

# Waters™

## Waters Xevo™ CDMS

See what no one has seen before

xevo™ | CDMS








## The Solution for Your Most Complex High Mass, High Heterogeneity MS Analysis

Understanding the mass and heterogeneity of large and complex biomolecules has long been a barrier to advancement. Conventional techniques fail to resolve the information needed to reconstruct, in detail, the nuance of structure—especially megadalton molecular assemblies—so it can take months or even years of tedious, expensive research to understand the basics of biomolecular structures.

Not anymore. With the breakthrough Xevo CDMS instrument, you can achieve precise measurement of challenging large and highly heterogeneous molecules—including viral vectors, virus-like particles (VLPs), RNA, and protein complexes—that were previously out of reach for mass characterization.

With this incredible innovation in charge detection mass spectrometry (CDMS), your lab can answer questions that were previously unaskable, unlocking the future of biological science, drug development, cell and gene therapy, and precision medicine. Let's take a closer look.

A complex, glowing green molecular structure visualization, possibly representing a protein complex or a viral vector, composed of numerous interconnected nodes and lines, set against a dark background.

"We're realizing we can ask entirely new questions with this technique—things we didn't even think were testable before."

— Tim Fenn, VP, Analytical Development and Quality, LEXEO

“ A high-resolution tool like CDMS helps ensure your screening is on equal footing. That means better confidence in the pipeline you move forward with.”

— Ben Draper, Co-founder and Research Scientist, Megadalton Solutions

## Uncover Biology's Hidden Dimensions

CDMS technology opens an exciting new frontier in biomolecular analysis for labs working in cell and gene therapy, biotherapeutics, biophysical science, and nanoparticle research. With Xevo CDMS, your lab can:

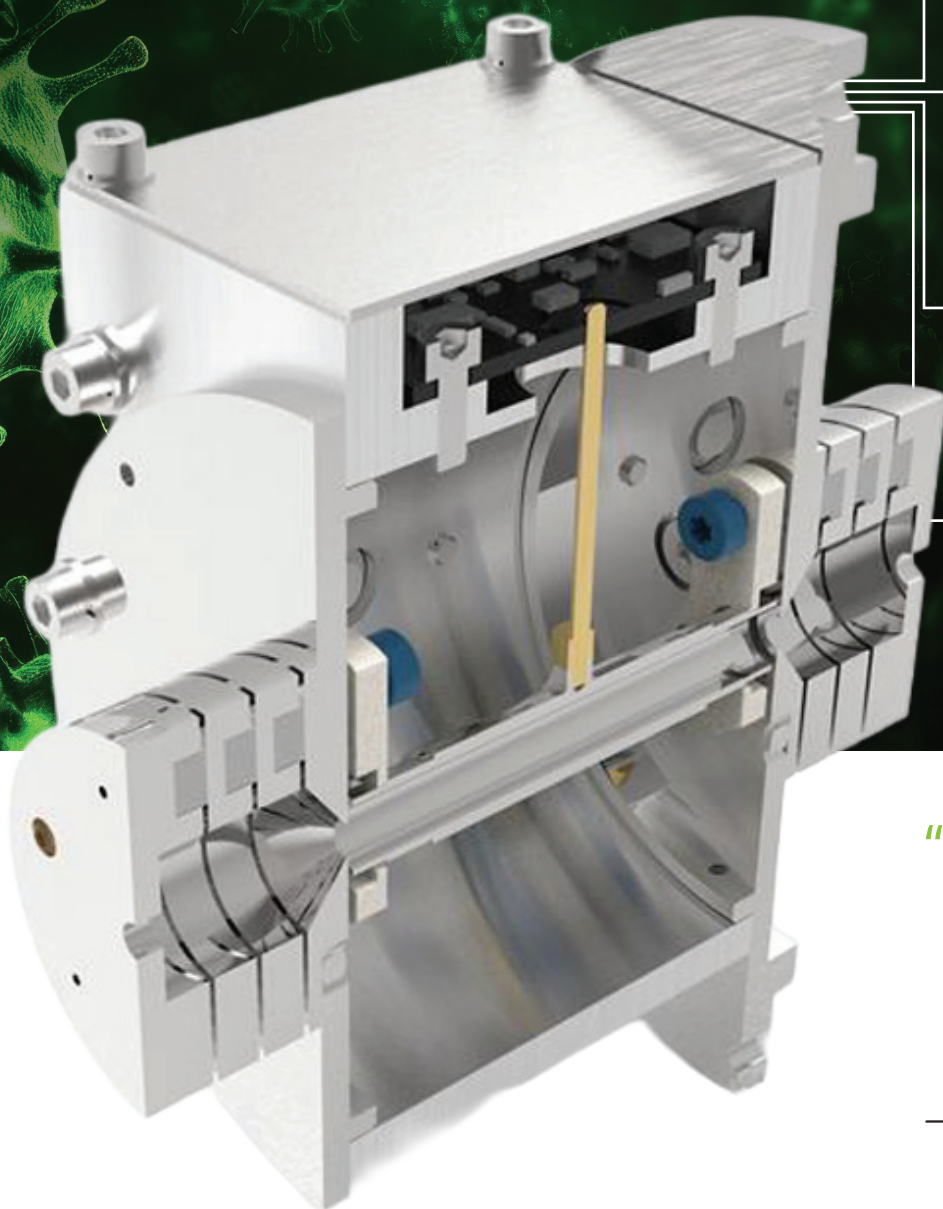
- **Investigate protein structure, function, and mechanisms of disease at scale** with measurement of massive, heterogeneous molecules that were previously invisible
- **Achieve real mass clarity** with direct, unambiguous, single-ion mass measurement of highly complex, high mass molecules
- **Gain powerful insights into complex therapeutics as they're made** with robust characterization of viral vectors, mRNAs, and protein complexes
- **Understand the processes that develop the most promising target molecules** without resorting to trial and error approaches
- **Get intuitive, ready-to-submit data with effortless compliance-ready** workflows and GxP-ready architecture





# Breakthrough Capabilities

Electrostatic Linear Ion Trap (ELIT) Technology



## Direct Charge Identification

Removes the need to fragment or digest, preserving the integrity of macromolecules

## Ultra-Sensitive Detection

The ELIT system isolates and measures individual particles – a capability not available in traditional MS systems

## Single-Particle Measurement

Provides unambiguous results by capturing both  $m/z$  and charge for each particle, yielding its true mass directly

## Exact Charge Quantification

Determines the precise number of charges without the need for assignment, unlike conventional mass spectrometry

“ CDMS is going to become essential for analyzing very complex mixtures of proteins.”

— Martin Jarrold, Professor, Department of Chemistry, Indiana University

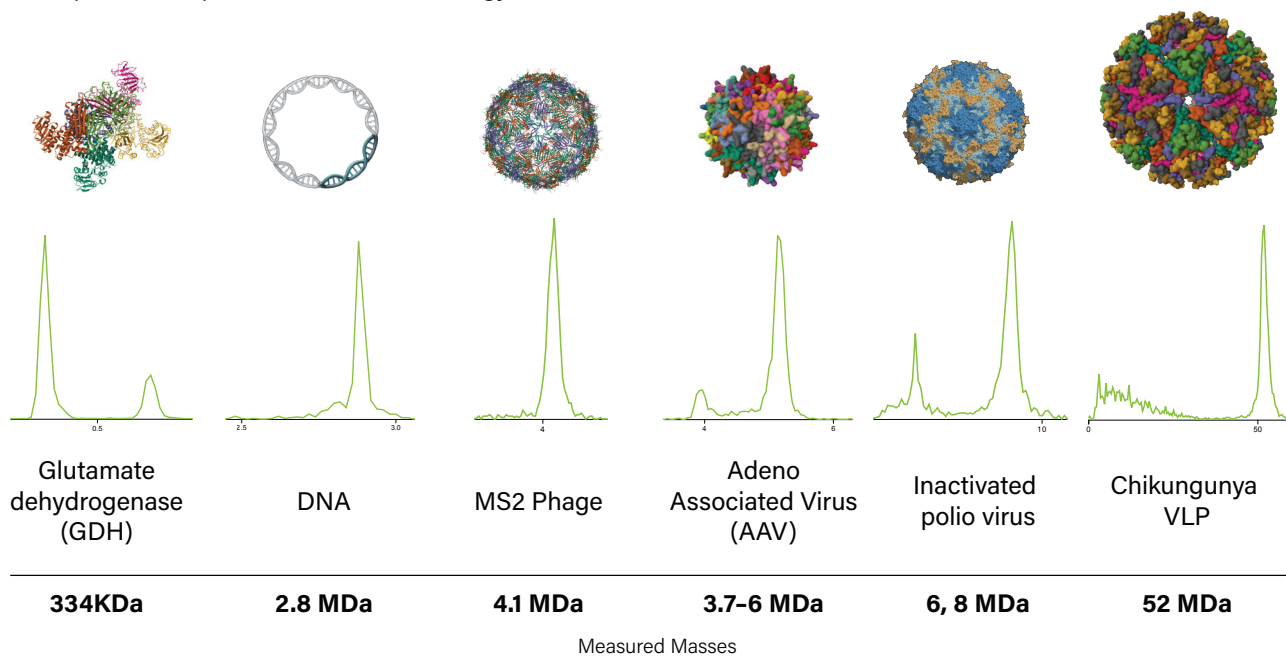
“ Only CDMS can identify how many different types of the particle are included.”

— Susumu Uchiyama, Professor, Osaka University

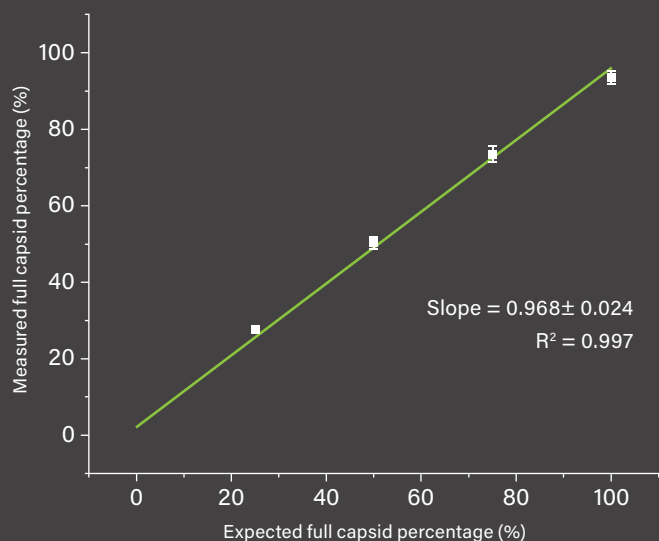
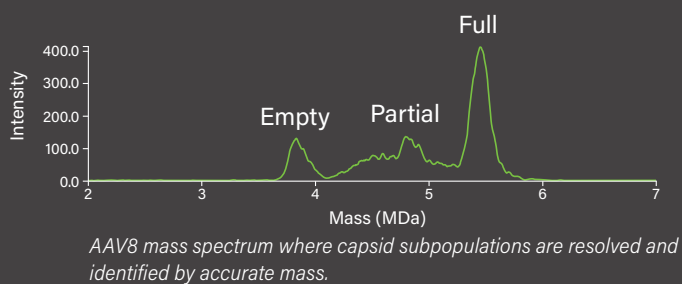


# The Data Speaks for Itself

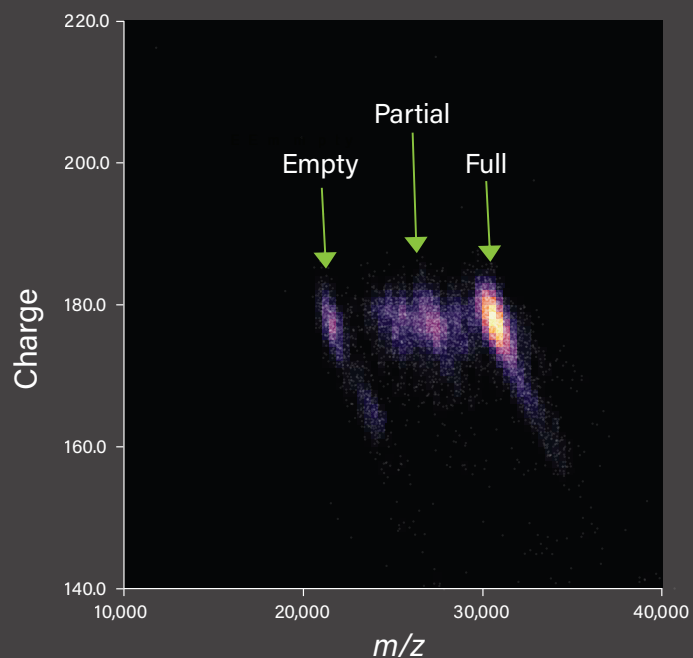
The Xevo CDMS is ideal for applications like adeno-associated viruses (AAVs) and lentiviral vector characterization, mRNA delivery systems, and protein complexes and structural biology.



## AAV Purity and Empty/Full Characterization with CDMS



Relative quantification of the peak area ratios of empty and full peaks in AAV8 empty and full capsid.



2D charge vs. m/z plot adds further definition for Empty:Partial:Full characterization.



# What are the Xevo CDMS Specifications?

- **Technology** - Charge detection mass spectrometry with individual particle detection
- **Detection** - Direct mass measurement powered by ELIT technology
- **Mass Range** - 100 MDa and beyond with molecular weight characterization and purity determination of the largest, most heterogeneous biotherapeutics
- **Resolution** - High-resolution analysis of complex mixtures
- **Sample Types** - Ideal for a variety of sample types, including viral particles, protein assemblies, and exosomes
- **Instrument Footprint** - Modern benchtop design with revolutionary nanoESI source
- **User Interface** - Intuitive software with guided workflows



|                     | AUC | Mass Photometry | SEC-MALS | Xevo CDMS                                                                                      |
|---------------------|-----|-----------------|----------|------------------------------------------------------------------------------------------------|
| Ease of Use         | —   | ✓               | ✓        | ✓ Simple Interfaces, user focused designs                                                      |
| Low Sample Volume   | —   | ✓               | ✓        | ✓ Only requires 10 µL of sample                                                                |
| Mass Range          | ✓   | —               | ✓        | ✓ >100 MDa, but potentially limitless                                                          |
| Specificity         | ✓   | —               | —        | ✓ Direct measurement on individual structures, able to resolve AAV empty/partial/full/overfull |
| Compliant Workflows | —   | ✓               | ✓        | ✓ Support for compliant workflows                                                              |

AUC: Analytical Ultracentrifugation; SEC-MALS: Size Exclusion Chromatography-Multi-angle Light Scattering; CDMS: Charge Detection Mass Spectrometry



## A Partner for Your Future

The Xevo CDMS isn't just an innovative system capable of seeing the unseen – it's a system from Waters, built on decades of leadership and collaborative expertise. What can you achieve with Waters as your partner?

- **Meet your lab's unique requirements** with tailored workflow solutions for large molecule therapy development
- **Benefit from decades of leadership** in separations, mass spectrometry, precision chemistries and consumables, light scattering, and bioprocessing
- **Access timely, specialized support** from the service team recognized for delivering the highest service satisfaction scores among all instrument vendors\*
- **Get systems trusted by labs worldwide** with a more than 150,000 installed base of instruments
- **Simplifies compliance with built-in data integrity**, audit trails, and secure user management—ideal for regulated environments
- **Advance biologics development** with cutting-edge R&D and applications

*\*Strategic Directions International (SDI)*

## Are You Ready to See the Unseen?

Regardless of your goals with characterization of mega-mass biomolecules, Waters is ready to help your lab achieve them with the power of Xevo CDMS.

Contact your Waters representative or visit [waters.com/CDMS](https://waters.com/CDMS) today.







Are you ready to discover the power of Xevo CDMS  
and see what no one has seen before?

**Contact your Waters representative or visit:  
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