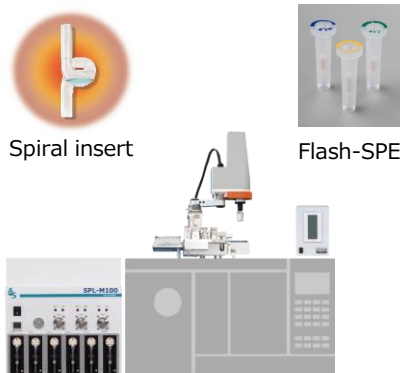


Metabolome analysis of chicken liver

by online solid-phase analytical derivatization GC-MS system

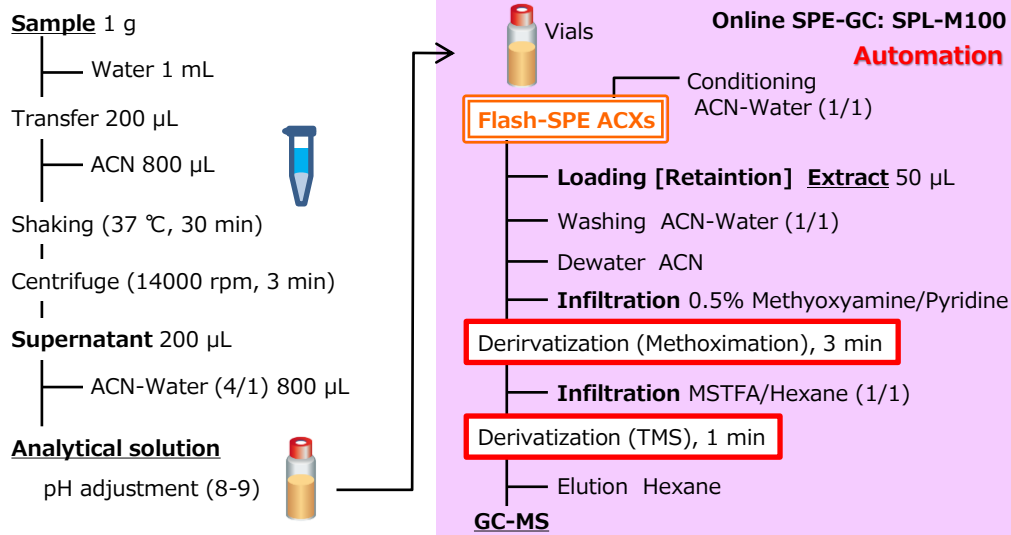
Introduction

Solid-phase derivatization (SPD) is a technique of derivatization without the time-consuming centrifugal concentration and lyophilization, by retaining the target compounds on a solid phase and dewatering it by passing a organic solvent through it then infiltrating the derivatization reagent and performing the reaction on the solid phase. The example of pretreatment method and analytical condition for metabolome analysis of chicken liver are shown below.



Online SPE-GC-MS system

SPD pretreatment workflow



Analytical condition

SPE-GC interface

SPE cartridge

PTV injection port

Insert type

Temp.

Gas chromatograph

Inlet mode

Flow mode

Pre-column

Column

Oven Temp.

Transfer line Temp.

Mass spectrometer

Acquisition mode

Data acquisition

SPL-M100 (AiSTI SCIENCE)

Flash-SPE

LVI-S250 (AiSTI SCIENCE)

Spiral insert

220°C(0.5 min)-50°C/min-290°C(23 min)

Split 1:50

Constant flow, 1.0 mL/min

0.25 mm i.d. x 0.5 m

Vf-5ms, 0.25 mm i.d. x 30 m, df=0.25 µm

100°C(2 min)-10°C/min-320°C(2min)

290°C

Scan (m/z 70-600)

3.0-26 min



SPL-M100

for SPE-GC system

Sample



Liver (chicken)

Information

AiSTI SCIENCE

Product

Online SPE-GC

SPL-M100

Solid-phase

cartridge

Flash-SPE

GC large volume

injection port

LVI-S250



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Results

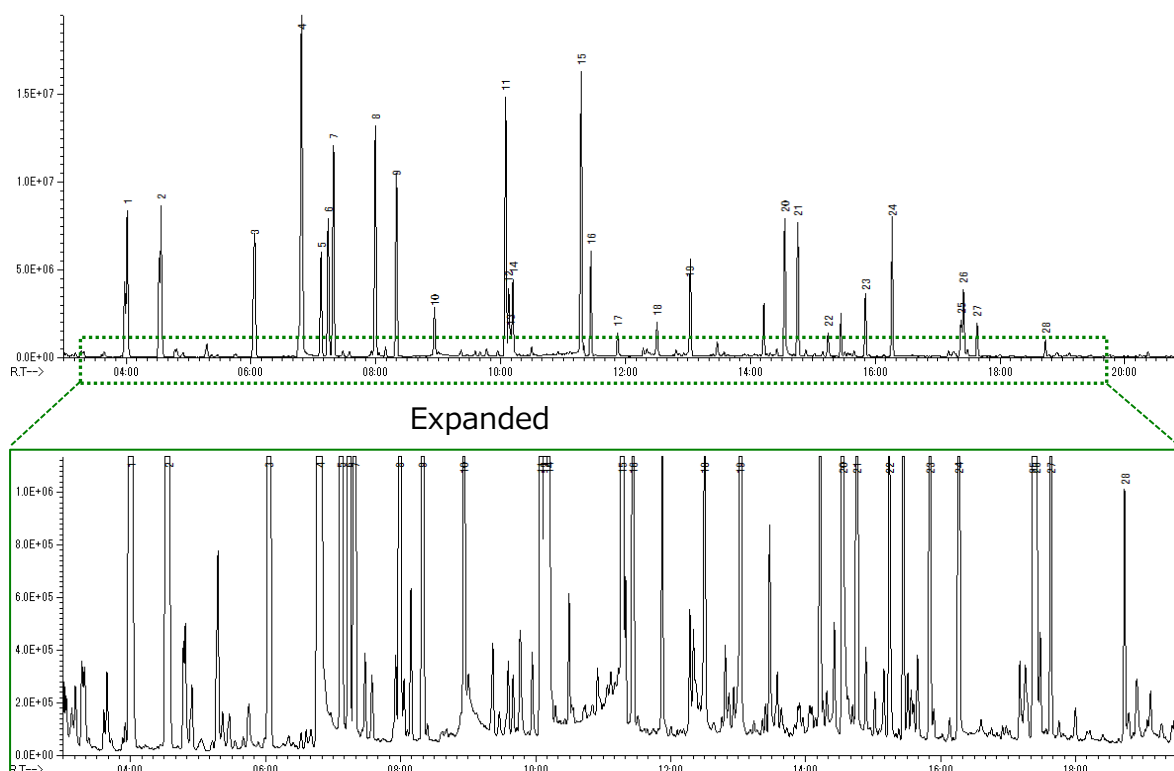


Figure: Total ion current chromatogram

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