

Comprehensive Analysis of Hydrophilic Metabolites in Metabolomics

Chromatography Column for Hydrophilic Interactions

Shim-pack[™] Mix-HILIC

CoreFocus

Metabolomics is a technique for comprehensively measuring metabolites (the metabolome) in living organisms. The metabolome is equivalent to the furthest stage downstream of the process of expressing genetic information. Accordingly, it can be considered as directly reflecting the phenotype of the organism. Because of this, applications of metabolomics are anticipated in a variety of fields including drug discovery, functional foods, and metabolic engineering.

The Shim-pack Mix-HILIC chromatography column for hydrophilic interactions enables separation of important amino acids in organisms as well as nucleobases, nucleosides, nucleotides, coenzymes, and organic acids via characteristic hydrophilic interactions and ionic interactions. Accordingly, it is suitable for the simultaneous monitoring of hydrophilic metabolites with a variety of physicochemical properties.

Simultaneous Monitoring of a Variety of Hydrophilic Metabolic Components

Shim-pack Mix-HILIC uses gradient elution to elute hydrophilic metabolic components such as nucleobases, nucleosides, and amino acids first, and organic acids, coenzymes, and nucleotides after.



3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5 20.0 min

Classification	•	4	_	- T	,	0	'	0	5	10		12	15	14	1.2		· /	10	15	20	21	22	25	27	25	20	21	20	25	50	21	52	55	54	55	50	57	50	55	40		72	45		45	40	47	40	
Nucleobase	Ura	cil	Cytr	sine Ade	hine									Gua	hine																																		
Nucleoside		Ade	nosi	ne				Urid	jine Cyti	dine											Guá	anos	ine																										
Amino acid					phe	Leu	lle			pro	Met	.Na/	Trp		Ala 1	yr T	hr	His	Gln	Asn		ser	P19	LYS		ASP	Glu																						
Coenzyme																									NAT)		FAD		FWN	dTM	<i>P</i>			NAC)P Ace	COA COA	l	dTD	5				dTT	6				
Organic acid																													Mali	ic ac	iq										Citr	ic ac	jd						
Nucleotide																																AWP	CWE	UMF	2			GM	8	CDP		ADP	UD	\$	CTP	GDI	UTP	ATP	GTP

Classification 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49

Applications to Samples of Biological Origin



Shim-pack Mix-HILIC can be applied to the measurement of samples of biological origin.

Shim-pack Mix-HILIC Column

Part number	Model	Size	Particle Size
227-32751-01	Shim-pack Mix-HILIC	150 mm × 2.1 mm l.D.	5 µm

Optimal LC System for Metabolome Data Analysis

The HPLC configuration combines the Nexera[™] X3, which is equipped with Analytical Intelligence functions, and the LCMS-8060NX, which provides MS detection with both minimization of matrix effects and high sensitivity, thereby increasing operability and durability, and heightening the efficiency of the work flow as a whole.

In addition, using LabSolutions Insight[™], which dramatically improves data analysis efficiency, and Peakintelligence[™], which significantly reduces the difficulty of integrating the detected peaks, can optimize the output of data analysis tasks.



Liquid Chromatograph Mass Spectrometer LCMS-8060NX

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