CESI 8000 Plus High Performance Separation-ESI Module

- Increased coverage from limited samples
- High-resolution separation of polar analytes and critical PTMs
- In-depth characterization of proteoforms and protein complexes
Expand the reach of your mass spectrometer

The CESI 8000 Plus High Performance Separation ESI Module

The CESI 8000 Plus is a valuable accessory for your mass spectrometer when analyzing charged and polar compounds in every analytical laboratory. The CESI 8000 Plus:

• Consumes minute samples with extraordinary sensitivity
• Excels at charged and polar metabolites, peptides and more
• Enables high-resolution separation of proteins and protein complexes
• Eliminates ion suppression bias so you can see what you’ve been missing
• Is robust and easy-to-use

“CESI-MS “showed better separation efficiency and resolution with 100-fold less sample consumption compared to an LC-based intact protein separation.”
John Yates III
The Scripps Research Institute, La Jolla, CA, USA

“CESI-MS “shows a separation efficiency for high-molecular-mass compounds like larger peptides and proteins that is remarkably higher than that seen with any LC method”
Herbert Lindner
Innsbruck Medical University, Austria

“CESI-MS is a high-end tool for metabolomics work in my lab”
Dr. Jan Vanhoutte
Leiden Academic Center for Drug Research, The Netherlands

“...high resolution CZE separation of intact glycoprotein species coupled to MS has significant potential for the in-depth characterization and quantitative analysis of biopharmaceutical proteoforms.”
Barry Karger
Barnett Institute, Northeastern University, Boston, MA, USA

“With only a 200 fmol injection, CESI-MS/MS enables high quality mass spectra while completely characterizing the primary structure of biotherapeutic proteins in terms of amino acid sequence, glycosylation and post-translational modifications. This allows you to see more with less, and strengthens the power of the methodology in the context of biosimilarity assessment.”
Yannis-Nicolas Francois
University of Strasbourg, France

“With monoclonal antibodies having become such a significant class of drugs, not just in the biopharma space but the entire pharma, capillary electrophoresis has become an indispensable tool for monitoring product related impurities and product variants of these blockbuster drugs. Advances like the CESI 8000 now allow for the coupling of CE and MS and provide a solution for the desperately needed identification of peaks separated by capillary electrophoresis.”
Timothy Blanc
Eli Lilly

Connecting the CESI 8000 Plus to your MS is as easy as plug and spray.
Simply click the OptiMS cartridge tip into the source adapter.

For more information, visit: sciex.com/CESI800plus

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Using only 100 ng of yeast mitochondrial extract, CESI-MS significantly increased peptide identification, resulting in a substantial increase in the number and variety of proteins identified.

Example of high sensitivity from a limited sample

Number of proteins identified: 49, 222, 78
Number of peptides identified: 412, 564, 1201

Multiple experiments in the time of one, with <1 µL sample injected.

The unique multi-segment injection (MSI) feature significantly increases throughput. Multiple injections are separated by 60 seconds of background electrolyte injections for sequential MS analysis. This technique is commonly used with MRM targeted analyte detection.

More data from less sample

The CESI 8000 Plus High Performance Separation ESI Module

CESI-MS is particularly valuable for precious samples such as subcellular fractions, microdialysates, CSF, murine samples, CTCs, needle biopsies and FFPE archives, or highly toxic samples such as ADCs and venoms.

- Consumes minute samples with extraordinary sensitivity
- Unique multi-segment injection increases throughput 10X
- Extraordinary sensitivity and high resolution enable maximum information with minimal sample consumption (~50 nL per injection)

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Separate charged / polar molecules and proteins in high resolution

Measurements of highly charged analytes pose considerable challenges to current technologies. CESI is the method of choice for high-resolution separation of polar metabolites, peptides and proteins rich in particular post-translational modifications (such as glycosylation, citrullination, methylation, and phosphorylation).

Electrophoretic separation combined with highly efficient ESI supports a variety of applications, from investigating the anionic and cationic metabolome, to the study of proteoforms, glycoforms, and multimeric protein complexes.

The separation of sugar phosphates in central metabolism and baseline separation of isobaric positional isomers such as citrate and isocitrate demonstrates CESI-MS’s high resolving power. CESI is also the preferred technology for chiral compound separations in a cost-effective manner compared to chiral LC columns.

For more information, visit: sciex.com/CESI800plus

Intact MAb Separation of IgG1 by CESI-MS

For deep characterization of proteoforms, glycoforms, charge states and PTMs, CESI front-end technology enables liquid phase high resolution separation of proteins, metal binding and protein complexes. CESI-MS is an invaluable tool to drive biopharmaceutical development and biochemical mechanistic studies.
The CESI 8000 Plus was developed in collaboration with mass spectrometry researchers covering a number of applications. They sought to expand their range of detection and increase sensitivity. In order to achieve this, ultra-low flow separation was integrated with mass spectrometry using proprietary CESI-MS technology.

The sprayer, located within a protective housing of the OptiMS cartridge, combines an intrinsically low-flow CE separation with electrospray ionization (ESI) within a single device.

- The CESI OptiMS capillary inlet and outlet are of the same inner diameter
- The electrical contact for CE separation as well as for ESI generation is achieved through the ESI metal needle filled with conductive fluid
- Ultra low flow at the porous capillary tip instantly generates a fine ESI spray when a low voltage ~ 1.25 KV is applied
- The low voltage of CESI-MS reduces oxidation artifacts

The OptiMS cartridge locks into place in the CESI 8000 Plus and the tip simply clicks into the source adapter, creating an easy-to-use plug-and-spray for supported MS brands and models.

 CESI 8000 Plus mobile design

The CESI 8000 Plus comes equipped with an electric height adjustable mobile lab bench.

- Switching between nanoLC and CESI is swift and simple
- Zero dead-volume design
- A single continuous separation capillary is contained within the OptiMS cartridge, with the same internal diameter from sample to spray. This design:
  - Does not require lengthy column equilibration
  - Eliminates sample carry-over
  - Reduces sample-to-sample injection time
  - Increases robustness

Service, support and consumables

Our customer support organization has access to the latest product updates, software revisions, methods and repair procedures. The following is available to further optimize your use of CESI-MS:

- Application training
- Operation qualification (OQ)
- Chemistries for MS as well as optical detection

For more information, visit: sciex.com/CESI800plus
flows–assays and method development

CE assays and method development

MS analysis

Multi-MS connectivity and multi-detection capability

In CESI-MS mode, the CESI 8000 Plus can be connected to a variety of MS brands and models. In stand-alone CE mode, UV/VIS, PDA, or LIF detection can be selected. This allows for the analysis of biologics using our CE-SDS, cIEF and glycan chemistries.

For more information, visit: sciex.com/CESI800plus
Ready for use within minutes
Simply select one of the pre-loaded methods, follow visuals to place samples and reagents and hit START.

Flexible yet expandable
Select programmed control or direct control to maximize throughput and optimize separation performance.

Visual and intuitive
The layout of the user interface mimics the instrument to enable direct tracking of sample contents.

For more information, visit: sciex.com/CESI800plus

Module specifications

Dimensions
Height: 29.2 in (74.2 cm)
Door Open: 38.8 in (98.6 cm)
Width: 25 in (63.5 cm)
Depth: 28.4 in (72.1 cm)

Height adjustable portable lab bench with memory settings
36 in x 30 in (91.4 cm x 76.2 cm)
Height adjustable from 27 in to 44 in (69 - 112 cm)

Weight (uncrated)
188 lbs (85.3 kg)

Electrical requirements
Voltage: 100 - 240 V; 50/60 Hz
Voltage range
1 to 30 kV programmable at 0.1 kV increments
Current range
3 to 300 µA programmable at 0.1 µA increments

Operating environment range
15 - 30°C
20 - 80% relative humidity (non-condensing)

Sample trays
2 x 48 CESI vials/0.3 mL microvials
Buffer tray
2 x 36 CESI vials
Sample temperature adjustment range
4 - 60°C
Capillary temperature adjustment range
15 - 30°C
Stand-alone capillary temperature adjustment range
15 - 60°C
Pressure delivery range
-5 to +100 psi
Minimum required sample
Volume
50 µL when using microvials
5 µL when using nanovials

For more information, visit: sciex.com/CESI800plus
A98089: CESI 8000 Plus High Performance Separation - ESI Module
Includes CE separation module, OptiMS Sprayer technology and UV detector ready for stand-alone or CESI-MS analysis. Also includes computer, monitor and system controller pre-loaded with the CESI 8000 Plus software. An electric height adjustable mobile lab bench makes switching between CESI-MS and other front-end separation instruments swift and simple.

B07367: Silica Surface OptiMS Cartridge
30 μm ID, 150 μm OD x 90 cm
Contains bare fused silica capillary for high-resolution separation of peptides, glycans, amino acids and nucleotides/nucleosides.

B07368: Neutral OptiMS Cartridge
30 μm ID, 150 μm OD x 90 cm
Contains covalently attached neutral hydrophilic capillary surface enabling high-resolution separation of intact proteins and protein/peptide/small molecule/metal complexes.

5043467: nanoVial
5 μL starting volume validated, 1 μL starting volume demonstrated

A59494: LIF Detector Upgrade (optional)
Solid state laser and detector

B68372: PDA Detector Upgrade (optional)
PDA detector

Biologic Characterization Kits

Ordering information

For more information, visit: sciex.com/CESI800plus

For more product information on our capillary electrophoresis systems visit sciex.com/ceproducts

For information on CESI-8000 Plus and supported MS models/sources, contact your SCIEX representative.