

オンライン固相誘導体化-GC-MSシステムによる 鶏レバー中メタボローム分析

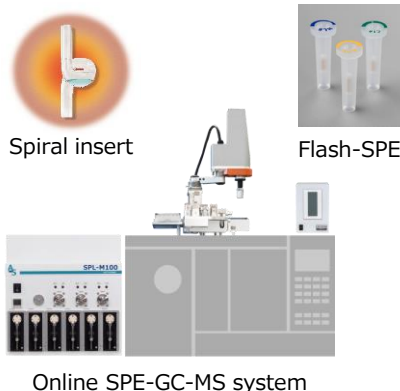


SPL-M100
for SPE-GC system

Introduction

固相誘導体化法（Solid-phase derivatization: SPD）は、分析対象成分を固相に保持し溶媒通液によって脱水処理を行うことで時間のかかる遠心乾固や凍結乾燥をすることなく誘導体化反応を行う手法です。

本アプリケーションでは鶏レバー中メタボローム分析における前処理方法および分析条件を紹介します。



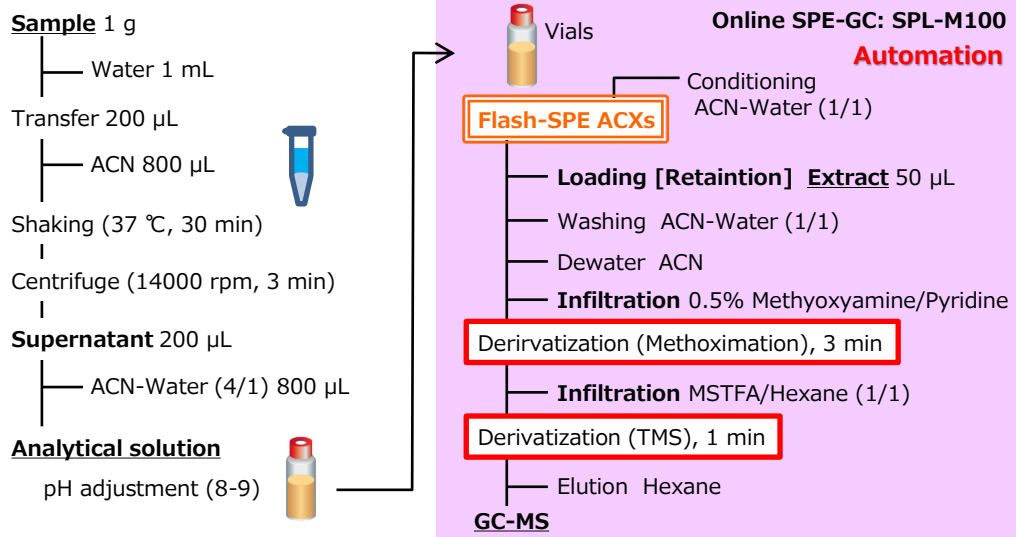
Sample



鶏レバー

Information

SPD pretreatment workflow



Analytical condition

SPE-GC interface	SPL-M100 (AiSTI SCIENCE)
SPE cartridge	Flash-SPE
PTV injection port	LVI-S250 (AiSTI SCIENCE)
Insert type	Spiral insert
Temp.	220 $^{\circ}$ C(0.5 min)-50 $^{\circ}$ C/min-290 $^{\circ}$ C(23 min)
Gas chromatograph	
Inlet mode	Split 1:50
Flow mode	Constant flow, 1.0 mL/min
Pre-column	0.25 mm i.d. x 0.5 m
Column	Vf-5ms, 0.25 mm i.d. x 30 m, df=0.25 μ m
Oven Temp.	100 $^{\circ}$ C(2 min)-10 $^{\circ}$ C/min-320 $^{\circ}$ C(2min)
Transfer line Temp.	290 $^{\circ}$ C
Mass spectrometer	
Acquisition mode	Scan (m/z 70-600)
Data acquisition	3.0-26 min

AiSTI SCIENCE

Product

オンライン SPE-GC
SPL-M100

固相カートリッジ
Flash-SPE

大量注入口装置
LVI-S250



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Results

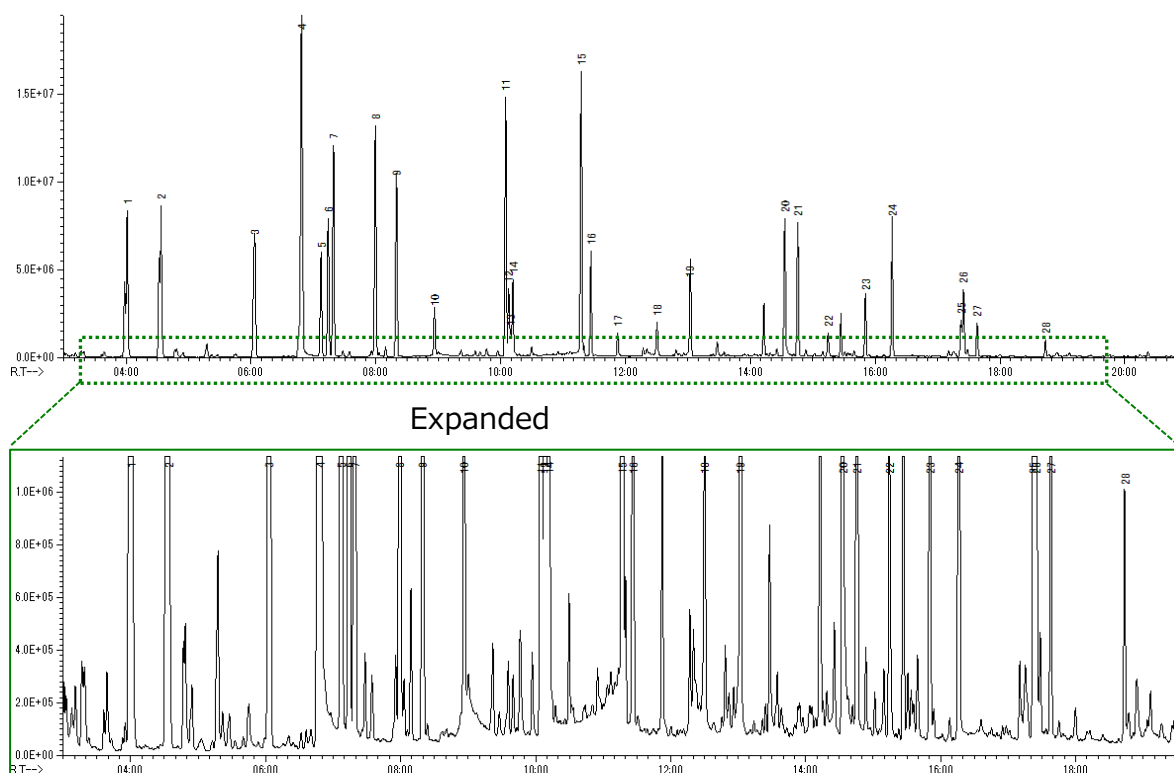


Figure: Total ion current chromatogram

Table: Result of repeatability test (n=5, RSD%)

No.	Metabolites	1	2	3	4	5	Ave.	RSD, %
1	Lactic acid_2TMS	9,262,000	8,665,000	9,610,000	8,632,000	9,583,000	9,150,400	5.2
2	Alanine_2TMS	18,330,000	17,960,000	18,290,000	18,100,000	18,150,000	18,166,000	0.8
3	Valine_2TMS	11,330,000	11,100,000	11,340,000	11,280,000	11,340,000	11,278,000	0.9
4	Phosphate_3TMS	13,080,000	14,290,000	15,760,000	15,190,000	15,900,000	14,844,000	7.9
5	Isoleucine_2TMS	7,530,000	7,478,000	7,716,000	7,693,000	7,683,000	7,620,000	1.4
6	Proline_2TMS	13,220,000	13,140,000	13,420,000	13,360,000	13,450,000	13,318,000	1.0
7	Glycine_3TMS	11,330,000	11,300,000	11,770,000	11,600,000	11,440,000	11,488,000	1.7
8	Serine_3TMS	4,217,000	4,070,000	4,218,000	4,167,000	4,180,000	4,170,400	1.4
9	Threonine_3TMS	2,152,000	2,096,000	2,153,000	2,152,000	2,145,000	2,139,600	1.1
10	beta-Alanine_3TMS	1,152,000	1,125,000	1,193,000	1,174,000	1,161,000	1,161,000	2.2
11	Aspartic acid_3TMS	8,020,000	7,178,000	7,640,000	7,525,000	7,633,000	7,599,200	4.0
12	Methionine_2TMS	2,438,000	2,365,000	2,490,000	2,486,000	2,490,000	2,453,800	2.2
13	Hydroxyproline_3TMS	37,220	34,980	39,910	36,090	36,810	37,002	5.0
14	Pyroglutamic acid_2TMS	4,924,000	4,513,000	4,615,000	4,781,000	4,571,000	4,680,800	3.6
15	Glutamic acid_3TMS	8,770,000	7,753,000	8,353,000	8,250,000	8,426,000	8,310,400	4.4
16	Phenylalanine_2TMS	2,531,000	2,438,000	2,570,000	2,541,000	2,575,000	2,531,000	2.2
17	Asparagine_3TMS	173,700	163,500	158,000	170,000	169,100	166,860	3.7
18	Glutamine-TMS	529,400	583,500	634,500	518,900	643,500	581,960	9.9
19	L-Glutamine-3TMS	3,871,000	3,613,000	3,810,000	3,810,000	3,906,000	3,802,000	3.0
20	Lysine_4TMS	523,000	481,100	535,400	523,600	524,500	517,520	4.1
21	Tyrosine_3TMS	6,123,000	5,808,000	6,279,000	6,303,000	6,438,000	6,190,200	3.9
22	Gluconic acid_6TMS	198,100	157,500	190,100	171,900	195,200	182,560	9.5
23	Palmitic acid-TMS	843,200	724,400	808,800	788,200	825,600	798,040	5.8
24	Uric acid-4TMS	3,099,000	2,251,000	2,557,000	2,424,000	2,676,000	2,601,400	12.3
25	Linoleic acid-TMS	95,410	76,620	81,480	76,570	84,040	82,824	9.3
26	Oleic acid-TMS	341,900	280,500	310,400	286,900	323,400	308,620	8.2
27	Stearic acid-TMS	385,000	325,700	348,700	349,900	360,000	353,860	6.1
28	Arachidonic acid-TMS	31,050	25,380	26,610	24,410	26,570	26,804	9.5