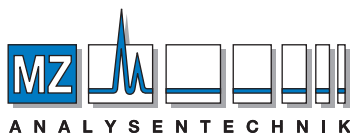


HPLC TECHNICAL INFORMATION

LC-MS



AUTHORIZED DISTRIBUTOR

MZ-Analysentechnik GmbH, Barcelona-Allee 17• D-55129 Mainz

Tel +49 6131 880 96-0, Fax +49 6131 880 96-20

e-mail: info@mz-at.de, www.mz-at.de

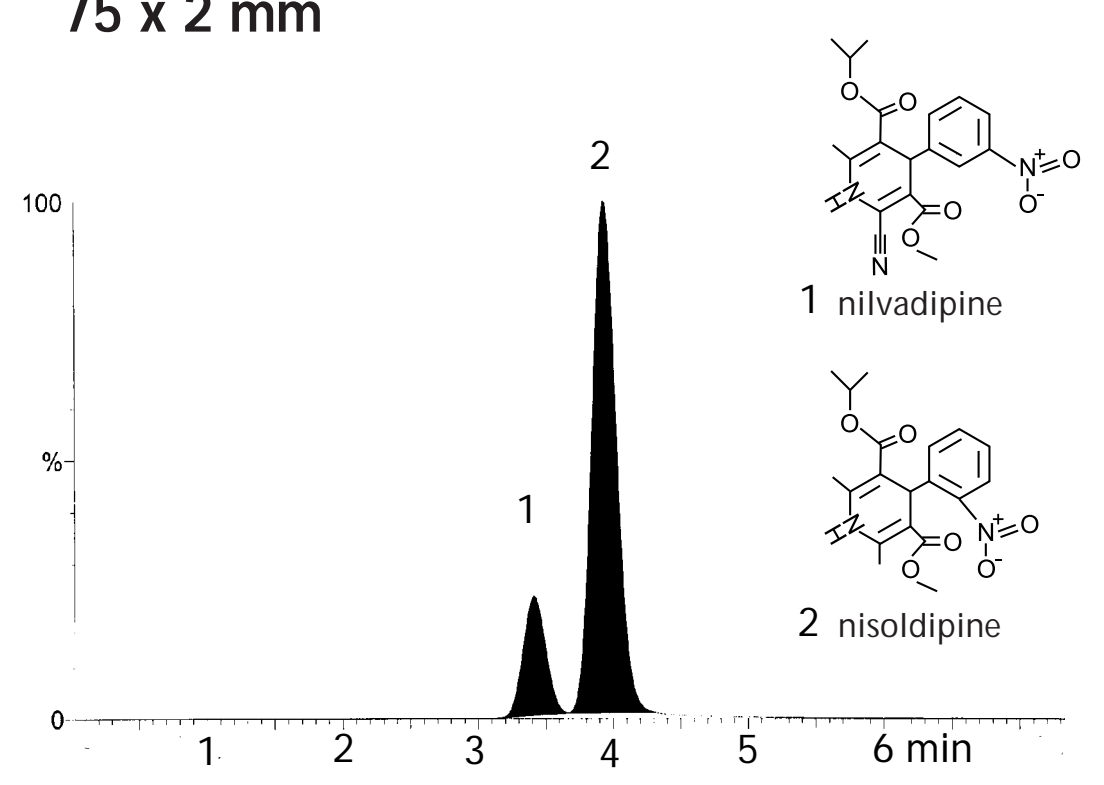
Cadenza CD-C18

75 x 2 mm

Application

LC-ESI-MS application

75 x 2 mm



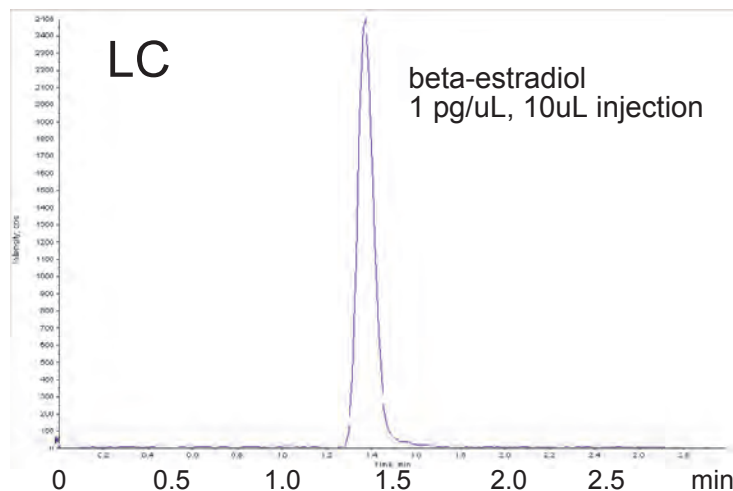
Cadenza CD-C18, 75 x 2.0 mm
60% acetonitrile, 0.2 mL/min, 40 °C
Negative-ESI

Cadenza CD-C18

50 x 2 mm

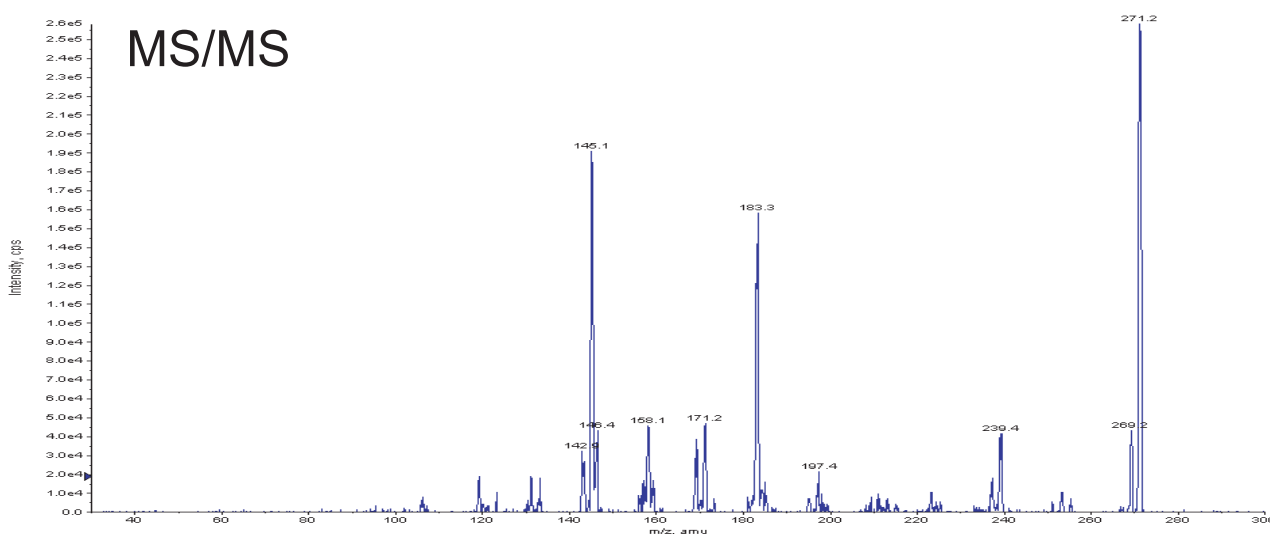
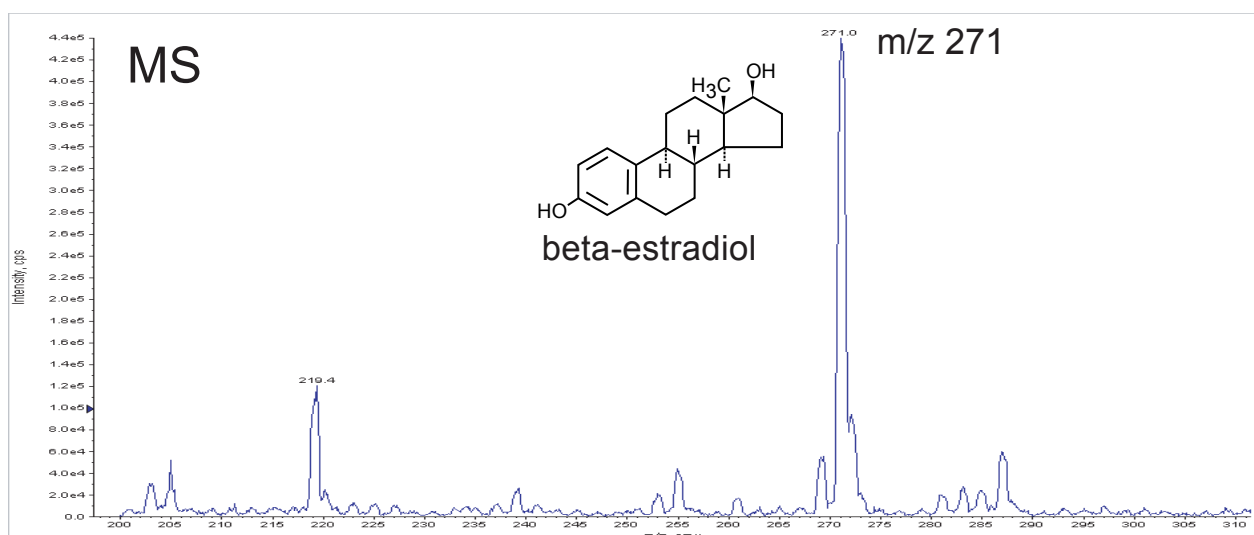
Application

LC-MS/MS High Throughput Analysis



[LC]
Cadenza CD-C18, 50 x 2 mm
methanol / water = 75 / 25
0.2 mL/min, 40 °C

[MS]
API 4000
ESI-negative



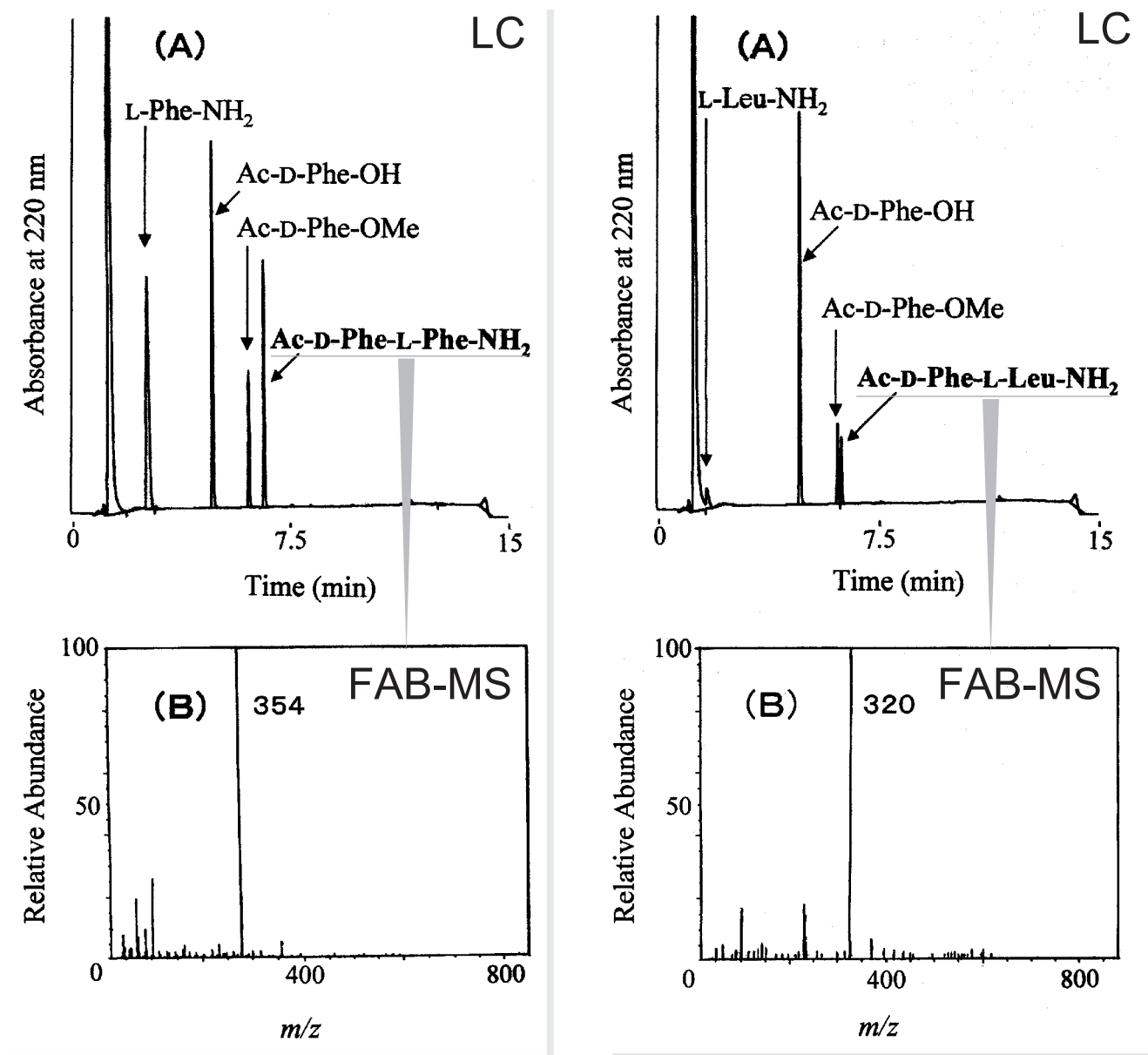
Courtesy of TAKARA SHUZO CO., LTD.

Cadenza CD-C18

75 x 4.6 mm

Application

LC and FAB Mass Analyses of D-Amino Acid-containing Peptides



[LC]
 Cadenza CD-C18, 75 x 4.6 mm
 5-45% of methanol/acetonitrile (6:4) in 50 mM phosphate, pH 5.7
 1 mL/min

Courtesy of A. Sugihara, Osaka Municipal Technical Research Institute

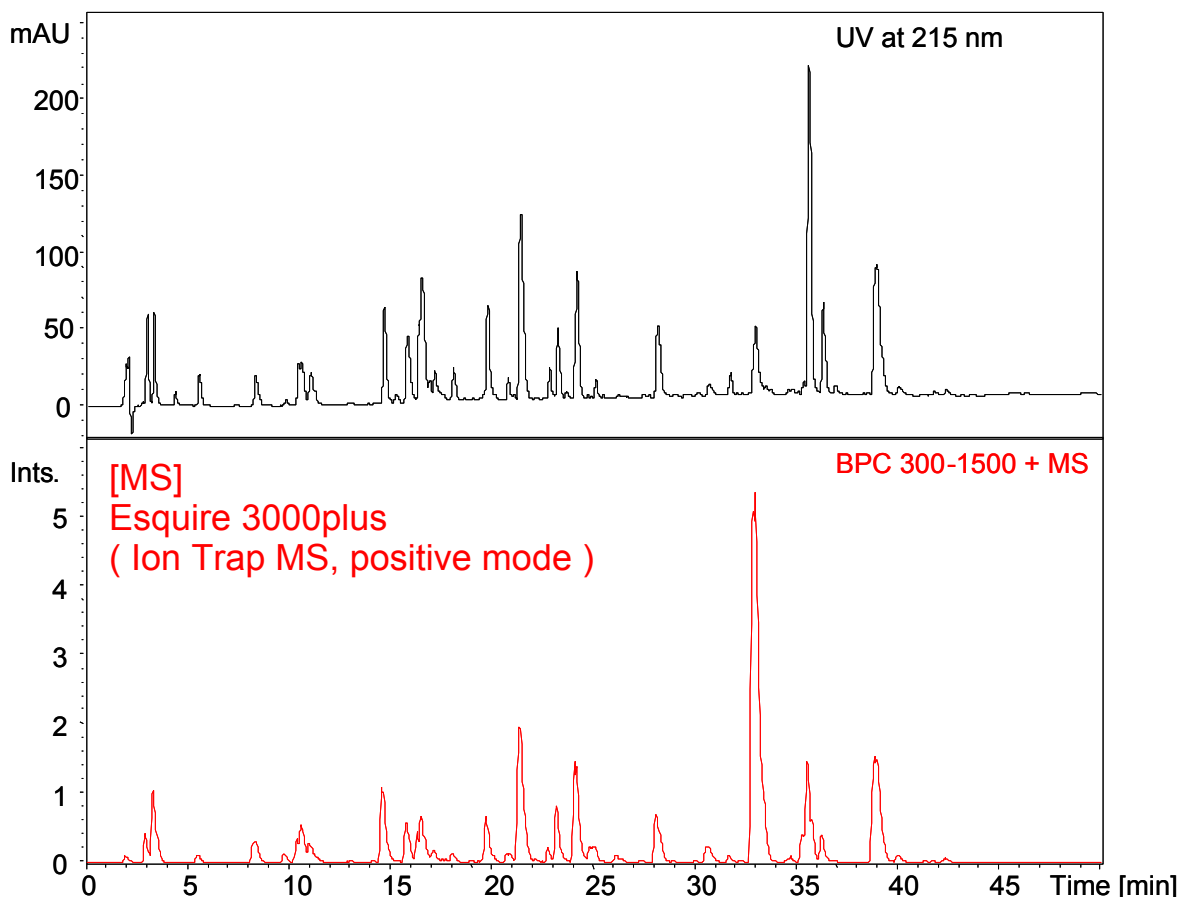
Cadenza CD-C18

150 x 2 mm

Application

LC-MS Application of Myoglobin Tryptic Digest

ミオグロビン酵素分解物のLC-MS



Cadenza CD-C18, 150 x 2 mm
 A: 0.01% TFA in water
 B: 0.01% TFA in acetonitrile
 2 - 50 %B (0 - 50 min)
 0.2 mL/min, 45 °C
 Myoglobin (Horse Heart), Tryptic digest

Courtesy of D.Higo, Bruker Daltonics K.K.

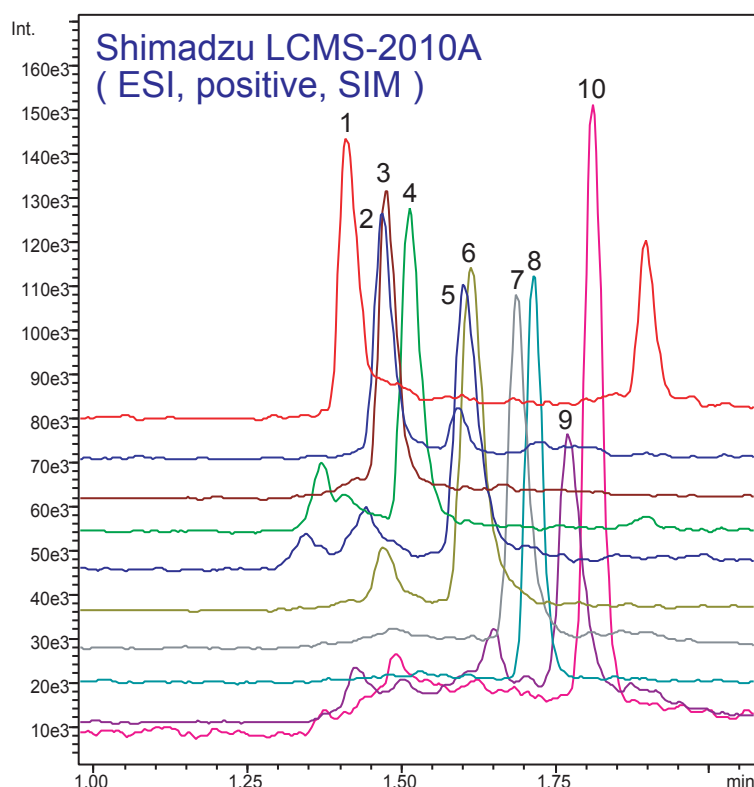
Cadenza CD-C18

30 x 2 mm

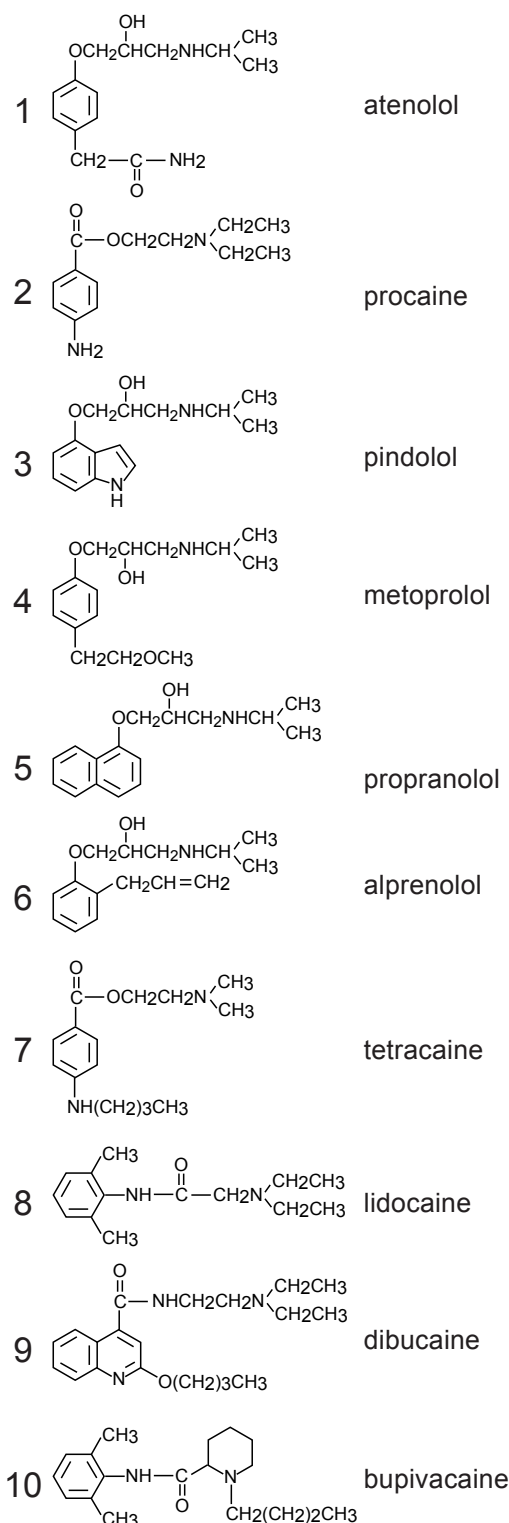
Application

High Throughput LC-MS Application for Local Anesthetic and Antiarrhythmic Drugs

局所麻酔薬と抗不整脈薬の高速LC-MS



Cadenza CD-C18, 30 x 2 mm
 A: 10mM ammonium acetate
 B: acetonitrile
 0 - 90 %B (0 - 1 min), 90 %B (1 - 2 min)
 0.5 mL/min, 40 °C
 10 pg/uL, 5uL



Cadenza CD-C18

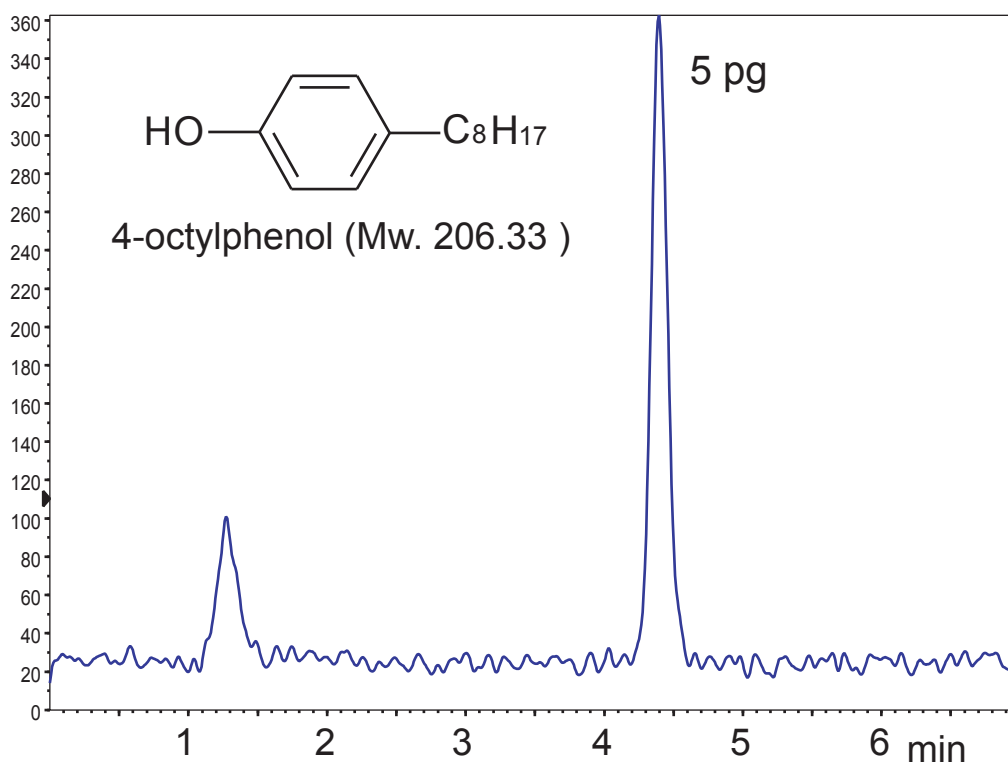
100 x 2 mm

Application

LC-MS Application for Endocrine Disruptor

LC-MSアプリケーション (環境ホルモン, オクチルフェノール)

API4000 (TAKARA BIO INC.)



Cadenza CD-C18, 100 x 2 mm
 80% methanol, 0.2 mL/min, 40 °C, 5µL(1pg/µL)
 API4000: ESI, MRM Negative, Q1/Q3 : 205 / 106

Courtesy of J.Watanabe, TAKARA BIO INC.

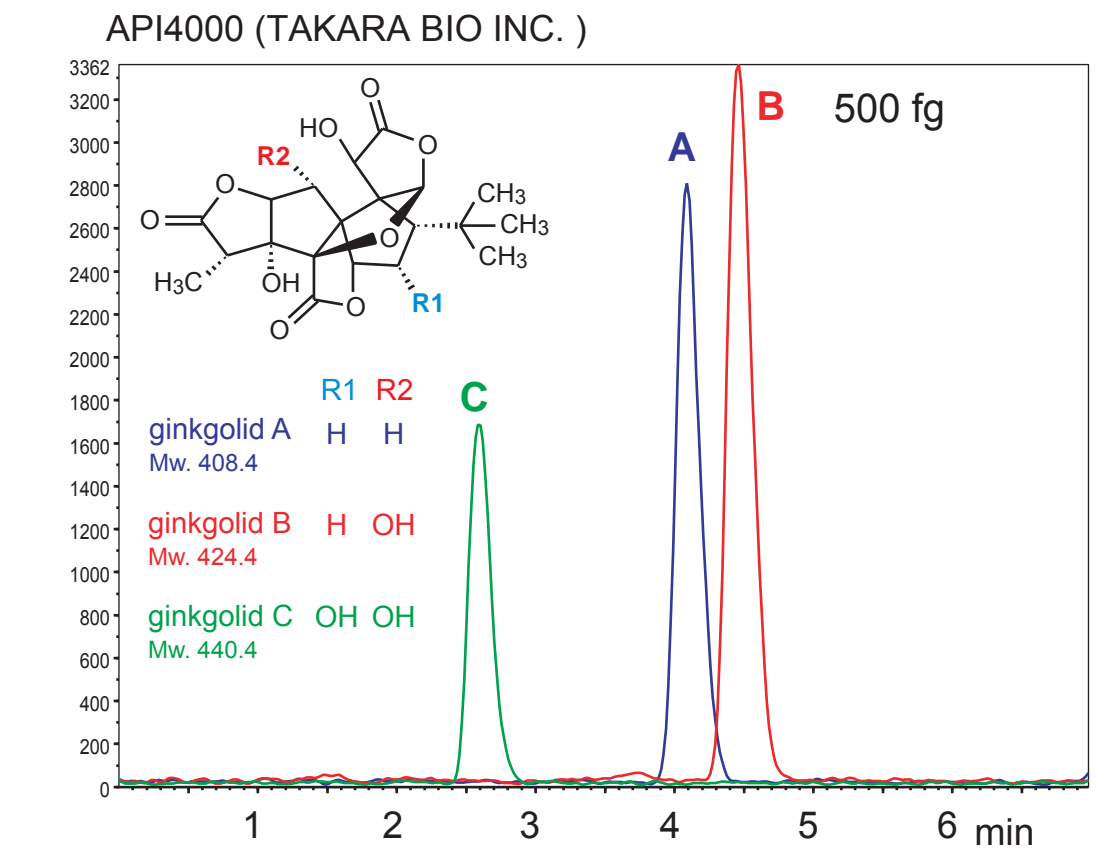
Cadenza CD-C18

100 x 2 mm

Application

LC-MS Application for Substances in Ginkgo Leaves

LC-MSアプリケーション（イチョウ葉の有効成分，ギンコライド）



Cadenza CD-C18, 100 x 2 mm
 60% methanol, 0.2 mL/min, 40 °C, 5µL(100fg/µL)
 API4000: ESI, MRM Negative
 Q1/Q3:
 ginkgolid A 407/351
 ginkgolid B 423/367
 ginkgolid C 439/383

Courtesy of J.Watanabe, TAKARA BIO INC.

Cadenza CD-C18

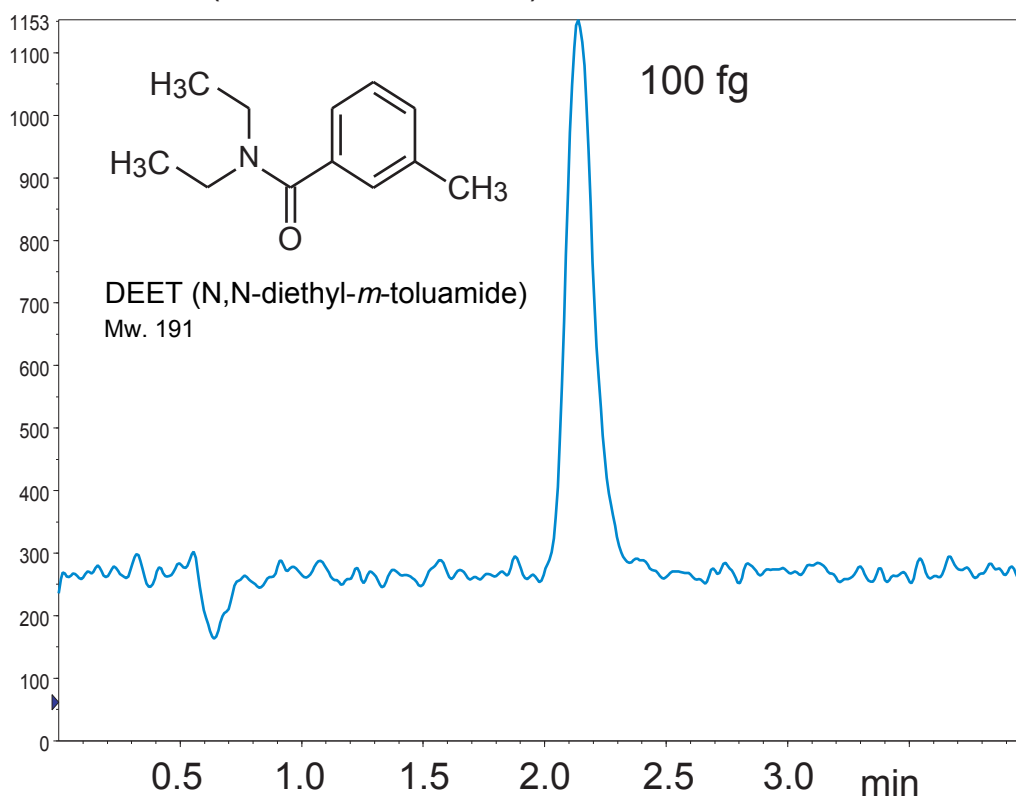
50 x 2 mm

Application

LC-MS Application for Bug Repellent Active Ingredient

LC-MSアプリケーション（虫除けスプレーの有効成分）

API3000 (TAKARA BIO INC.)



Cadenza CD-C18, 50 x 2 mm

0.1% formic acid / 60% methanol, 0.2 mL/min, 40 °C, 5µL (20fg/µL)

API3000: ESI, MRM Positive

Q1/Q3: 192/119

Courtesy of J.Watanabe, TAKARA BIO INC.

Cadenza CD-C18

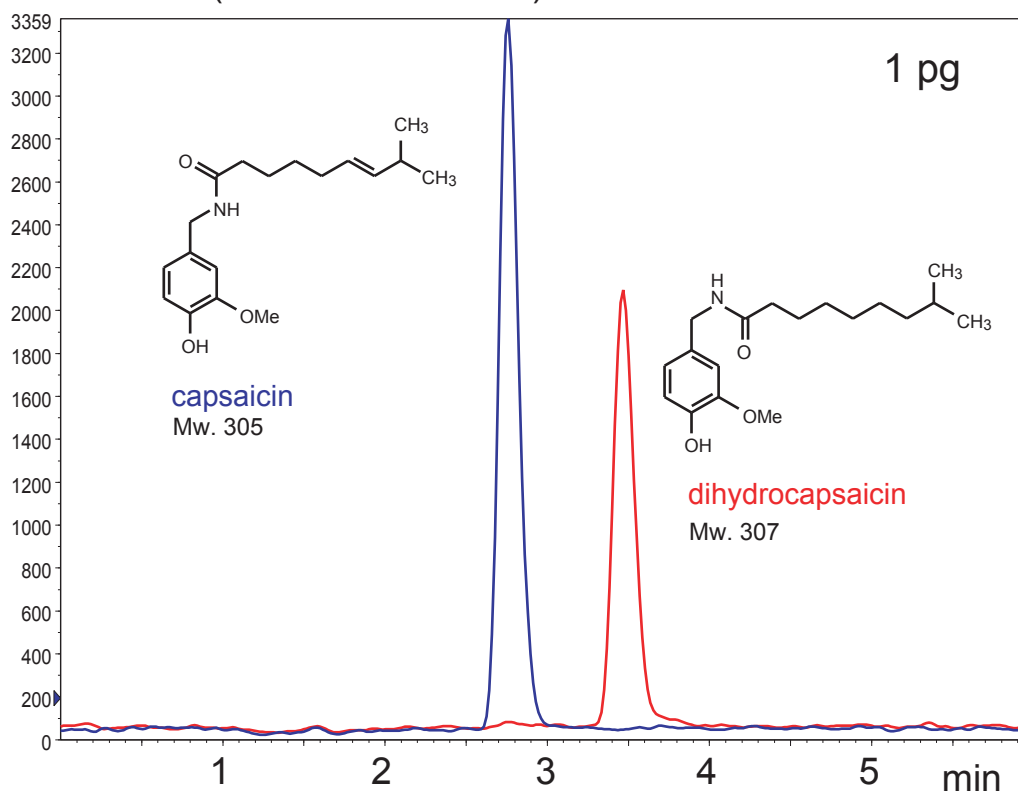
100 x 2 mm

Application

LC-MS Application for Capsaicins

LC-MSアプリケーション（唐辛子成分、カプサイシン）

API4000 (TAKARA BIO INC.)



Cadenza CD-C18, 100 x 2 mm

0.1% acetic acid / 75% methanol, 0.2 mL/min, 40 °C, 5 μ L (200fg/ μ L)

API4000: ESI, MRM Positive

Q1/Q3:

capsaicin 306/137

dihydrocapsaicin 308/137

Courtesy of J.Watanabe, TAKARA BIO INC.

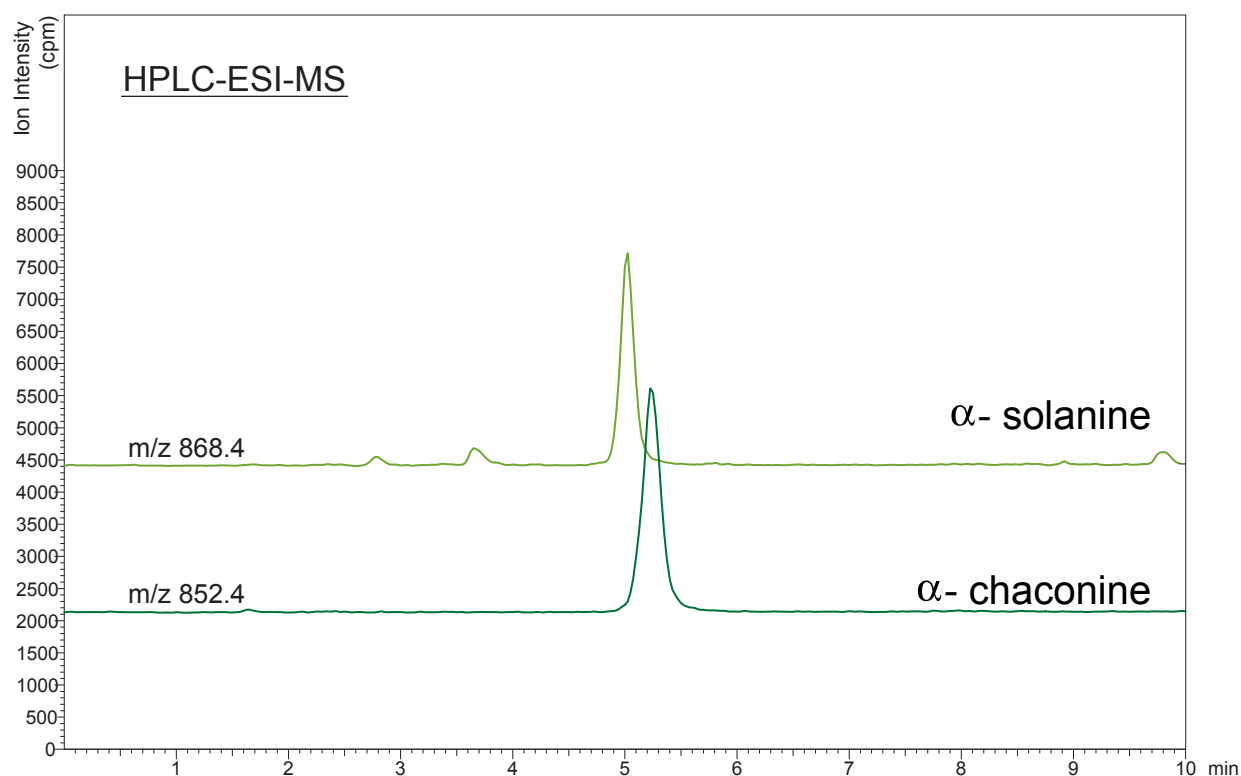
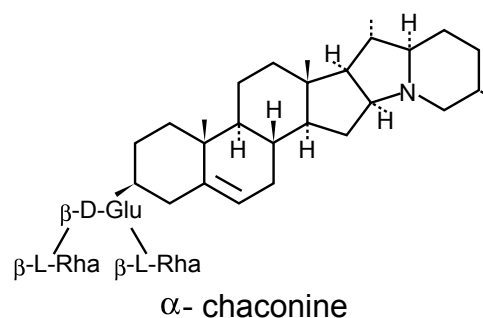
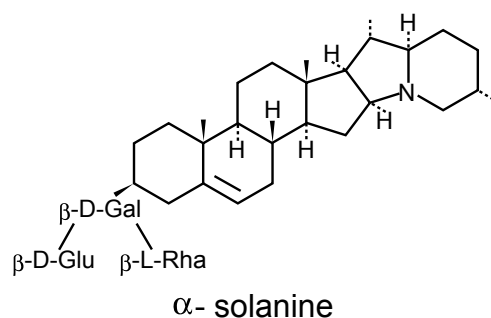
Cadenza CD-C18

75 x 2 mm

Application

α - Solanine and α - Chaconine from Potato

ジャガイモ中の α -ソラニンと α -チャコニン



Cadenza CD-C18, 75 x 2 mm
 0.1% trifluoroacetic acid / acetonitrile = 75 / 35
 0.2 mL/min, 35 deg.C,
 LCMS-2010A, ESI positive

Courtesy of Dr. Fumio MATSUDA and Prof. Hisashi MIYAGAWA,
 Department of Agriculture, Kyoto University.

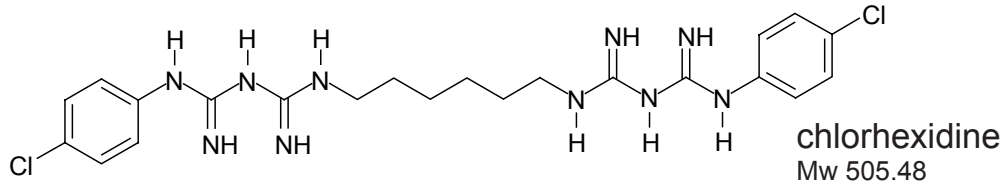
Unison UK-C8

50 x 2 mm

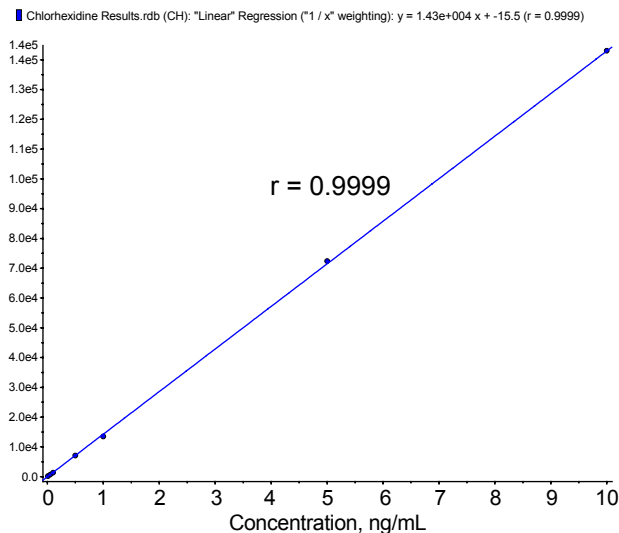
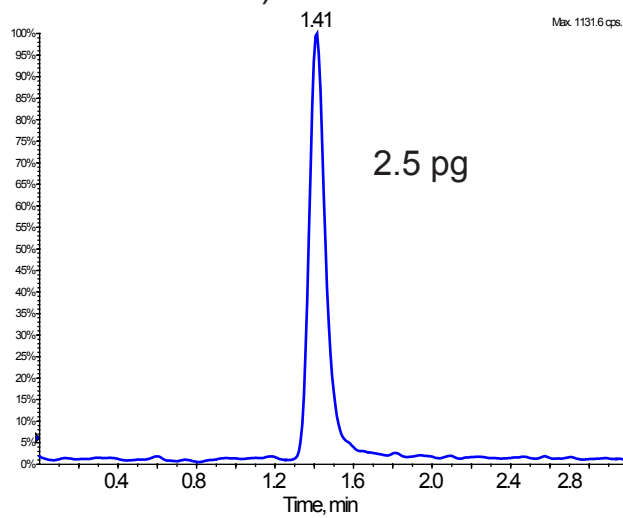
Application

LC-MS Application for Antiseptic Substance

LC-MSアプリケーション (消毒薬, クロルヘキシジン)



API4000 (TAKARA BIO INC.)



Unison UK-C8, 50 x 2 mm

0.1% formic acid / acetonitrile = 2 / 1, 0.2 mL/min, 5uL(500 fg/uL)

API4000: ESI, MRM Positive, Q1/Q3 : 505 / 336

Courtesy of J.Watanabe, TAKARA BIO INC.

Unison UK-C8

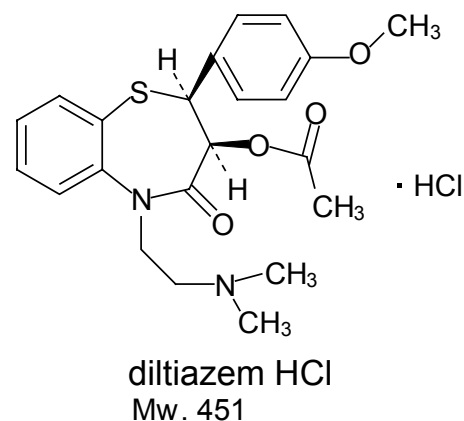
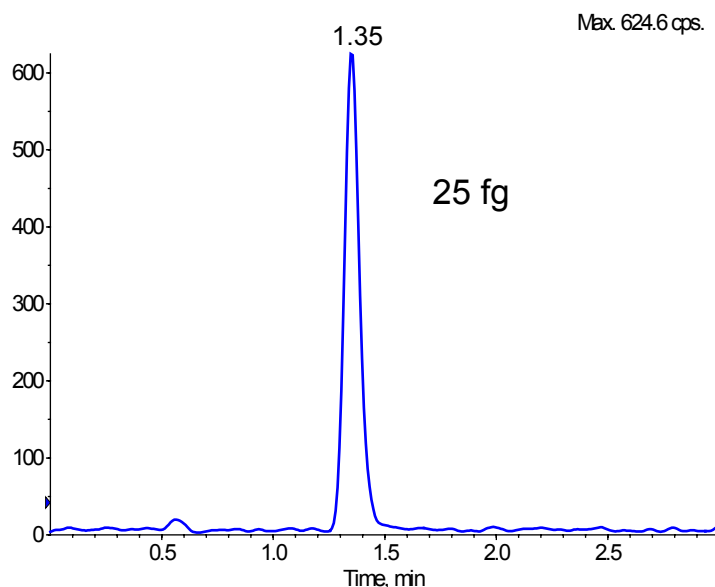
50 x 2 mm

Application

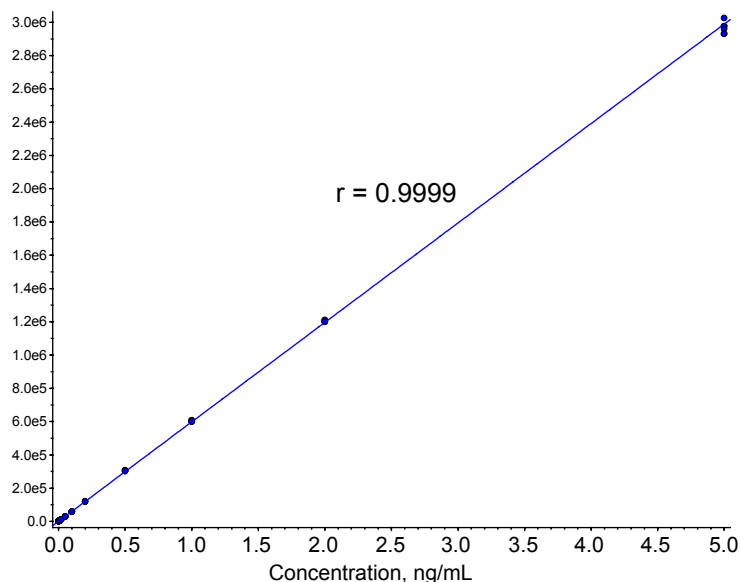
LC-MS Application for Calcium Antagonist

LC-MSアプリケーション (カルシウム拮抗薬, 塩酸ジルチアゼム)

API4000 (TAKARA BIO INC.)



Results.rdb (Diltiazem): "Linear" Regression ("1 / x" weighting): $y = 5.98e+005 x + -22.1$ ($r = 0.9999$)



Unison UK-C8, 50 x 2 mm

0.1% formic acid / acetonitrile = 2 / 1, 0.25 mL/min, 5 uL(5 fg/uL)

API4000: ESI, MRM Positive, Q1/Q3 : 415 / 178

Courtesy of J.Watanabe, TAKARA BIO INC.

Unison UK-C8

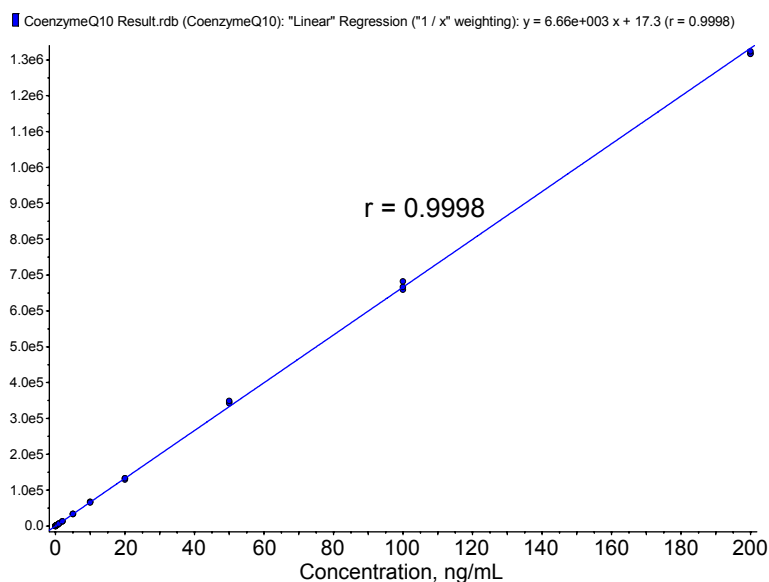
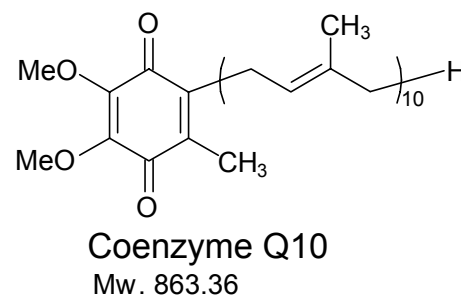
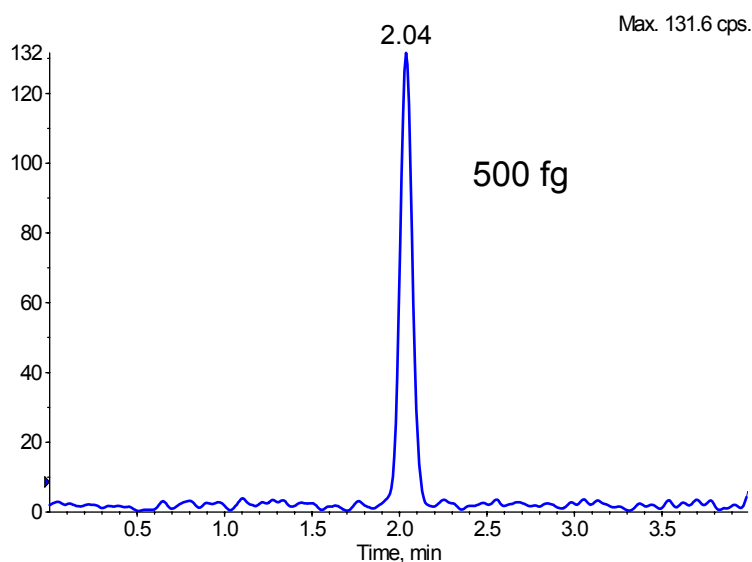
75 x 3 mm

Application

LC-MS Application for Coenzyme Q10

LC-MSアプリケーション (コエンザイム Q10)

API4000 (TAKARA BIO INC.)



Unison UK-C8, 75 x 3 mm

0.1% formic acid / acetonitrile / isopropanol = 1 / 5 / 5

0.8 mL/min, 10 uL(50 fg/uL)

API4000: APCI, MRM Positive, Q1/Q3 : 863.5 / 197

Courtesy of J.Watanabe, TAKARA BIO INC.

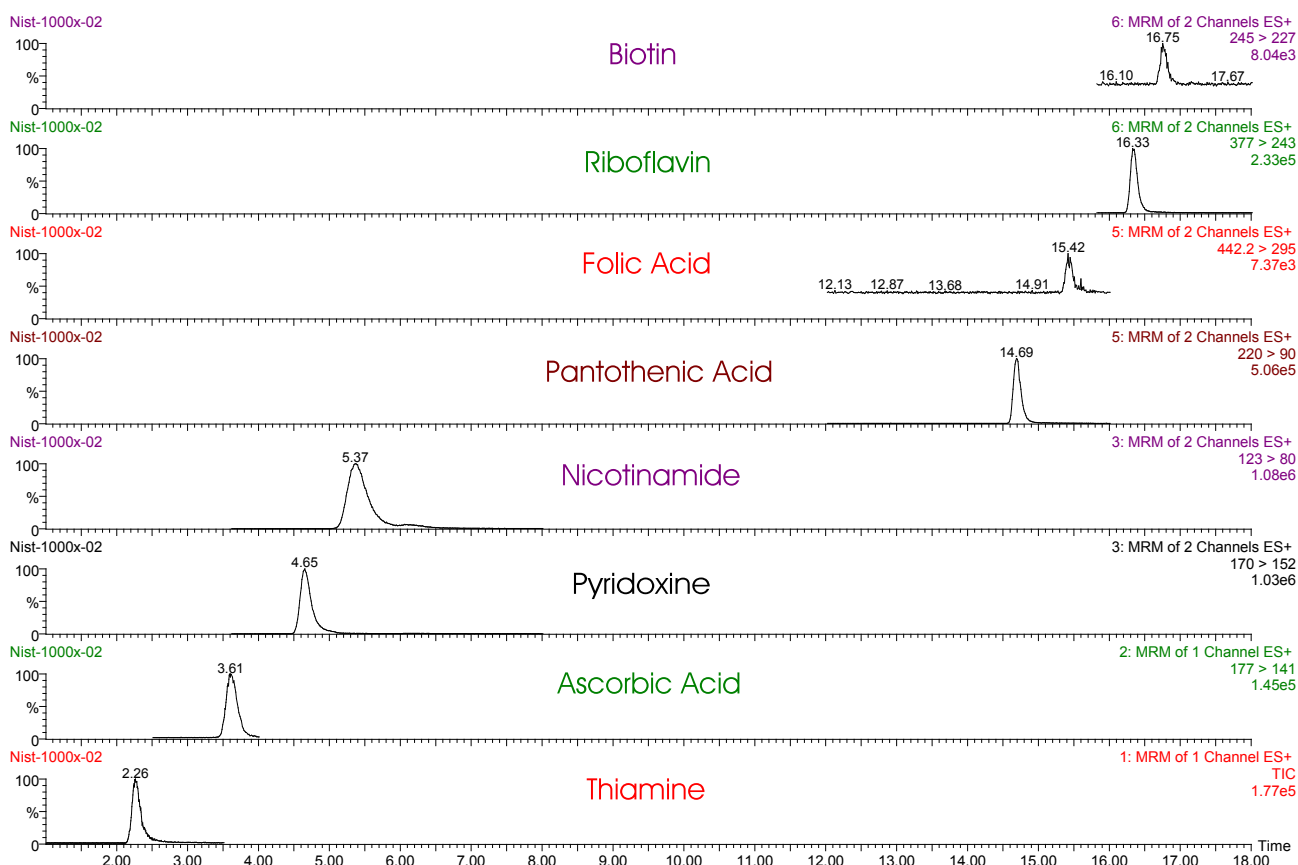
Unison UK-C18

250 x 2 mm

Application

LC-MS/MS Application of Water Soluble Vitamins

LC-MS/MSアプリケーション(水溶性ビタミン)



Unison UK-C18, 250 x 2 mm

A: 0.1% HCOOH in water

B: 0.1% HCOOH in acetonitrile

0%B (0-5min), 0-50%B (5-15min), 50-95%B (15-17min), 0%B (17-25min)

0.25mL/min, ambient, 5uL

ESI-MS, MRM Positive

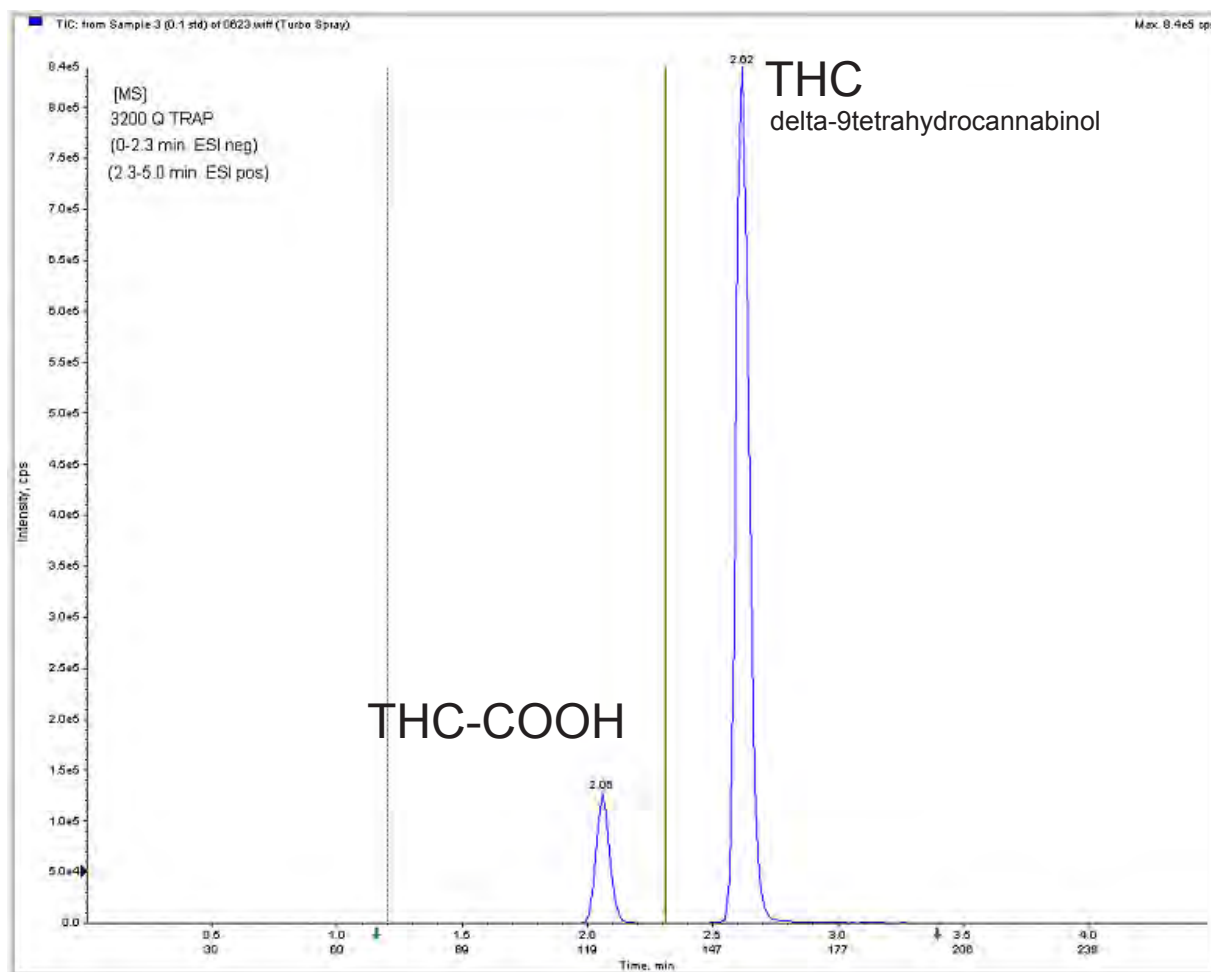
Courtesy of Dr. Pei Chen, USDA, ARS, BHNRC, Food Composition Lab - Beltsville, MD, USA

Unison US-C18

50 x 2 mm

Application

LC-MS/MS Application of Marijuana and its Metabolite in Blood
 血液中のマリファナ成分と代謝物 (LC-MS/MS)



Unison US-C18, 50 x 2 mm

A: 0.1% HCOOH in water, B: 0.1% HCOOH in acetonitrile
 50-90%B in 5 min, 0.5 mL/min, 28 deg. C

3200 Q Trap
 0-2.3 min, ESI Negative, 2.3-5 min, ESI Positive

Whole blood, SPE extraction
 LOD THC = 0.1ng/mL
 LOD THC-COOH = 0.5ng/mL

Courtesy of Massachusetts State Crime Lab., USA

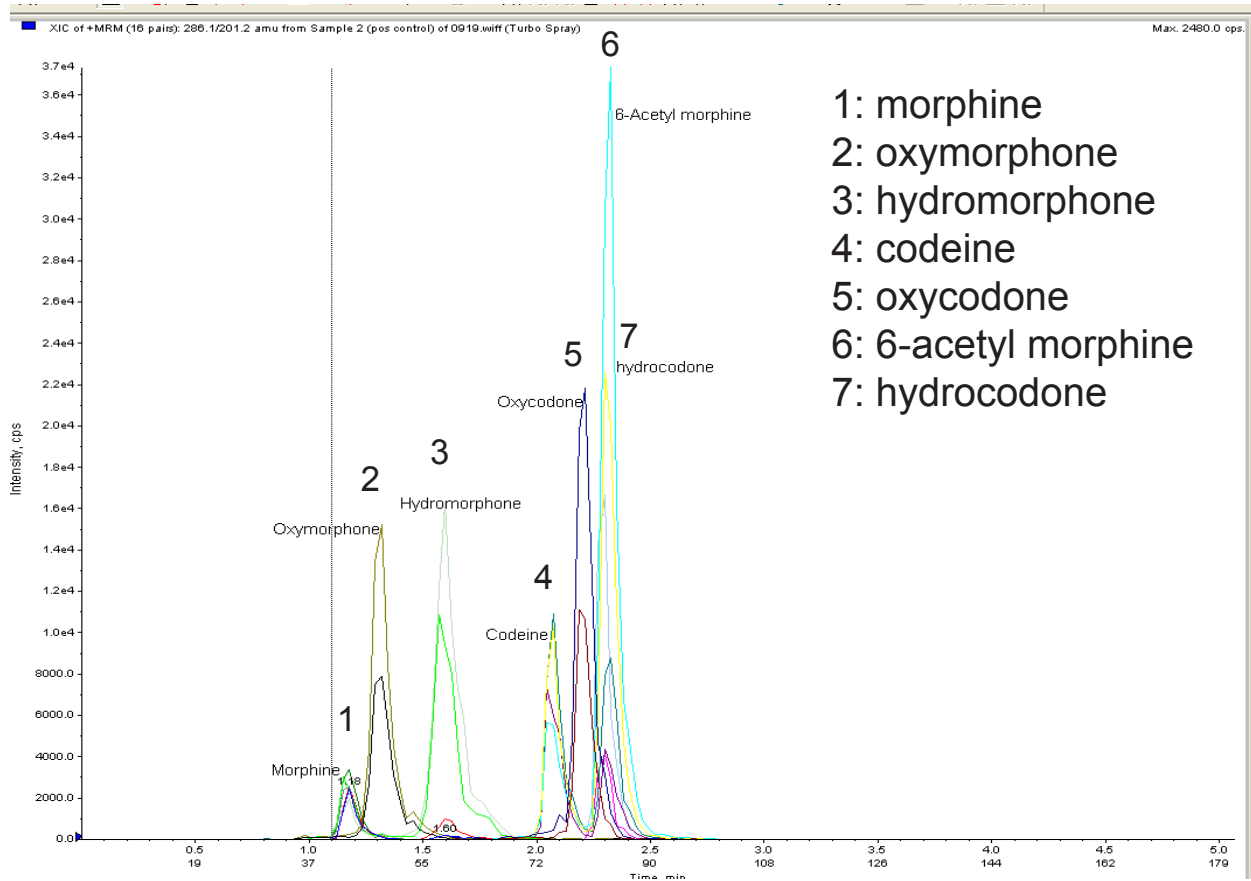
Unison US-C18

50 x 2 mm

Application

LC-MS/MS Application of Opiates in Whole Blood

血液中の麻薬性鎮痛剤 (LC-MS/MS)



Unison US-C18, 50 x 2 mm

A: 0.1% HCOOH in Water
 B: 0.1% HCOOH in Acetonitrile
 5%B (0-0.5min)
 5-25%B (0.5-2.0min)
 25-90%B (2.0-3.5 min)
 90%B (3.5-3.6 min)
 0.6 mL/min, 28 deg. C

3200 Q-Trap, ESI Positive
 Whole blood, SPE Extraction
 LOD = 0.5ng/mL; LOQ = 1.0ng/mL

Courtesy of Massachusetts State Crime Lab., USA

Unison UK-C18

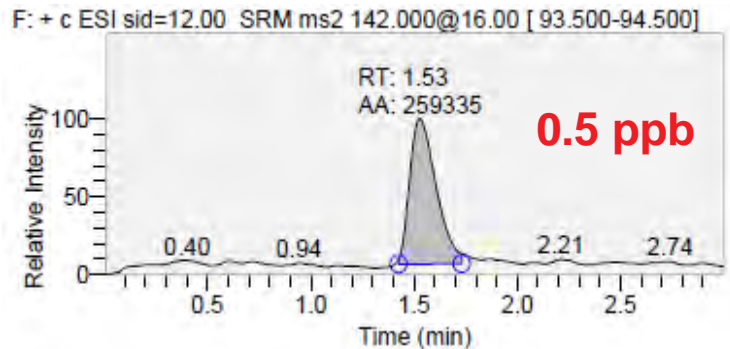
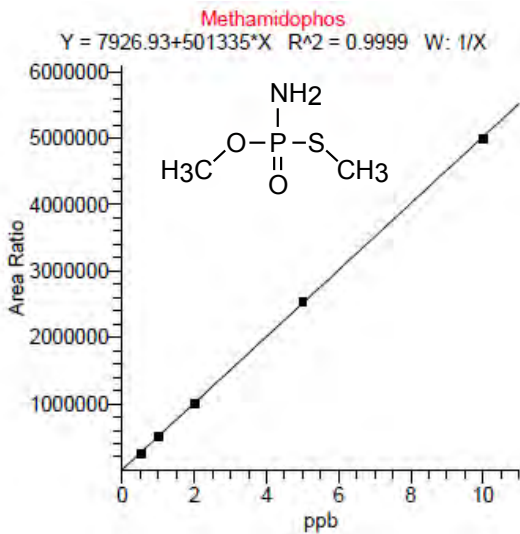
50 x 2 mm

Application

LC-MS/MS Application - Organophosphorous Pesticides

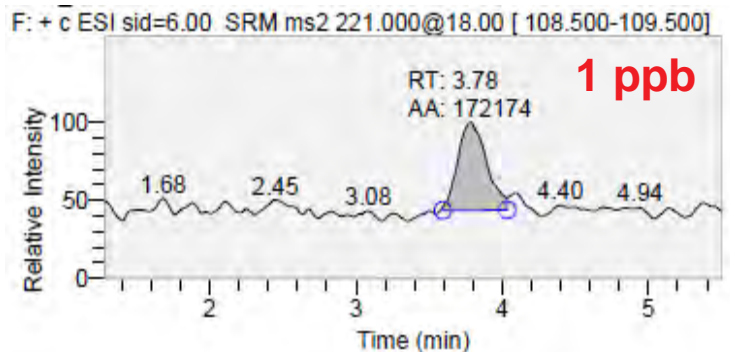
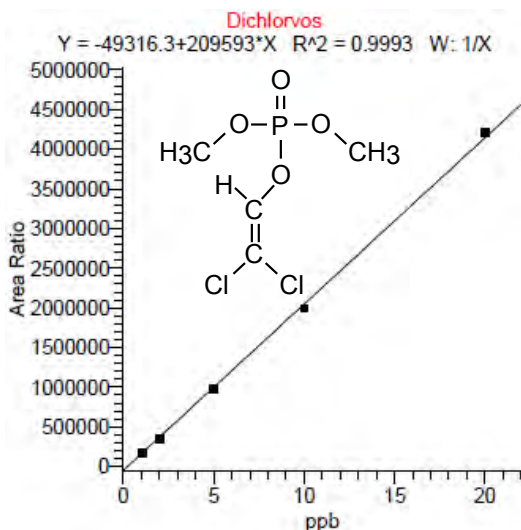
残留農薬(メタミドホス, ジクロルボス)のLC-MS/MS分析

methamidophos



Unison UK-C18, 50 x 2 mm
 Mobile phase: 0.1% HCOOH in 5% MeOH
 flow rate: 0.25 mL/min
 Column temp.: 40 deg.C
 Ionization: ESI positive
 SRM transition: m/z 142 -> m/z 94, CID 16V

dichlorvos



Unison UK-C18, 50 x 2 mm
 Mobile phase: 0.1% HCOOH in 40% MeOH
 flow rate: 0.25 mL/min
 Column temp.: 40 deg.C
 Ionization: ESI positive
 SRM transition: m/z 221 -> m/z 109, CID 18V

Courtesy of Dr. T. Hayama, Environmental Science Center, Foundation for Kyushu Environmental and Occupational Health, Japan

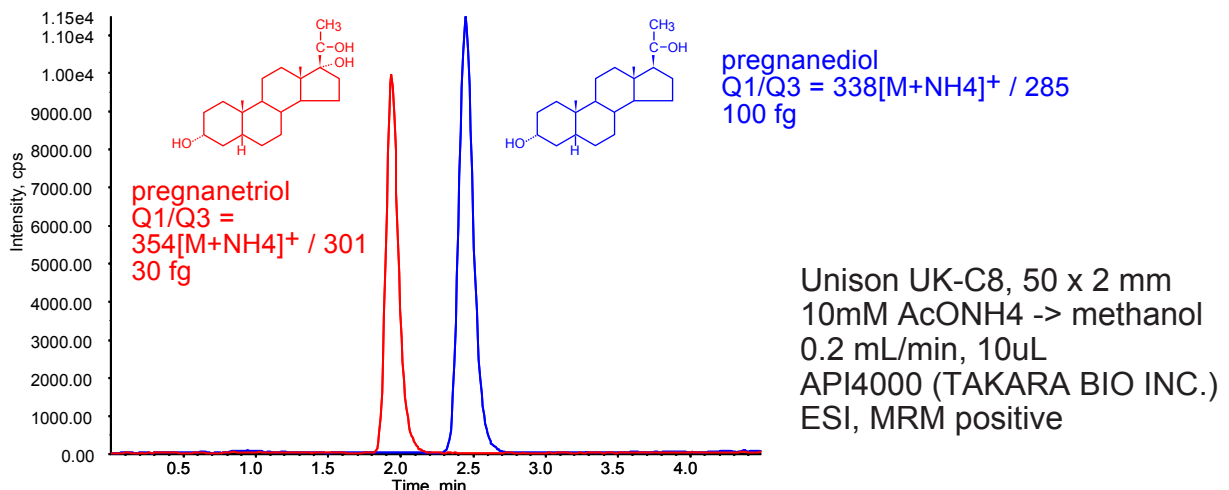
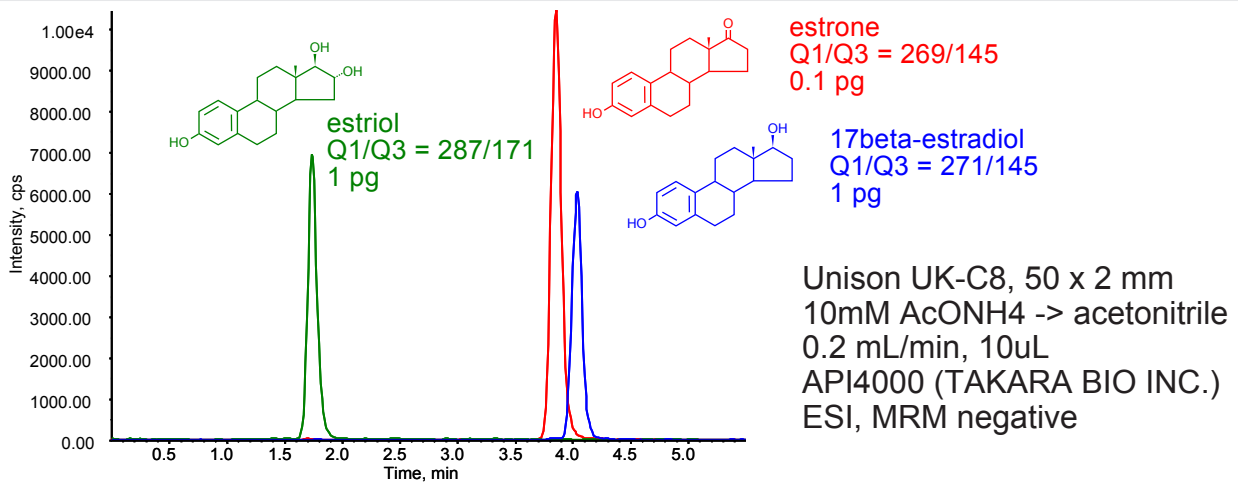
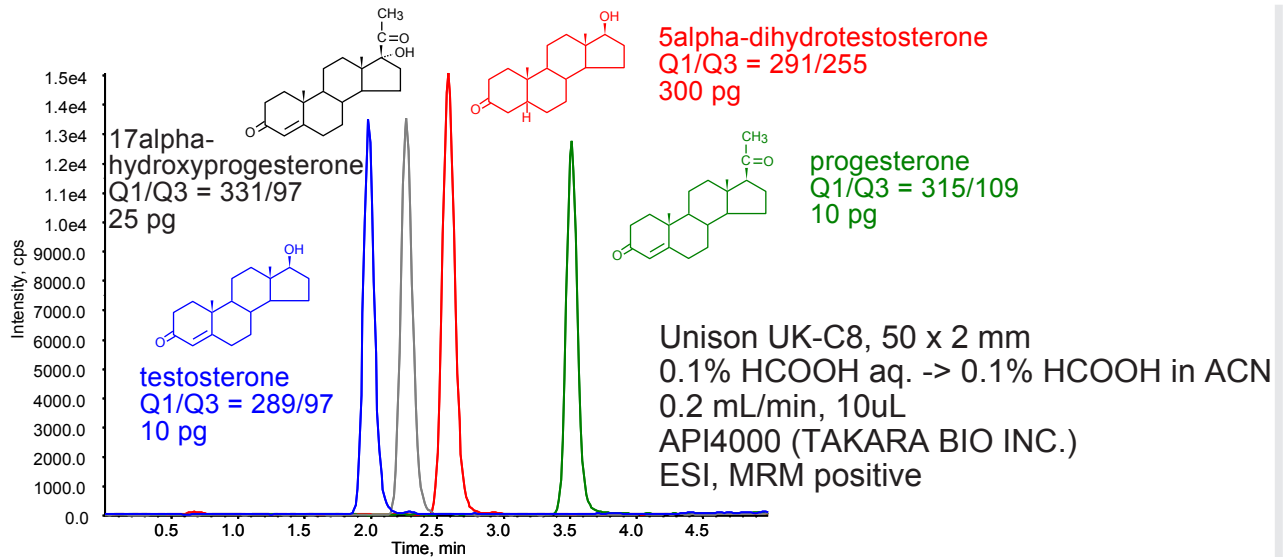
Unison UK-C8

50 x 2 mm

Application

LC-MS/MS Application - Steroid Hormones and Metabolites

ステロイドホルモンと代謝物のLC-MS/MS分析



Courtesy of TAKARA BIO INC.

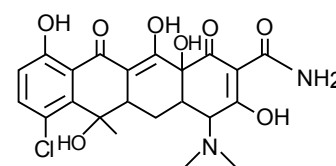
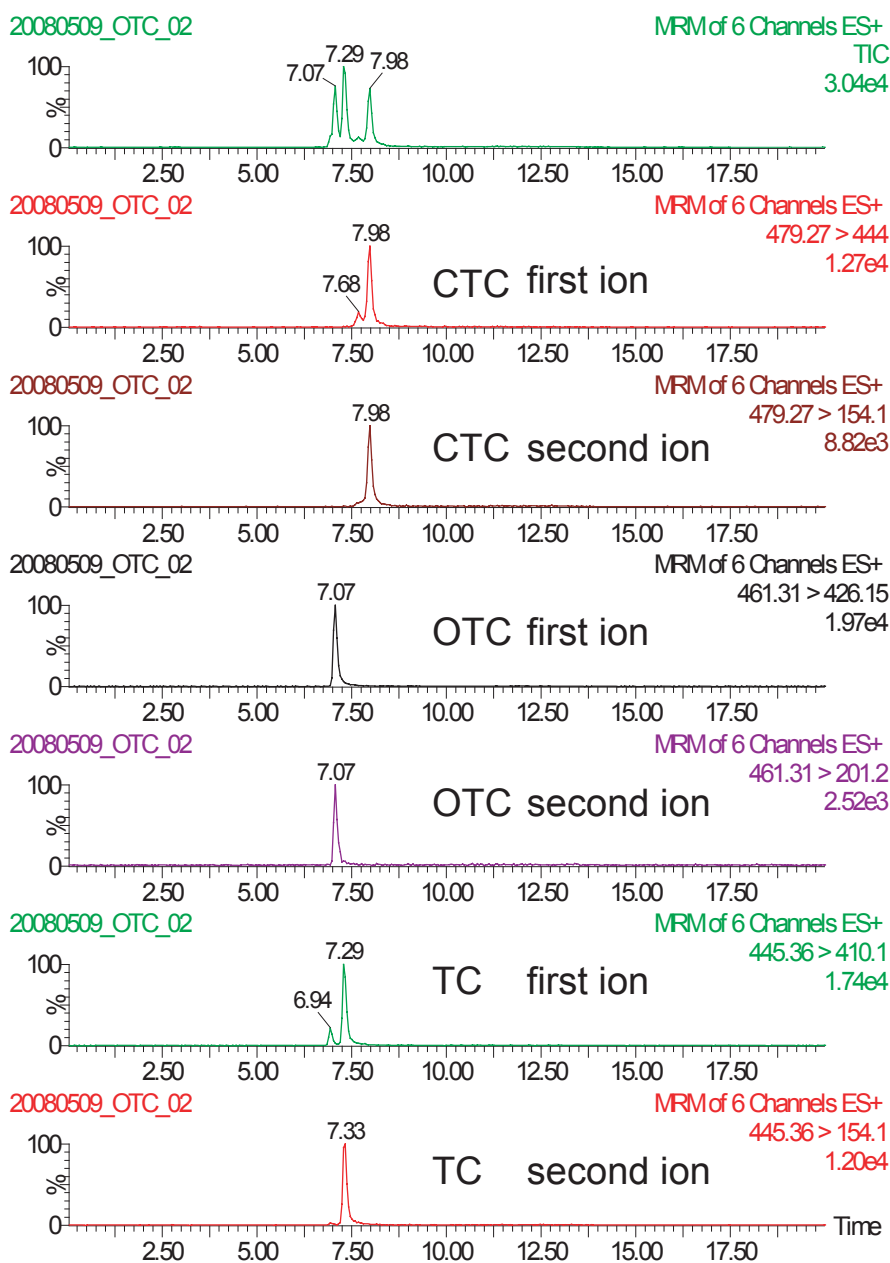
Cadenza CW-C18

100 x 2 mm

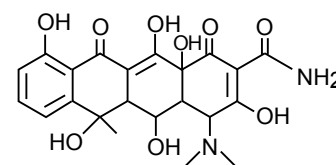
Application

LC-MS/MS Application -Tetracycline Antibiotics

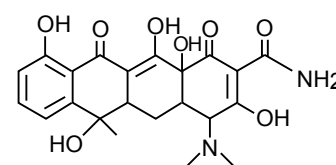
テトラサイクリン系抗生物質のLC-MS/MS分析



chlortetracycline (CTC)



oxytetracycline (OTC)



tetracycline (TC)

Cadenza CW-C18, 100 x 2 mm + Guard column
 A: 0.1% HCOOH aq., B: 0.1% HCOOH in ACN
 5 - 95%B (0 - 7 min), 95 - 5%B (7 - 8 min), 5%B (8 - 17 min)
 0.2 mL/min, 40 deg.C, 10 uL (20 ppb), ESI, positive

Courtesy of Mr. N. MAEDA, ASSOCIATION OF MEAT SCIENCE & TECHNOLOGY INSTITUTE, JAPAN

Unison UK-Amino

150 x 3 mm

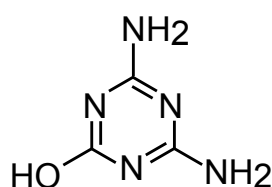
Application

LC-MS/MS: Melamine and Related Compounds

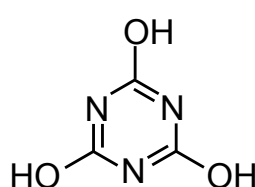
LC-MS/MS (メラミンと関連化合物)



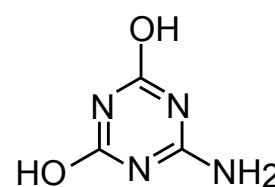
1. melamine



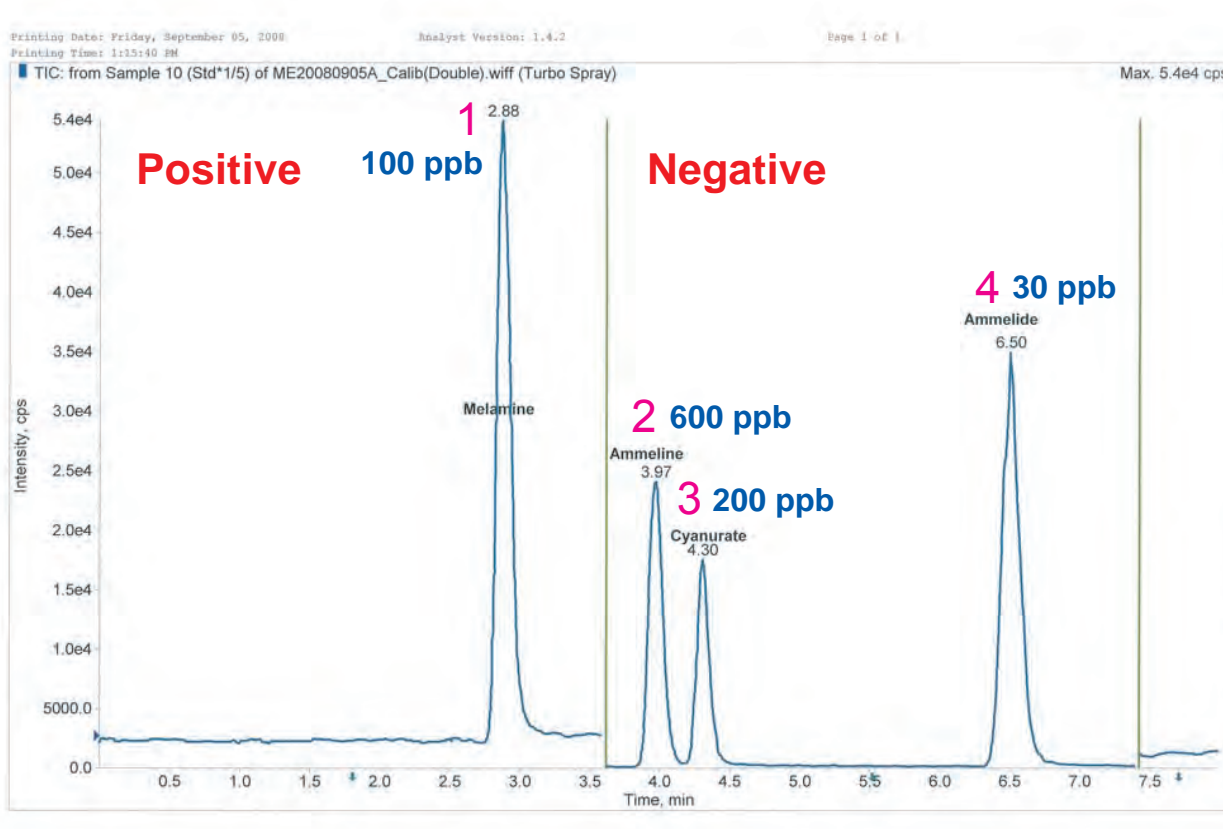
2. ammeline



3. cyanuric acid



4. ammelide



Unison UK-Amino, 150 x 3 mm

A: acetonitrile, B: 10mM ammonium acetate + 0.1% acetic acid
 25%B (Isocratic)

0.4 mL/min (5.9MPa), 40 deg.C, 5uL

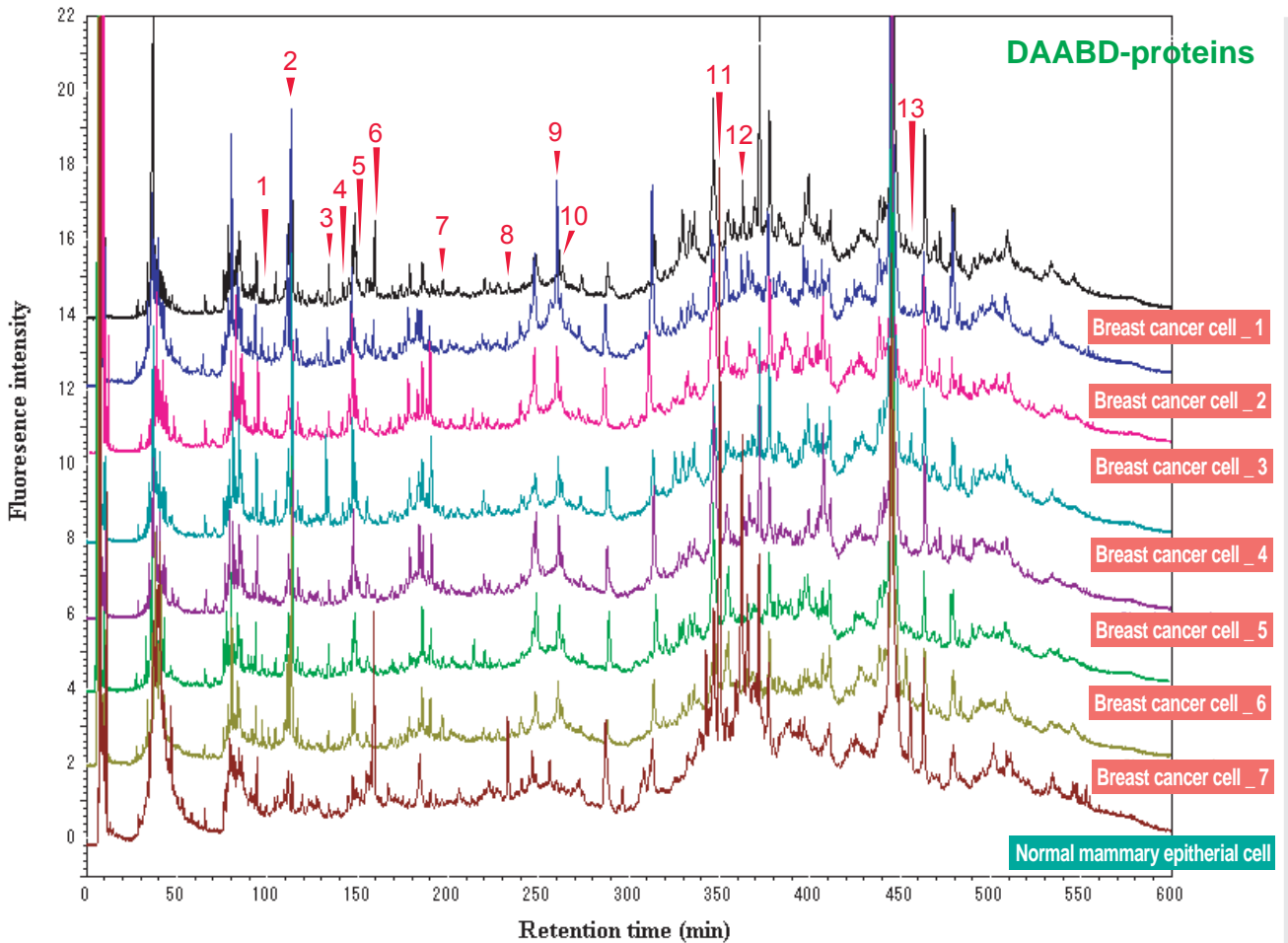
Intrada WP-RP

250 x 4.6 mm

Application

A proteomics study on human breast cancer cell lines by fluorogenic derivatization-liquid chromatography/tandem mass spectrometry

蛍光誘導体化 LC-MS/MS法による乳癌細胞のプロテオーム解析



Ref-1: *Biomedical Chromatography*, 2008, 22 (11), 1304-1314

Ref-2: *Journal of Proteome Research*, 2007, 6, 2841-2849

Intrada WP-RP, 250 x 4.6 mm

A: 0.15% TFA in (acetonitrile /isopropanol /water = 9 /1 /90)

B: 0.15% TFA in (acetonitrile /isopropanol /water = 69 /1 /30)

C: 0.20% TFA in (acetonitrile /isopropanol /water = 9 /1 /90)

5%B,1%C(0-5min), 5-30%B,1-35%C (5-30min), 30%B,35%C(30-65min)

30-35%B,35%C(65-70min), 35-38%B,35%C(70-130min)

38-44%B,35-55%C(130-250min), 44%B,55%C(250-300min)

44-47%B,55-53%B(300-330min), 47-60%B,53-40%C(330-480min)

60-70%B,40-30%C(480-520min), 70-90%B,30-10%C(520-570min)

0.55 mL/min, 60 deg.C, FLD(Ex.395nm, Em.505nm)

Courtesy of Kazuhiro Imai, Ph.D. Dhc., Professor & Dean, Musashino University, Japan

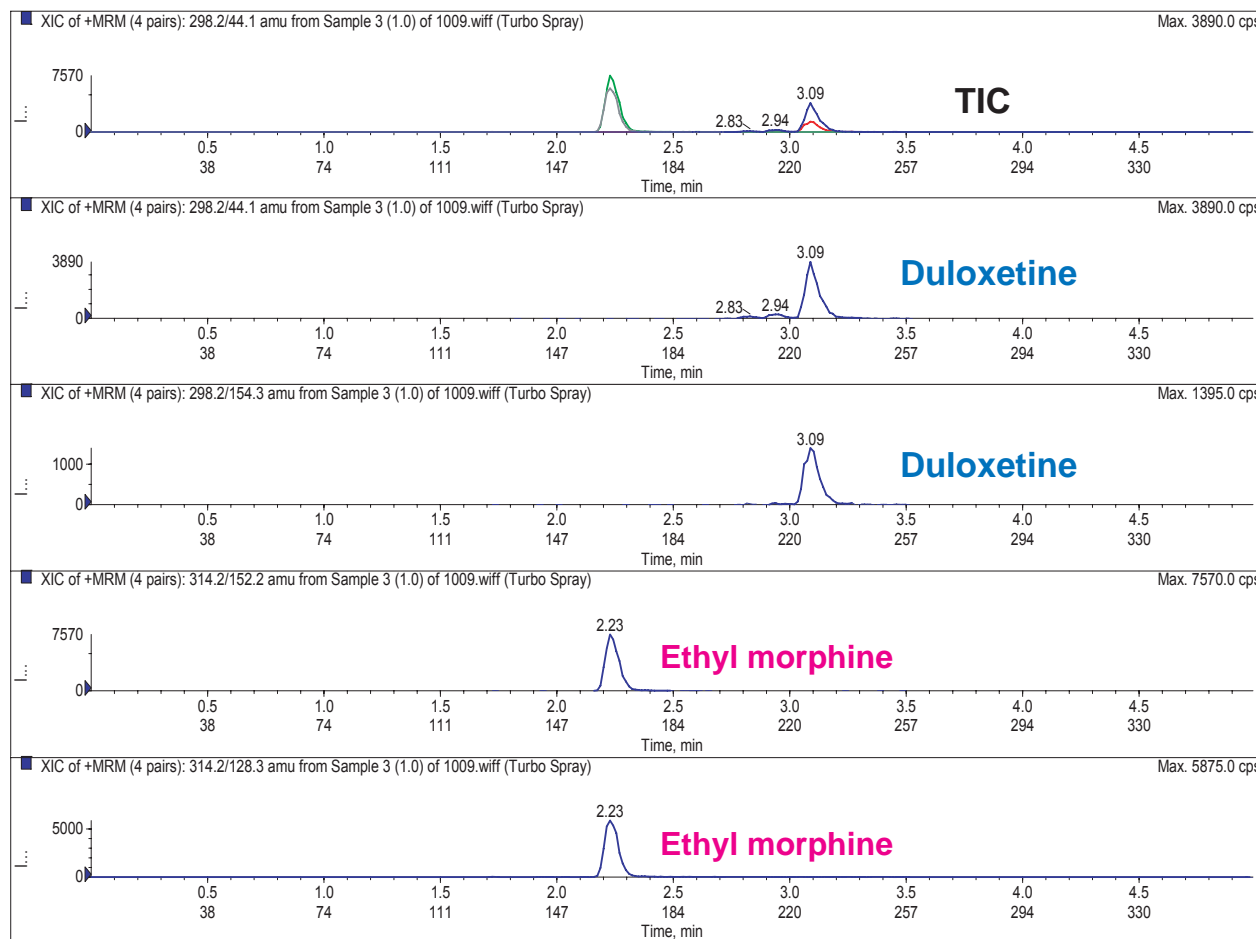
Unison US-C18

50 x 2 mm

Application

LC-MS/MS Application for Duloxetine and Ethyl Morphine in Whole Blood

血液中の麻薬性鎮痛薬と抗うつ剤のLC-MS/MS高速分析



Unison US-C18, 50 x 2 mm

A: 0.1% HCOOH in water, B: 0.1% HCOOH in acetonitrile
 5%B (0-0.5min), 5-90%B (0.5-4.5min), 5%B (4.5-6min)
 0.5mL/min (LOD 0.05 ng/mL, LOQ 0.1 ng/mL)

Whole Blood, SPE Extraction
 3200 Q-Trap: ESI, MRM Positive
 Duloxetine: m/z 298.1 -> 44.1 and 154.3
 Ethyl Morphine (I.S.): m/z 314.2 -> 152.2 and 128.3

Ref) *Rapid Quantification of Duloxetine in Blood and Urine by LC-ESI-MS/MS*
 Albert Elian, Massachusetts State Police Crime Lab, USA
 Society of Forensic Toxicologists (SOFT), 2008, USA

Courtesy of Massachusetts State Police Crime Lab., USA

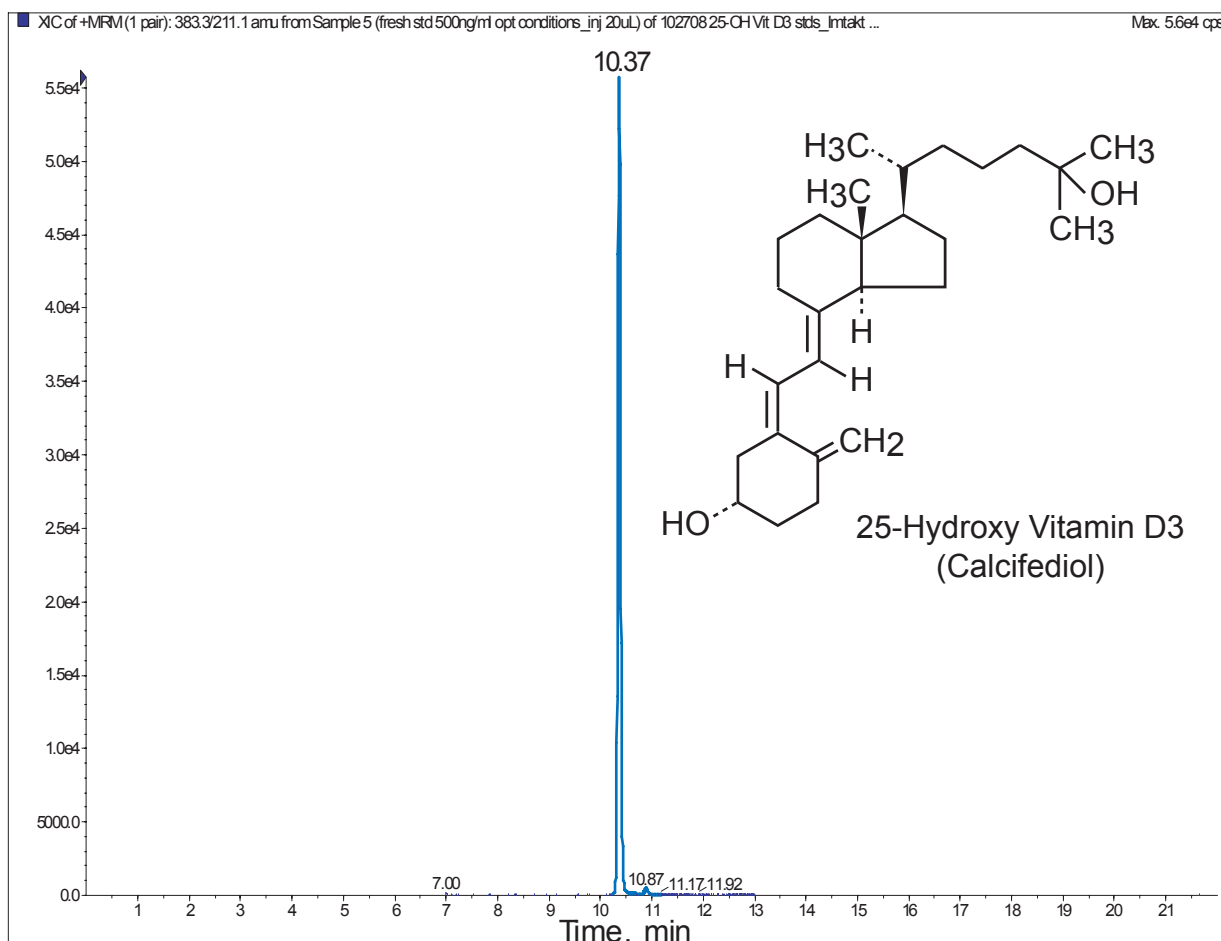
Cadenza CD-C18

150 x 4.6 mm

Application

LC-MS/MS Application for 25-Hydroxy Vitamin D3

25-ヒドロキシビタミンD3 のLC-MS/MS分析



Cadenza CD-C18, 150 x 4.6 mm

A: water / methanol = 75 / 25

B: acetonitrile / ethyl acetate = 70 / 30

40%B (0-1min), 40-95%B (1-8min), 95%B (8-15min), 40%B (15-22min)

0.7mL/min, ambient

Applied Biosystems 4000 Q trap

Ionization: APCI Positive mode

LOQ: 1ng/mL

Courtesy of Penn State Hershey Medical Center, USA

Cadenza CW-C18

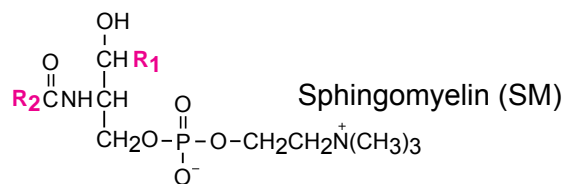
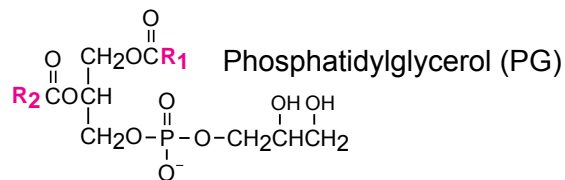
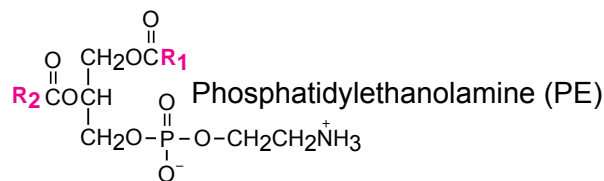
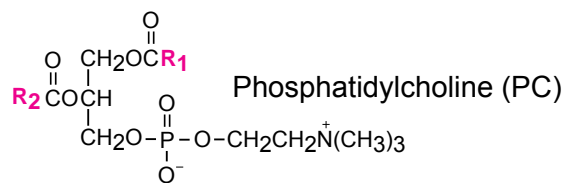
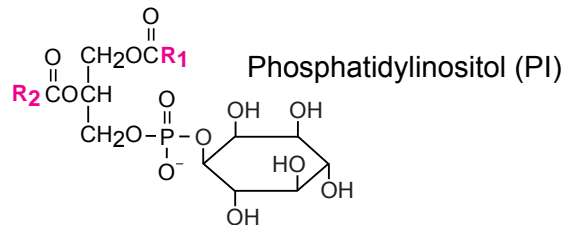
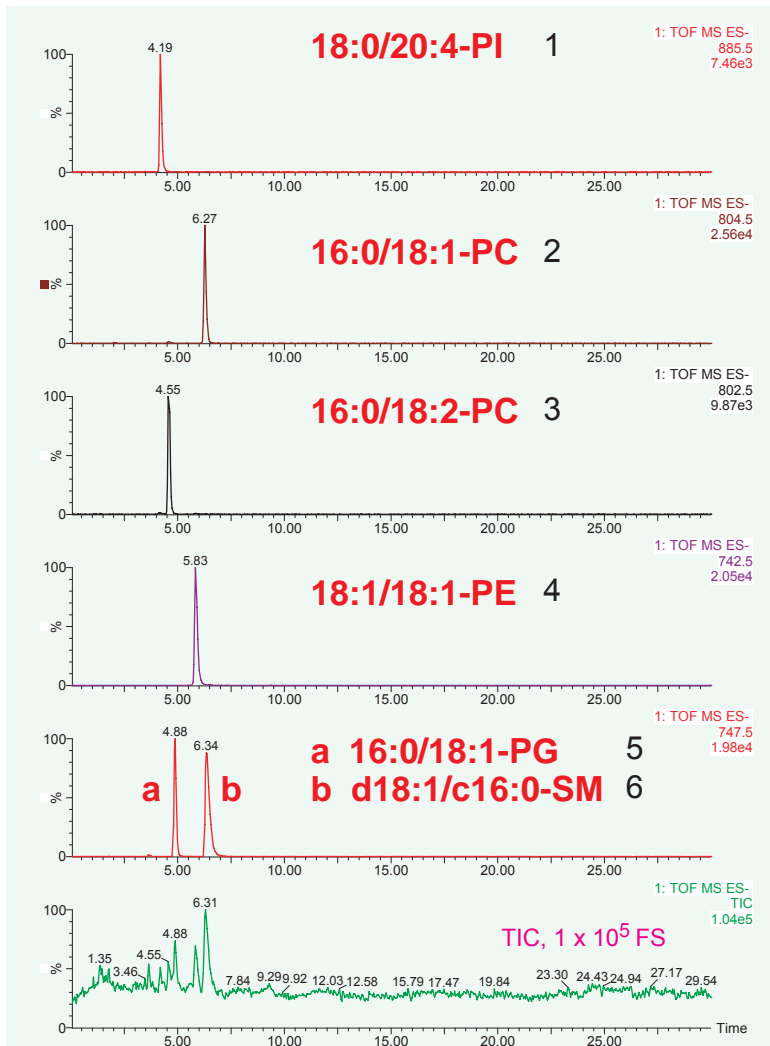
100 x 2 mm

Application

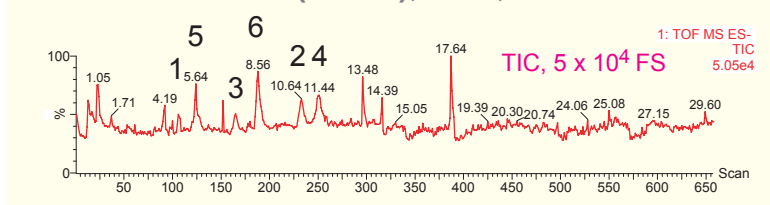
LC-MS application for phospholipids

リン脂質のLC-MS高速分析

Cadenza CW-C18



Fused Core™ (2.7um), ODS, 100 x 2.1 mm



Cadenza CW-C18, 100 x 2 mm
 5mM HCOONH₄ in (acetonitrile / methanol = 1 / 1)
 0.2mL/min, 20deg.C
 ESI-TOFMS, Negative

Courtesy of Yasuko Yoshioka, Inst. Health Biosciences, Univ. of Tokushima, Japan

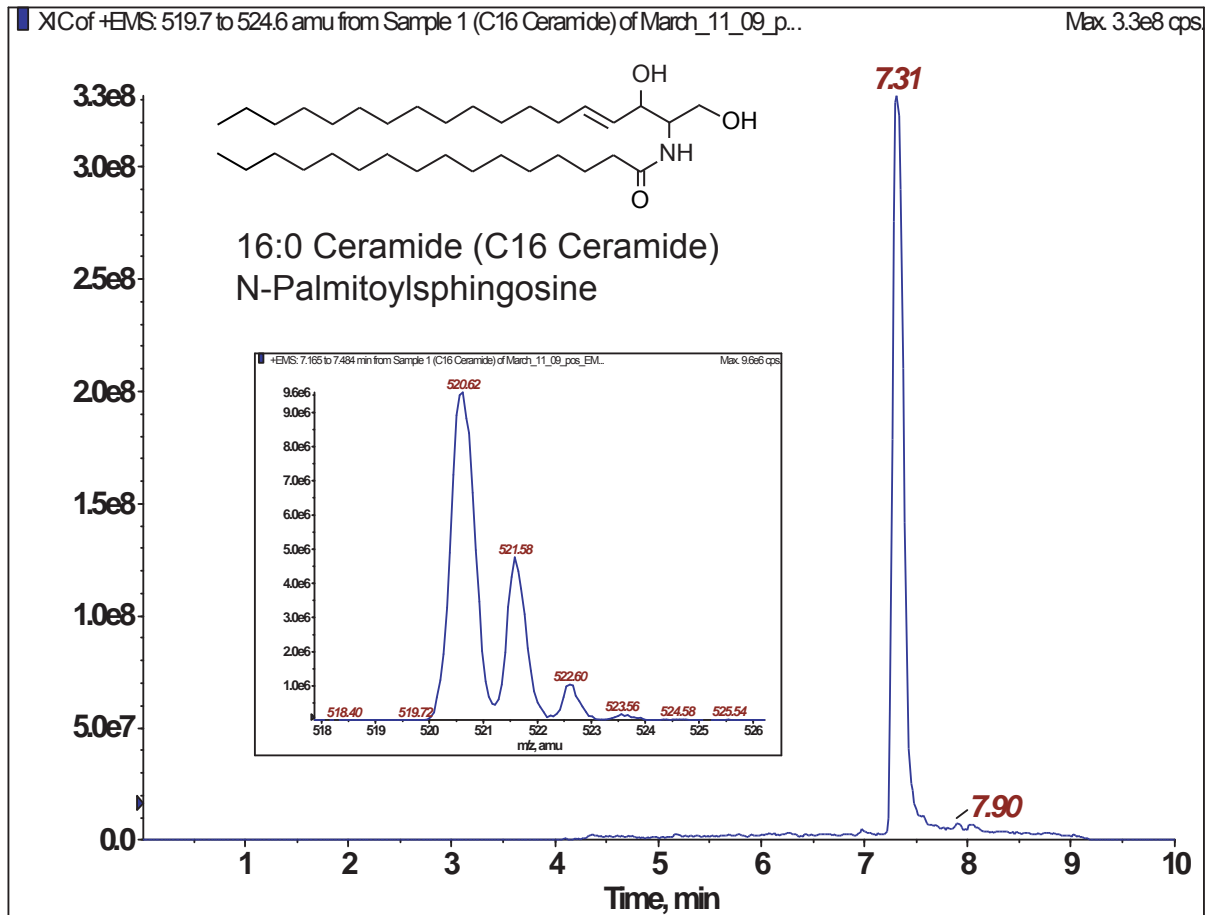
Cadenza CW-C18

150 x 2 mm

Application

LC-MS/MS Application for Sphingolipids (Ceramide)

スフィンゴ脂質(セラミド)のLC-MS/MS分析



Cadenza CW-C18, 150 x 2 mm

A: [water / HCOOH (100:0.2 v/v)] containing 7mM ammonium formate

B: [methanol / HCOOH (100:0.2 v/v)] containing 5mM ammonium formate

70-90%B (0-1min), 90%B (1-1.5min), 90-100%B (1.5-2.5min),

100%B (2.5-6min), 100-40%B (6-6.5min), 40%B (6.5-10min)

0.2mL/min - 0.28mL/min (0-6min), 0.2mL/min (6-10min)

48deg.C, 5uL (50ug / mL)

 Applied Biosystems QTrap, ESI Positive [M-H₂O+H]

Courtesy of Jennifer Ro and Joe Williams
 Department of Evolution, Ecology, and Organismal Biology, Ohio State University - USA

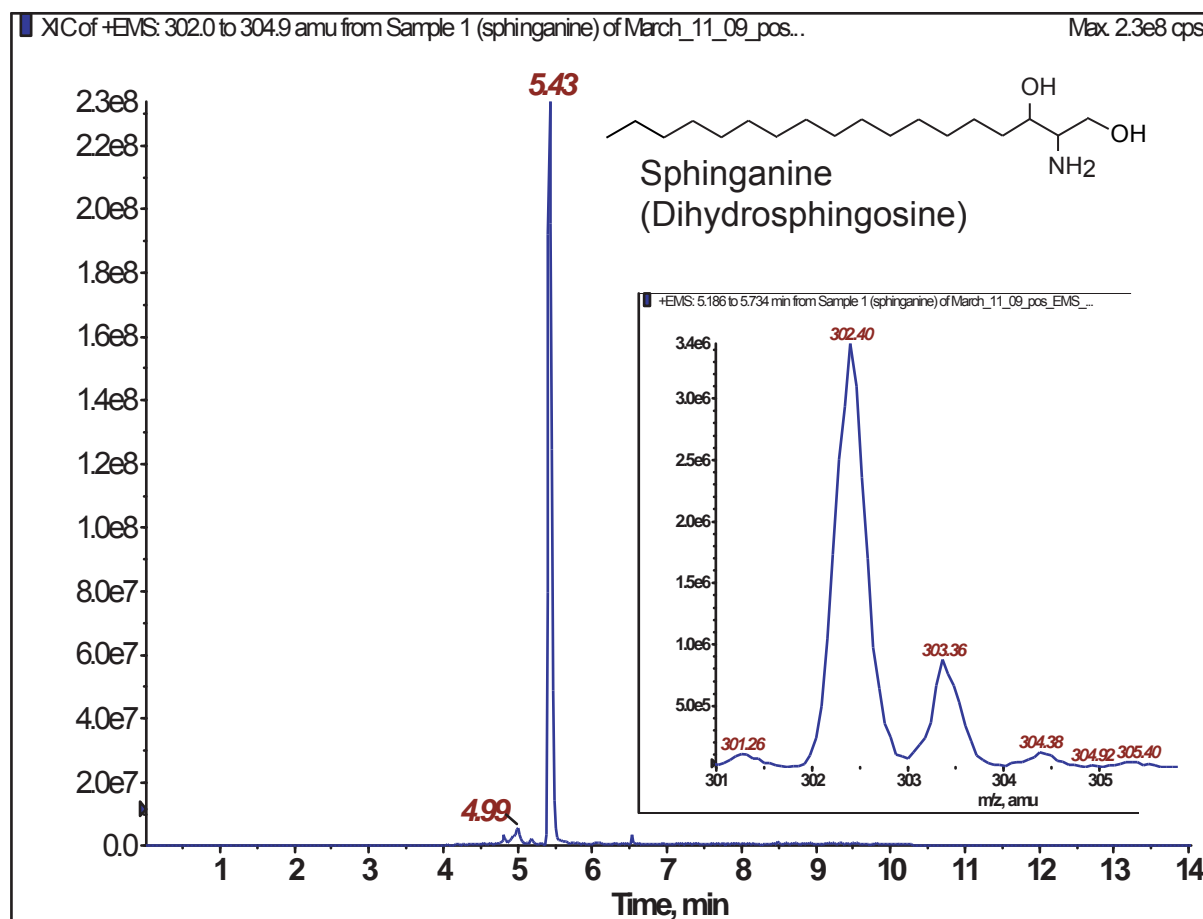
Cadenza CW-C18

150 x 2 mm

Application

LC-MS/MS Application for Sphingolipids (Sphinganine)

スフィンゴ脂質(スフィンガニン)のLC-MS/MS分析



Cadenza CW-C18, 150 x 2 mm

A: [water / HCOOH (100:0.2 v/v)] containing 7mM ammonium formate

B: [methanol / HCOOH (100:0.2 v/v)] containing 5mM ammonium formate

70-90%B (0-1min), 90%B (1-1.5min), 90-100%B (1.5-2.5min),

100%B (2.5-6min), 100-40%B (6-6.5min), 40%B (6.5-10min)

0.2mL/min - 0.28mL/min (0-6min), 0.2mL/min (6-10min)

48deg.C, 5uL (50ug / mL)

Applied Biosystems QTrap, ESI Positive

Courtesy of Jennifer Ro and Joe Williams
Department of Evolution, Ecology, and Organismal Biology, Ohio State University - USA

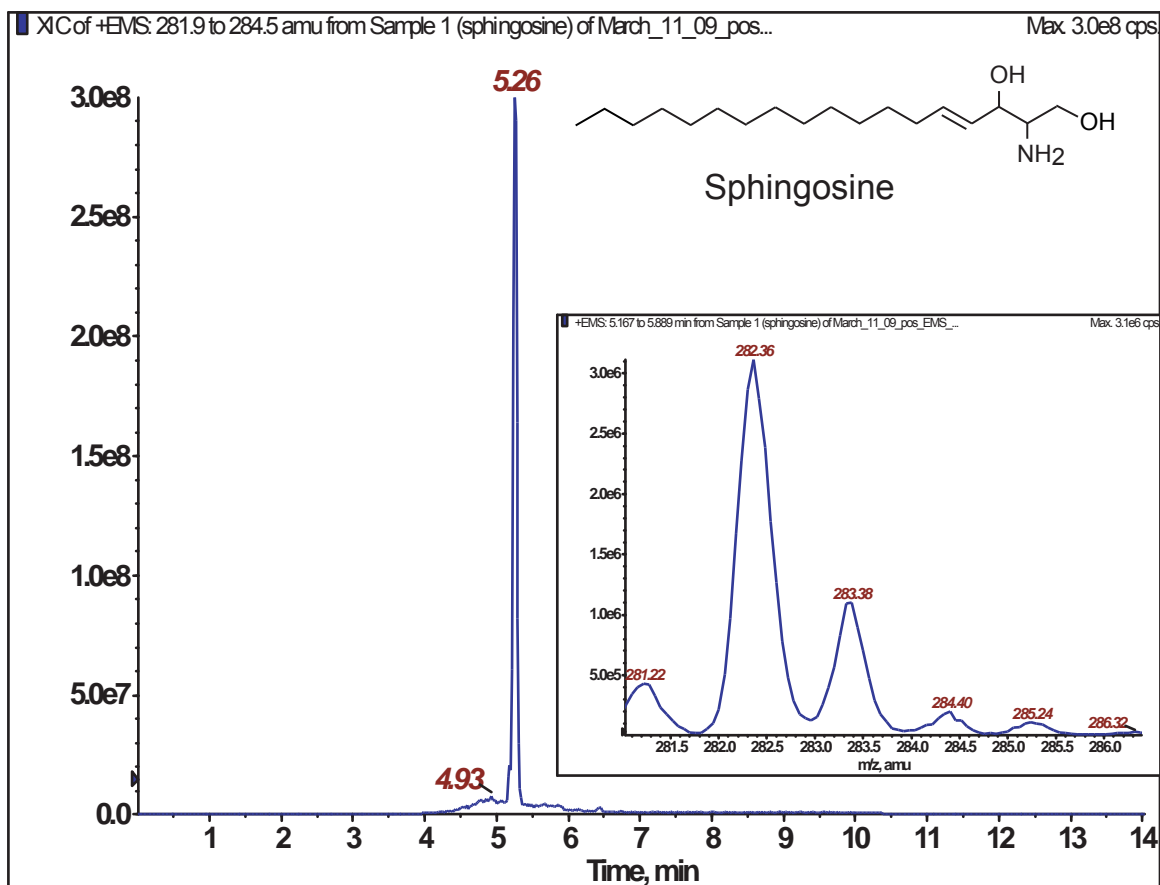
Cadenza CW-C18

150 x 2 mm

Application

LC-MS/MS Application for Sphingolipids (Sphingosine)

スフィンゴ脂質(スフィンゴシン)のLC-MS/MS分析



Cadenza CW-C18, 150 x 2 mm

A: [water / HCOOH (100:0.2 v/v)] containing 7mM ammonium formate

B: [methanol / HCOOH (100:0.2 v/v)] containing 5mM ammonium formate

70-90%B (0-1min), 90%B (1-1.5min), 90-100%B (1.5-2.5min),

100%B (2.5-6min), 100-40%B (6-6.5min), 40%B (6.5-10min)

0.2mL/min - 0.28mL/min (0-6min), 0.2mL/min (6-10min)

48deg.C, 5uL (50ug / mL)

Applied Biosystems QTrap, ESI Positive [M-H₂O+H]

Courtesy of Jennifer Ro and Joe Williams
Department of Evolution, Ecology, and Organismal Biology, Ohio State University - USA

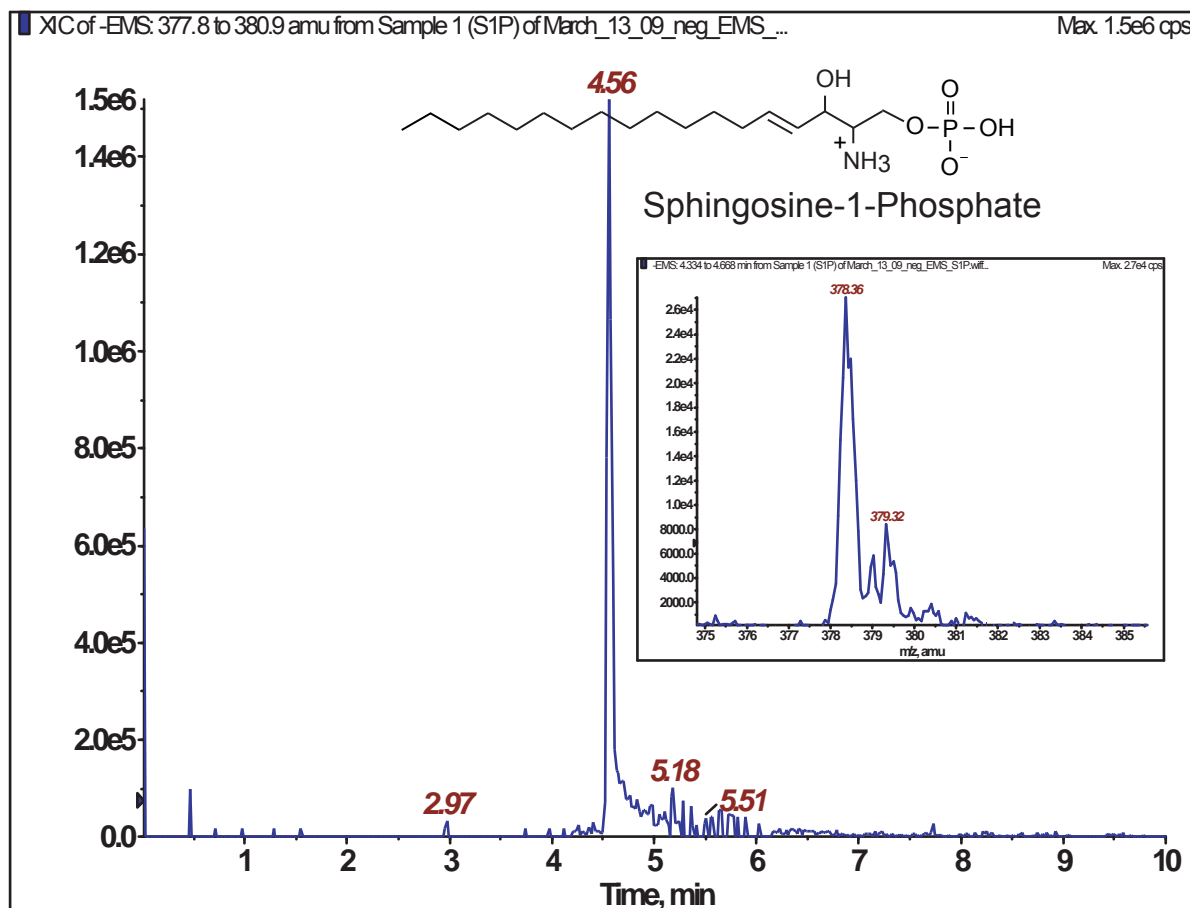
Cadenza CW-C18

150 x 2 mm

Application

LC-MS/MS Application for Sphingolipids (Sphingosine-1-PO4)

スフィンゴ脂質(スフィンゴシン-1-リン酸)のLC-MS/MS分析



Cadenza CW-C18, 150 x 2 mm

A: [water / HCOOH (100:0.2 v/v)] containing 7mM ammonium formate

B: [methanol / HCOOH (100:0.2 v/v)] containing 5mM ammonium formate

70-90%B (0-1min), 90%B (1-1.5min), 90-100%B (1.5-2.5min),

100%B (2.5-6min), 100-40%B (6-6.5min), 40%B (6.5-10min)

0.2mL/min - 0.28mL/min (0-6min), 0.2mL/min (6-10min)

48deg.C, 5uL (3ug / mL)

Applied Biosystems QTrap, ESI Negative

Courtesy of Jennifer Ro and Joe Williams
Department of Evolution, Ecology, and Organismal Biology, Ohio State University - USA

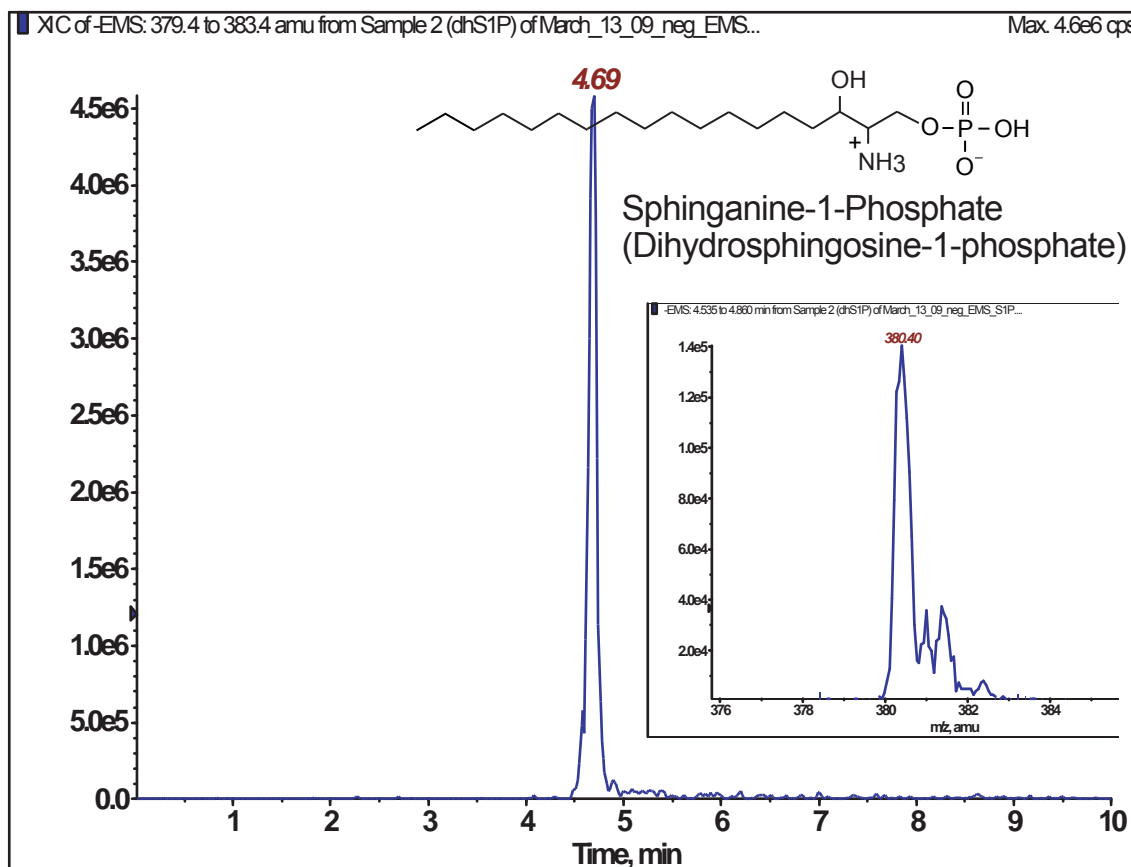
Cadenza CW-C18

150 x 2 mm

Application

LC-MS/MS Application for Sphingolipids (Sphinganine-1-PO₄)

スフィンゴ脂質(スフィンガニン-1-リン酸)のLC-MS/MS分析



Cadenza CW-C18, 150 x 2 mm

A: [water / HCOOH (100:0.2 v/v)] containing 7mM ammonium formate

B: [methanol / HCOOH (100:0.2 v/v)] containing 5mM ammonium formate

70-90%B (0-1min), 90%B (1-1.5min), 90-100%B (1.5-2.5min),

100%B (2.5-6min), 100-40%B (6-6.5min), 40%B (6.5-10min)

0.2mL/min - 0.28mL/min (0-6min), 0.2mL/min (6-10min)

48deg.C, 5uL (50ug / mL)

Applied Biosystems QTrap, ESI Negative

Courtesy of Jennifer Ro and Joe Williams
Department of Evolution, Ecology, and Organismal Biology, Ohio State University - USA

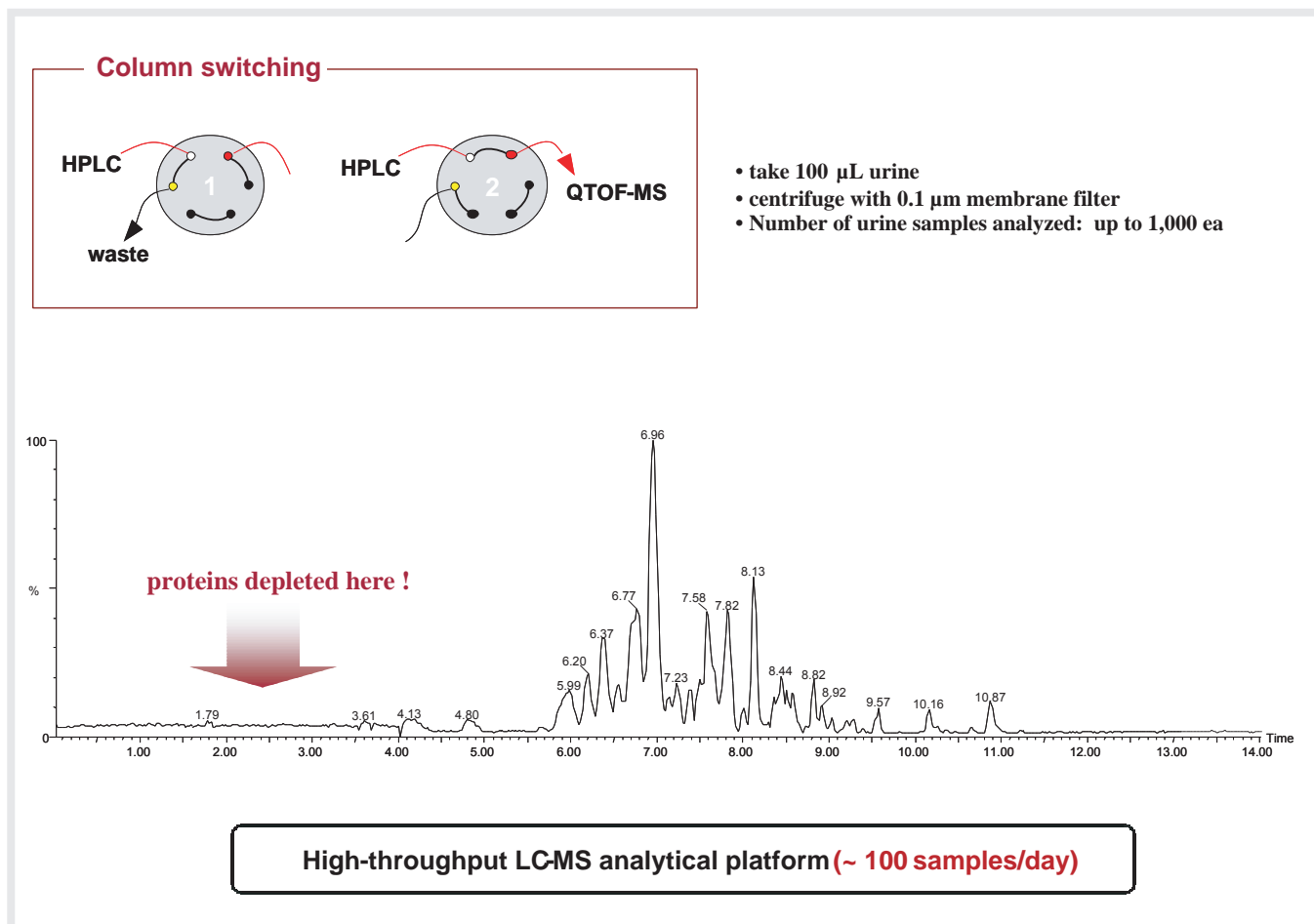
Cadenza HS-C18

100 x 2 mm

Application

LC-Q-TOF-MS application for high-throughput non-targeted metabolomics with a hybrid ODS column

ハイブリッドODSカラムを用いたLC-Q-TOF-MSによるノンターゲット・メタボロミクス



Cadenza HS-C18, 100 x 2 mm

A: 0.1% formic acid in 5% acetonitrile

B: 0.1% formic acid in 95% acetonitrile

10%B (0-3min), 10-90%B (3-12min), 90-10%B (12-14min)

0.32mL/min, 40deg.C, 5-10uL

Q-TOF-MS, Switching time: 3min

Ref) KISToday, Vol.2, No.1, 15-17, January 2009

Courtesy of Man-Ho Choi, Ph.D.
Life Sciences Division, Korea Institute of Science and Technology

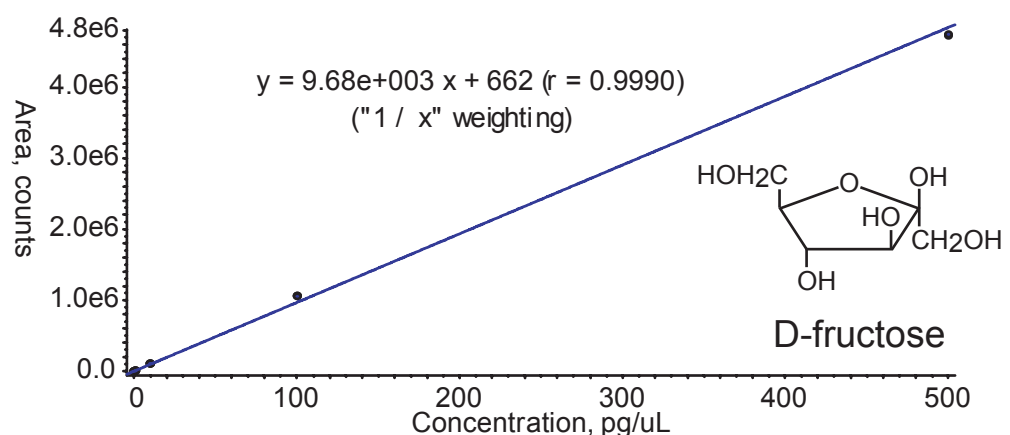
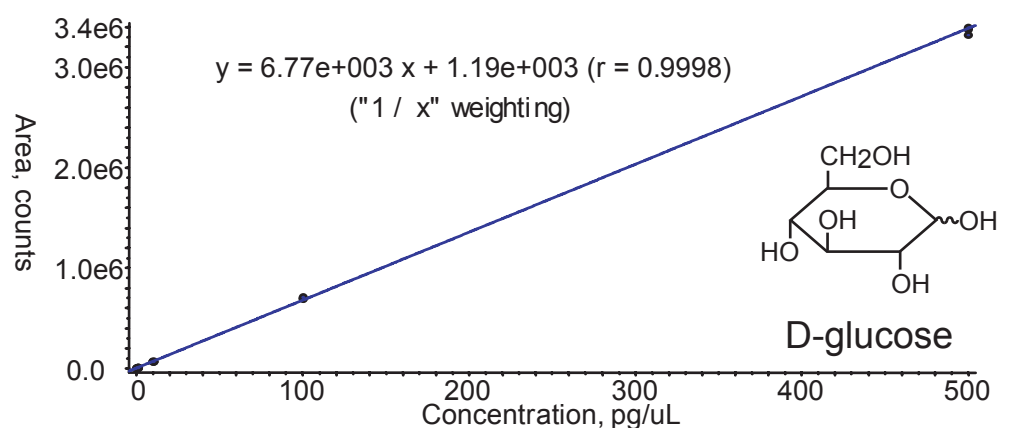
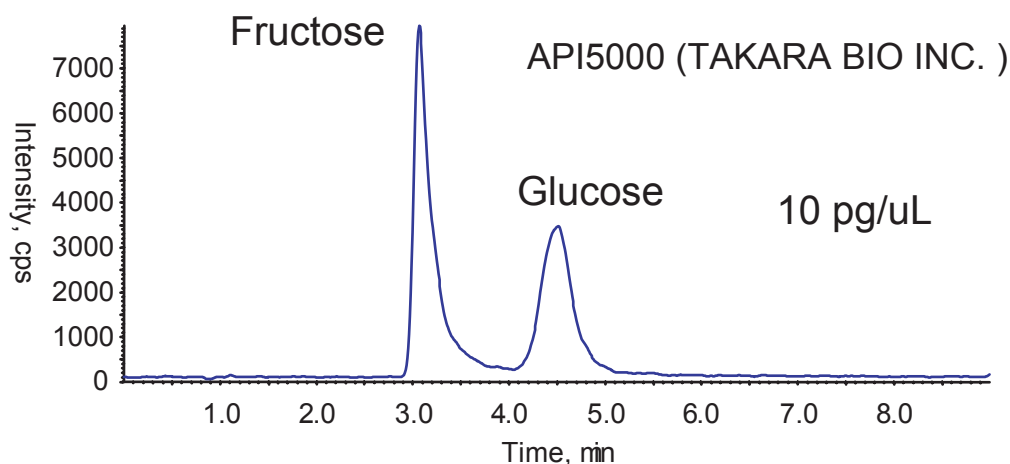
Unison UK-Amino

150 x 2 mm

Application

LC-MS/MS application for saccharides

LC-MS/MSアプリケーション(糖類)



Unison UK-Amino, 150 x 2 mm
acetonitrile / water = 90 / 10, 0.4 mL/min, 10 uL
API5000: ESI, MRM Negative, Q1/Q3=179.0 / 89.0

Courtesy of TAKARA BIO INC., Japan

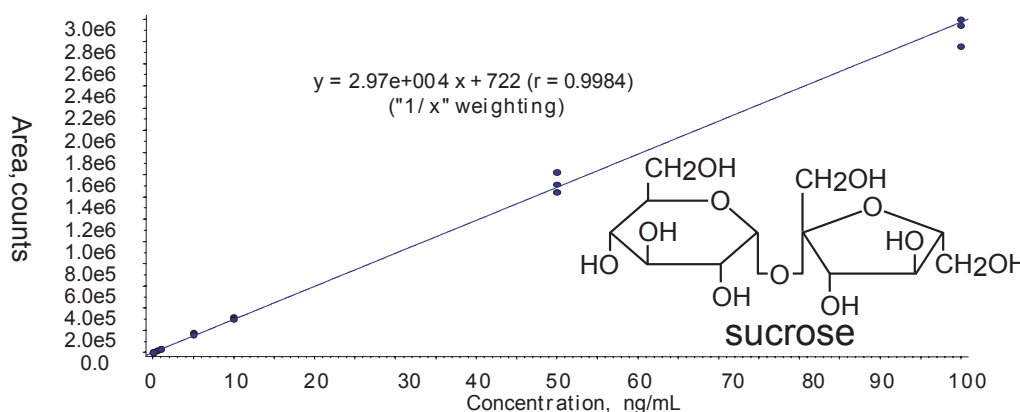
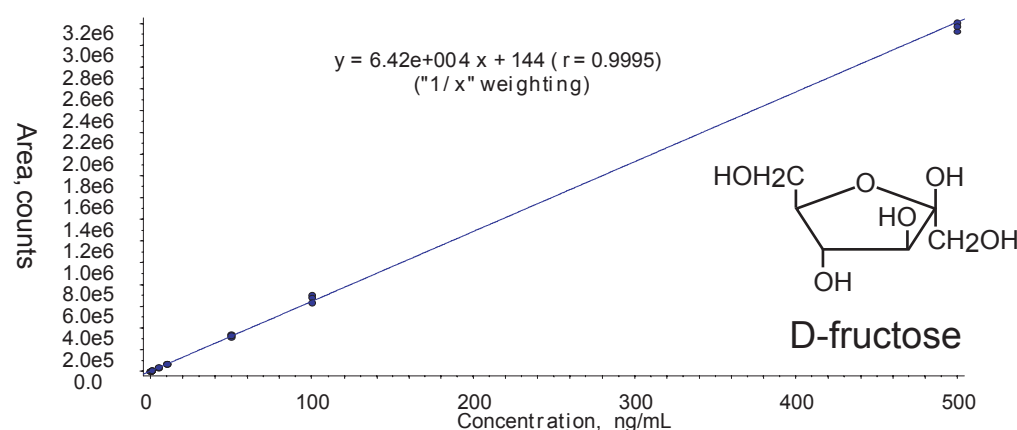
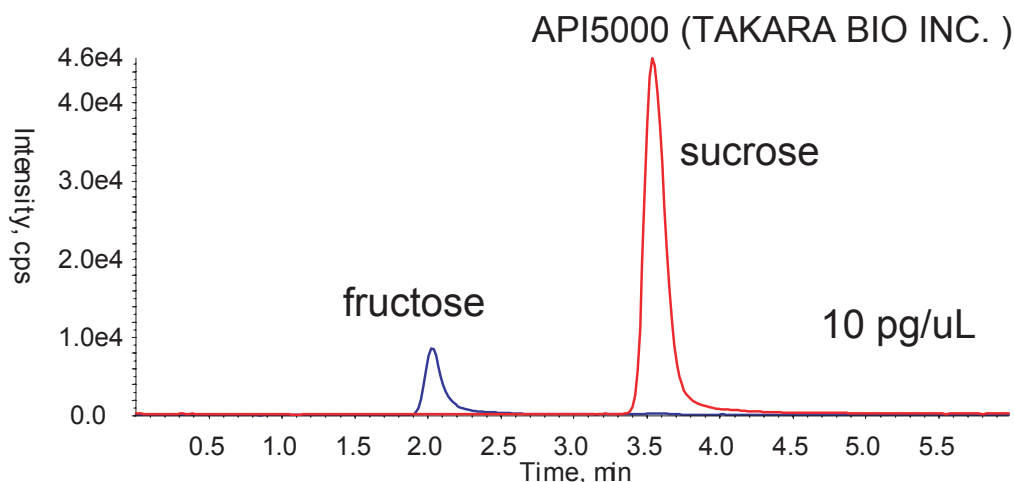
Unison UK-Amino

150 x 2 mm

Application

LC-MS/MS application for saccharides

LC-MS/MSアプリケーション(糖類)



Unison UK-Amino, 150 x 2 mm
 acetonitrile / water = 83 / 17, 0.4 mL/min, 10 uL
 API5000: ESI, MRM Negative
 Q1/Q3:
 fructose 179.0 / 89.0, sucrose 341.2 / 89.0

Courtesy of TAKARA BIO INC., Japan

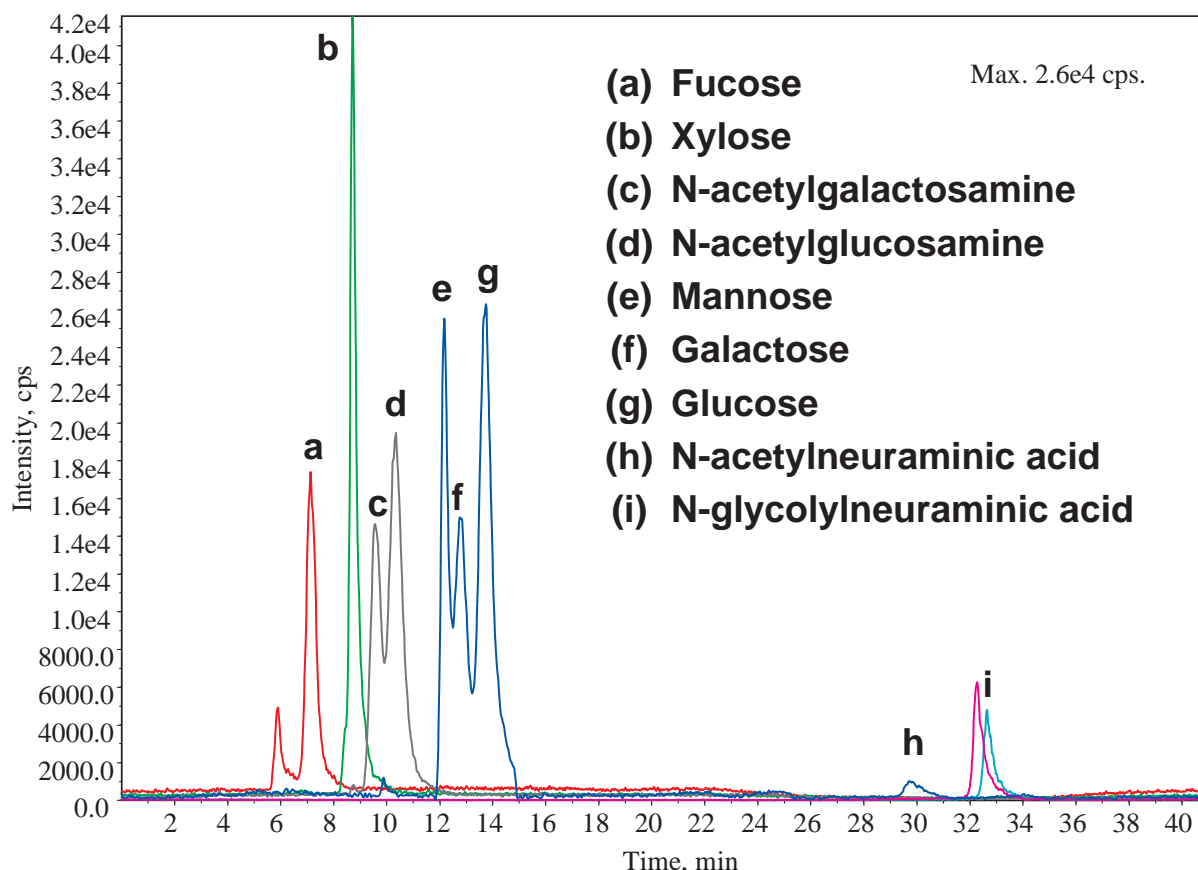
Unison UK-Amino

250 x 2 mm

Application

LC-MS(MRM) Application For Monosaccharides

LC-MSアプリケーション (単糖)



Unison UK-Amino, 250 x 2 mm

A: [0.01% w/w ammonium acetate in water]

B: [100 % acetonitrile]

91-89 %B (0 - 3.01 min), 89 %B (3.01 - 17 min), 89-30 % B (17 - 26 min),

30 %B (26 - 30 min), 91 %B (30 - 40 min)

178 µL/min

55 deg.C, 1 µL (100 pg / µL in 91 %B)

Applied Biosystems QTrap 4000; ESI Negative;

[M+CH₃CO₂]⁻ precursor to [M-H]⁻ product for (a-g);

and [M-H]⁻ parent to m/z 87 and 116 for h and i, respectively

Ref) Rapid Communications in Mass Spectrometry Vol 24 Issue 11 (June 2010) 1565 - 1574

Courtesy of Loubna Hammad, Dakota Derryberry, Yazen Jmeian, and Yehia Mechref
 METACyt Biochemical Analysis Center, Department of Chemistry,
 Indiana University 800 E. Kirkwood Ave, Bloomington, Indiana 47405 USA

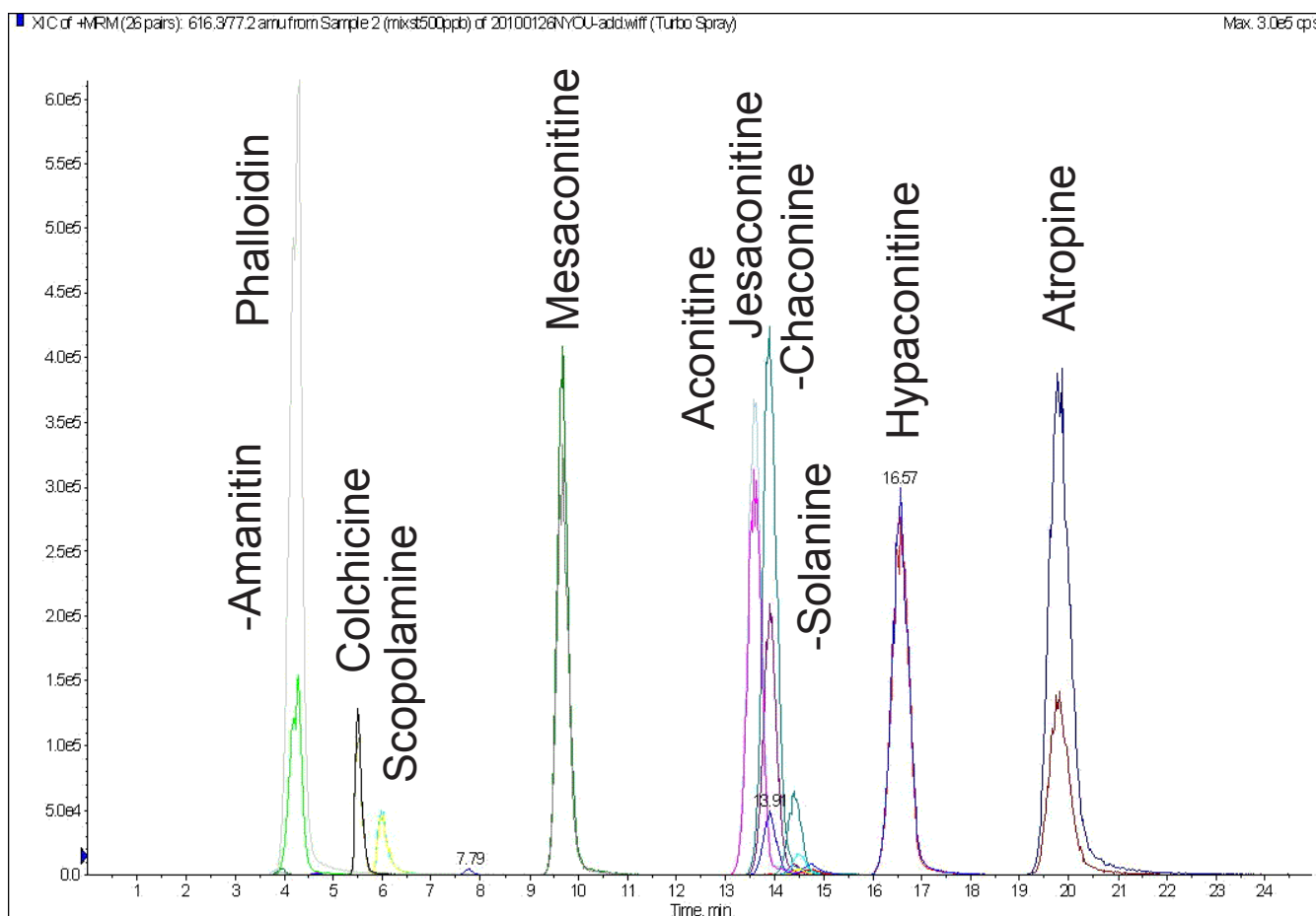
Scherzo SM-C18

150 x 2 mm

Application

LC-MS/MS Application:
Simultaneous determination of phytotoxins in urine

LC-MS/MSによる尿中植物性自然毒一斉分析



Scherzo SM-C18, 150 x 2 mm
10mM ammonium formate / methanol = 10 / 90
0.2 mL/min, 40 deg.C, 10uL
ESI-MS (MRM, positive)

Ref.)

Simultaneous Determination of phytotoxins in urine with LC/MS/MS

Kouji Tachino, Michiko Fujiwara, Izumi Miura

山口県環境保健センター所報 (ISSN 1882-4536), 第52号 (2010)

Courtesy of TACHINO Kouji, Yamaguchi Prefectural Institute of Public Health and Environment, JAPAN

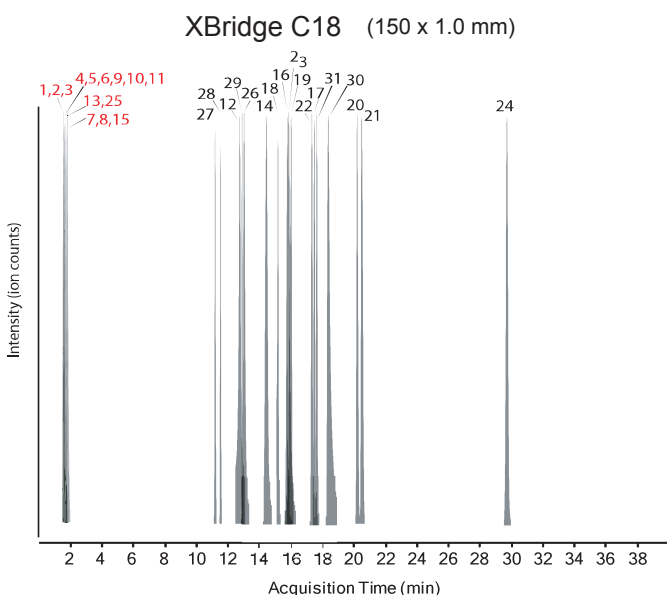
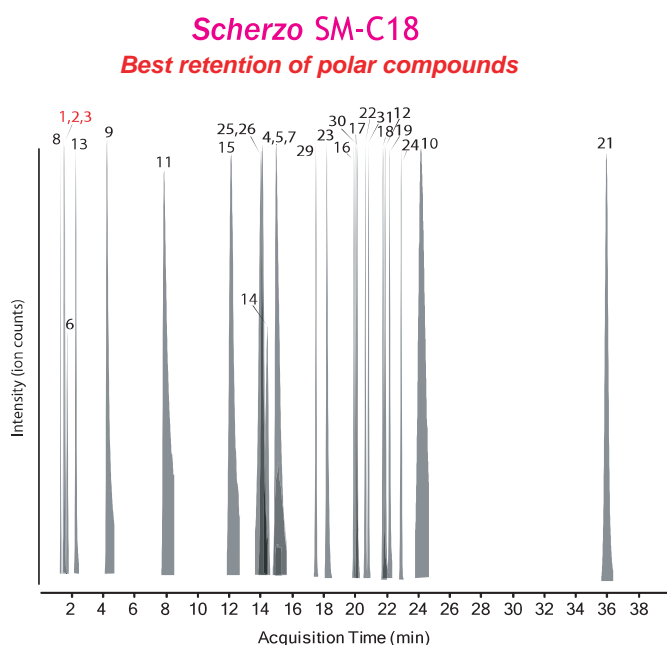
Scherzo SM-C18

150 x 2 mm

Application

Exploring different C18 stationary phases for metabolite profiling

代謝産物プロファイリングに関するC18カラム比較



1. alanine
2. *N,N*-dimethylglycine
3. serine
4. fumaric acid
5. succinic acid
6. cysteine
7. oxaloacetic acid
8. Gly-Gly
9. malic acid
10. alpha-ketoglutarate
11. citric acid
12. 2-methylhippuric acid
13. gamma-D-glutamylglycine
14. salbutomal
15. AMP
16. ribo-avin
17. Phe-Gly-Phe-Gly
18. *s*-(*p*-nitrobenzyl)glutathione
19. *s*-(*p*-azidophenacyl)glutathione
20. Taurocholic acid
21. *O*-beta-D-glucuronosyl-naphthol AS-BI
22. Leucine enkephalin
23. Arg-Pro-Pro-Gly-Phe
(Bradykinin fragment 1-5)
24. Reserpine
25. GSSG
26. Arg-Lys-Asp-Val-Tyr
(Thymopoietin II fragment 32-36)
27. Coenzyme A
28. Acetyl CoA
29. Ala-Ser-Thr-Thr-Thr-Asn-Tyr-Thr (peptide T)
30. Arg-Pro-ProGly-Phe-Ser-Pro-Phe
(bradykinin fragment 1-8)
31. Tyr-Tyr-Tyr-Tyr-Tyr

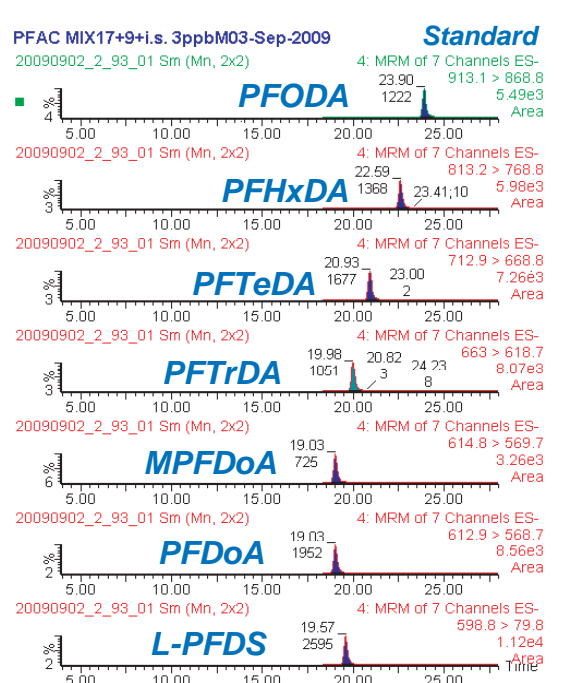
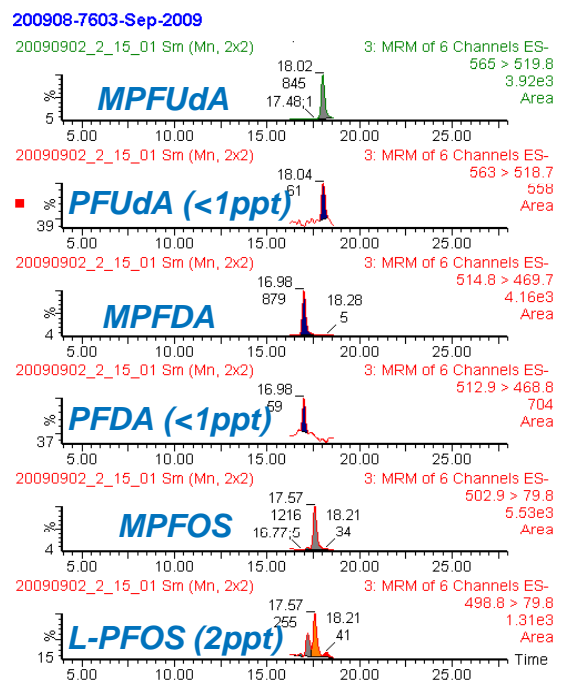
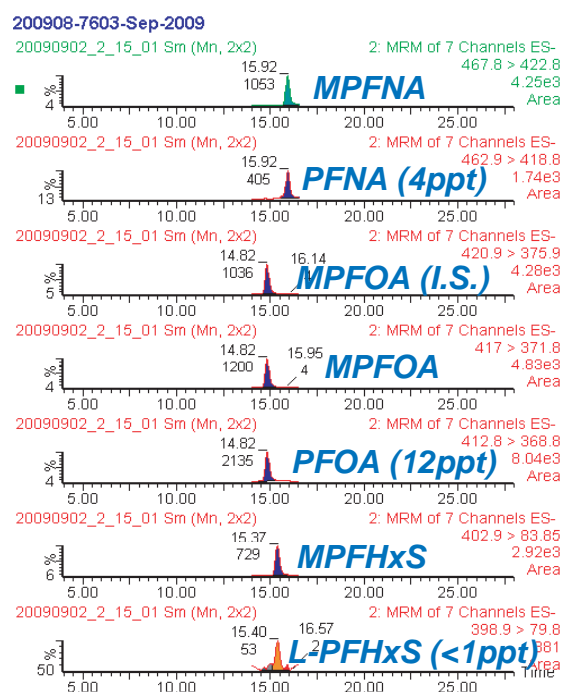
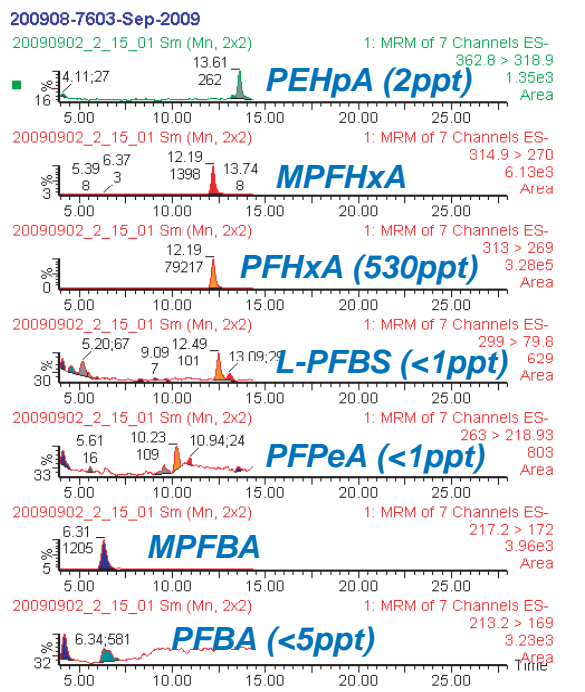
Scherzo SM-C18, 150 x 2 mm
 A: 0.1% formic acid in water
 B: 0.1% formic acid in acetonitrile
 The linear gradient elution used started at 100% A (time 0-5 min) and finished at 100% B (35-40 min).
 250 uL/min, room temp.
 ESI-MS in positive and negative ionization mode

Ref.) Expanding Coverage of the Metabolome for Global Metabolite Profiling
 Oscar Yanes, Ralf Tautenhahn, Gary J. Patti, and Gary Siuzdak
 Analytical Chemistry, 2011, 83(6), pp 2152-2161

Courtesy of Oscar Yanes, Ph.D.
 Metabolomics Platform of the Spanish Biomedical Research Centre
 in Diabetes and Associated Metabolic Disorders (CIBERDEM),
 University Rovira i Virgili, SPAIN

LC-MS/MS analysis of perfluorinated organic compounds (PFCs) in seawater

海水中の有機フッ素化合物(PFCs)のLC-MS/MS分析



Unison UK-C18, 250 x 2 mm
 A: 10mM ammonium acetate, B: acetonitrile
 20-95%B (0-20min), 95%B (20-28min), 20%B (28-38min)
 0.2 mL/min (14.2MPa), 40°C
 10uL (<1 - 530ppt in seawater, 1ppb in surrogate or standard solution)
 ESI-MS/MS, negative

Courtesy of YAGI Masahiro, Kobe Institute of Health, JAPAN

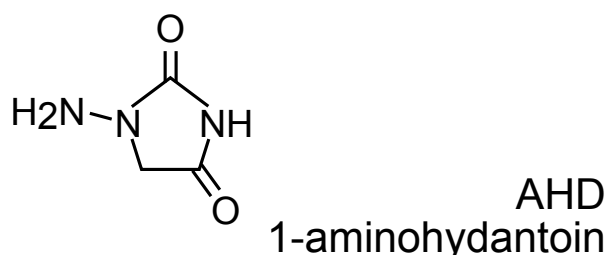
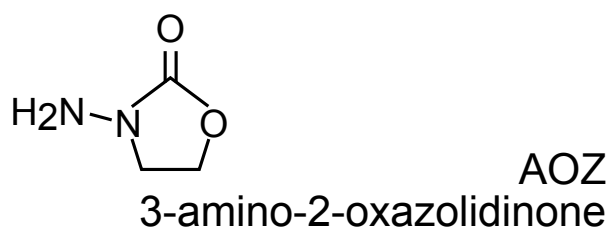
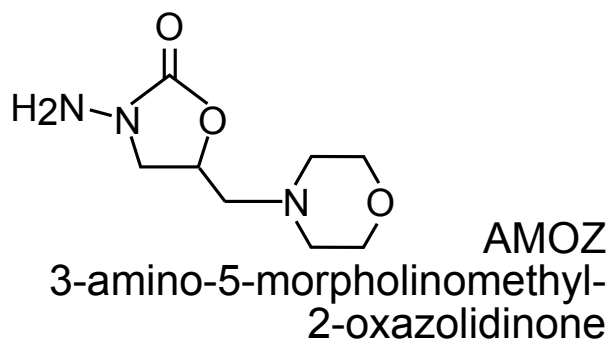
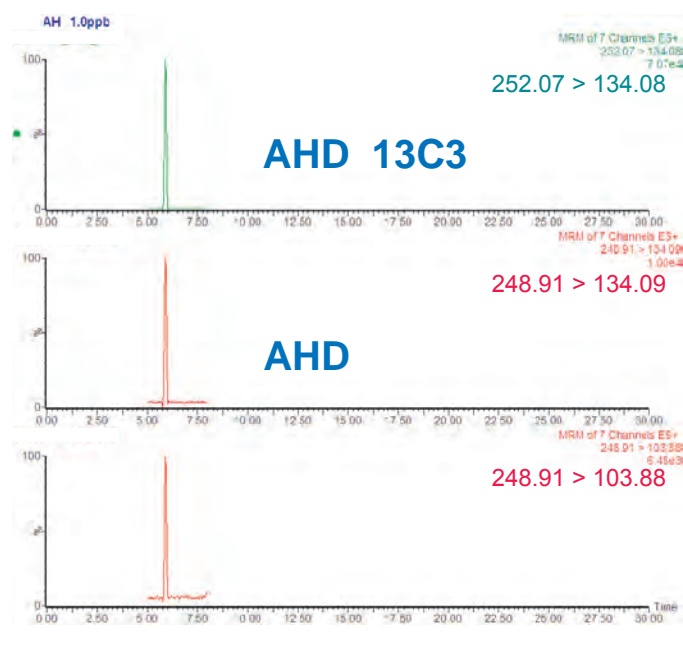
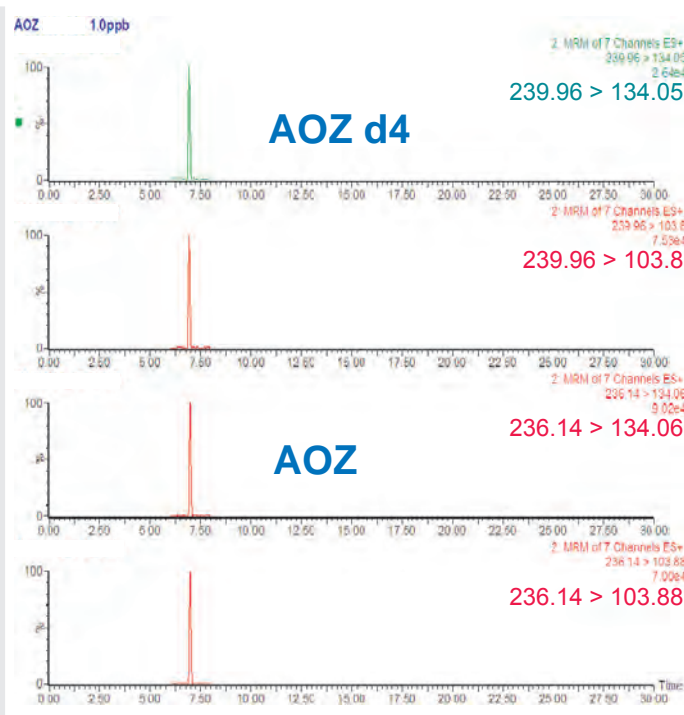
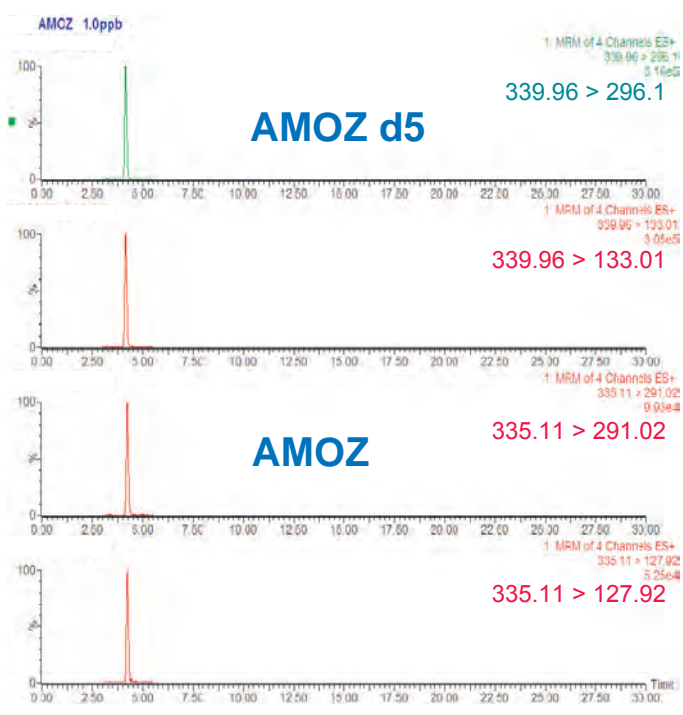
Cadenza CD-C18

150 x 2 mm

Application

LC-MS/MS analysis of nitrofurans metabolites (AOZ, AMOZ, AHD)

ニトロフラン類代謝物 (AOZ, AMOZ, AHD) のLC-MS/MS分析 (告示試験法)



Cadenza CD-C18, 150 x 2 mm
 A: 0.1% AcOH
 B: acetonitrile
 20-80%B (0-15min), Runtime 19min
 0.2 mL/min, 40°C
 5uL (AOZ, AMOZ, AHD 1.0 ppb, IS 5.0ppb)
 ESI, MRM, positive

Courtesy of MAEDA Naoyuki, ASSOCIATION OF MEAT SCIENCE & TECHNOLOGY INSTITUTE, JAPAN

Cadenza CD-C18

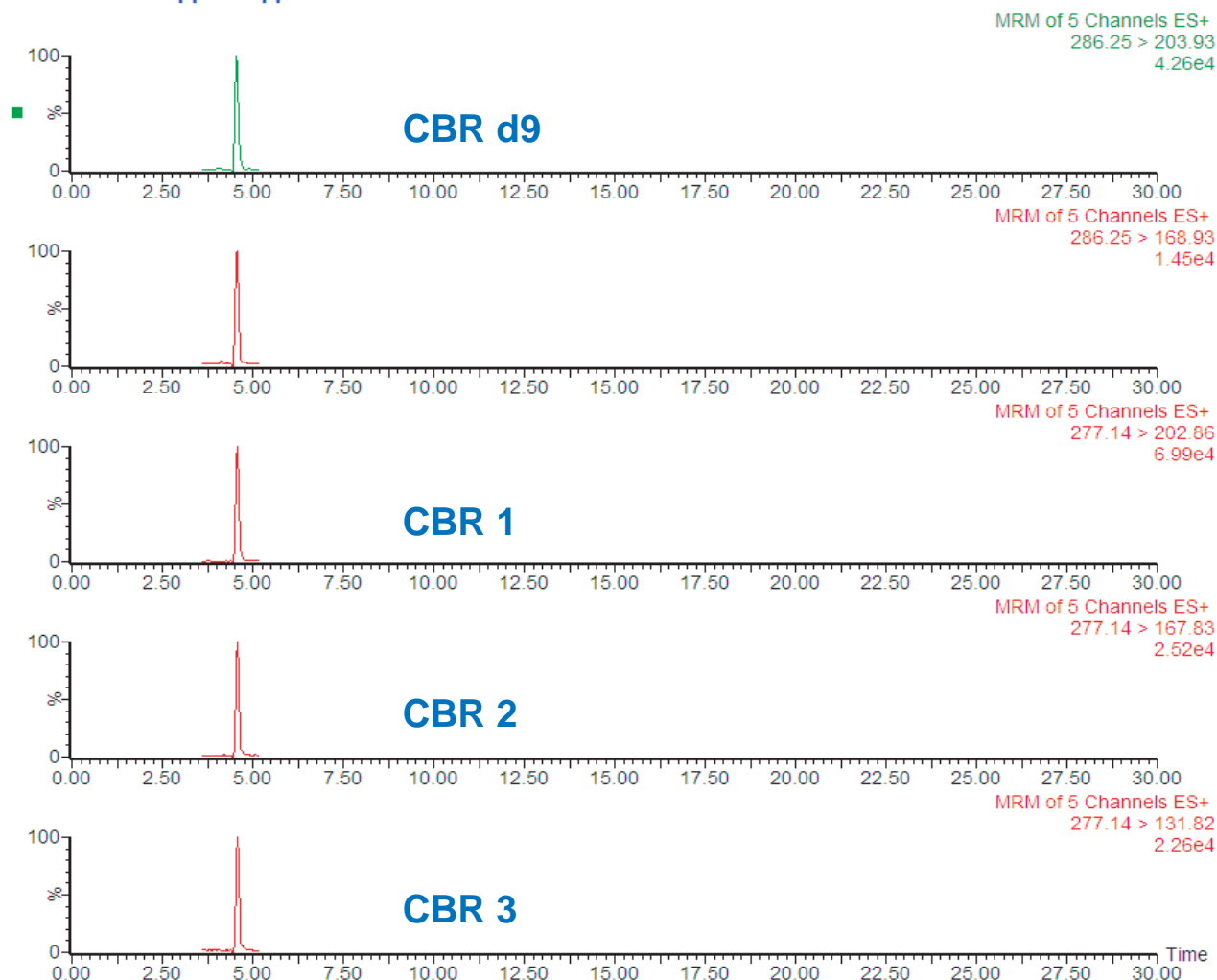
150 x 2 mm

Application

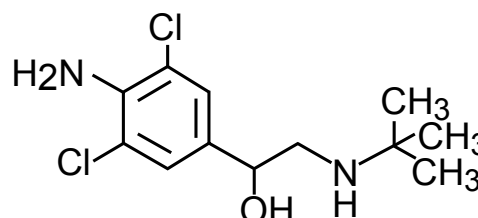
LC-MS/MS analysis of clenbuterol (CBR)

クレンブテロール (CBR) のLC-MS/MS分析(告示試験法)

CBR CBRd9 0.5ppb 0.5ppb STD imtakt



Cadenza CD-C18, 150 x 2 mm
 A: 0.1% formic acid in water
 B: 0.1% formic acid in acetonitrile
 5-95%B (0-7min), 95%B (7-10min)
 Runtime 15min
 0.2 mL/min, 40°C
 5uL (CBR 0.5ppb, IS 0.5ppb)
 ESI, MRM, positive



clenbuterol (CBR)

Courtesy of MAEDA Naoyuki, ASSOCIATION OF MEAT SCIENCE & TECHNOLOGY INSTITUTE, JAPAN

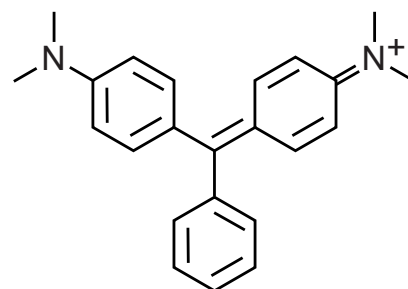
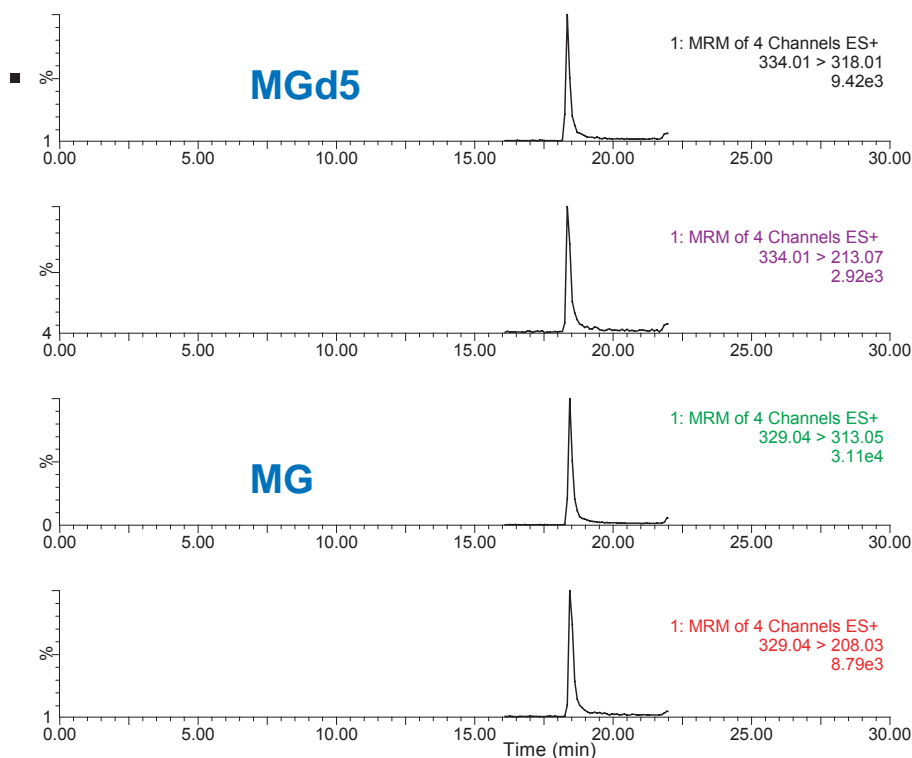
Cadenza CD-C18

150 x 2 mm

Application

LC-MS/MS analysis of [leuco]malachite green (MG, LMG)

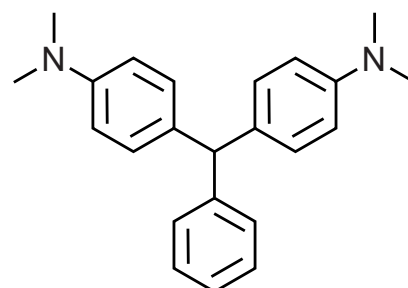
マラカイトグリーン (MG) ロイコマラカイトグリーン (LMG) のLC-MS/MS分析 (告示試験法)



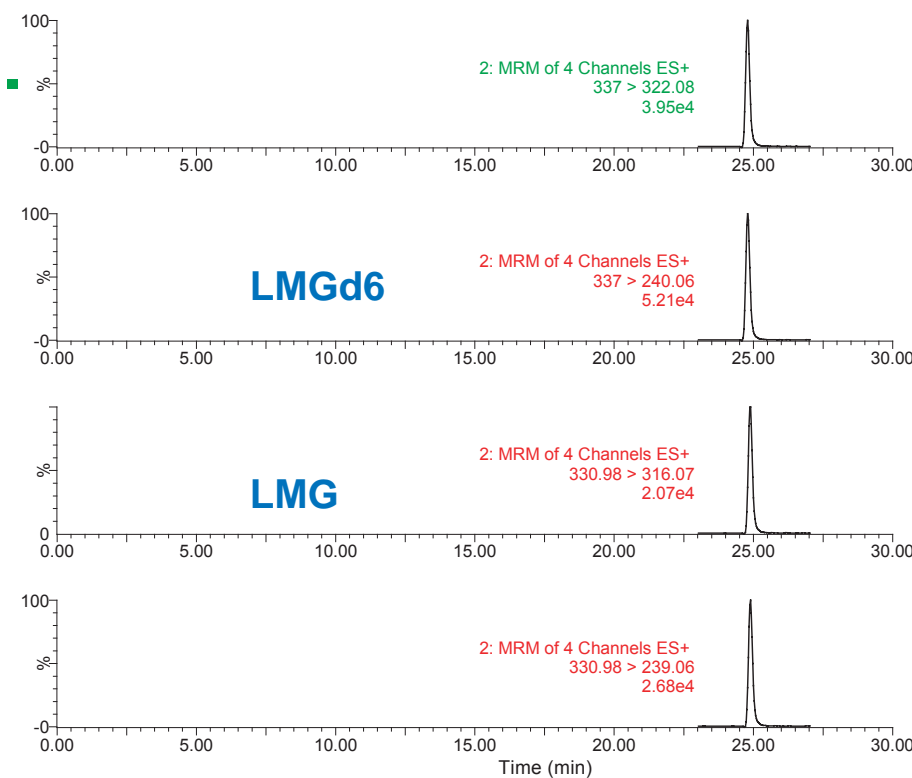
malachite green (MG)

Cadenza CD-C18
150 x 2 mm
A: 10mM HCOONH4 / ACN
= 90 / 10

B: acetonitrile
0-100%B (0-20min)
100%B (20-30min)
Runtime 40min
0.2 mL/min, 40°C
5uL
(MG, LMG 10ppb, IS 25ppb)
ESI, MRM, positive



leucomalachite green (LMG)



Courtesy of MAEDA Naoyuki, ASSOCIATION OF MEAT SCIENCE & TECHNOLOGY INSTITUTE, JAPAN

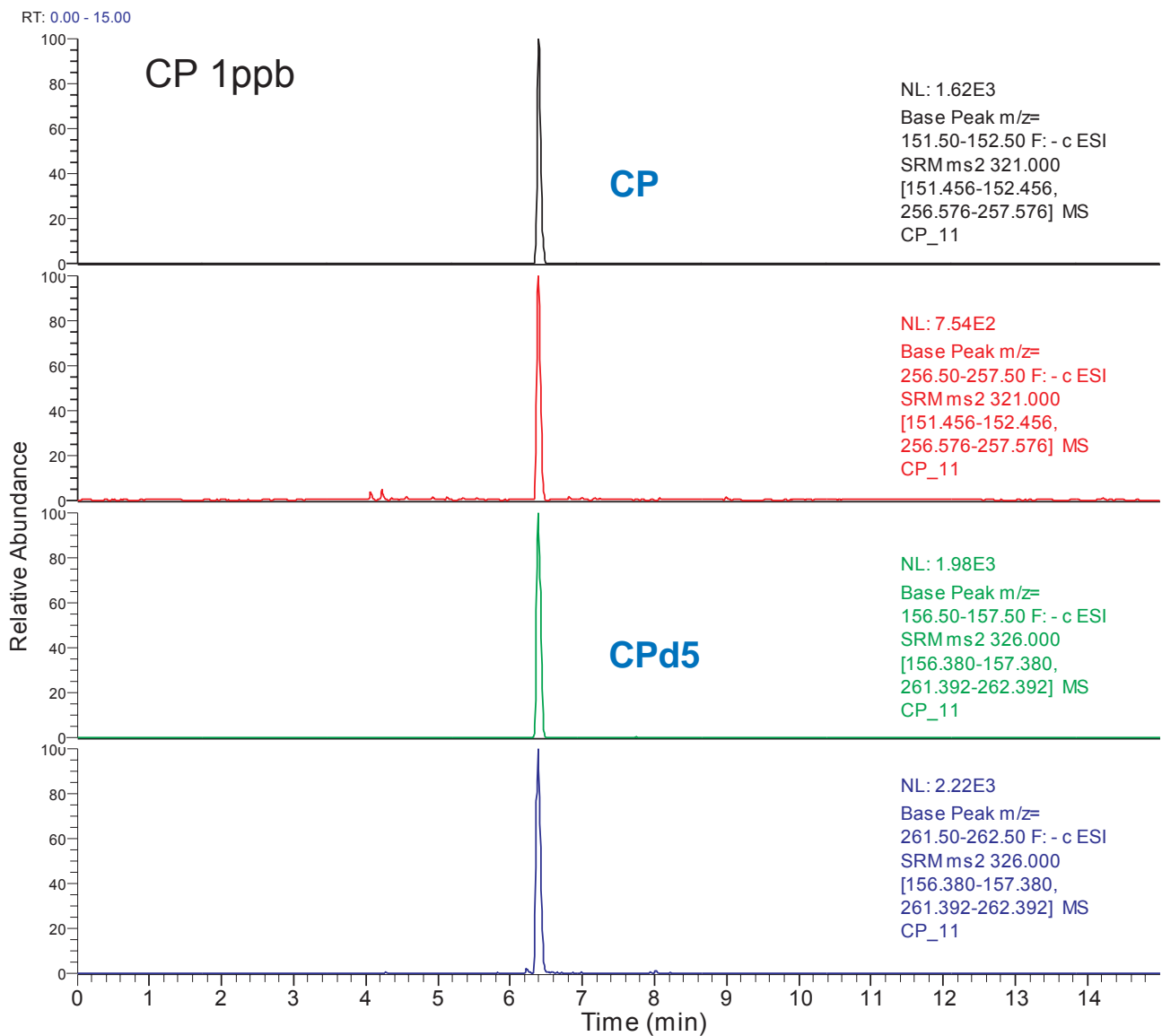
Cadenza CD-C18

150 x 2 mm

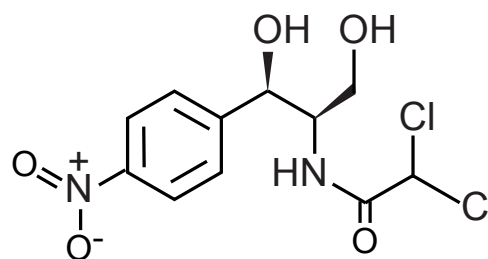
Application

LC-MS/MS analysis of chloramphenicol (CP)

クロラムフェニコール (CP) のLC-MS/MS分析(告示試験法)



Cadenza CD-C18, 150 x 2 mm
10mM HCOONH4 / ACN = 70 / 30
Runtime 15min
0.2 mL/min, 40°C
5uL (CP 1.0ppb, IS 5.0ppb)
ESI, SRM, negative



chloramphenicol (CP)

Courtesy of MAEDA Naoyuki, ASSOCIATION OF MEAT SCIENCE & TECHNOLOGY INSTITUTE, JAPAN

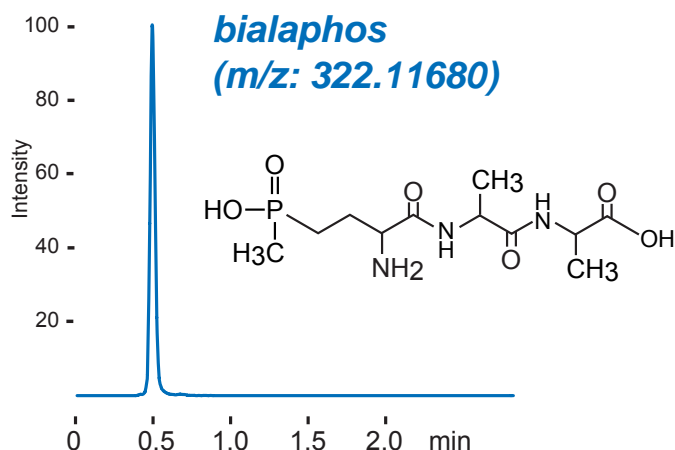
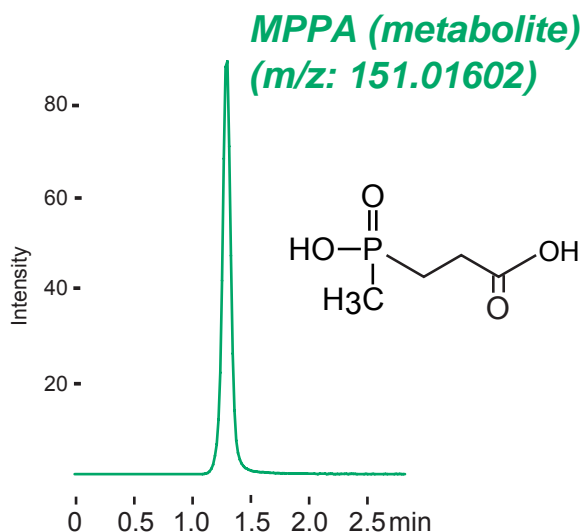
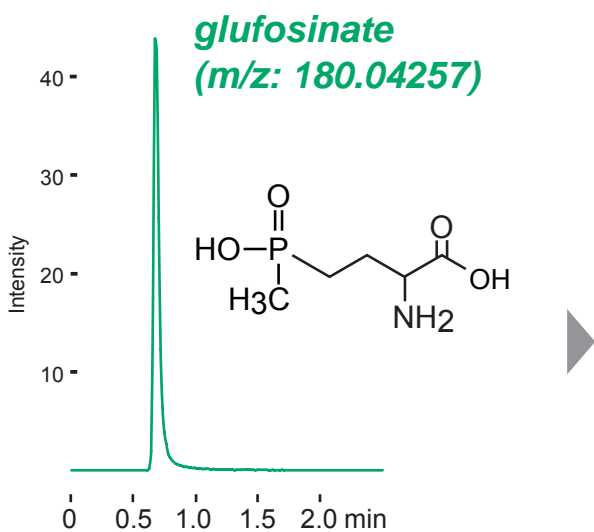
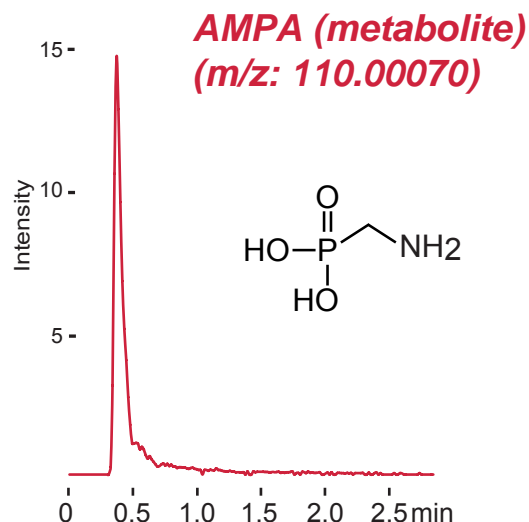
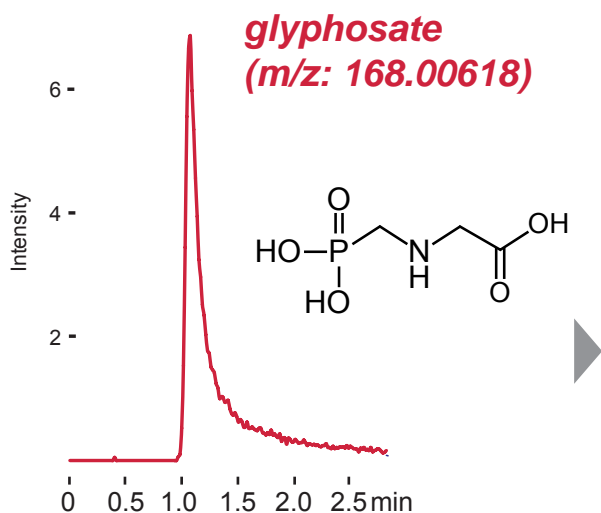
Scherzo SM-C18

30 x 3 mm

Application

LC-MS analysis of phosphorus-containing amino acid type herbicides and their metabolites

含リンアミノ酸系農薬のLC-MS分析



Scherzo SM-C18, 30 x 3 mm
 A: 0.1% HCOOH
 B: acetonitrile
 5 - 30%B (0 - 3 min)
 0.5 mL/min
 10uL (1ug/mL)

ESI (Jet Stream), Q-Tof,
 SIM, negative mode

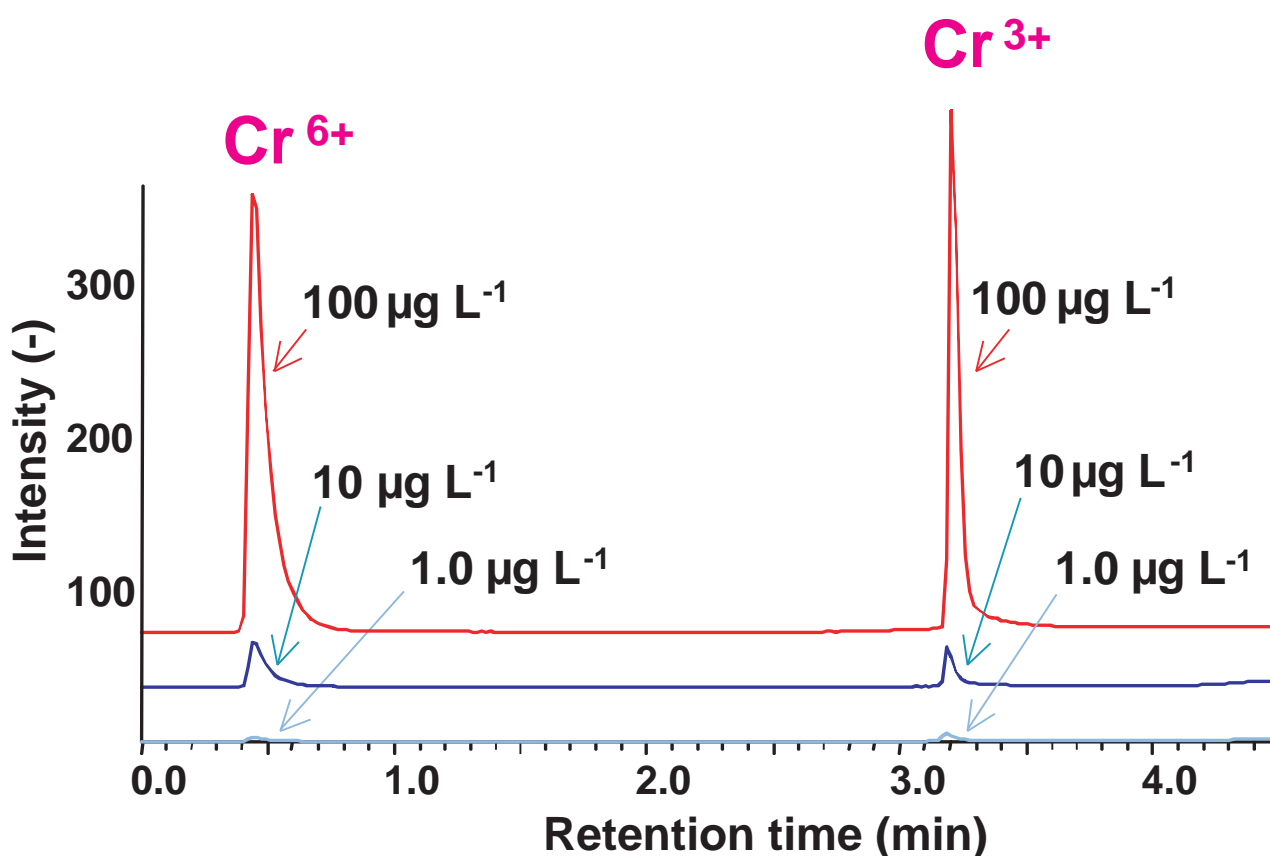
Scherzo SM-C18

50 x 3 mm

Application

LC-ICP-MS analysis of Cr(III) and Cr(VI)

三価クロムと六価クロムのLC-ICP-MS同時分析



Scherzo SM-C18, 50 x 3 mm
 A: phosphoric acid / NaOH (25mM, pH 7)
 B: 100mM phosphoric acid
 0%B (0-1min), 0-100%B (1-4min), 100%B (4-7min)
 1.0 mL/min
 150uL

[ICP-MS]
 ELAN DRC-e (PerkinElmer)
 m/z 52

Cadenza CD-C18 HT

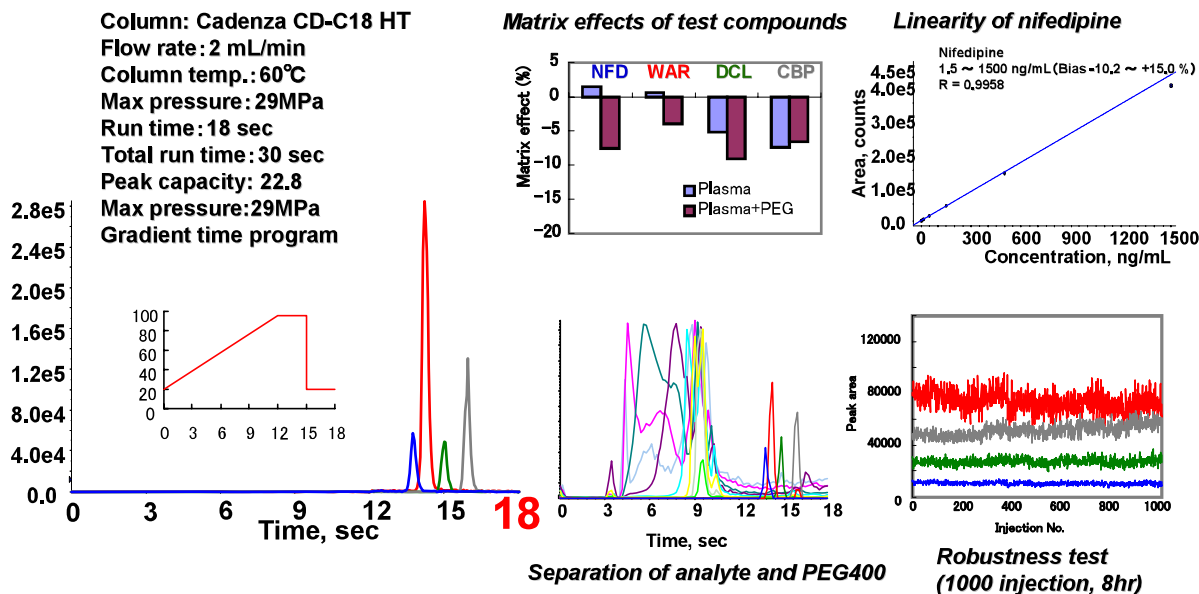
50 x 2 mm

Application

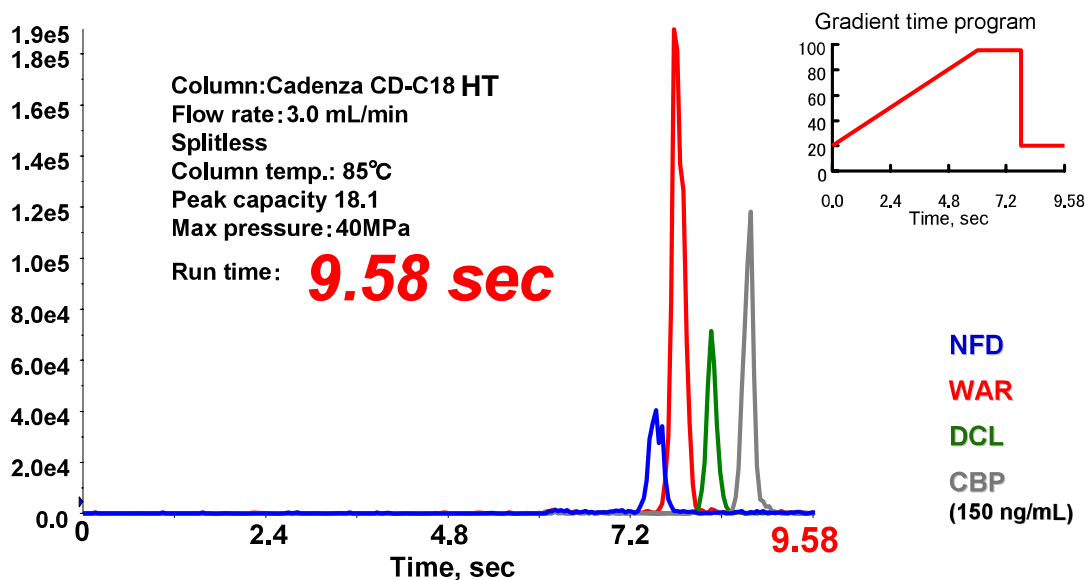
Ultra-high throughput LC-MS/MS analysis of drugs in blood plasma

LC-MS/MSによる血漿中薬物の超高速定量分析

Results of "Ultra-high" throughput analysis (18 sec)



Pushing the envelope of ultra-high throughput analysis!!



Cadenza CD-C18 HT, 50 x 2 mm

A: 0.1% HCOOH in water, B: 0.1% HCOOH in acetonitrile

2µL (20µL plasma + 500µL acetonitrile)

Shimadzu UFLC - AB Sciex API5000 (ESI positive, MRM)

NFD(nifedipine) 347 > 254, WAR(warfarin) 309 > 163,

DCL(diclofenac) 296 > 214, CBP(2-amino-5-chlorobenzophenone) 232 > 126

Courtesy of Dr. IKEHARA Tatsuya, Shionogi Co., Ltd., JAPAN

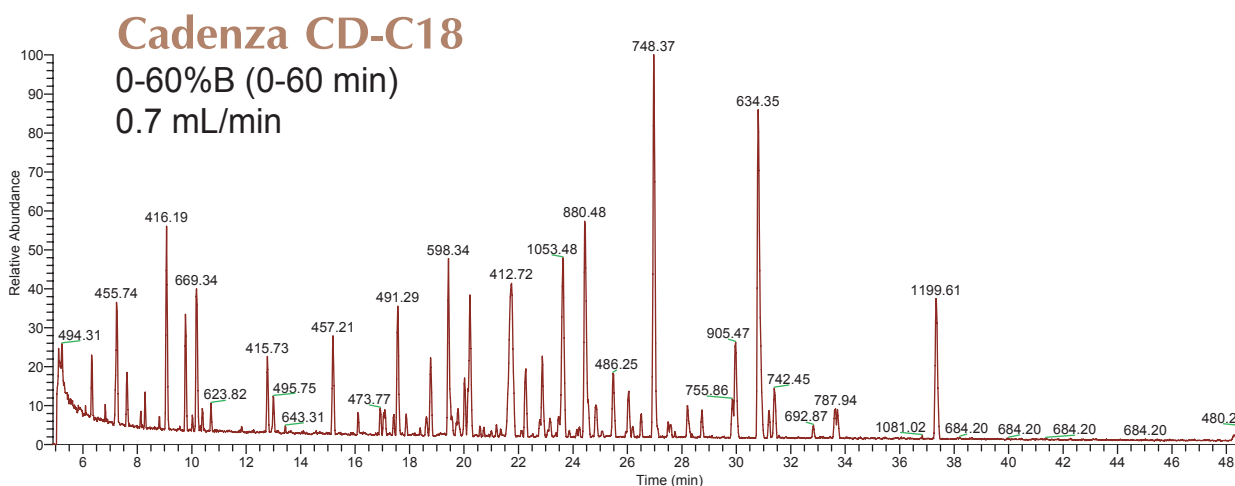
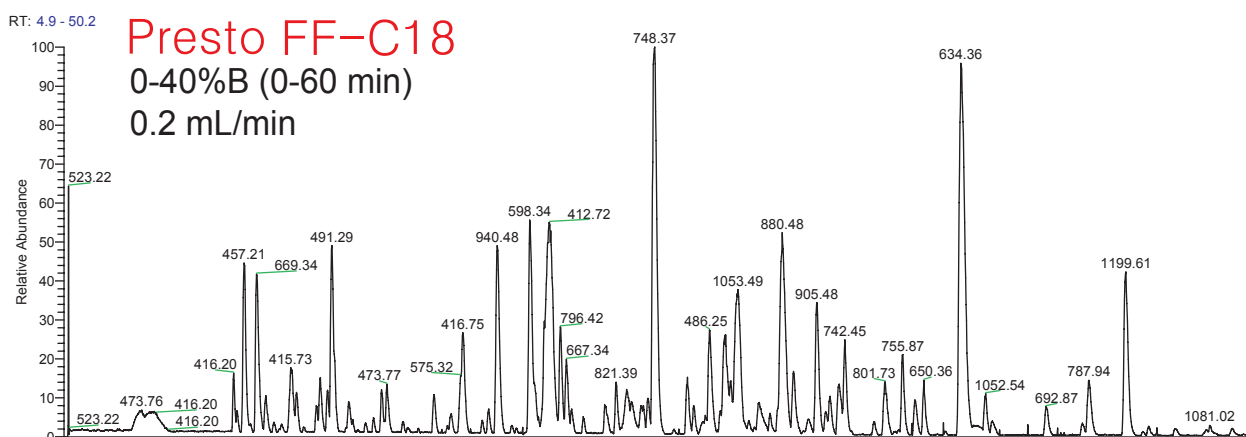
Presto FF-C18
Cadenza CD-C18

150 x 3 mm

Application

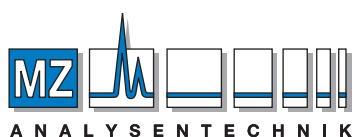
Peptide mapping using LC-FTMS

LC-FTMSによるペプチドマッピング



Presto FF-C18, Cadenza CD-C18, 150 x 3 mm
A: water / formic acid / TFA = 100 / 0.5 / 0.02
B: acetonitrile / formic acid / TFA = 100 / 0.5 / 0.02
50 deg.C, 2uL (tryptic digest of alpha-casein)

FTMS (Thermo Scientific Exactive), ESI-positive (Full ms)



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Courtesy of Dr. KUWATA Keiko, Kyoto University, JAPAN