

**LTQ Orbitrap XL ETD™
Hybrid FT Mass Spectrometer**



*The Comprehensive Solution for Protein ID,
Characterization and Quantitation*

The Comprehensive Proteomics Solution Three Complementary Fragmentation Techniques

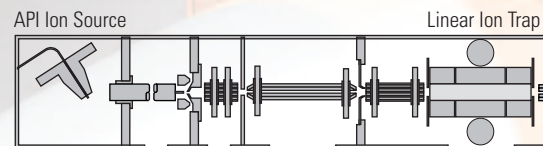
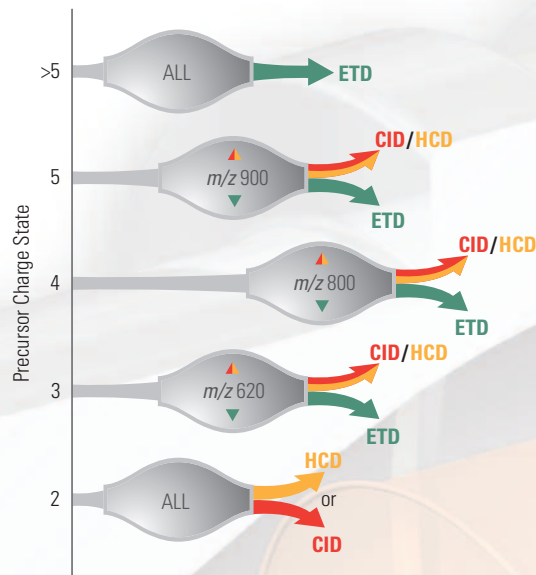
The Thermo Scientific L^{TQ} Orbitrap XL ETD is the most powerful instrument for proteomics analyses, combining three different and complementary fragmentation techniques - CID, HCD, and ETD - with the proven benefits of Orbitrap™ technology. It is the most comprehensive solution for complex PTM analysis, intelligent sequencing of peptides, top-down and middle-down analysis, and protein quantitation via stable isotope labelling such as TMT®, iTRAQ™ or label-free quantitation.

L^{TQ} Orbitrap XL ETD offers

- Highly confident peptide identification using multiple activation types and Data Dependent Decision Tree
- High-throughput sequencing applications with parallel acquisition capabilities
- Identification of unexpected PTMs using high resolution and accurate mass
- Quantitation over a wide dynamic range, including low abundance peptides



Example of a Data Dependent Decision Tree

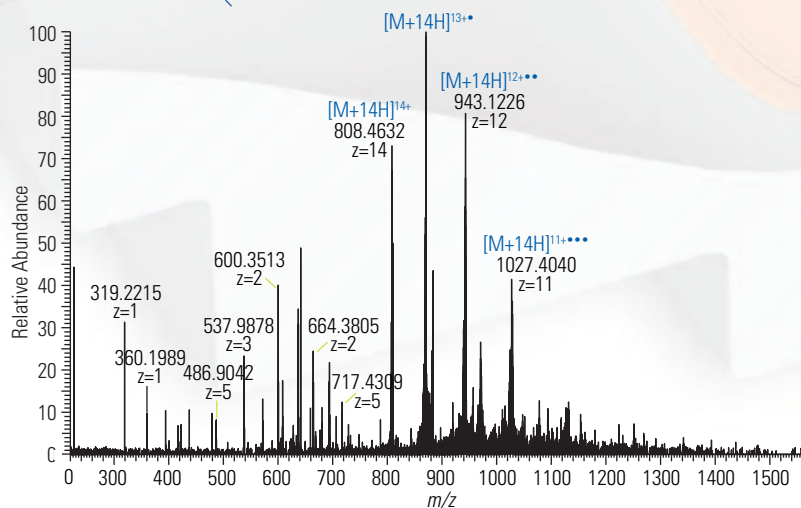


Schematic of the L^{TQ} Orbitrap XL ETD

Ⓢ G R | G | K | G | G | K | G | L | G | K | G | G | A | K | R | H | R | Ⓢ V | L | R | D | N | I | Q | G | I | T
K | P | A | I | R | R | L | A | R | R | G | G | V | K | R | I | S | G | L | I | Y | E | E | T | R | G | V | L | K | V
| F | L | E | N | V | I | R | D | A | V | T | Y | T | E | H | A | K | R | K | T | | V | T | A | M | D | V | V | | A | L
K | R | Q | G | R | T | L | Y | G | F | G | G

Large Peptides and Protein Analysis

- High resolution and high mass accuracy for complex ETD spectra analysis
- Unambiguous charge state determination of precursor and fragment ions
- ProSightPC™ software suite for automated data mining

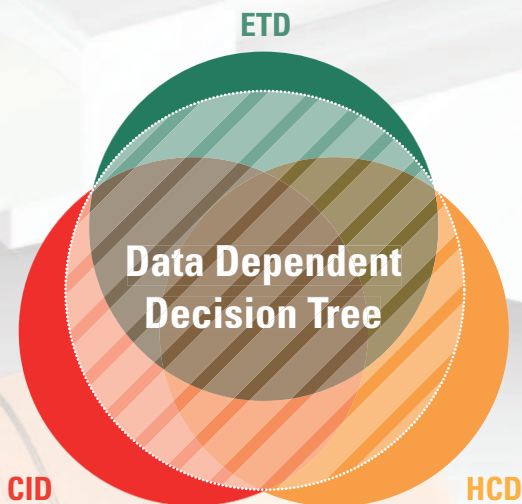


Title page reproduced with permission from Anal. Chem., May 15, 2007, 79(10). Copyright 2007 American Chemical Society. Graphic concept by Lucas Magalsky, illustration by Julie Farrar

Proteomics Solution with Fragmentation Techniques

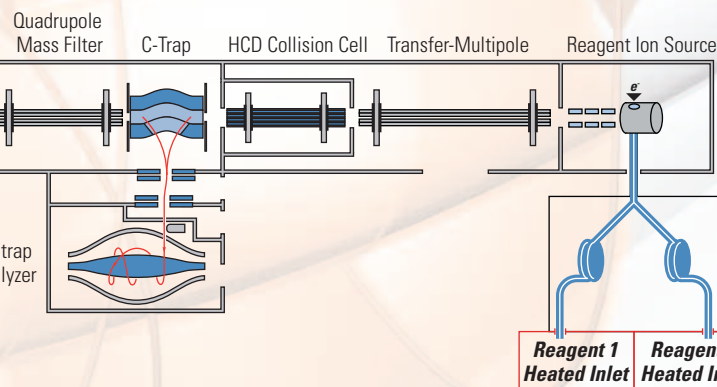
ProteomeDynamics™
INTEGRATED SOLUTIONS FOR PROTEIN
CHARACTERIZATION AND QUANTITATION

Result of a Data Dependent Decision Tree



Data Dependent Decision Tree for Peptide Sequencing by LC/MS

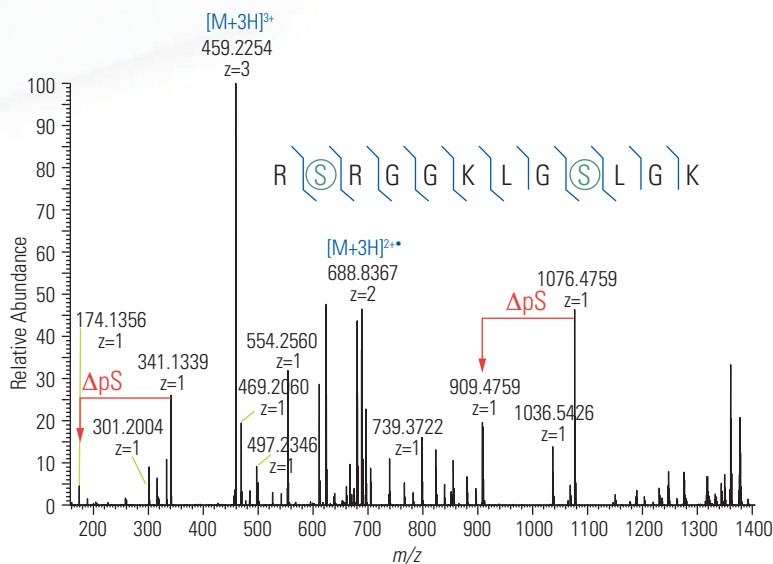
- Increasing the number of identified peptides without increasing the experiment time
- Automatic selection of optimal fragmentation technique based on peptide properties (charge state, m/z etc.) for highest fragmentation efficiencies
- Proteome Discoverer Software Platform for qualitative and quantitative data analysis
- Complementary ETD, CID, and HCD spectra for unambiguous *de novo* sequencing



**ETD UPGRADES
AVAILABLE FOR
LTQ ORBITRAP AND
LTQ ORBITRAP XL**

PTM Analysis

- ETD for labile PTM analysis such as phosphorylation and glycosylation
- Unambiguous PTM site determination
- High mass accuracy and high resolution for differentiation between phosphorylation and sulfation
- Combination of ETD, CID, and HCD for glycosylation site determination and glycan structure elucidation
- Supplemental activation of the charge reduced species for high ETD efficiencies



THERMO SCIENTIFIC APPLICATION-SPECIFIC SOFTWARE

TURNING DATA INTO INFORMATION

Xcalibur™ data system

Stable operating platform

Xcalibur is the versatile, easy-to-use data system that controls all Thermo Scientific MS systems. Xcalibur's Home Page offers easy navigation through the process of instrument setup, sequence setup, and data acquisition. The XReport package simplifies custom reporting with drag-and-drop functionality.

Protein Calculator

Protein Calculator performs *in silico* digestion on specified peptide sequences with post-translational modifications. The proteolytic fragment spectra can be saved as RAW data files for comparison with acquired spectra.

Xtract

Xtract deconvolutes isotopically resolved data, simplifying complex MS/MS spectra acquired in top-down, intact protein analysis. Specify the mass range, mass resolution, and S/N criteria for deconvolution and display in one of four modes: monoisotopic masses, isotopic pattern, or approved or disapproved signals. The results can be exported as RAW or ASCII file formats.

Proteome Discoverer

Mass informatics platform for protein scientists

Proteome Discoverer is a new, workflow-based, proteomics data processing software for in depth data mining of complex LC-MSⁿ data sets. With the ability to exploit data from different dissociation techniques (CID, HCD, IRMPD, ETD and ECD), Proteome Discoverer provides extra certainty for peptide and protein identifications. Optional inclusion of multiple search algorithms increases analytical flexibility, and results can now be merged into a single report for easier interpretation.

ProSightPC™

ProSightPC was developed to address the specific requirements of a top-down and middle-down proteomics strategy. The fragmentation spectra of multiply-charged, intact proteins are exceedingly complicated. ProSightPC processes high resolution, accurate mass data from the Thermo Scientific LTQ Orbitrap XL ETD to produce a list of neutral fragment masses and performs comparisons to proteome databases to identify and characterize proteins.

Installation Requirements

Power

230 Vac ±10% 3 phase, 16 Amps, 50/60 Hz, with earth ground for the instrument

120 or 230 Vac single phase with earth ground for the data system

120 or 230 Vac single phase, 15 Amps, with earth ground for the water chiller

Gas

One high purity nitrogen gas supply (99.5% pure, flow rate 15 L/min) for the API source

One ultra-high purity helium gas supply (99.998%) with less than 1 ppm each of water, oxygen, and total hydrocarbons for the linear ion trap

One ultra-high purity nitrogen gas supply (99.999% or higher) is required for ETD operation

Environment

System averages 2800 W (10,000 Btu/hr) output when considering air conditioning needs

Operating environment must be 15-26 °C (59-78 °F) and relative humidity must be 40-70% with no condensation

Optimum operating temperature is 18-21 °C (65-70 °F)

Weight

~700 kg

Dimensions

141.4 × 91.3 × 170.6 cm
(H × W × D)

In addition to these offices, Thermo Fisher Scientific maintains a network of representative organizations throughout the world.

Africa

+43 1 333 5034 127 * analyze.emea@thermo.com

Australia

+61 2 8844 9500 * analyze.au@thermo.com

Austria

+43 1 333 50340 * analyze.at@thermo.com

Belgium

+32 2 482 30 30 * analyze.be@thermo.com

Canada

+1 800 530 8447 * analyze.ca@thermo.com

China

+86 10 8419 3588 * analyze.cn@thermo.com

Denmark

+45 70 23 62 60 * analyze.dk@thermo.com

Europe - Other

+43 1 333 5034 127 * analyze.emea@thermo.com

France

+33 1 60 92 48 00 * analyze.fr@thermo.com

Germany

+49 6103 408 1014 * analyze.de@thermo.com

India

+91 22 6742 9434 * analyze.in@thermo.com

Italy

+39 02 950 591 * analyze.it@thermo.com

Japan

+81 45 453 9100 * analyze.jp@thermo.com

Latin America

+1 608 276 5659 * analyze.la@thermo.com

Middle East

+43 1 333 5034 127 * analyze.emea@thermo.com

Netherlands

+31 76 579 55 55 * analyze.nl@thermo.com

South Africa

+27 11 570 1840 * analyze.sa@thermo.com

Spain

+34 914 845 965 * analyze.es@thermo.com

Sweden / Norway / Finland

+46 8 556 468 00 * analyze.se@thermo.com

Switzerland

+41 61 48784 00 * analyze.ch@thermo.com

UK

+44 1442 233555 * analyze.uk@thermo.com

USA

+1 800 532 4752 * analyze.us@thermo.com

www.thermo.com

©2016 Thermo Fisher Scientific Inc. All rights reserved. TMT is a registered trademark of Proteome Sciences plc. iTRAQ is a trademark of Applied Biosystems Corporation. ProSightPC is a trademark of the University of Illinois at Urbana-Champaign. All other trademarks are the property of Thermo Fisher Scientific Inc. and its subsidiaries.

Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representative for details.

BR30152_E 08/16C

Thermo
SCIENTIFIC