



Advanced Hybrid  
Triple Quadrupole –  
Linear Ion Trap  
Technology

A high-performance ion trap and a high-sensitivity triple quad. All in one system – from the leaders in mass spectrometry. Innovative AB SCIEX 4000 QTRAP® Linear Ion Trap (LIT) technology combines fast, sensitive qualitative analysis with the proven, high-sensitivity quantitation of the industry standard triple quadrupole.



### Exciting new application possibilities

With its outstanding quantitative sensitivity and qualitative performance, the new 4000 QTRAP® LC/MS/MS system opens up a new class of application workflows for proteomics, drug discovery, and drug development. By combining true triple quadrupole scan modes with sensitive ion trap scans in a single LC/MS/MS run, you can achieve results that previously required multiple analyses on multiple MS platforms. In many cases, you can acquire data that is difficult to obtain by any other means.

### A complete, integrated system

The rugged, robust 4000 QTRAP LC/MS/MS system sets a new standard of dependability for the high-throughput laboratory. With a full complement of automation features, it fits seamlessly into your lab's workflow and boosts your discovery productivity. The system includes intuitive application-specific software with all the controls required for 21 CFR Part 11 compliance. In addition to the mass spectrometer, AB SCIEX can supply the chromatography front end through our LC partners and help with any validation support you may need.

### Powerful, industry-leading software

Powerful Analyst®, MultiQuant™, MRM Pilot™, and Cliquid® software put all of the 4000 QTRAP system's sophisticated performance features at your fingertips and simplify every aspect of methods development, data acquisition, and processing. Advanced, built-in automation capabilities make it easy to get meaningful results, and the flexible control software supports most popular LC platforms.

### A single solution for discovery and development

The combination of the high-sensitivity triple quad, the sensitive linear ion trap technology, and versatile Analyst Software offers a total system solution that's a perfect fit for any busy laboratory. The extended productivity features of the application-specific software – LightSight®, and ProteinPilot™ – complement the 4000 QTRAP system's superior sensitivity and performance to give you more useful information per sample than any other single system.

The innovative 4000 QTRAP LC/MS/MS system provides a superior level of performance while enabling fast, automated workflows that reduce analysis time and maximize the information you achieve from every run.



# One system that not only does it all, but does it better

## Combined triple quad and ion trap sensitivity

Superior triple quad performance, patented collisional focusing, and linear ion trap technologies combine to maximize full scan MS and MS/MS sensitivity. So you can identify more low-abundance metabolites, proteins, and post-translational modifications, with a high degree of confidence.

## High sensitivity MRM

The 4000 QTRAP® system provides true triple quadrupole multiple reaction monitoring (MRM) at a higher level of sensitivity and an extended dynamic range to ensure superior quantitation performance for both small molecules and peptides.

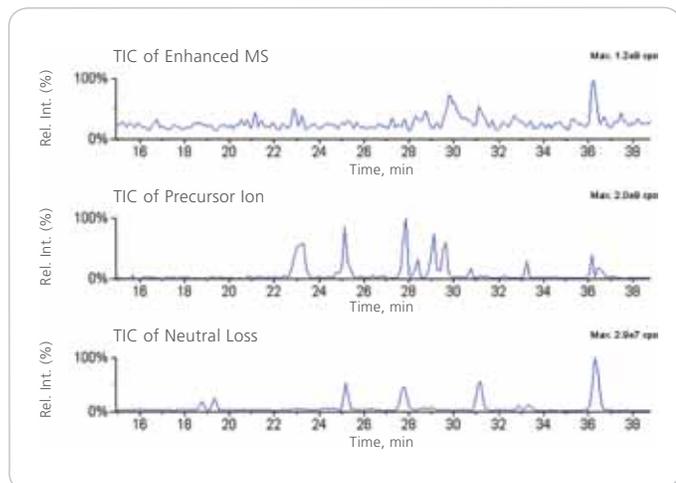
## MS<sup>3</sup> capability

Advanced MS<sup>3</sup> functionality together with triple quadrupole fragmentation patterns, gives you more useful information in fewer experiments – including detailed structural information and insight into metabolic pathways.

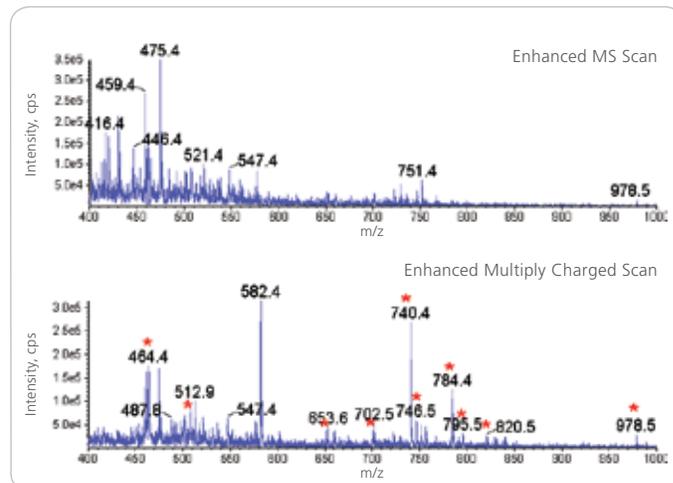
## Advanced scanning capabilities

Used in flexible combinations, the highest sensitivity neutral loss, precursor ion, and enhanced multiply charged scans enable information-rich, high-throughput workflows.

Automated LC/MS/MS workflows using Information Dependent Acquisition (IDA) provide the framework for deriving maximum information from every experiment. When used with the 4000 QTRAP system's powerful mixed scan modes, IDA lets you focus on specific ions of interest for increased productivity.



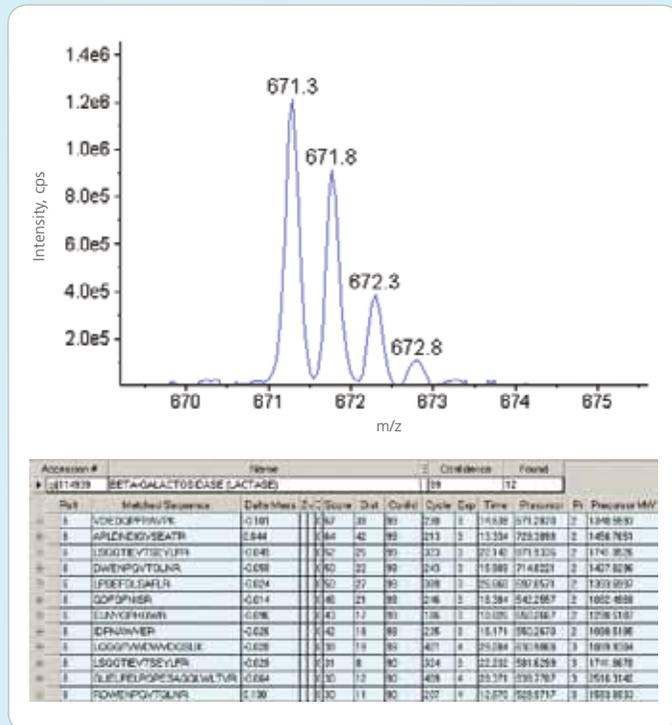
Highly specific precursor ion and neutral loss scans extract more meaningful information from any given run.



Enhanced multiply charged scan preferentially reduces singly charged ions and highlights the peptide ions of interest.

### Higher resolution, improved mass accuracy

Advanced linear ion trap technology enhances resolution for reliable real-time charge state and isotope pattern determination as well as superior mass accuracy across the entire mass range.



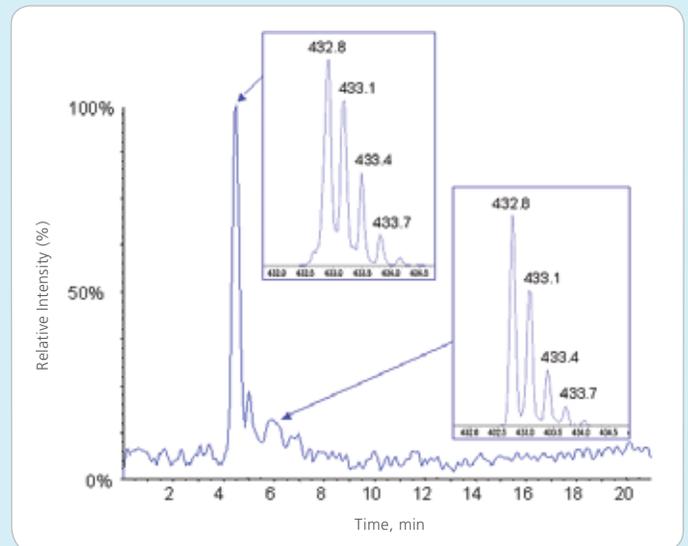
Superior resolution and higher mass accuracy greatly increase the specificity and speed of database searches to give you better confidence in all identification results.

### Plug-and-play sources

Rugged, reliable ion sources are easily interchanged for a wide range of applications and flow rates to suit your lab's needs. Choices include the exclusive Turbo V™ source with TurbolonSpray® probe and APCI probe, the DuoSpray™ ion source – a combined software-selectable ESI/APCI ionization source – and the NanoSpray™ III source with heated interface for nanoflow applications.

### Dynamic Fill Time (DFT)

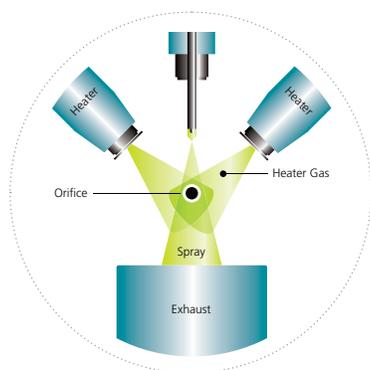
The system dynamically calculates the time required to fill the linear ion trap. For abundant compounds, a short fill time reduces the space charge effects by limiting the number of ions in the ion trap while a longer fill time increases weak signals by allowing ions to accumulate.



Dynamic Fill Time (DFT) ensures high quality data over a wide dynamic range.

# Take Linear Ion Trap technology to new levels of performance and sensitivity

The 4000 QTRAP<sup>®</sup> LC/MS/MS system takes advantage of a number of mass spectrometry innovations to deliver unmatched quantitative and qualitative performance within a single system. The instrument combines the advanced features of AB SCIEX Linear Ion Trap (LIT) technology – including significantly higher injection and trapping efficiencies, greater ion capacity, and higher duty cycle – with the unequalled sensitivity of the leading triple quadrupole system for drug development.



Innovative Turbo V™ ion source



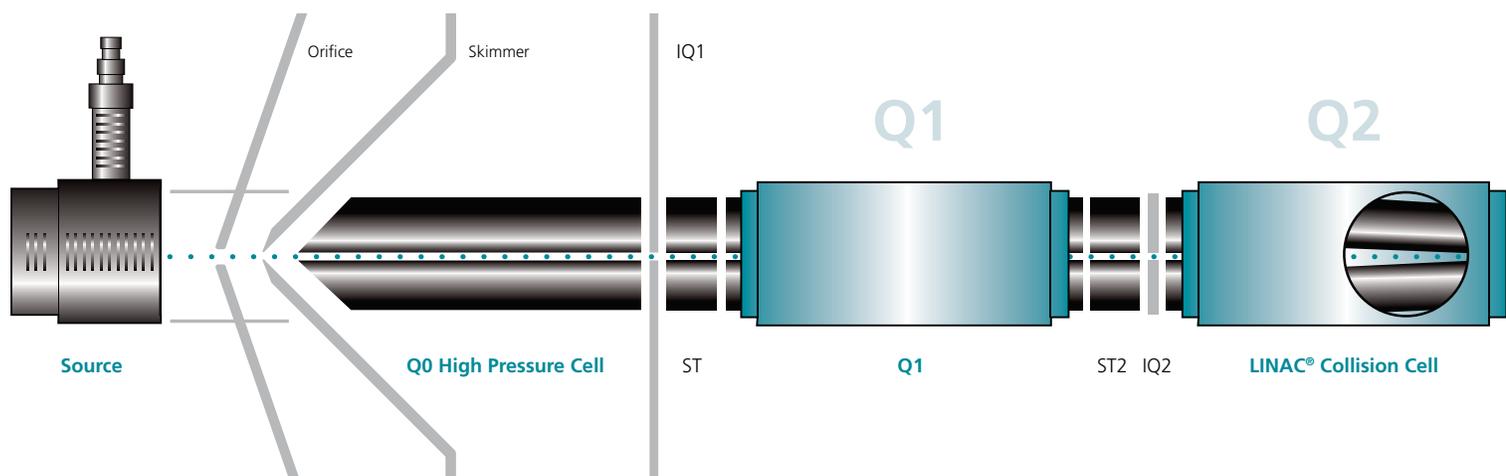
NanoSpray™ III Source and Heated Interface

## Innovative Turbo V™ ion source

Embedded ceramic heater technology and improved gas dynamics give you the lowest detection limits available, enabling the highest sensitivity quantitation over the wide range of flow rates used in drug metabolism and DMPK analyses. Quick-change APCI and TurbolonSpray<sup>®</sup> probes let you switch between ionization modes in seconds.

## NanoSpray™ III Source and Heated Interface

This ultra-low flow source is designed for minimal sample consumption and highest sensitivity at flow rates from 50 nL/min to 2  $\mu$ L/min. It is ideal for analyzing biological samples such as peptides and proteins while using very small sample amounts. The source features easy tip and column replacement, with finger-tight fittings and a quick release spray assembly for simplified maintenance and troubleshooting.



*“The 4000 QTRAP® system is really more than just a hybrid instrument. It gives you all the capabilities of the world’s most sensitive triple quad and the world’s largest capacity linear ion trap, without sacrificing performance on either side.”*

DR. JIM HAGER, PRINCIPAL RESEARCH SCIENTIST, AB SCIEX

#### Patented Q0 High Pressure Cell

**Q0 collisional focusing** Unique, high-pressure collisional focusing technology maximizes transmission of ions for superior sensitivity.

**Q0 trapping** Ions can be accumulated in the Q0 region of the system while the Q3 trap is scanning ions during MS/MS and MS3 scans. This results in greatly improved duty cycle and improved sensitivity.

#### Patented LINAC® collision cell technology

The patented LINAC high-pressure collision cell accelerates ions through the collision quadrupole for increased sensitivity at greatly reduced dwell times.

#### Patented Q3 linear ion trap

Use of a quadrupole as a linear ion trap significantly enhances ion trap performance while maintaining complete triple quadrupole functionality.

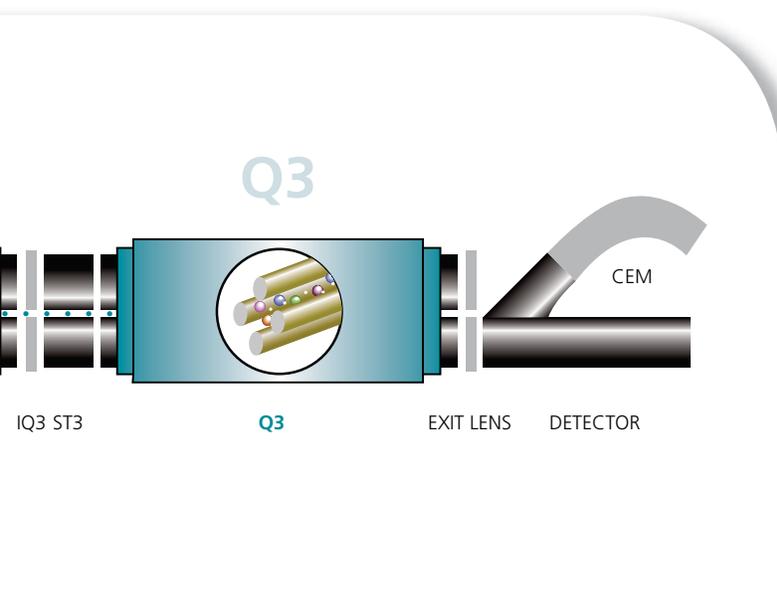
**Greater ion capacity** The larger linear ion trap can accommodate up to 70X more ions than a 3D ion trap, providing greater sensitivity before the onset of space charge effects.

**Improved injection and trapping efficiencies** With an ion path 30X longer than a 3D ion trap, ions have more time to lose energy, promoting capture and further enhancing sensitivity.

**New Dynamic Fill Time (DFT)** DFT ensures high quality data for a wide range of analyte concentrations.

**Higher duty cycle** Faster scan time provides more information in less time for any given experiment. More scans over a given chromatographic peak result in more thorough investigation of your complex samples.

**No low mass cut-off** The fragmentation step (LINAC collision cell) and the trapping step (Q3) are spatially separated, making capture and analysis of lower mass ions possible.



# Your success is our success

## We take it personally

As an AB SCIEX customer you have access to a world-class customer support organization. Wherever you are, we're there with you as a trusted partner to answer questions, provide solutions, and maximize lab productivity.

Our customer support organization has access to the latest product updates, software revisions, methods and repair procedures to make sure that you stay on top of your game.

When you have questions, we have answers.

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