or interferences render MRM workflows ineffective (top). **For research use only.**

High confidence library searching capabilities



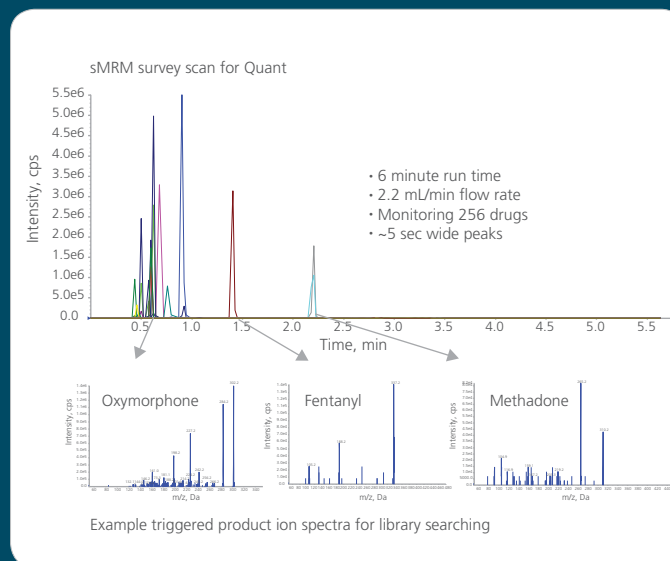
Combining intelligent peak detection with the ability to trap and scan out ions on a UHPLC time scale, creates a potent solution for detecting unexpected contaminants. Add to this a single library of thousands of QTRAP spectra for library matching, and contaminants at the lowest levels can be confidently identified.

Reactive metabolite screening



Troglitazone GSH adduct was detected using complimentary positive neutral loss and negative precursor ion scans, combined with Information Dependent Acquisition (IDA) linear ion trap scans. This unique workflow results in the comprehensive detection and characterization of GSH adducts in a single injection.

Qual-Quant: detection and confirmation



The QTRAP 4500 system allows *Scheduled* MRM (sMRM) to trigger high quality, full scan product ion spectra for use in library searching. With highly sensitive Triple Trap™ scanning it is possible to confidently identify compounds at up to 100X lower concentrations than triple quadrupole full scans. **For research use only.**

You invest in our technology. We invest in your success.

As the world leader in mass spectrometry, AB SCIEX solutions are backed by the industry's most extensive service and support organization. With a network of service professionals, experienced compliance specialists, and over 150 PhD application scientists worldwide, we are dedicated to supporting your technical needs and helping you get the most out of your AB SCIEX systems.

AB SCIEX service professionals are recognized as the most highly qualified in the industry. They are certified on our instrument platforms through a rigorous 4-step certification program, with re-certification occurring every two years. This award-winning program helps to ensure that you receive the most efficient, highest-quality, and most up-to-date service available for AB SCIEX products and technology. Choose from flexible service plans and a variety of services for the right level of support for your laboratory's needs and budget.

Our customer support network is available to provide expert assistance in the use and application of AB SCIEX products through a comprehensive range of services, including application support, technical service, and training.

Whether you access our service and support team by phone, email, on-site visits, or through our innovative remote monitoring technology, you can be confident that the AB SCIEX organization will be there for you.

For more information, visit www.absciex.com

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