C146-E279A

SHIMADZU
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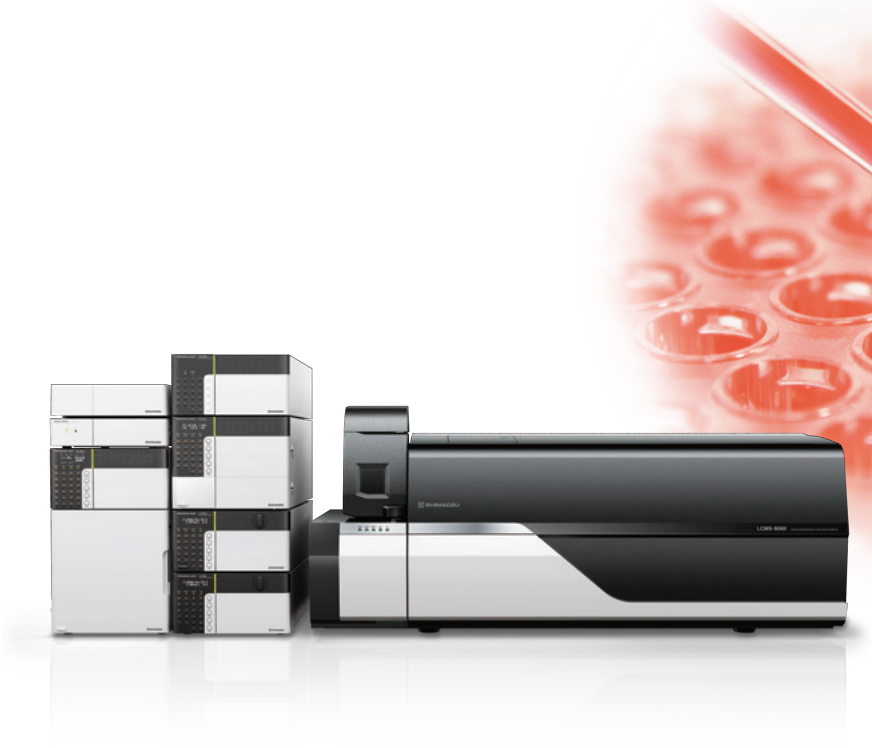
For LabSolutions LCMS

LC/MS/MS Method Package for Cell Culture Profiling



Provides Simultaneous Analysis Conditions for 95 Components

These methods target culture medium components and metabolites secreted by cells. This culture medium analysis platform enables the simultaneous analysis of up to 95 components, the highest number of target analysis components* that can be analyzed by such a platform. Such features make it possible to acquire detailed data concerning cell culture profiles.

* Per survey results as of January 2015

Enables Simultaneous Analysis in 17 minutes

Compounds such as amino acids and vitamins are commonly analyzed by each compound group, which makes analysis of a culture medium time-consuming. By providing conditions for efficient and simultaneous multi-component analysis, this method package enables simultaneous analysis in 17 minutes.

Optimized Methods for the Analysis of a Culture Medium

Pre-set analysis conditions fully utilize the capabilities of LC-MS/MS for analyzing trace components such as vitamins. In addition, since there is no saturation of the signal with high-concentration components, such as glucose or amino acids, it is possible to measure a variety of culture medium components using the same vial.

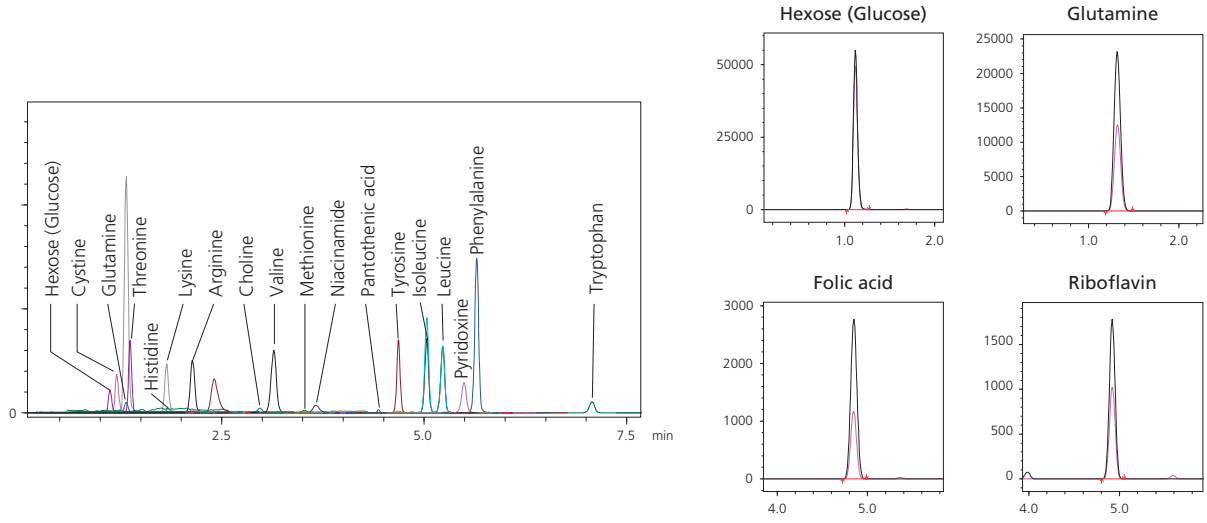
Note: In order to gain even more accurate quantitative results, a dilution series needs to be created.

Ready-to-Use Methods Provided

Shimadzu Method Packages deliver conditions for efficient and simultaneous multi-component analysis. They enable the user to quickly and easily implement complex methods without costly and laborious method development by providing sample preparation protocols, LC separation conditions, and MS acquisition parameters.

Supporting LCMS-8050/8060

LC/MS/MS Method Package for Cell Culture Profiling supports LCMS-8050/8060, enables analyses of trace medium components such as vitamins, glucose and amino acids with a single system.

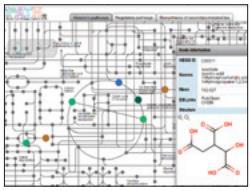


Example Showing the Analysis of DMEM (500 times dilution using ultrapure water, 1 µL analyzed)

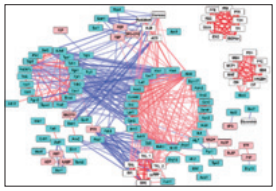
Improved Data Analysis Functionality in Method Package

A wide variety of new data analysis functions have been added to the LC/MS/MS Method Package for Cell Culture Profiling. Functions such as automatically pasting data on metabolic maps, using a bar graph to compare changes in compound quantities, or graphing the changes as a function of time, for example, can be performed using simple operations. It also enables correlation analysis, volcano plots, displaying data on metabolic maps for target compounds, and other functionality. Consequently, it can significantly reduce the amount of work required for bottleneck processes such as data analysis and visualization, so that all operations from measurement to data analysis can be performed smoothly.

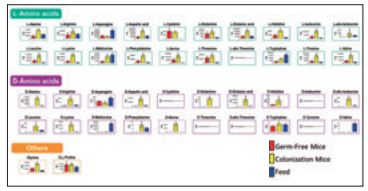
Automatic Visualization on a Metabolic Map



Results Displayed on a Metabolic Map



Visualization of Correlations



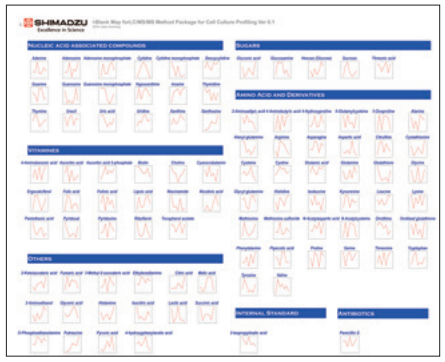
Comparison of Measurement Data

Data Analysis Example

The method package allows easy visualization of data on metabolic maps and graphical display of time-series changes in the amount of chemical compounds.

Time-series Measurement Data

Select file



Tools for Data Analysis

In this method package, we provide the data analysis software developed based on tools (gadgets) that have been released on the GARUDA™ open research platform, which is mainly managed by The Systems Biology Institute, Japan (SBI).

http://www.garuda-alliance.org/

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Data Analysis Tools Used in Method Package

Volcano Plot
A tool that combines a t-test (statistically significant difference) and a fold analysis (Example: Difference in mean value such as 2 times or 1/2) to visualize the differences between the 2 groups. The Volcano Plot gadget developed by Shimadzu is included in the package.

VANTED
Tool maintained at University of Konstanz, Germany, for visualization and analysis of networks across different data sets. (GARUDA support was developed at Monash University)

iPath
Data analysis tool developed by the European Molecular Biology Laboratory that can be used for visualization of diverse metabolic pathways or data mapping and customization.

Cytoscape
Bioinformatics tool developed by the Cytoscape Consortium, used to visualize metabolic pathways, to integrate gene expression profiles with related data, and so on. It is especially useful for analyzing networks and visualizing correlations.

List of Registered Compounds

Internal Standard

2-Isopropylmalic acid

Sugars

Gluconic acid
Glucosamine
Hexose (Glucose)
Sucrose
Threonic acid

Nucleic Acid Associated Compounds

Adenine
Adenosine
Adenosine monophosphate
Cytidine
Cytidine monophosphate
Deoxycytidine
Guanine
Guanosine
Guanosine monophosphate
Hypoxanthine
Inosine
Thymidine
Thymine
Uracil
Uric acid
Uridine
Xanthine
Xanthosine

Antibiotics

Penicillin G

Amino Acids and Derivatives

2-Aminoadipic acid
4-Aminobutyric acid
4-Hydroxyproline
5-Glutamylcysteine
5-Oxoproline
Alanine
Alanyl-glutamine
Arginine
Asparagine
Aspartic acid
Citrulline
Cystathionine
Cysteine
Cystine
Glutamic acid
Glutamine
Glutathione
Glycine
Glycyl-glutamine
Histidine
Isoleucine
Kynurenine
Leucine
Lysine
Methionine
Methionine sulfoxide
N-Acetylaspartic acid
N-Acetylcysteine
Ornithine
Oxidized glutathione
Phenylalanine
Pipecolic acid
Proline
Serine
Threonine
Tryptophan
Tyrosine
Valine

Vitamins

4-Aminobenzoic acid
Ascorbic acid
Ascorbic acid 2-phosphate
Biotin
Choline
Cyanocobalamin
Ergocalciferol
Folic acid
Folinic acid
Lipoic acid
Niacinamide
Nicotinic acid
Pantothenic acid
Pyridoxal
Pyridoxine
Riboflavin
Tocopherol acetate

Others

2-Aminoethanol
2-Ketoisovaleric acid
3-Methyl-2-oxovaleric acid
4-Hydroxyphenyllactic acid
Citric acid
Ethylenediamine
Fumaric acid
Glyceric acid
Histamine
Isocitric acid
Lactic acid
Malic acid
O-Phosphoethanolamine
Putrescine
Pyruvic acid
Succinic acid

Remarks and Precautions

1. LabSolutions LCMS Ver.5.93 or later is required.
2. Shimadzu makes no warranty regarding the accuracy of information included in the database or the usefulness of information obtained from using the database.
3. It is the user's responsibility to adopt appropriate quality control tests using standard samples to confirm qualitative and quantitative information obtained with this method package.

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