SCIEX

SWATH® Acquisition Compendium 2019

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Working in a research lab, core facility, or routine testing environment all have their unique sets of challenges. But there is often one shared common goal: to identify and quantify components in a sample in as timely and efficient a manner as possible. Having the right tool for the job can mean the difference between mediocre and exceptional results.

SWATH® Acquisition was designed to be easy to run while providing comprehensive sample quantitation all within a single sample injection. This innovation has been transformative!

The comprehensive and reproducible nature of SWATH Acquisition is proven to be ideal for scientists around the world who have now adopted the technique and are performing innovative research and routine testing in a variety of fields. After all, if you need to analyze the content of your sample, why settle for knowing almost everything when you can know it all with SWATH?

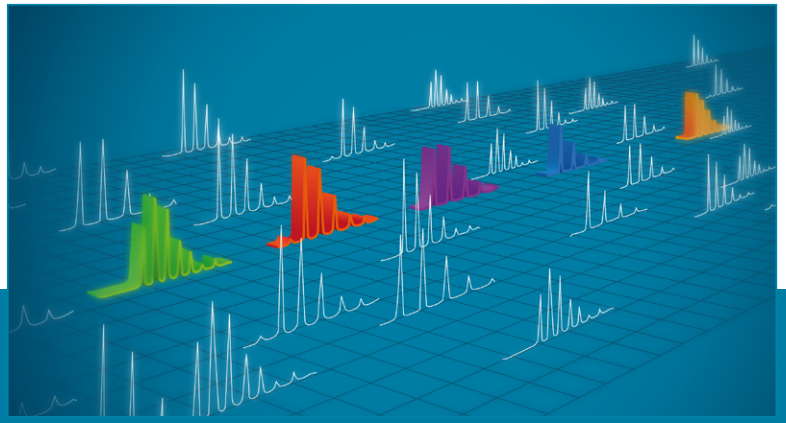
Here, we outline the benefits that SWATH provides across many applications within pharma, life sciences, food, environmental, and forensics testing. We hope these success stories will show you why SWATH Acquisition is truly the tool for exceptional results.

Christie Hunter
Director of Applications, SCIEX

Look deep into nature, and then you will understand everything better.

Albert Einstein

Background



SWATH® Acquisition

The Whole Picture

SWATH Acquisition is a Data Independent Acquisition (DIA) strategy that delivers the complete picture of a sample. It provides the best method of performing sample analysis, identifying and quantifying every detectable analyte in a single run, without the need for repeated sample re-analysis.

Contrary to traditional mass spec acquisition techniques that rely on Data Dependent Acquisition (DDA) strategies, the DIA strategy employed by SWATH Acquisition is not "dependent" upon some pre-set criteria determined by the abundance of the compound. With SWATH Acquisition, every detectable ion – irrespective of concentration – is fragmented, identified and quantified to provide the full MS and MS/MS picture for every peak.

The Eternal Sample

Post-acquisition, the complete set of data will function as a digital archive of the sample, allowing full access to pull out anything that you are interested in without the need to rerun samples. This allows you to re-analyze the sample data without re-analyzing the actual sample should new hypotheses arise tomorrow.

More Coverage. Where You Need It

SWATH technology is powered by variable window acquisition. This provides a comprehensive data acquisition, enhancing specificity without sacrificing analyte coverage. Narrower windows focus on those areas where analyte density is greatest, providing increased specificity and capturing more information on analytes similar in mass and reducing the risk of missing low-abundance analytes. A wider window is then used where analyte density is sparse, allowing a full coverage across the remaining mass range. This ensures a genuinely expeditious yet comprehensive acquisition strategy.

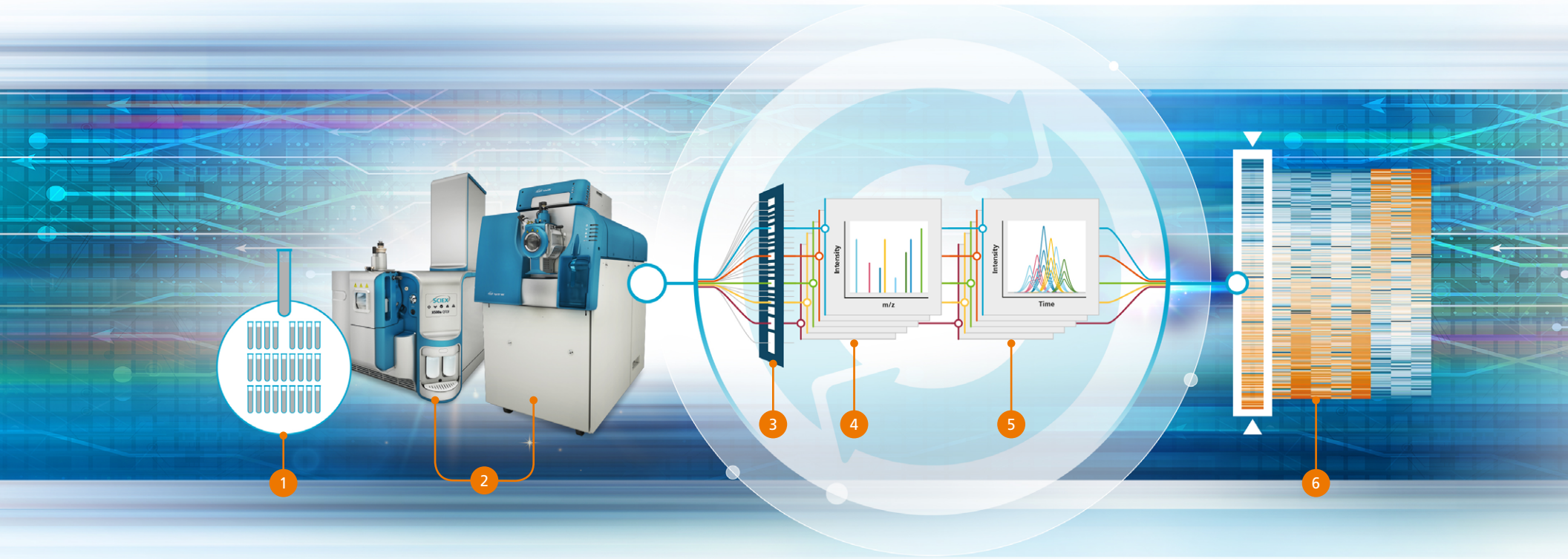
Additional Resources

SWATH Acquisition Website

Technical Note

Improved Data Quality Using Variable Q1 Window Widths in SWATH

The SWATH® Acquisition Workflow



Workflow Stages

1. Sample Set
2. X500 QTOF or TripleTOF®
3. Variable Windows SWATH Acquisition
4. MS/MS Data
5. Extracted Ion Chromatagrams
6. Digital Archive - Your Eternal Sample

SWATH® Acquisition Compendium

Life Science Research

Proteomics

SWATH® Acquisition is a comprehensive and reproducible technique that has proven to be ideal for studying extremely complex samples that could contain thousands of analytes over a wide dynamic range, like the proteome.

The data-independent acquisition of SWATH collects MS/MS data on everything detectable in the sample meaning every peak is reliably and reproducibly quantified to ensure complete detection of peptides and proteins.

In proteomics research, these advantages have proven to be vitally important in the research reproducibility and the industrialization of quantitative studies.

Downloadable Resources

Technical Notes

Evolution of SWATH® Acquisition Provides Large Gains in Quantified Proteins

Microflow SWATH® Acquisition for Industrialized Quantitative Proteomics

Multi-Omics Analysis of Human Embryonic Stem Cell Neural Differentiation

Enabling Systems Biology Driven Proteome Wide Quantitation of Mycobacterium Tuberculosis

Accelerating SWATH® Acquisition for Protein Quantitation – Up to 100 Samples Per Day

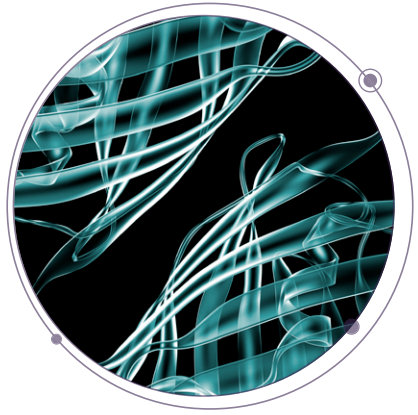
Webinars

Large Scale Protein Quantification Studies (cross lab study)

The Proteome: Composition and Organisation

Development of High Throughput Proteomics Pipeline Using SWATH® Acquisition for Profiling Biochemical Individuality

Proteome-Wide Profiling of Drug Dose-Response in Prostate Cancer Cell Lines by Microflow SWATH® Acquisition



Metabolomics and Lipidomics

Metabolomics and lipidomics research involves making quantitative measurements in order to understand the current and changing physiological state of an organism.

This type of high throughput research is essential in advancing the fundamental understanding of disease as well as identifying target pathways involved in key biological processes.

SWATH Acquisition provides the means to delve deeper into these processes, capturing previously undetected metabolites in a biological sample and more reproducibly quantifying metabolites across many samples.

Downloadable Resources

Technical Notes

Improves Metabolite Coverage over Traditional Data Dependent Techniques for Untargeted Metabolomics

Isotope Ratio Outlier Analysis (IROA) and Variable Window SWATH® Acquisition Allows for Unambiguous Metabolite Identification

Webinars

Biomarker Discovery: SWATH Acquisition Enabled – Metabolomics Differentiates Known Disease Classifications of Prostate Cancer

Solutions for Metabolomics and Lipidomics Research Webinar

SWATH® ACQUISITION Compendium

Pharma and Biologics

Drug Metabolism and Catabolism

Biotransformation studies are a necessary part of drug discovery and development, for both small and large molecule drugs.

By providing comprehensive analysis of a sample, SWATH® Acquisition provides the complete detection of all the biotransformations of a molecule, in one single run, to ensure no low-level or toxic compounds are missed.

The result from every run can be digitally archived and re-examined at any time to meet quality and regulatory requirements in the pharma industry.

Downloadable Resources

Technical Notes

Rapid Peptide Catabolite ID

Rapid Soft Spot Analysis

Streamlining Discovery Metabolite ID with SWATH® Acquisition

Therapeutic Peptide Catabolite Identification

Metabolite ID of Payload Species of Antibody Drug Conjugates with Noncleavable Linkers

Webinars

Confident and Powerful MetID for All Your Therapeutic Molecules

Comprehensive MetID with SWATH® Acquisition

Solution Guides

Fast, Efficient MetID with HRMS

Comprehensive Metabolism Analysis with HRMS

Biotherapeutic Characterization/ Host Cell Protein Analysis

One of the most common analytical workflows for in-depth characterization of biotherapeutics is peptide mapping.

SWATH® Acquisition provides a full understanding of the protein by capturing every peptide in the sample, making sure no unwanted post-translational modifications or metabolic remnants go undetected in the sample.

In a complex biological matrix sample, all detectable analyte fragments can be identified, even those in low abundance. Such advantages prove to be essential for biotherapeutic characterization, where SWATH® Acquisition can screen a large number of biologic-based molecules through a single method.

Downloadable Resources

Technical Notes

Comparative Peptide Mapping Between Different Manufacturers of Trastuzumab

Application of SWATH® Acquisition for Top-Down Characterization of IgG Light Chain

SWATH® Acquisition for Confidence in Biotherapeutic Peptide Mapping

Ultra-Sensitive Host Cell Protein Quantification Using CESI-SWATH® Acquisition MS

High Sensitivity Host Cell Protein Quantitation in an IgG1 Monoclonal Antibody Preparation via Data-Independent Acquisition with a TripleTOF® System

Webinars

Routinely Identify Low Level Attributes – Fast and Accurately

Enabling Use of Mass Spectrometry Throughout Biopharmaceutical Development

Characterization of Host-Cell Proteins Using Mass Spectrometry

Single-Digit PPM Level ID of HCPS

Customer Case Studies

Mass Spec is Going to Be the Gold-Standard for HCP Analysis, as It Provides More Detailed Information

Solution Guides

Peptide Mapping Analysis of Biotherapeutics

Articles

HCP Analysis Using Mass Spectrometry

SWATH® ACQUISITION Compendium

Food Screening

Food Screening

Food undergoes a long and multi-step process before it ends up on our plate. Along the journey from growth to harvesting and transportation there are numerous opportunities for commodities to be intentionally or accidentally adulterated or contaminated, making them unfit for consumption.

Therefore, it is vital to producers and consumers alike that all food produced is safe to eat; free from chemical residues, contaminants or adulterants. SWATH® Acquisition enables the identification and quantification of every single compound present in a food sample, making it the right choice to collect comprehensive information that can be stored as a digital archive allowing for further interrogation long after the food sample has degraded.

Downloadable Resources

Technical Notes

X500R QTOF System with SWATH® Acquisition for Pesticide Residue Screening in Fruits and Vegetables

Combining Non-Targeted SWATH MS/MS^{ALL} Acquisition with Highly Selective MRM^{HR} for the Analysis of Veterinary Drugs in Tissue Using the SCIEX X500R QTOF System

SWATH® Acquisition LC-QTOF-MS/MS Analysis of Food Colours and Illegal Dyes in Spices

Webinar

Validating the Routine Use of High Resolution QTOF LC-MS/MS for the Analysis of Pesticides in Baby Food

Watch Now >

SWATH® ACQUISITION Compendium

Environmental Analysis

Environmental Analysis

Environmental monitoring relies on the consistent and reliable detection of chemicals and pollutants. Quantitation and identification are key to understanding the impact these substances have on our environment.

Using the SWATH approach, comprehensive detection of many different varieties of compounds including pesticides, pharmaceuticals, industrial chemicals, and even unknown degradants or chemical by-products can be obtained, ensuring nothing goes undetected.

This sampling method supports complex matrices including those from water, soil, and plant samples, allowing for the screening of chemical compounds of interest and unknown chemical hazards that persist in the environment including analytes present at low or trace concentrations.

Downloadable Resources

Webinar

Using the X500R QTOF System and MS/MS^{ALL} SWATH® Acquisition for Pesticide Screening

Watch Now >

SWATH® ACQUISITION Compendium

Forensic Analysis

Forensic Analysis

Forensic investigators are constantly searching for the unknown. They need to detect and identify all the small molecules across a variety of complex matrices, such as surface swab samples, whole blood, serum or urine. In this industry, missing pieces of evidence is not an option.

SWATH® Acquisition can detect every component in a forensic sample, making it invaluable for identifying trace analytes from crime scene evidence hidden in complex specimens. Archiving data allows re-interrogation without needing the actual sample and is particularly advantageous where forensic samples are valuable and often in very low volumes. And as the analytes of interest are constantly changing (ie. new designer drugs), such an approach provides investigators a key advantage.

Downloadable Resources

Technical Notes

Ultra-Fast and Accurate Determination of Novel Synthetic Opioids

Ultra-Fast Forensic Toxicological Screening and Quantitation under 3 Minutes Using SCIEX X500R QTOF System and SCIEX OS Software 1.0

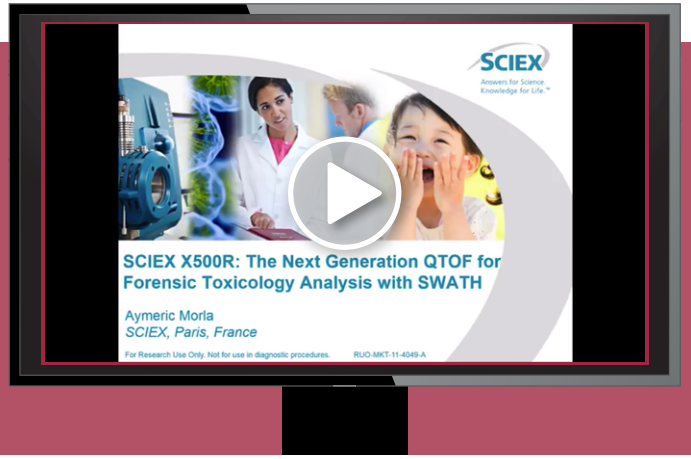
Forensic Designer Drug Analysis with SCIEX X500R QTOF System and SCIEX OS Software

Forensic Drugs Screening with SCIEX TripleTOF® 4600/5600+ LC-MS/MS System

Webinar

Forensic Drug Testing Using SWATH® Acquisition

Watch Now >



Network Your Way to Success

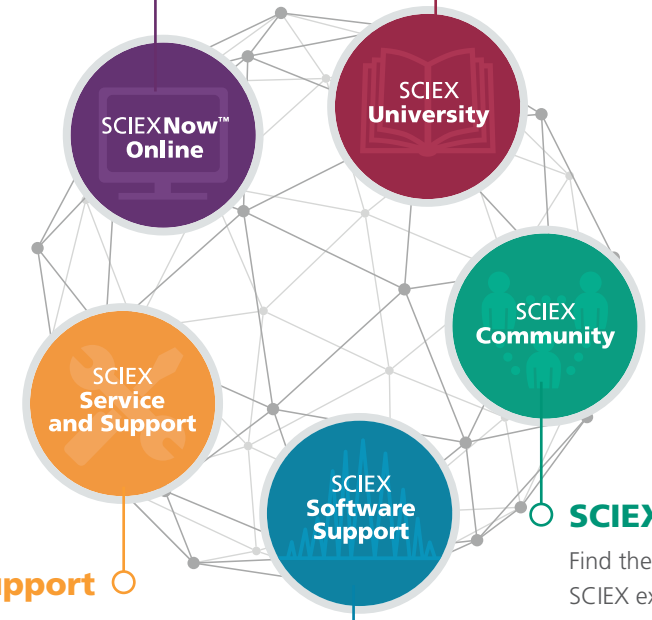
Discover How the SCIEX Success Network Speeds and Simplifies Your Path to Answers

SCIEX**Now**™ **Online**

The everything, anytime destination for all your SCIEX support needs

SCIEX**University**

The most diverse and flexible learning options available



SCIEX Community

Find the answers you need from SCIEX experts as well as your peers

SCIEX Service and Support

We're here to help you achieve your goals quickly and efficiently

SCIEX Software Support

Get the latest software, so your instruments run at peak performance

Start Your Path to Success Now: sciex.com/support

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