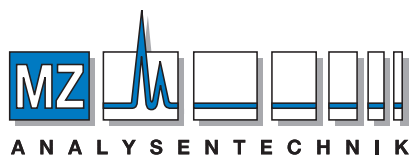




## HPLC TECHNICAL INFORMATION

### Biochemicals and Metabolites



AUTHORIZED DISTRIBUTOR

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

e-mail: [info@mz-at.de](mailto:info@mz-at.de)

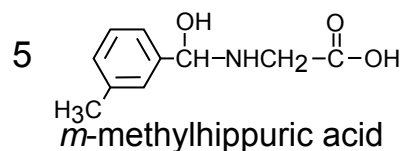
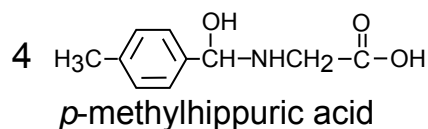
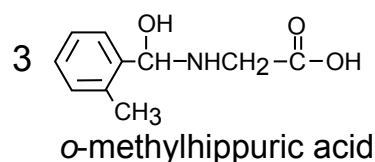
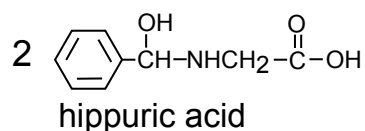
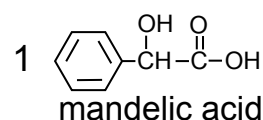
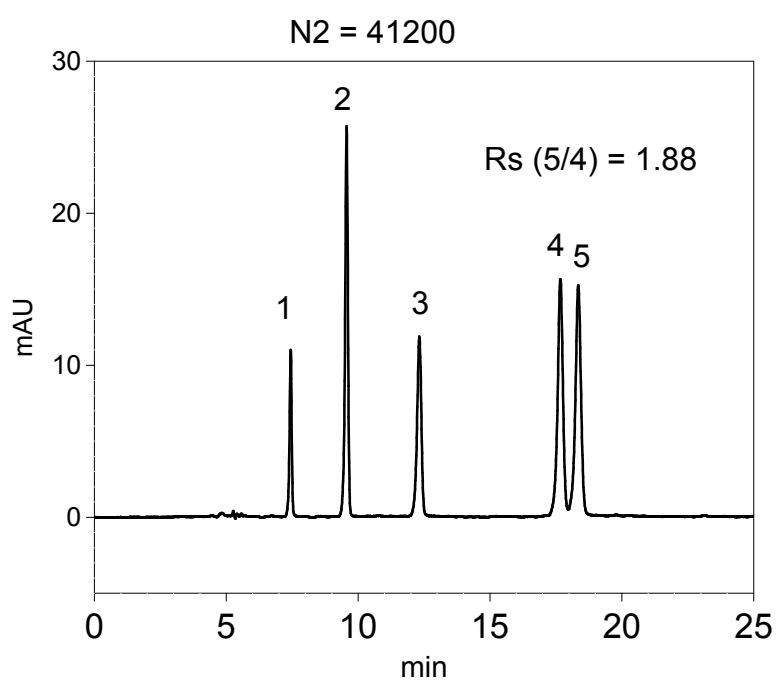
[www.mz-at.de](http://www.mz-at.de)

Cadenza CD-C18

250 x 4.6 mm

Application

## Metabolites of organic solvents



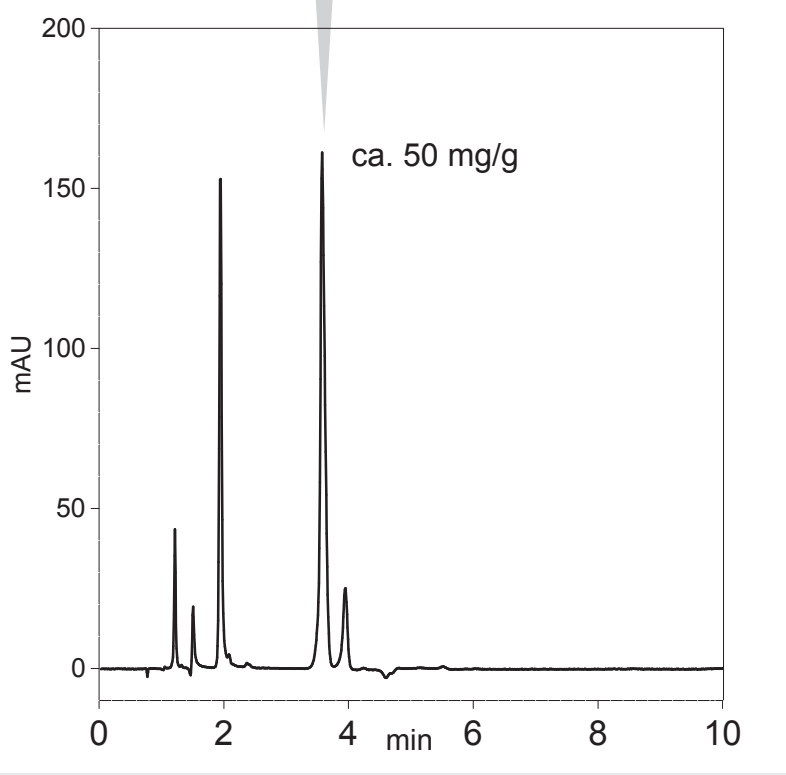
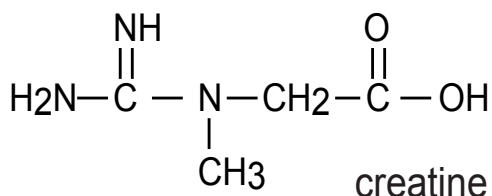
Cadenza CD-C18, 250 x 4.6 mm  
methanol / 20 mM KH<sub>2</sub>PO<sub>4</sub> = 30 / 70  
0.5 mL/min, 30 °C  
UV at 225 nm  
16.2 MPa

Cadenza CD-C18

100 x 4.6 mm

Application

**Creatine in Chewing Gum**



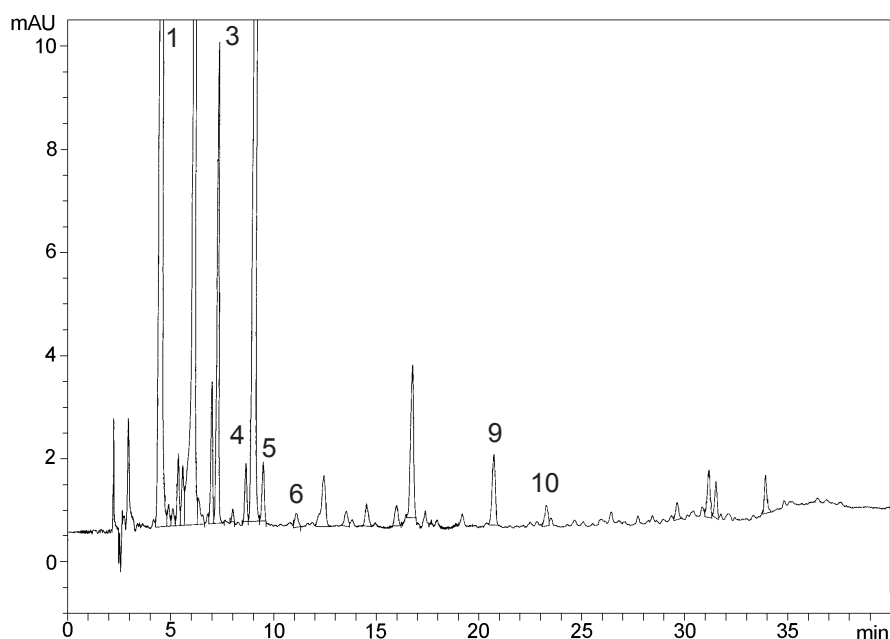
Cadenza CD-C18, 100 x 4.6 mm  
 acetonitrile / water / heptafluorobutyric acid = 5 / 95 / 0.1  
 1.0 mL/min, 37 °C, 8.5 MPa  
 UV at 210 nm

Cadenza CD-C18

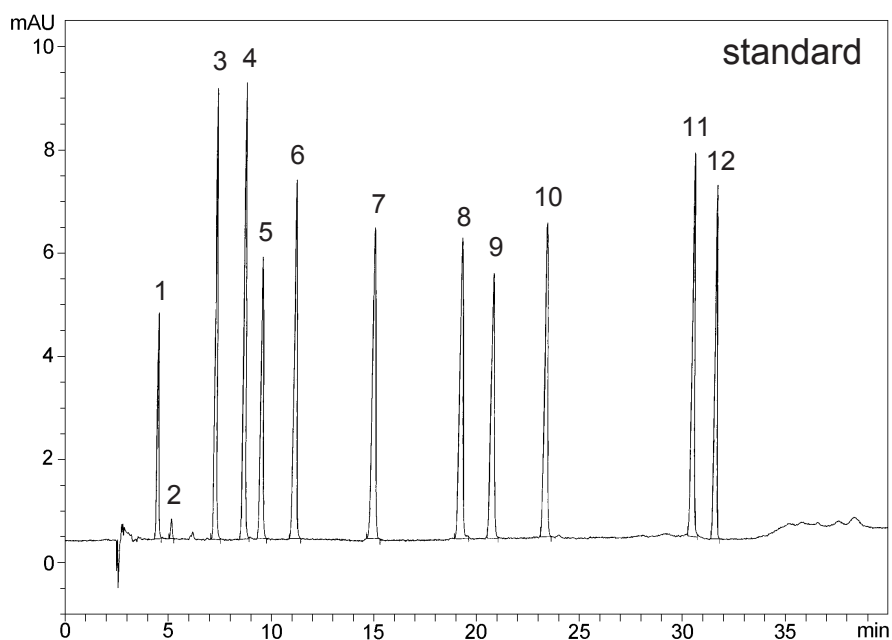
250 x 4.6 mm

Application

## Detection of Aldehydes in The Liver Homogenate of 9 Months-Old Mouse



1. DNPH
2. malondialdehyde-DNP
3. acetaldehyde-DNP
4. Propionaldehyde-DNP
5. acrolein-DNP
6. crotonaldehyde-DNP
7. pentenal-DNP
8. hexanal-DNP
9. hexenal-DNP
10. heptenal-DNP
11. nonanal-DNP
12. nonenal-DNP



Cadenza CD-C18  
 250 x 4.6 mm  
 A : water B : ACN  
 70%B(0-10min)  
 70-88%B(10-25min)  
 88-97%B(25-30min)  
 97-88%B(30-40min)  
 0.8 mL/min, 30 °C  
 UV at 368 nm  
 50pmol, 10 uL inj.

Courtesy of Prof. Dr. Seiichi Matsugo and Fumihiko Yasui, Yamanashi University

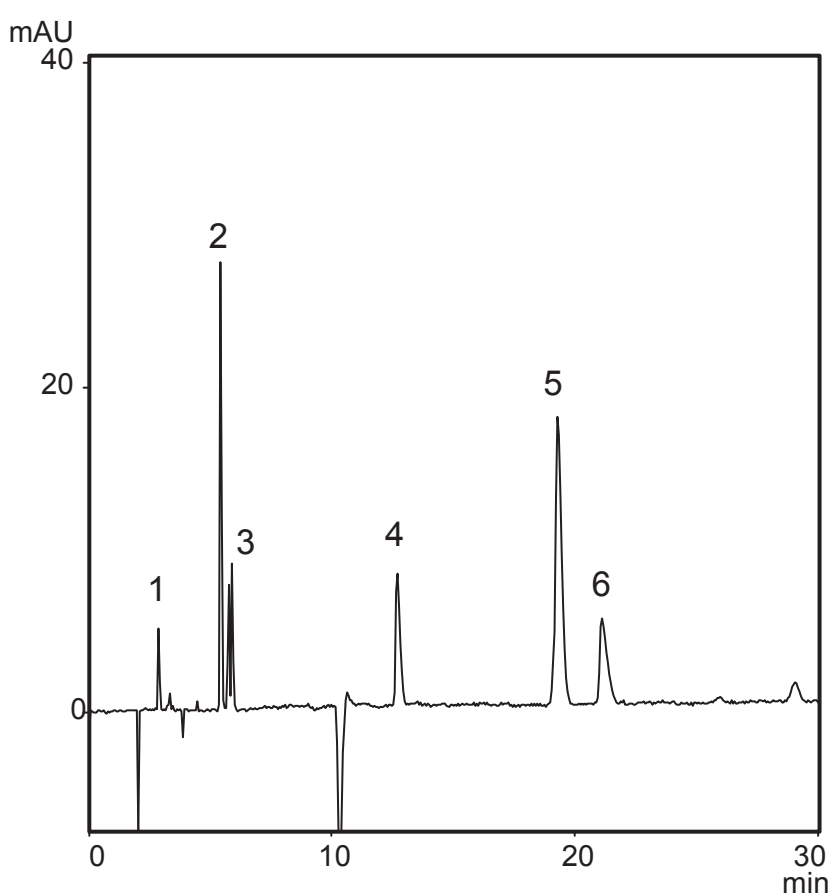
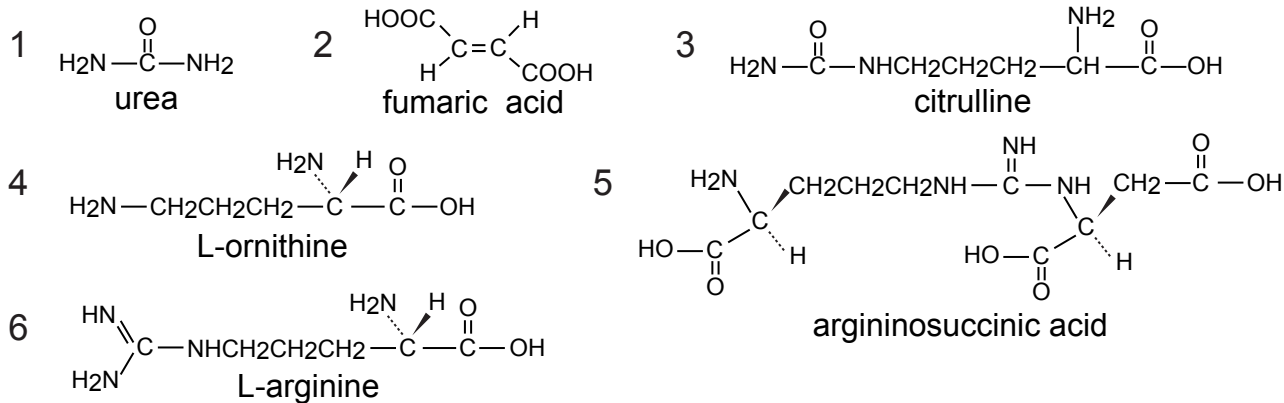
Unison UK-C18

250 x 4.6 mm

Application

### Ornithine Cycle

オルニチン回路



Unison UK-C18, 250 x 4.6 mm  
 water / ACN / HFBA = 95 / 5 / 0.1 □  
 1 mL/min, 37 °C, 15 MPa, 210nm  
 2 μL ( 2 - 40 μg )

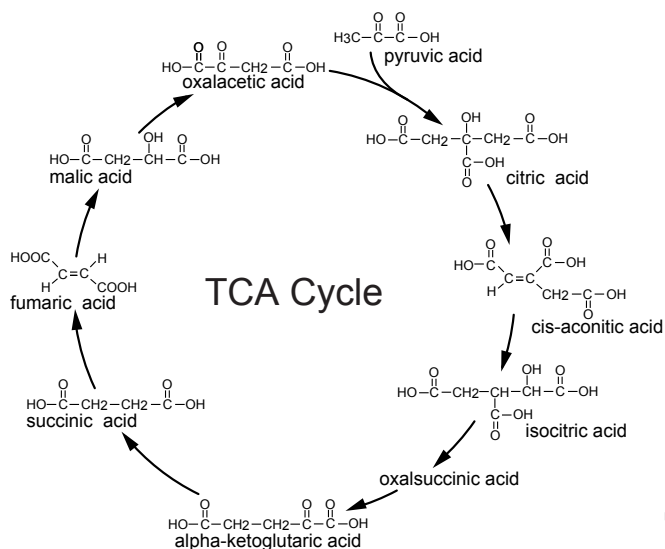
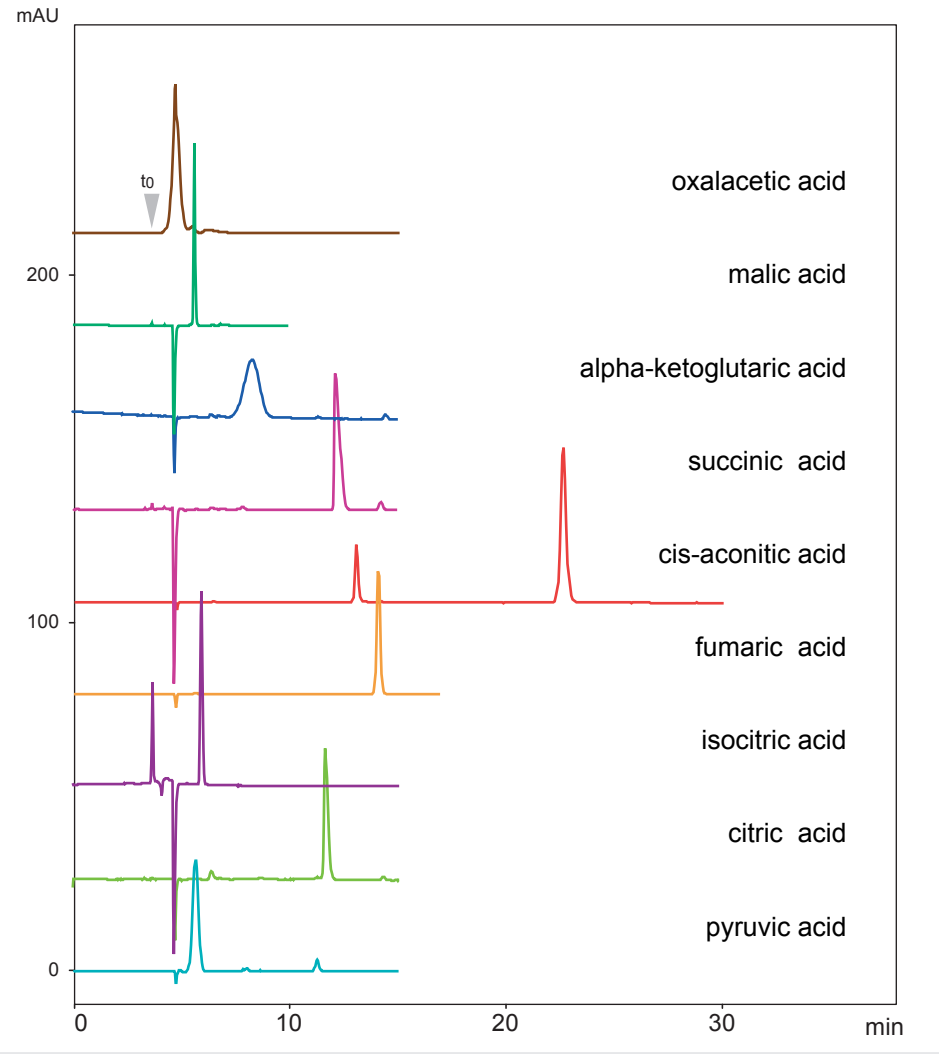
Unison UK-C18

250 x 4.6 mm

Application

TCA Cycle

TCA回路



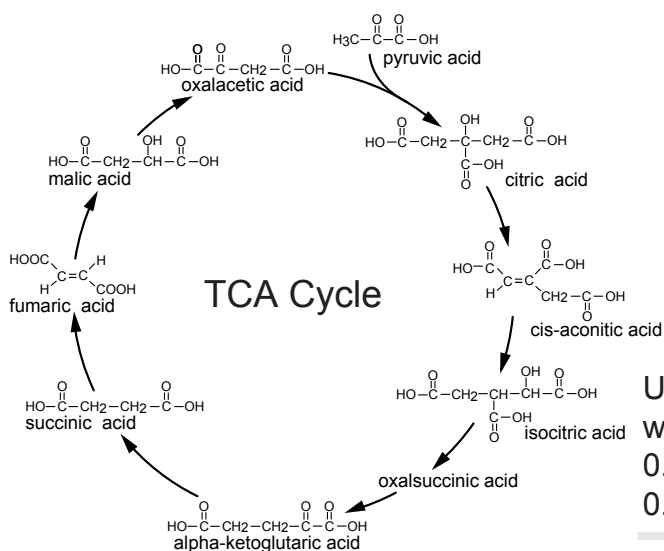
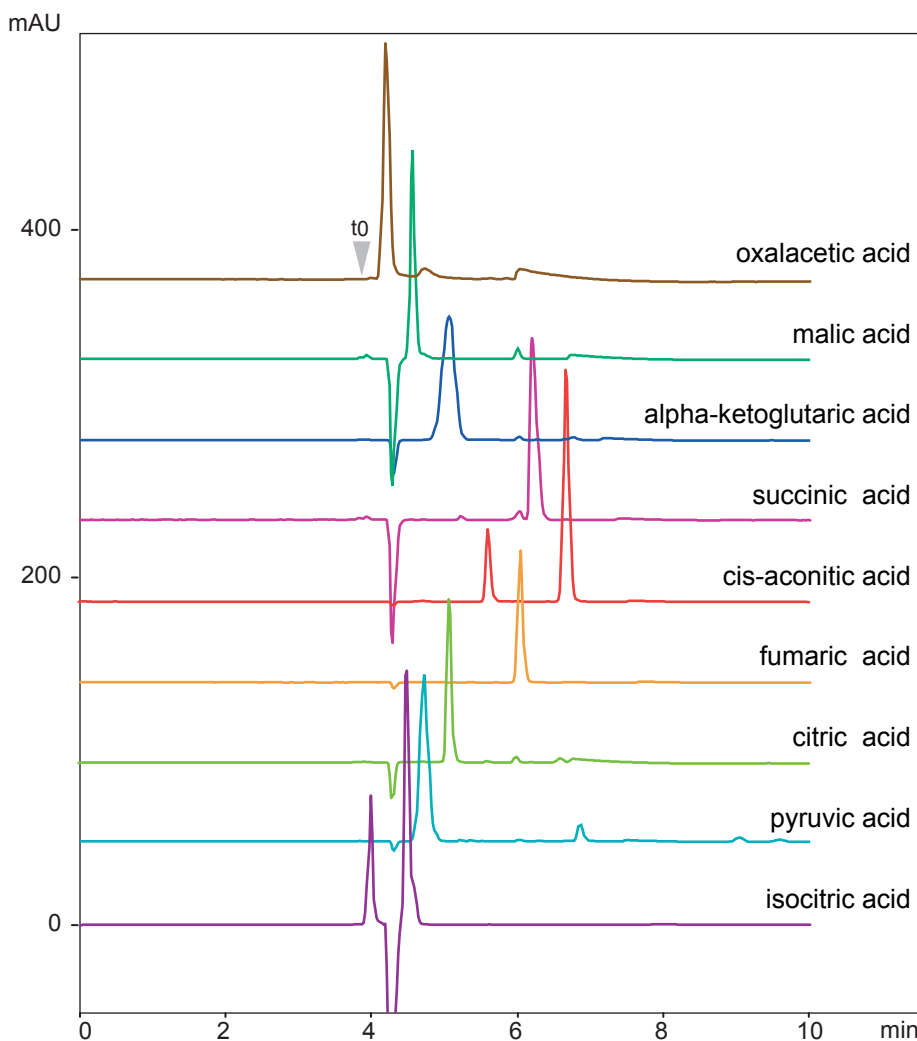
Unison UK-C18, 250 x 4.6 mm  
 water / TFA = 100 / 0.1  
 0.8 mL/min, 37 °C, 11 MPa, 210 nm  
 0.6 - 20 µL ( 0.1 - 20 µg )

Unison UK-Phenyl

250 x 4.6 mm

Application

**TCA Cycle**  
TCA回路



Unison UK-Phenyl, 250 x 4.6 mm  
water / TFA = 100 / 0.1  
0.8 mL/min, 37 °C, 12 MPa, 210 nm  
0.6 - 20 μL ( 0.1 - 20 μg )





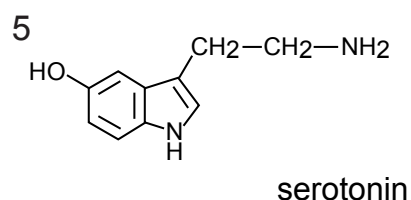
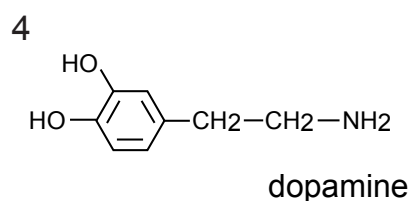
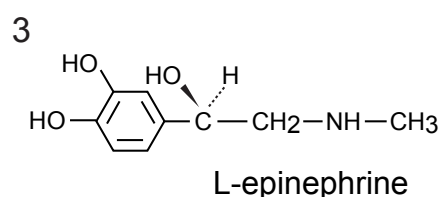
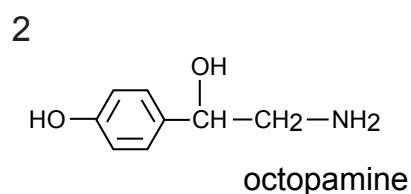
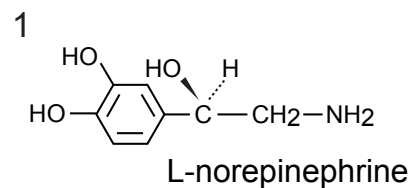
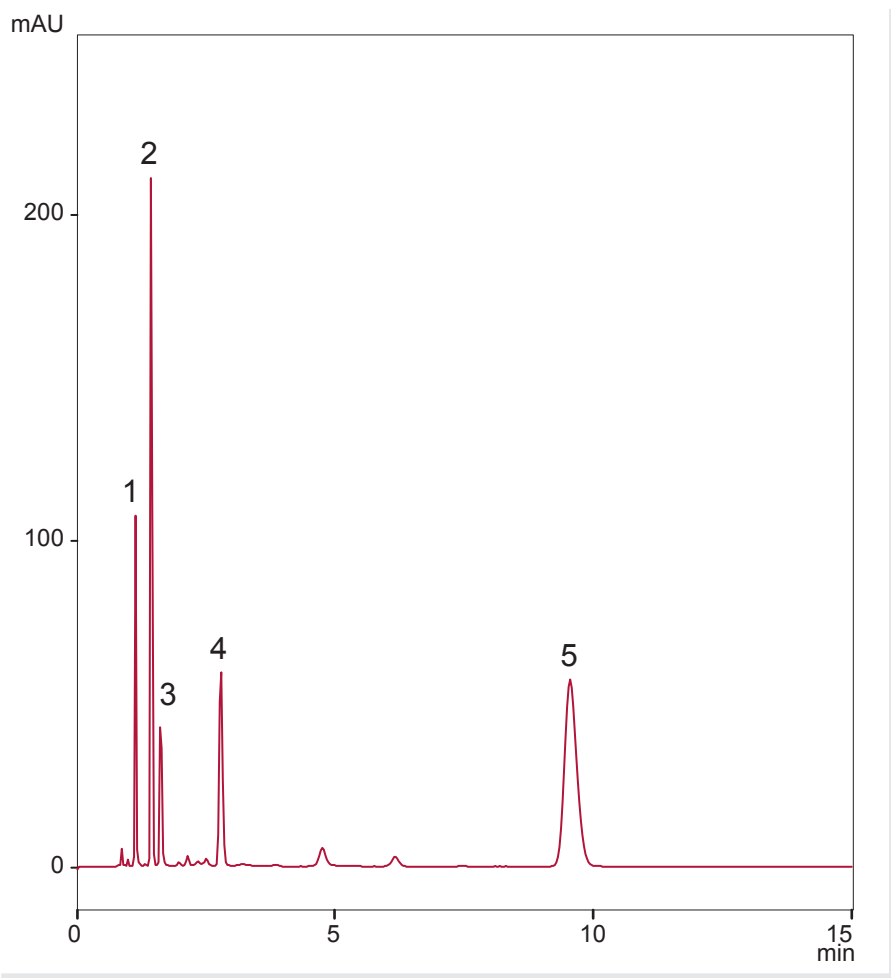
Unison UK-C18

75 x 4.6 mm

Application

**Catecholamines**

カテコールアミン



Unison UK-C18, 75 x 4.6 mm  
 20 mM NaH<sub>2</sub>PO<sub>4</sub>, 1 mL/min (6MPa)  
 37 °C, 220 nm, 2 μL (0.4 μg)

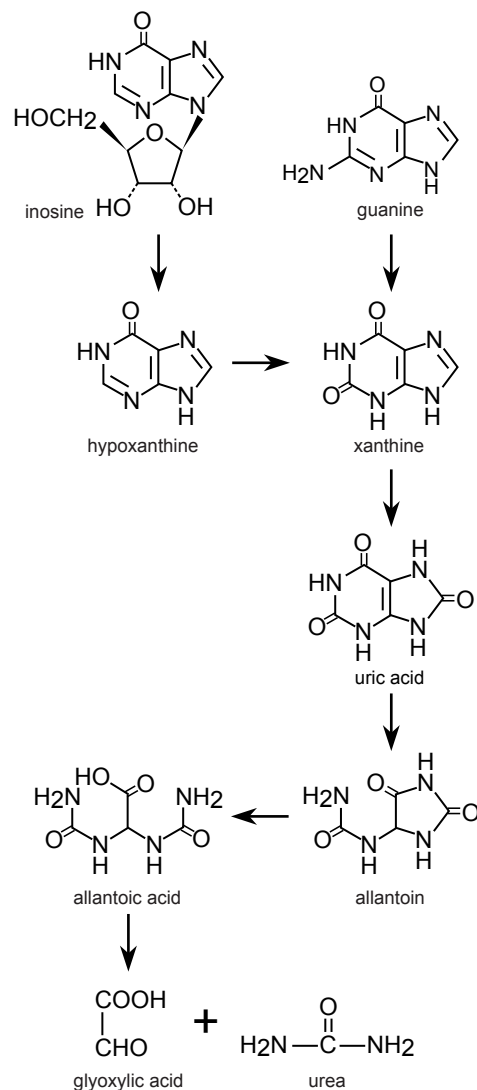
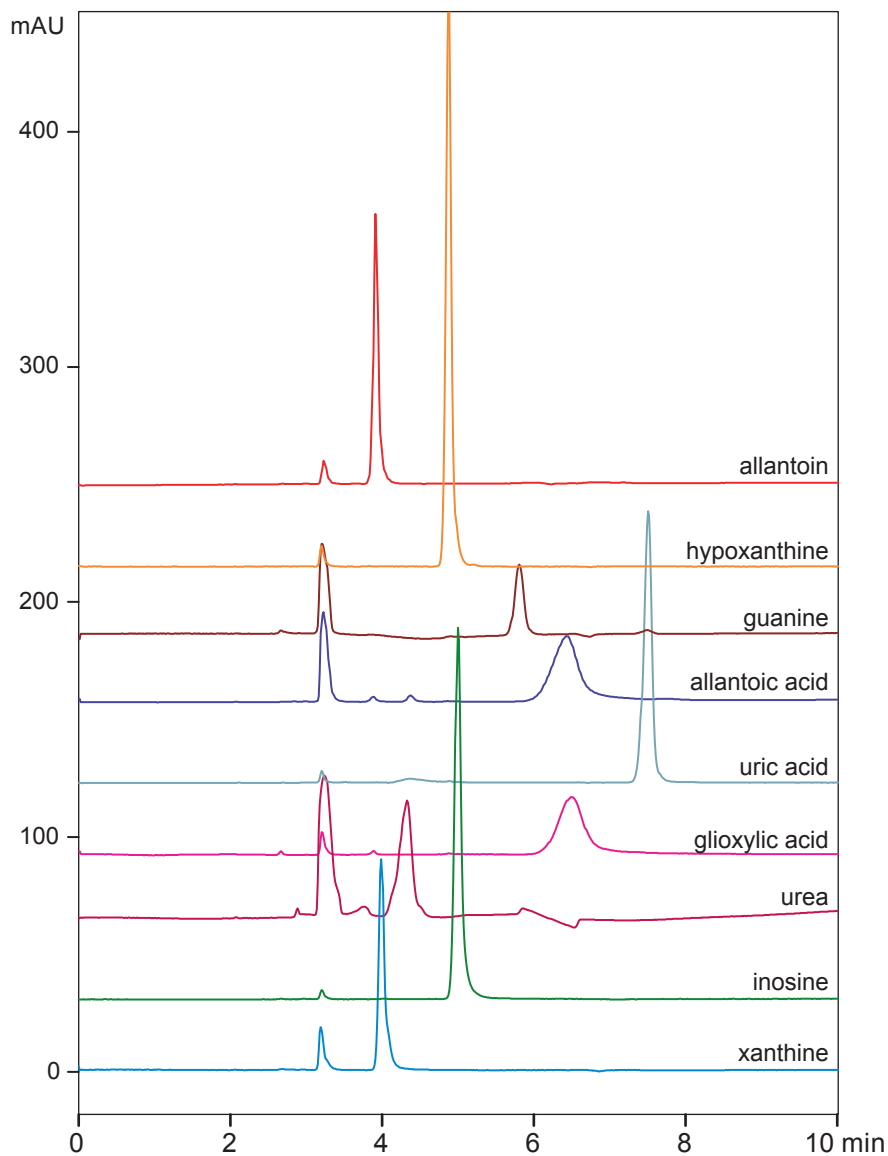
Unison UK-Silica

250 x 3 mm

Application

Purine Nucleotide Metabolites

プリンヌクレオチドの代謝物



Unison UK-Silica, 250 x 3 mm  
 acetonitrile / 20mM ammonium formate = 90 / 10  
 0.5 mL/min, 50 °C, 210 nm

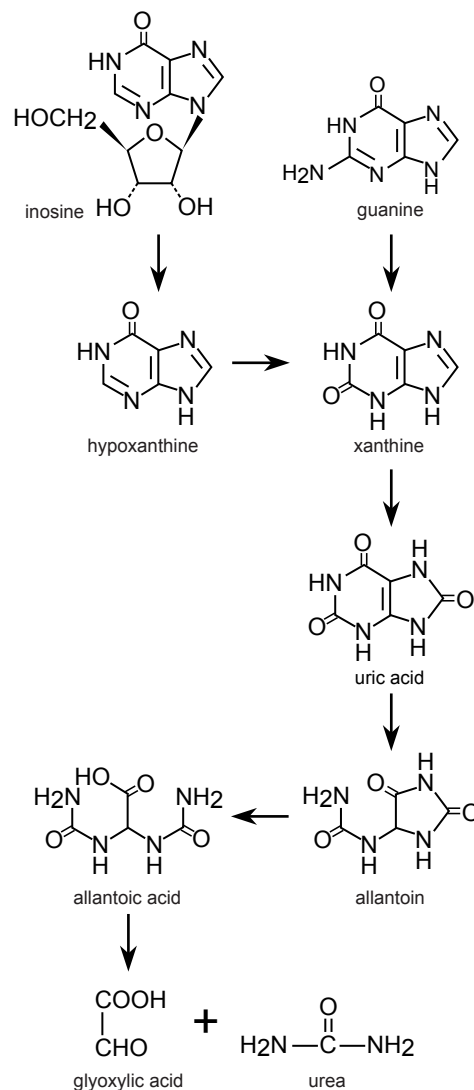
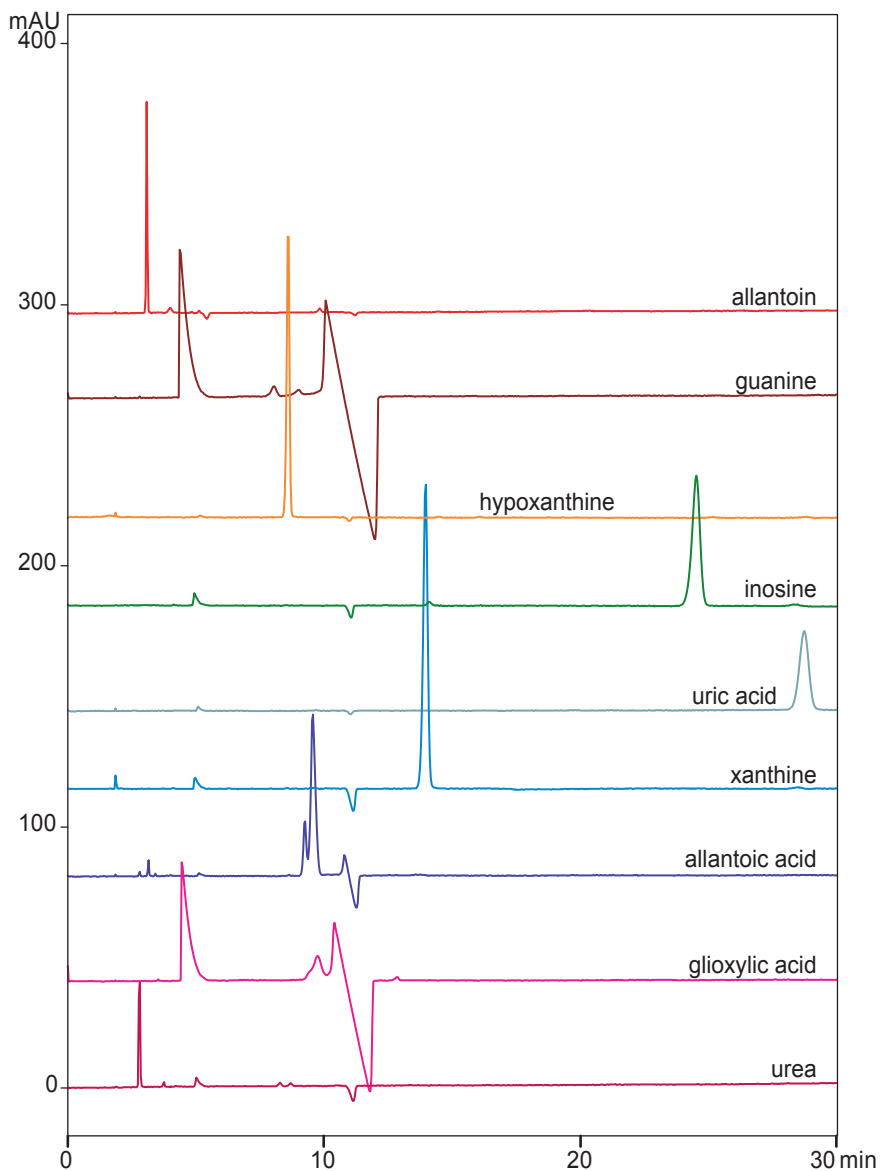
Unison UK-C18

250 x 3 mm

Application

Purine Nucleotide Metabolites

プリンヌクレオチドの代謝物



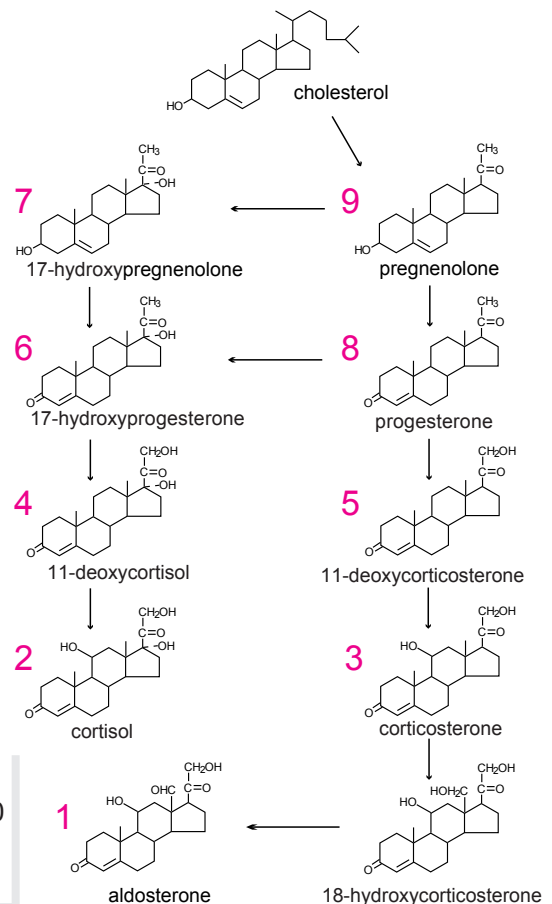
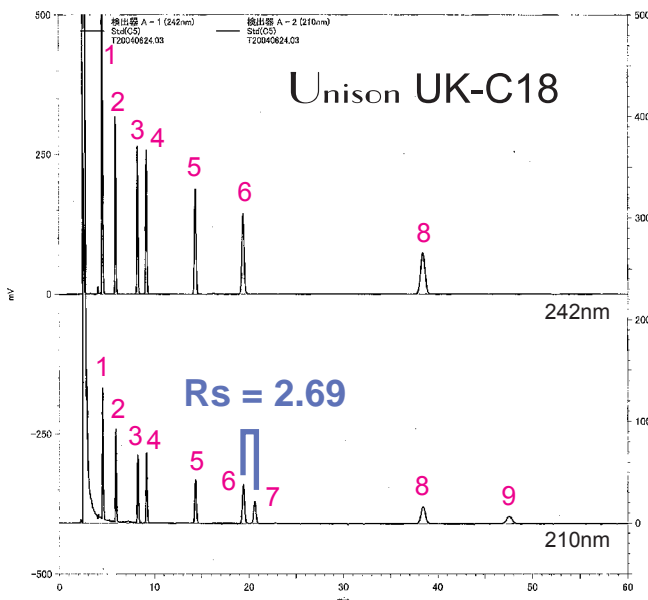
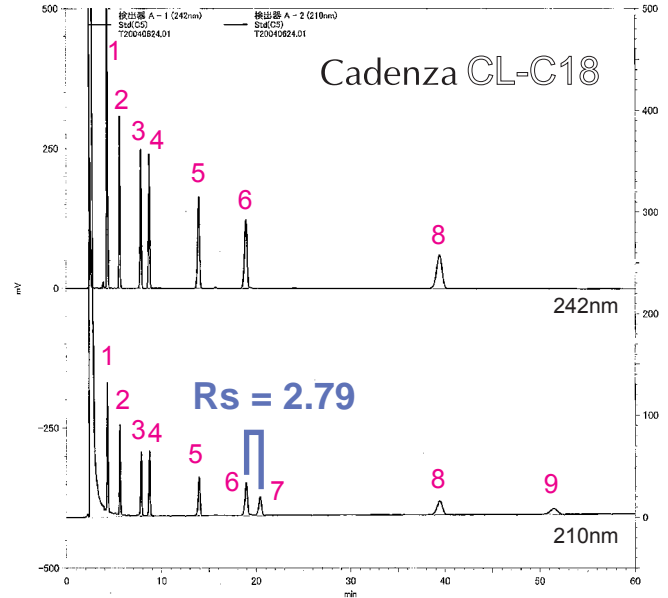
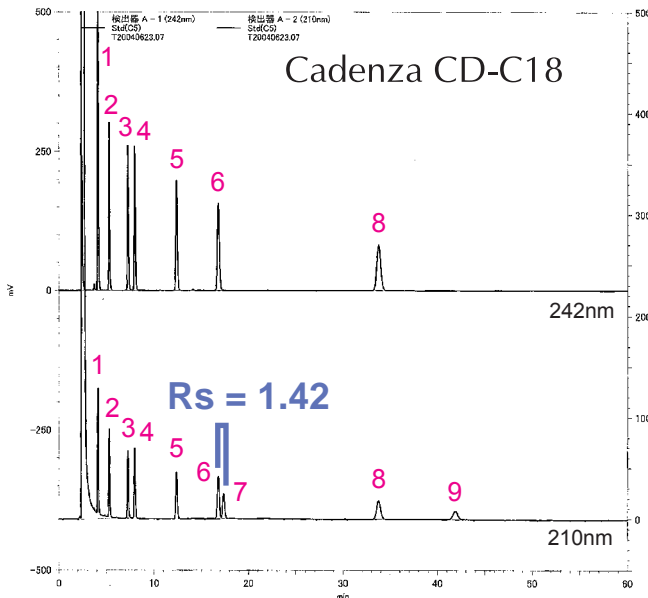
Unison UK-C18, 250 x 3 mm  
 10mM dibutylammonium acetate  
 0.45 mL/min, 37 °C, 210 nm

Cadenza CL-C18  
Cadenza CD-C18  
Unison UK-C18

250 x 4.6 mm

Application

Adreno-corticosteroids  
副腎皮質ホルモン



250 x 4.6 mm  
10mM KH<sub>2</sub>PO<sub>4</sub> / acetonitrile / tetrahydrofuran = 62 / 28 / 10  
1.0 mL/min, 50 deg.C  
242nm (upper) / 210nm (lower), 50uL injection

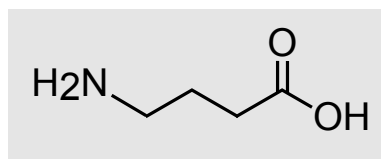
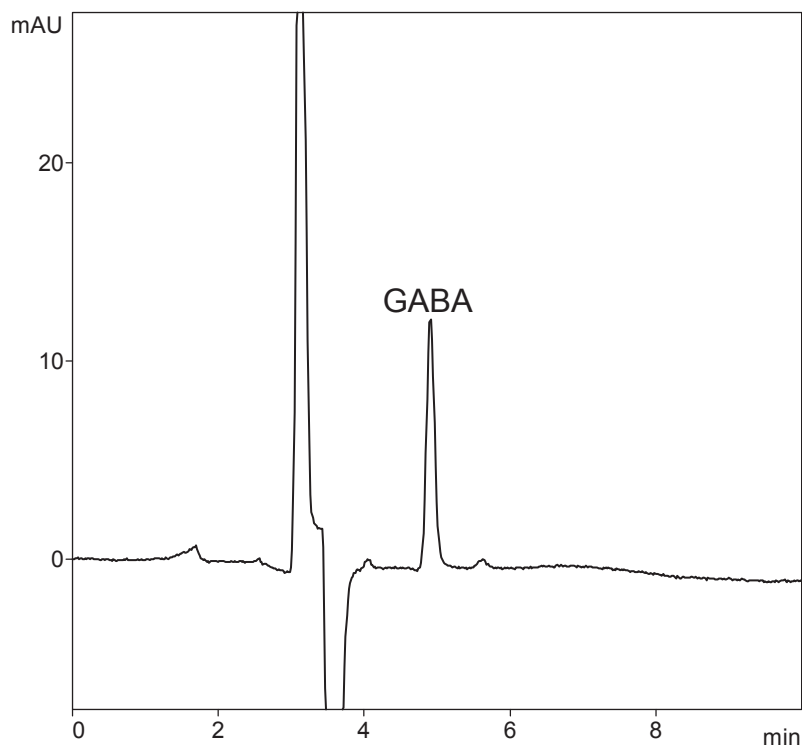
Ref.) Toxicology 165, 171-178 (2001)

Unison UK-Silica  
Unison UK-C18

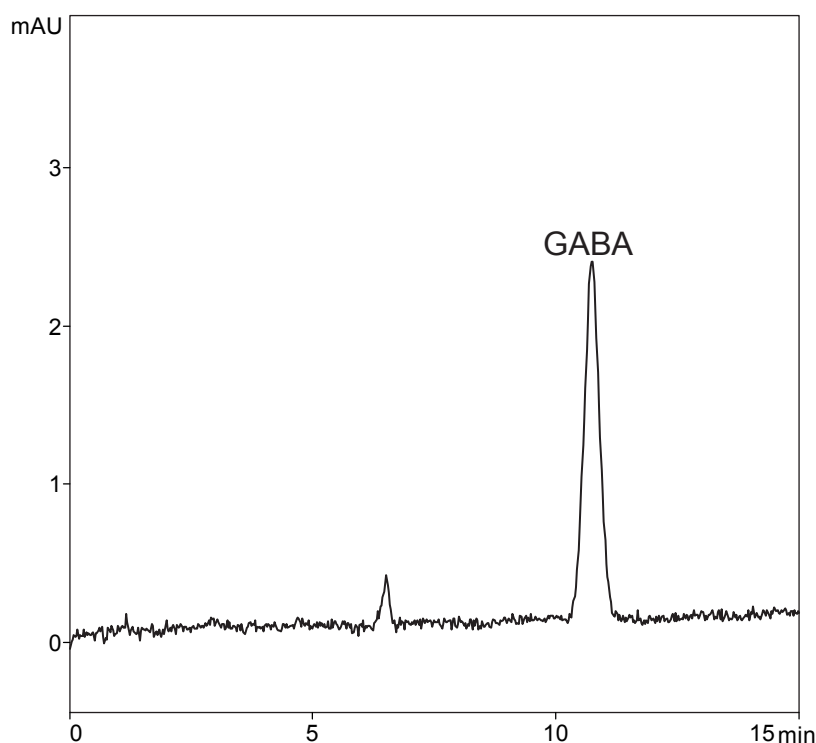
250 x 2 mm  
75 x 4.6 mm

Application

$\gamma$ -Aminobutyric Acid ( GABA )  
-アミノ酪酸



Unison UK-Silica, 250 x 2 mm  
acetonitrile / 20mM ammonium acetate = 50 / 50  
0.2 mL/min, 37 deg.C  
210 nm, 2 ug ( 2uL )



Unison UK-C18, 75 x 4.6 mm  
10mM H<sub>3</sub>PO<sub>4</sub> +  
5mM sodium heptansulfonate  
1 mL/min, 37 deg.C  
210 nm, 5 ug ( 5uL )

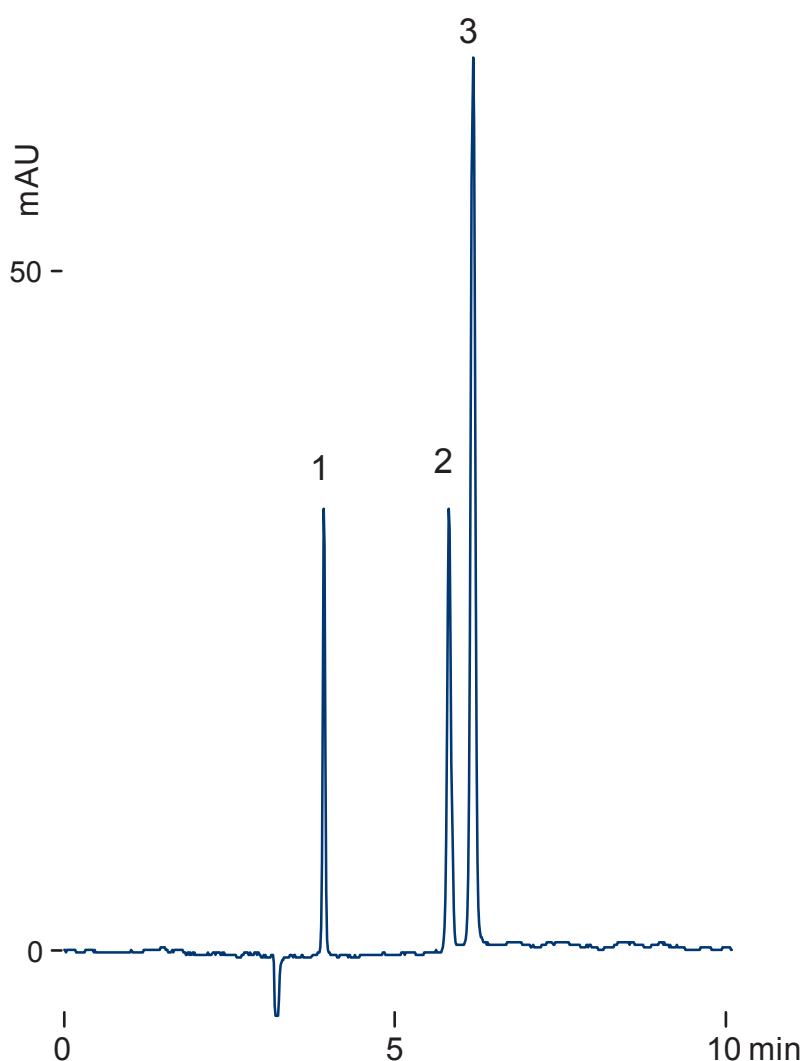
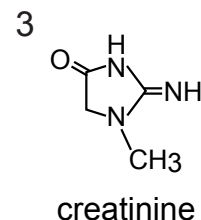
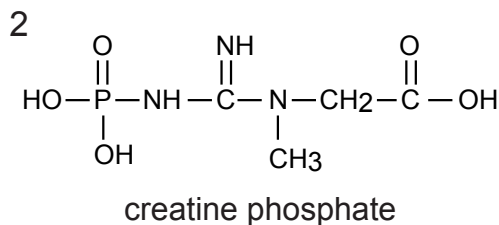
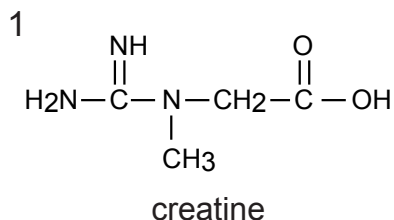
Unison UK-C18

250 x 4.6 mm

Application

**Creatine Metabolites**

クレアチン代謝物



Unison UK-C18, 250 x 4.6 mm,  
50mM HCOONH4 - 1mM dibutylammonium acetate,  
0.8 mL/min (12MPa), 210 nm, 37 degC, 2 uL (0.1 ug)

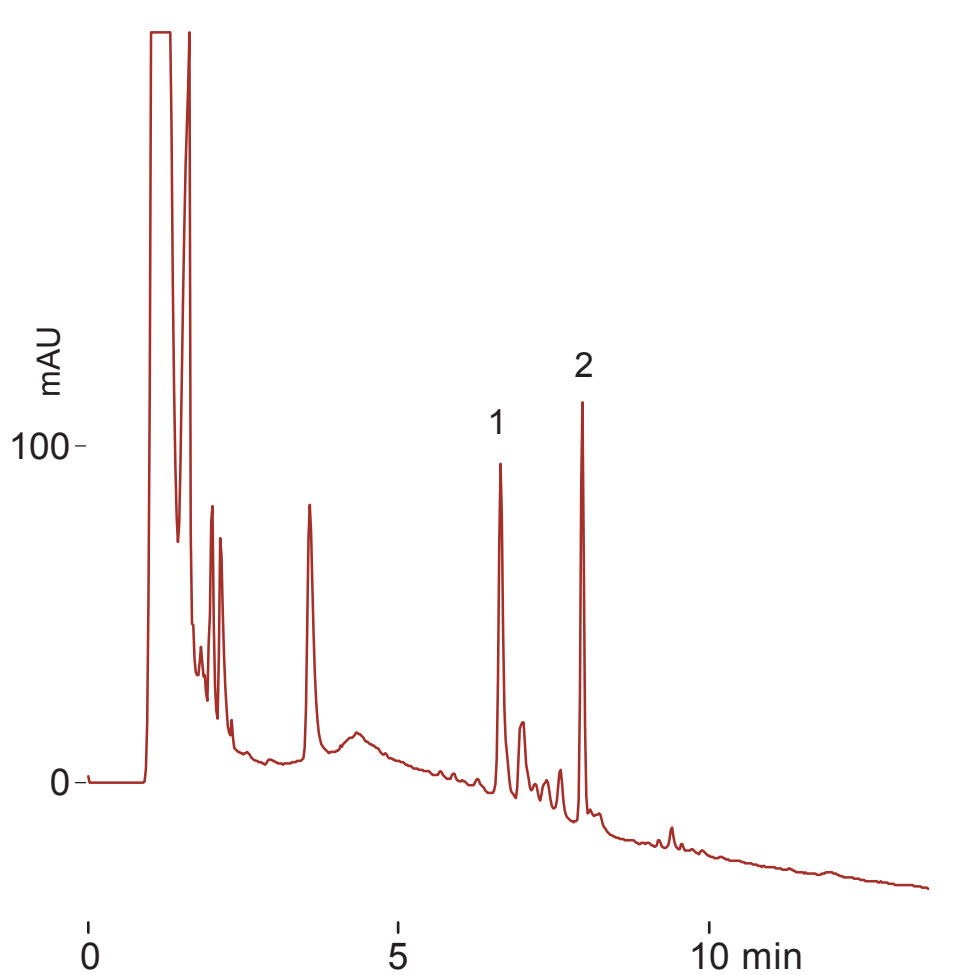
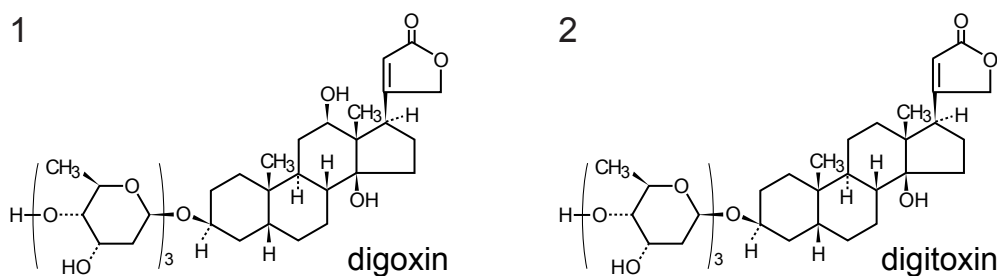
Cadenza **HS-C18**

150 x 3 mm

Application

## Digitalis Glycosides in Bovine Serum

血清中のジギタリス配糖体



Cadenza HS-C18, 150 x 3 mm

A: 10mM ammonium acetate, B: acetonitrile, 0-80%B (0-12min)

0.4 mL/min (10MPa), 37 deg.C, 220 nm, 5uL (0.5ug)

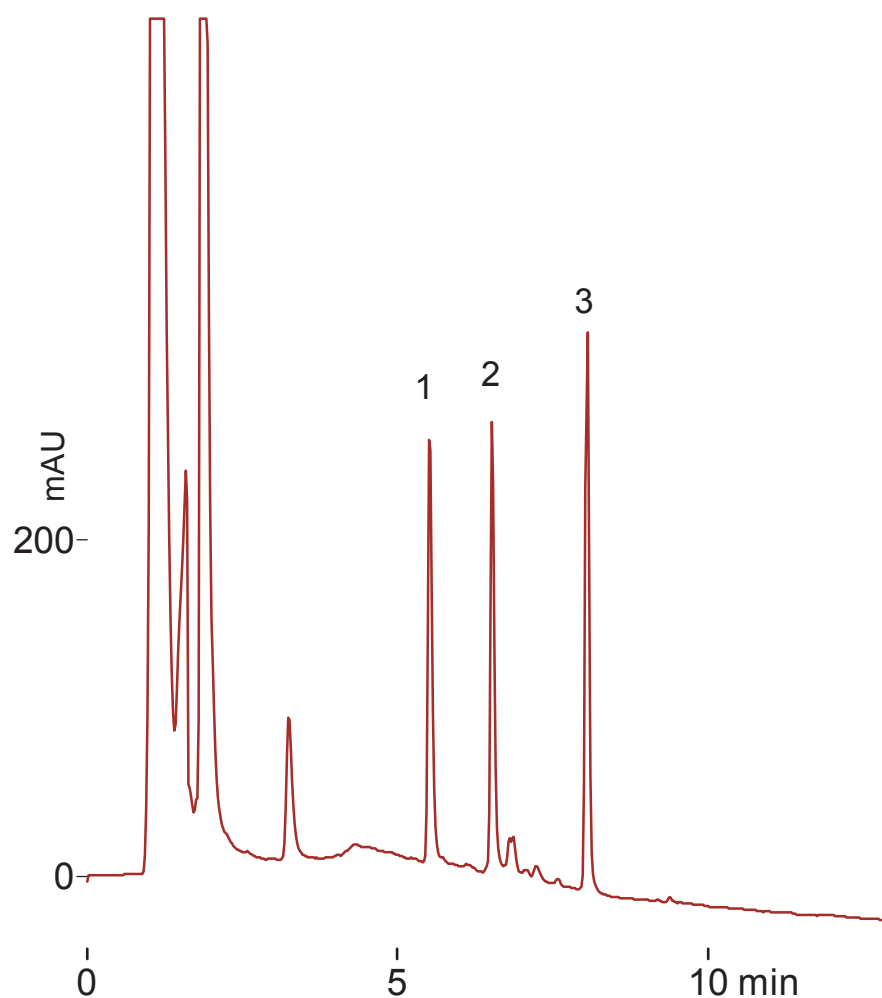
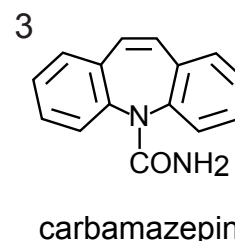
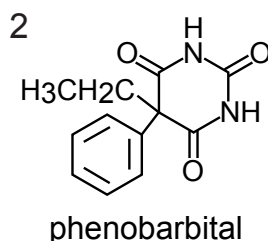
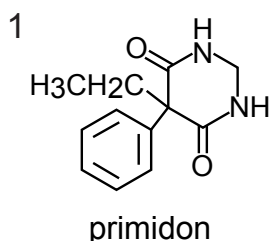
Cadenza **HS-C18**

150 x 3 mm

Application

**Antiepileptics in Bovine Serum**

血清中の抗てんかん薬



Cadenza HS-C18, 150 x 3 mm

A: 10mM ammonium acetate, B: acetonitrile, 0-80%B (0-12min)

0.4 mL/min (10MPa), 37 deg.C, 220 nm, 5 uL (50-150ng)



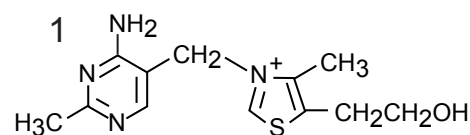
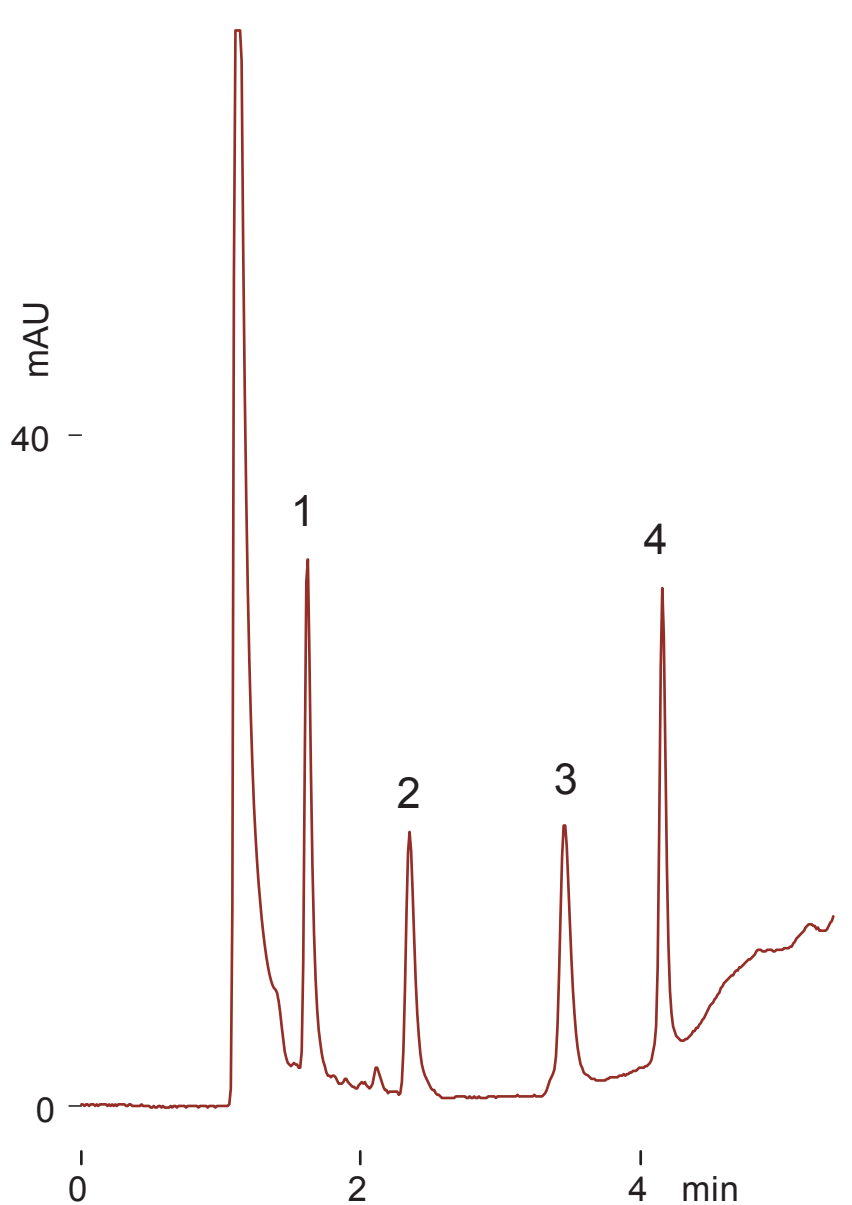
Cadenza **HS-C18**

150 x 3 mm

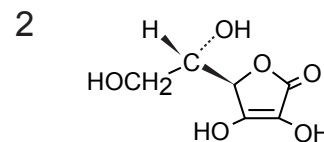
Application

**Water-Soluble Vitamins in Bovine Serum**

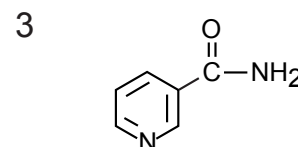
血清中の水溶性ビタミン



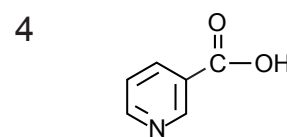
thiamine



L-ascorbic acid



nicotinamide



nicotinic acid

Cadenza HS-C18, 150 x 3 mm

A: 10mM dihexylammonium acetate, B: acetonitrile

0-50%B (0-5min), 0.4 mL/min (10MPa)

37 deg.C, 260 nm, 5 uL (250-500ng)

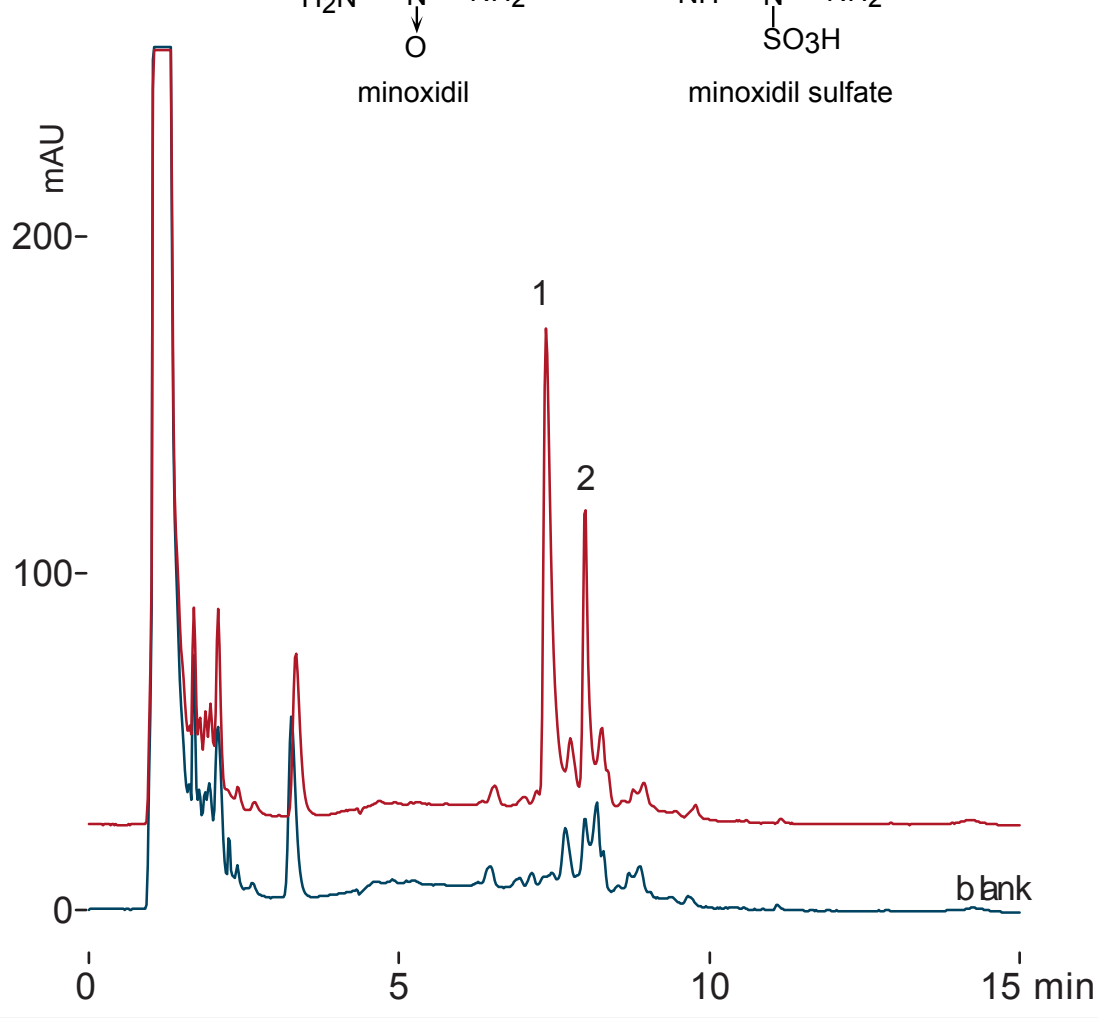
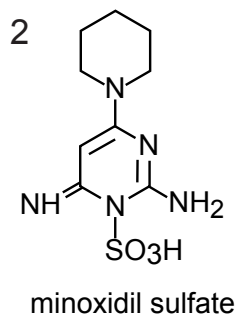
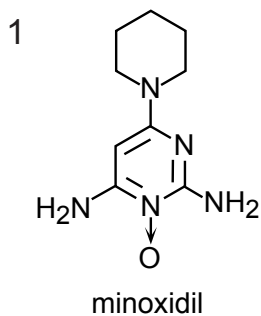
Cadenza HS-C18

150 x 3 mm

Application

### Minoxidil and Metabolite in Bovine Serum

血清中のミノキシジルと代謝物



Cadenza HS-C18, 150 x 3 mm

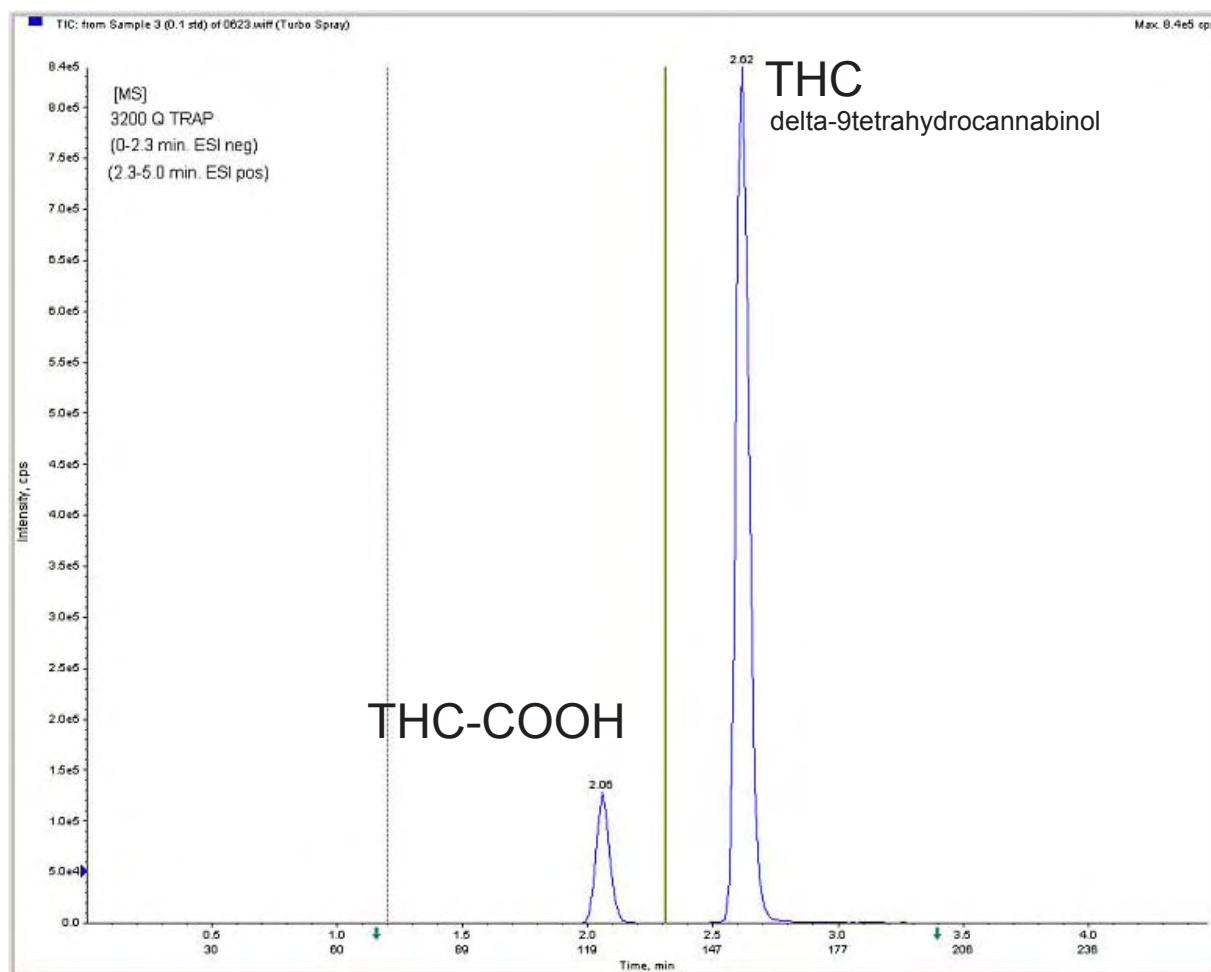
A: 50mM ammonium acetate, B: acetonitrile, 0-70%B (0-14min)  
0.4 mL/min, 37 deg.C, 260 nm, 20uL (100-300ng)

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

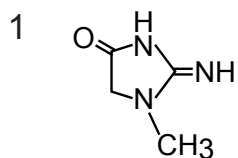
Unison UK-Amino

150 x 2 mm

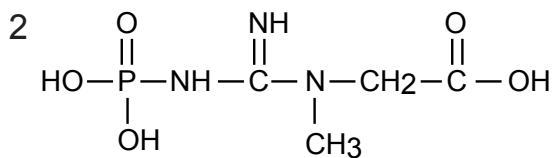
Application

### Creatine Metabolites

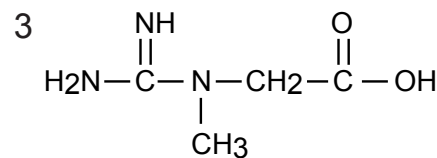
クレアチン代謝物



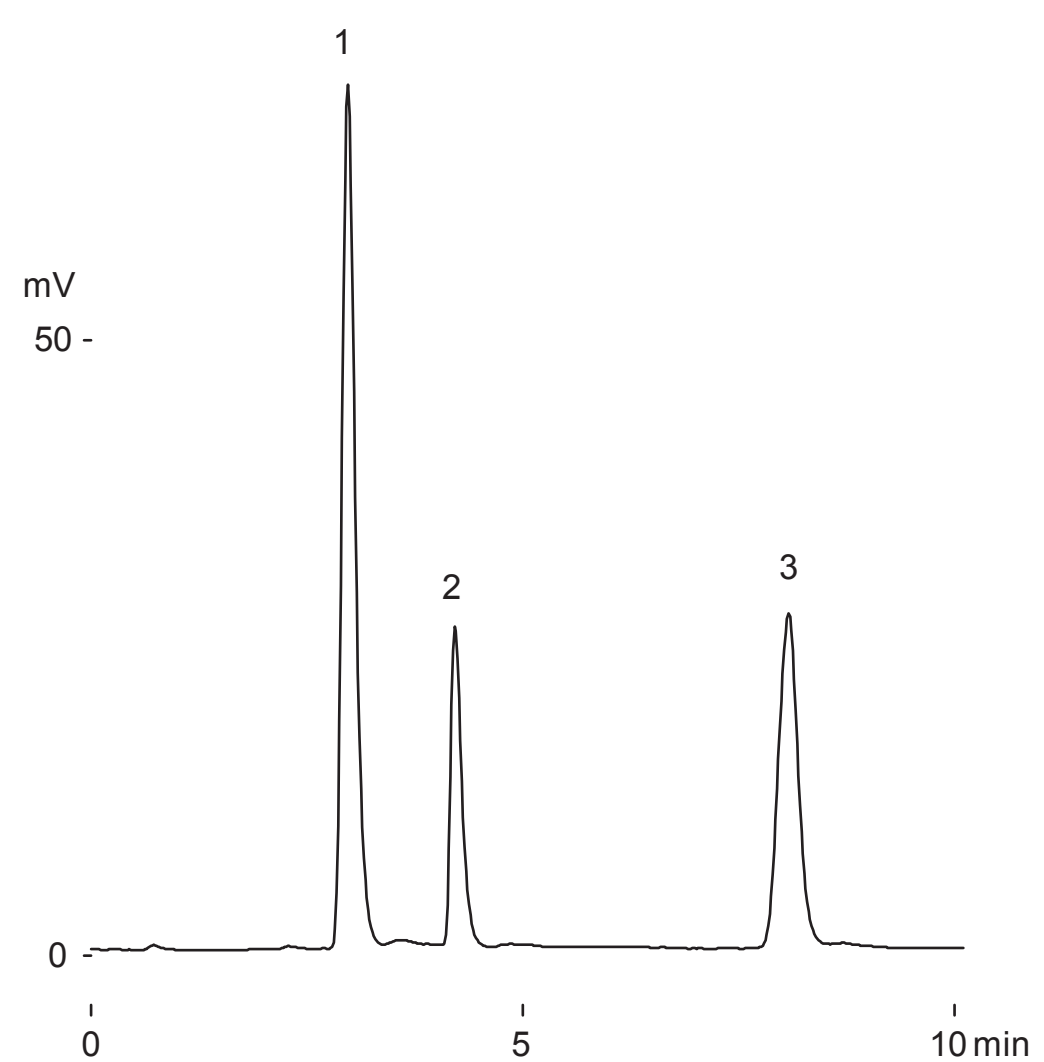
creatinine



creatine phosphate



creatine



Unison UK-Amino, 150 x 2 mm  
 acetonitrile / 100mM ammonium acetate = 80 / 20  
 0.2 mL/min (4 MPa), 37 degC, ELSD, 2 uL (0.8 ug)

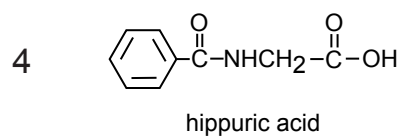
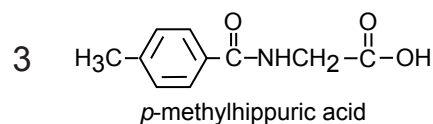
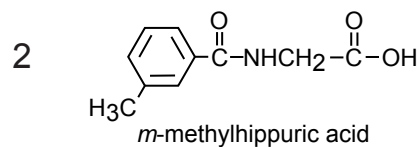
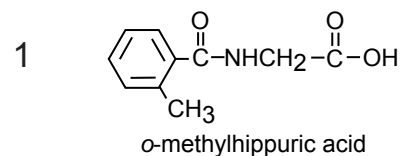
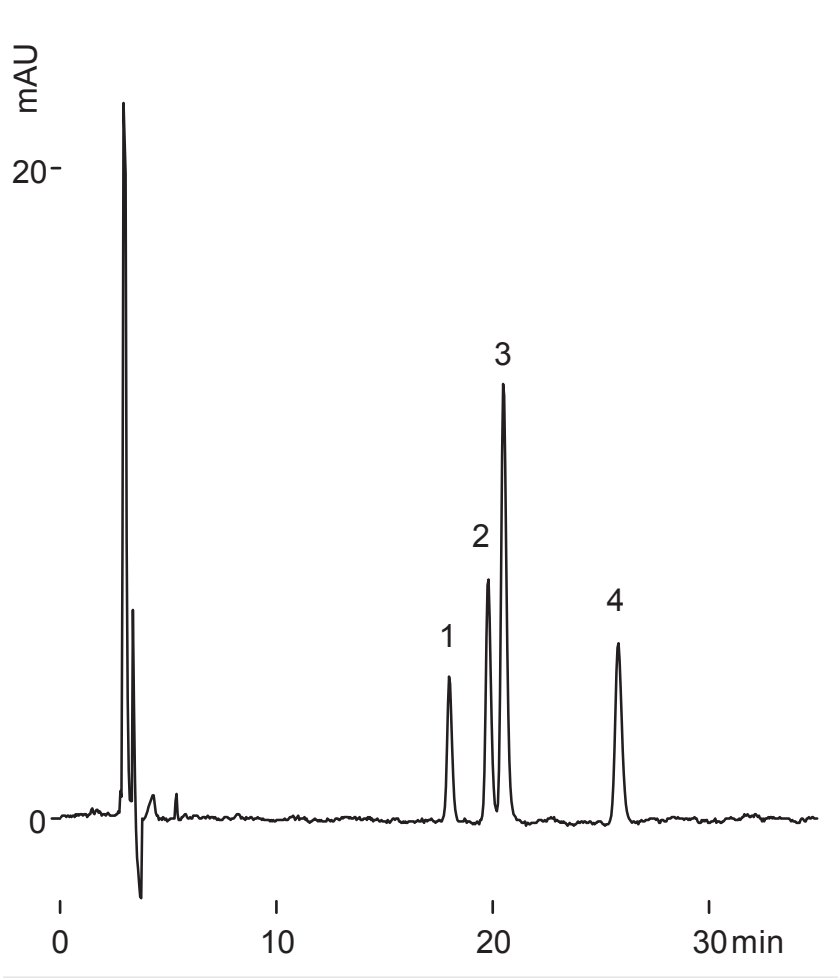
Unison UK-Amino

250 x 4.6 mm

Application

Hippuric Acids

馬尿酸類



Unison UK-Amino, 250 x 4.6 mm  
acetonitrile / water / acetic acid = 90 / 10 / 1  
1 mL/min (9MPa), 37 deg.C, 260 nm  
5 uL (1ug)

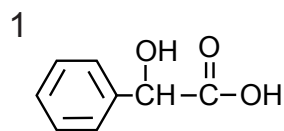
Unison UK-Amino

150 x 4.6 mm

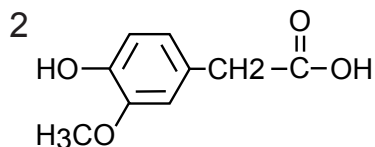
Application

## Mandelic Acid and Related Compounds

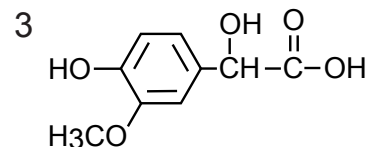
マンデル酸と類縁化合物



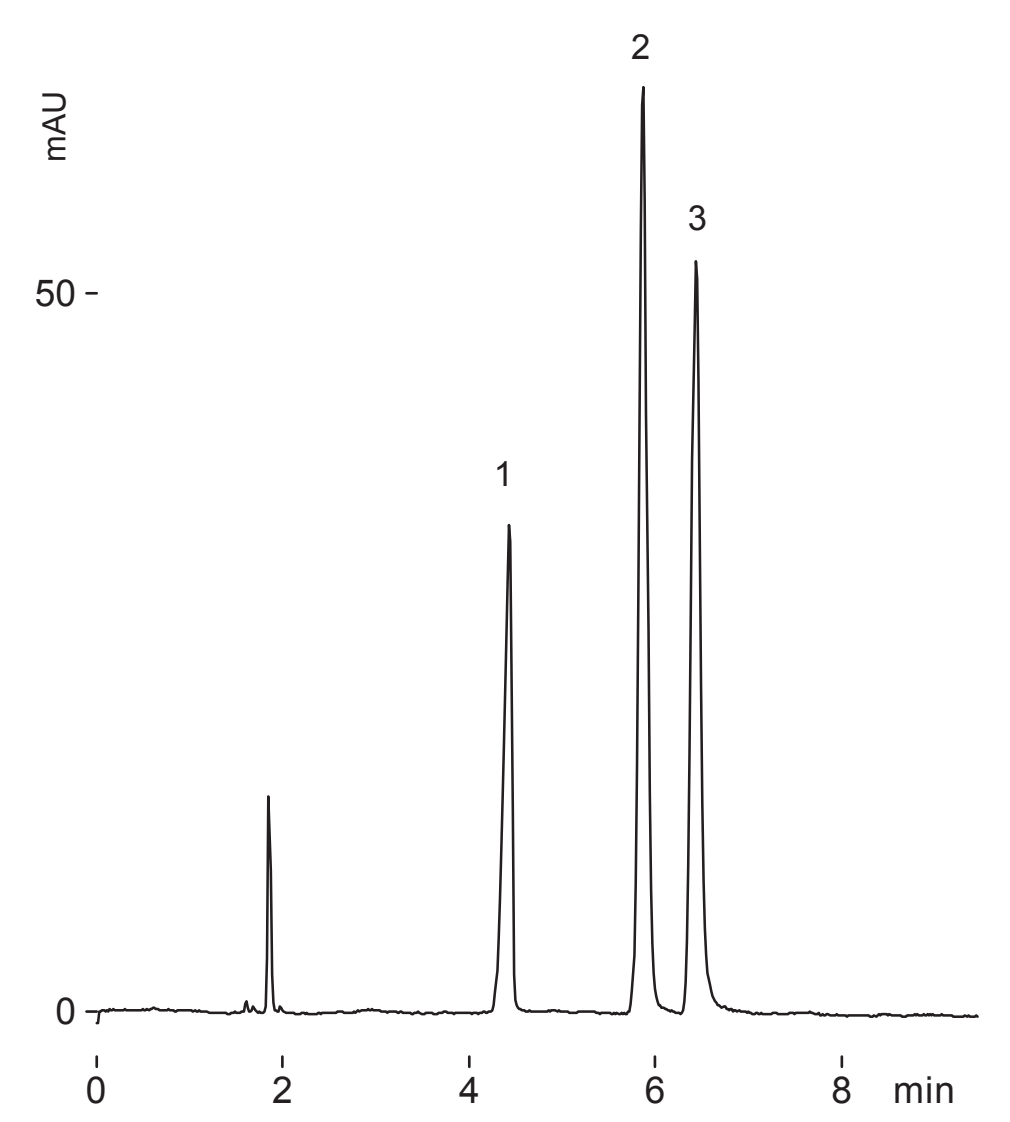
mandelic acid



homovanillic acid (HVA)



vanillylmandelic acid (VMA)



Unison UK-Amino, 150 x 4.6 mm  
 acetonitrile / 100mM ammonium acetate = 75 / 25  
 1 mL/min (6MPa), 37 deg.C, 260 nm, 2 uL (4-8ug)

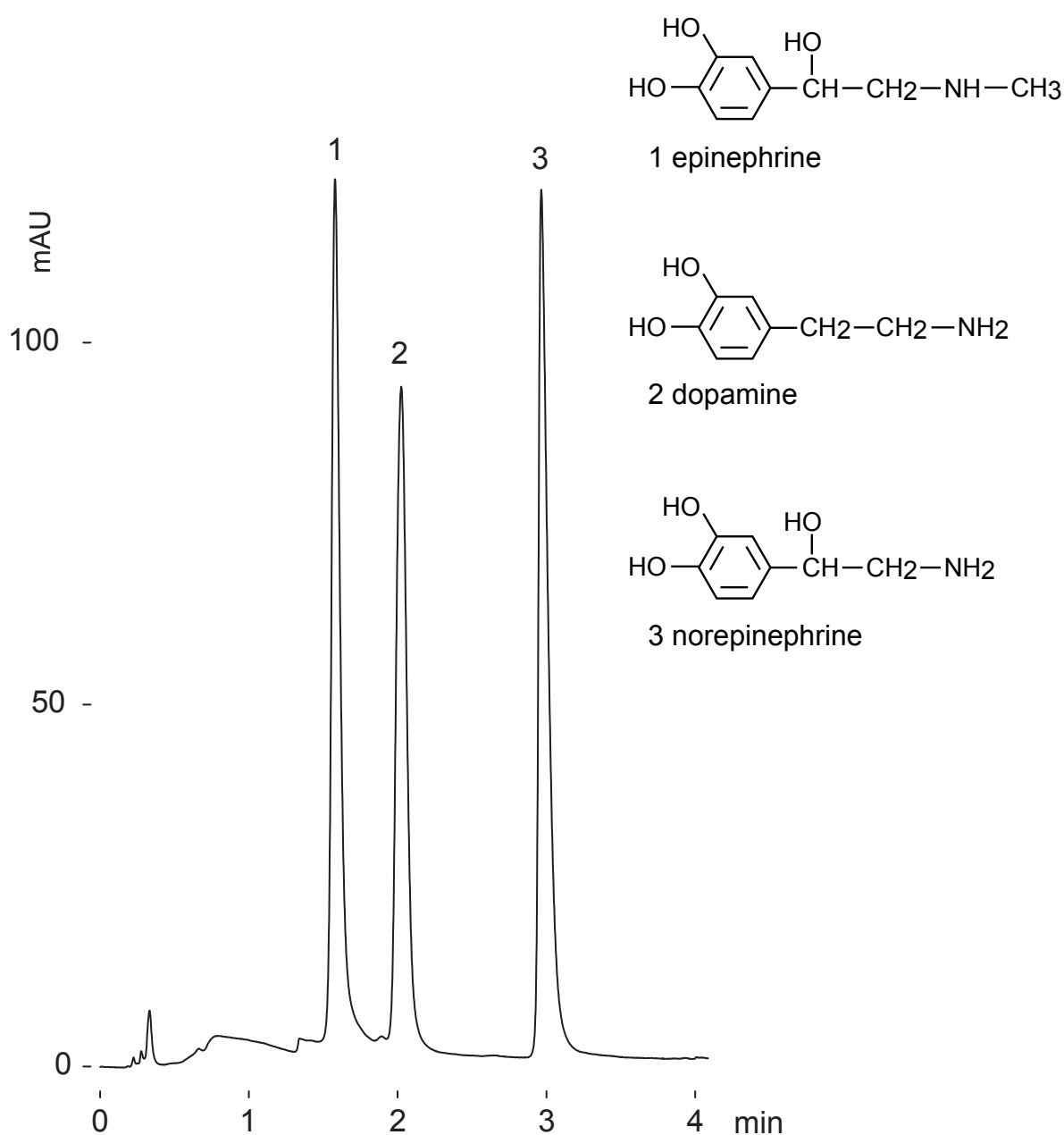
Unison UK-Amino

30 x 3 mm

Application

**Catechol amines**

カテコールアミン



Unison UK-Amino, 30 x 3 mm

A: 10mM ammonium trifluoroacetate in acetonitrile

B: 10mM ammonium trifluoroacetate in (acetonitrile / water = 90 / 10)  
0-70%B (0-4min), 0.8mL/min (1.8MPa), 37deg.C, 260nm, 3uL (3ug)

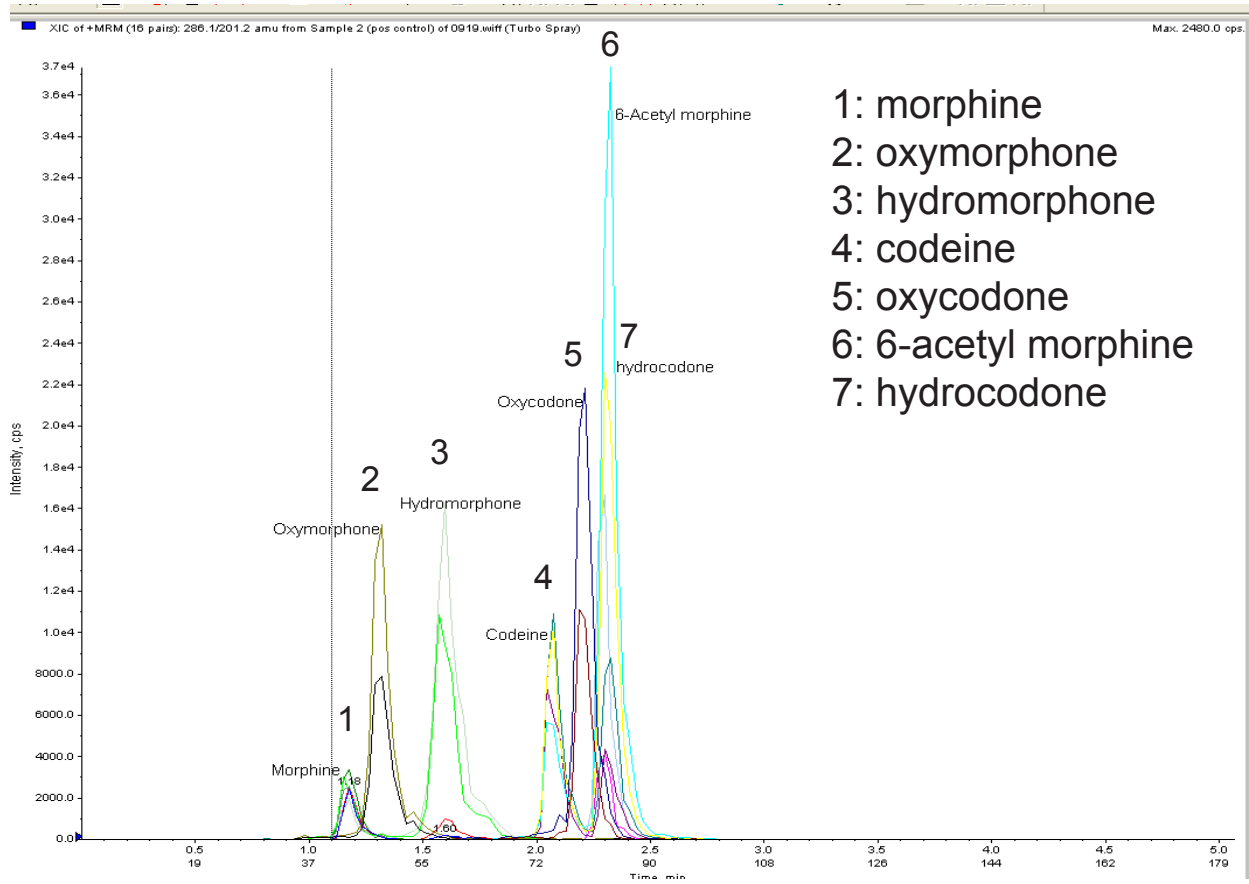
Unison US-C18

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



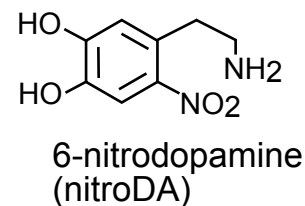
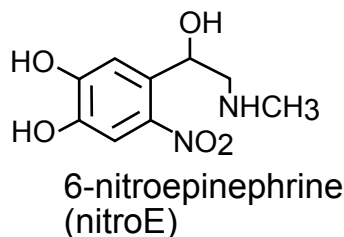
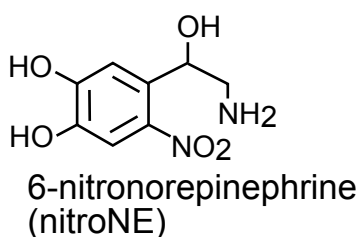
Unison UK-C18

250 x 4.6 mm

Application

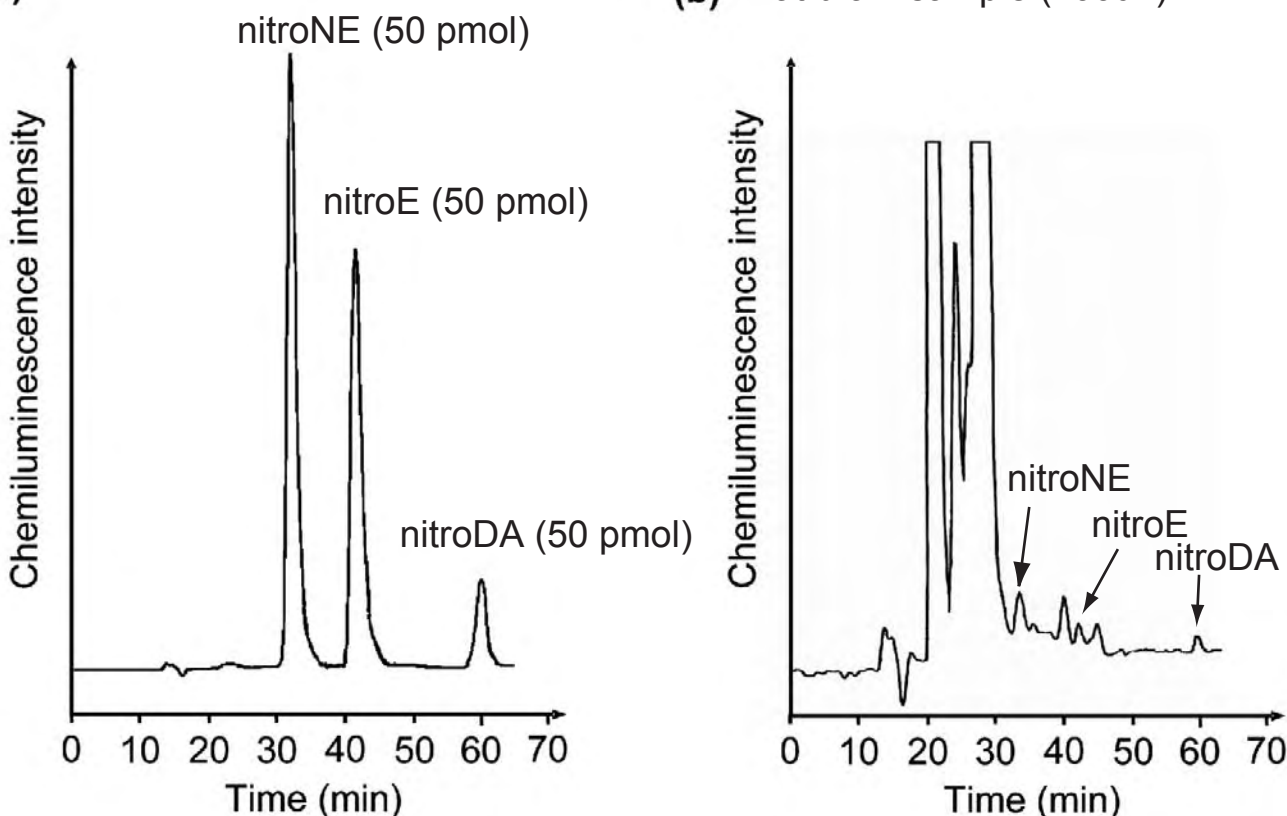
Determination of 6-nitrocatecholamines in rat brain using HPLC-chemiluminescence reaction detection

ラット脳中の6-ニトロカテコールアミンのHPLC化学発光測定



(a) Standard mixture

(b) Rat brain sample (100uL)



Unison UK-C18, 250 x 4.6 mm  
 75mM potassium acetate buffer (pH 3.2) /  
 50mM potassium dihydrogenphosphate buffer (pH 3.2) / acetonitrile (86.5 / 4.5 / 9, v/v/v)  
 containing 5mM sodium 1-heptanesulfonate, 0.5 mL/min

Post column derivatization with fluorogenic (FL) reagent; 105mM ethylenediamine,  
 175mM imidazole in acetonitrile / ethanol / water (80 / 10 / 10, v/v/v)  
 and chemiluminescence (CL) reagent; 0.25mM TDPO, 150mM H<sub>2</sub>O<sub>2</sub>,  
 and 110mM TFA in 1,4-dioxane / ethylacetate (50 / 50, v/v)

Journal of Chromatography A, 1164 (2007) 162-166

Courtesy of Dr. TSUNODA, University of Tokyo, JAPAN

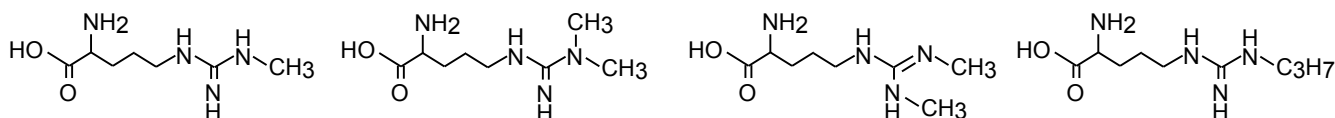
Unison UK-C18

150 x 4.6 mm

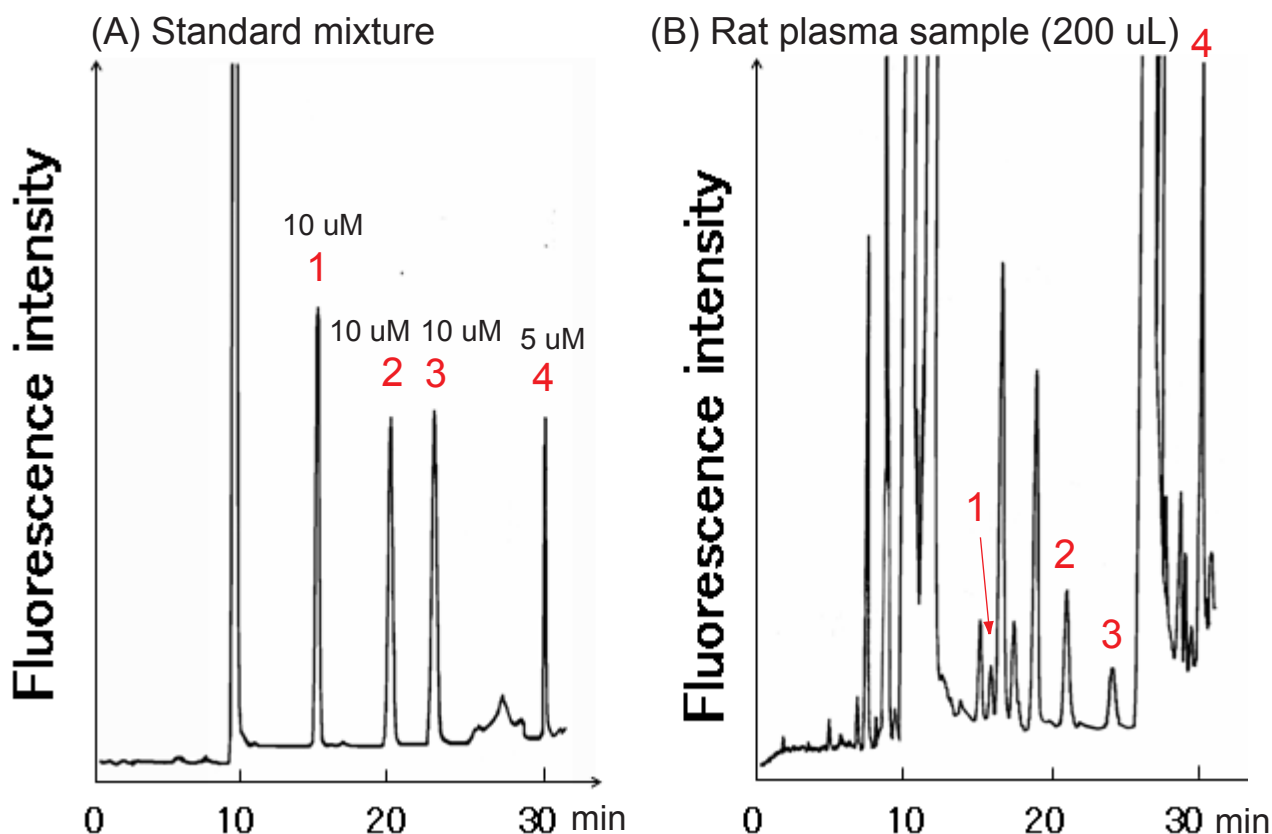
Application

## HPLC assay of methylated arginines using NBD-F as a fluorescent reagent

蛍光ラベル化剤NBD-Fを用いたラット血漿中のメチル化アルギニンのHPLC分析



- 1:  $N^G$ -monomethyl-L-arginine (L-NMMA)    2:  $N^G,N^G$ -dimethyl-L-arginine (ADMA)    3:  $N^G,N^{G'}$ -dimethyl-L-arginine (SDMA)    4:  $N^\omega$ -propyl-L-arginine (N-PLA)



Unison UK-C18, 150 x 4.6 mm  
 A: 50mM sodium phosphate buffer (pH 3.2) / acetonitrile = 91 / 9 (v/v)  
 B: acetonitrile  
 0%B (0-18 min), 0-30%B (18-28 min), 30%B (28-32 min)  
 0.75 mL/min, 40 deg.C, Ex.470 nm / Em. 530 nm

Pre-column derivatization: 105  $\mu$ l of 100mM borate buffer (pH 9.0) and 30  $\mu$ l of 40mM NBD-F in acetonitrile were added to the 30  $\mu$ l of sample. Then, the reaction was incubated at 40 deg.C for 3 min. To stop the reaction, 435  $\mu$ l of 0.5% acetic acid (v/v) was added. A 10  $\mu$ l aliquot of sample was injected onto the HPLC.

Journal of Chromatography A, 1066 (2005) 41-45

Courtesy of Dr. TSUNODA, University of Tokyo, JAPAN

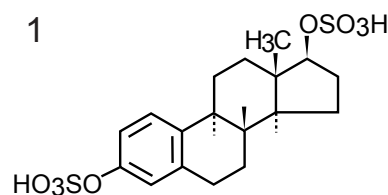
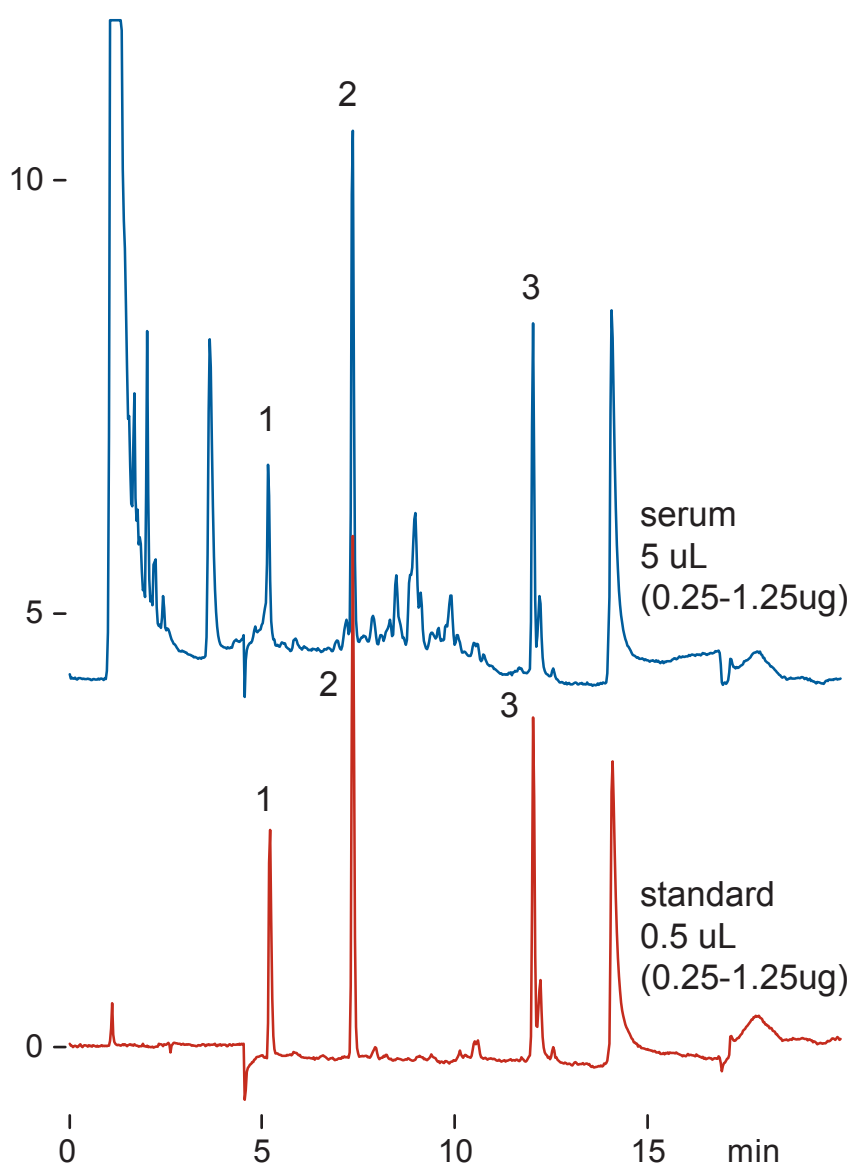
Cadenza HS-C18

150 x 3 mm

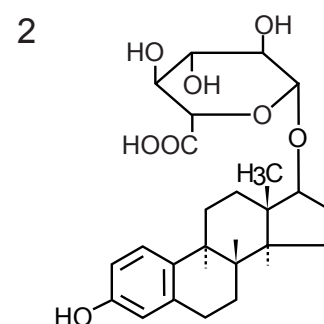
Application

## Estradiol and Metabolites in Bovine Serum

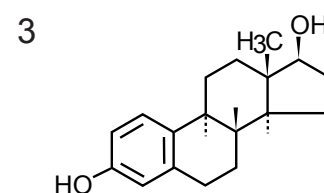
血清中のエストラジオールと代謝物



beta-Estradiol 3,17-disulfate



beta-Estradiol  
17-(beta-D-glucuronide)



17beta-estradiol

Cadenza HS-C18, 150 x 3 mm,  
A: 50mM ammonium acetate  
B: acetonitrile  
0-65%B(0-15min)  
0.4 mL/min, 37 deg.C, 280 nm

Unison UK-Amino

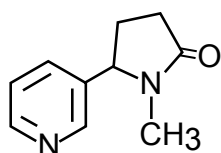
Cadenza CD-C18

100 x 3 mm

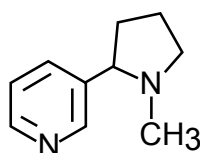
Application

Nicotine derivatives and Metabolites

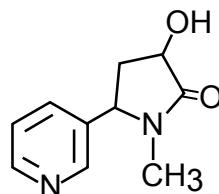
ニコチン類縁体と代謝物



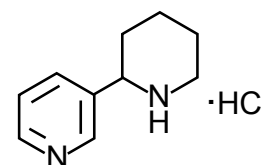
1 cotinine



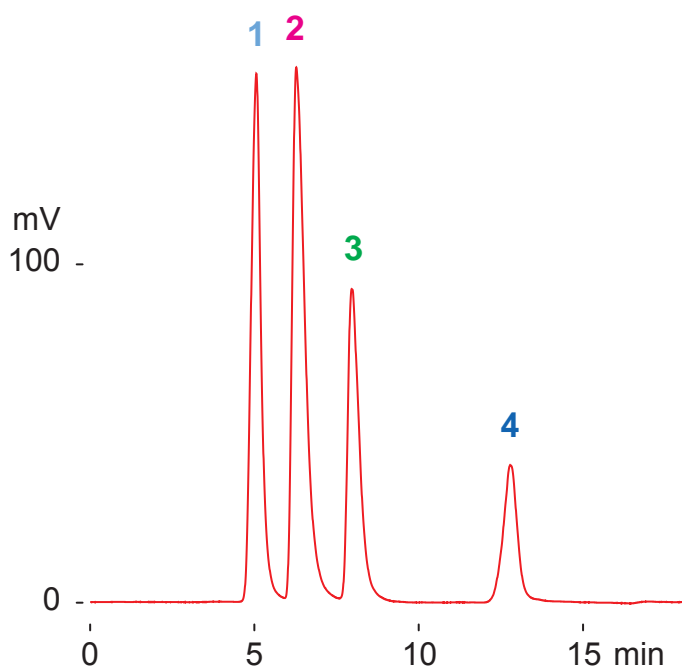
2 nicotine



3 3-hydroxycotinine

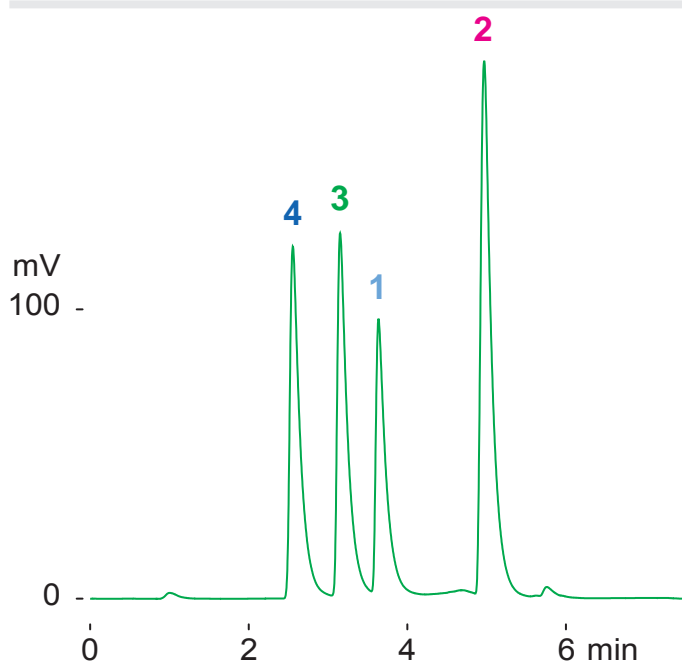


4 anabasine hydrochloride



**normal phase**

Unison UK-Amino, 100 x 3 mm  
 A: hexane /TFA = 100 /0.5  
 B: ethanol /water /TFA = 100 /0.1 /0.5  
 15-65%B(0-15min)  
 0.4mL/min (2MPa), 37deg.C, ELSD  
 0.8uL (4ug)



**reversed phase**

Cadenza CD-C18, 100 x 3 mm  
 A: water / HFBA = 100 / 0.1  
 B: acetonitrile / HFBA = 100 / 0.1  
 0-40%B(0-6min)  
 0.4mL/min (6MPa), 37deg.C, ELSD  
 1uL (5ug)

Unison UK-Amino

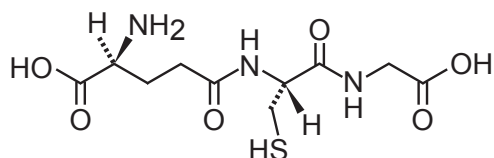
100 x 4.6 mm

Application

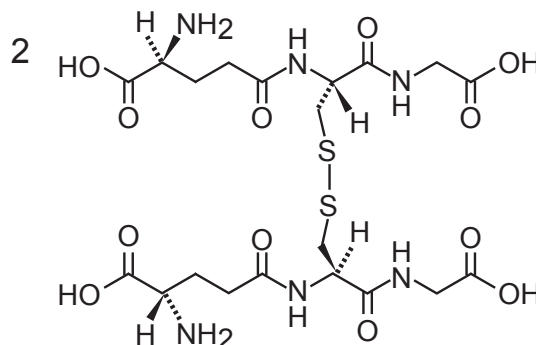
## Glutathiones

グルタチオン

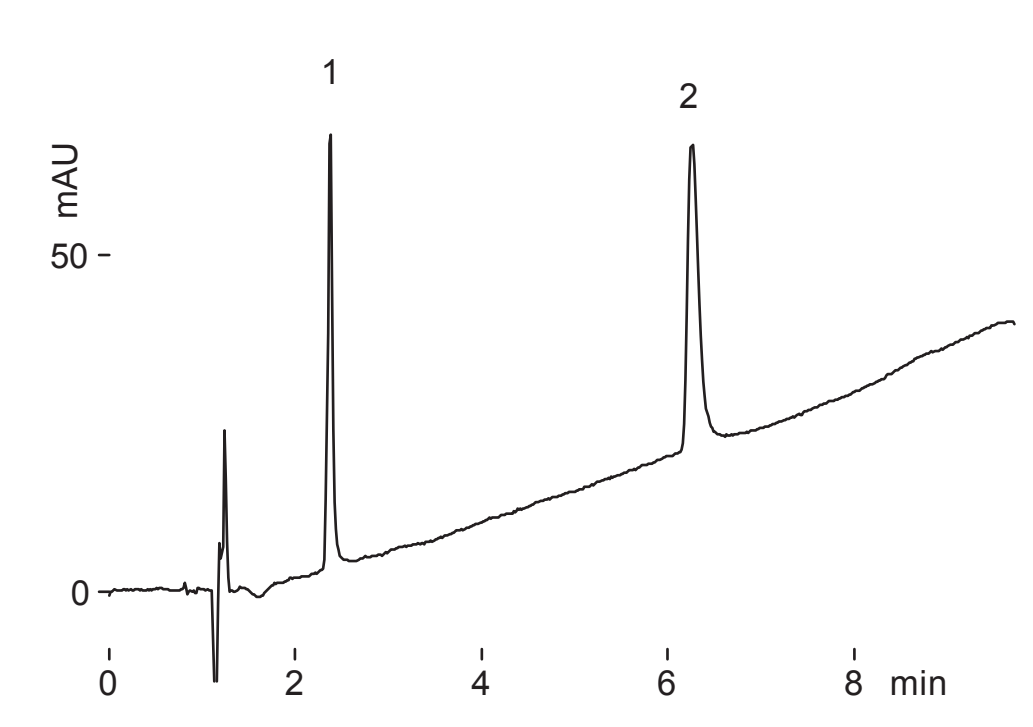
1



glutathione reduced (GSH)



glutathione oxidized (GSSG)



UK-Amino, 100 x 4.6 mm

A: acetonitrile, B: 50mM ammonium acetate

80-100 %B (0-8min), 1 mL/min

37 deg.C, 220 nm, 5 uL(5ug)

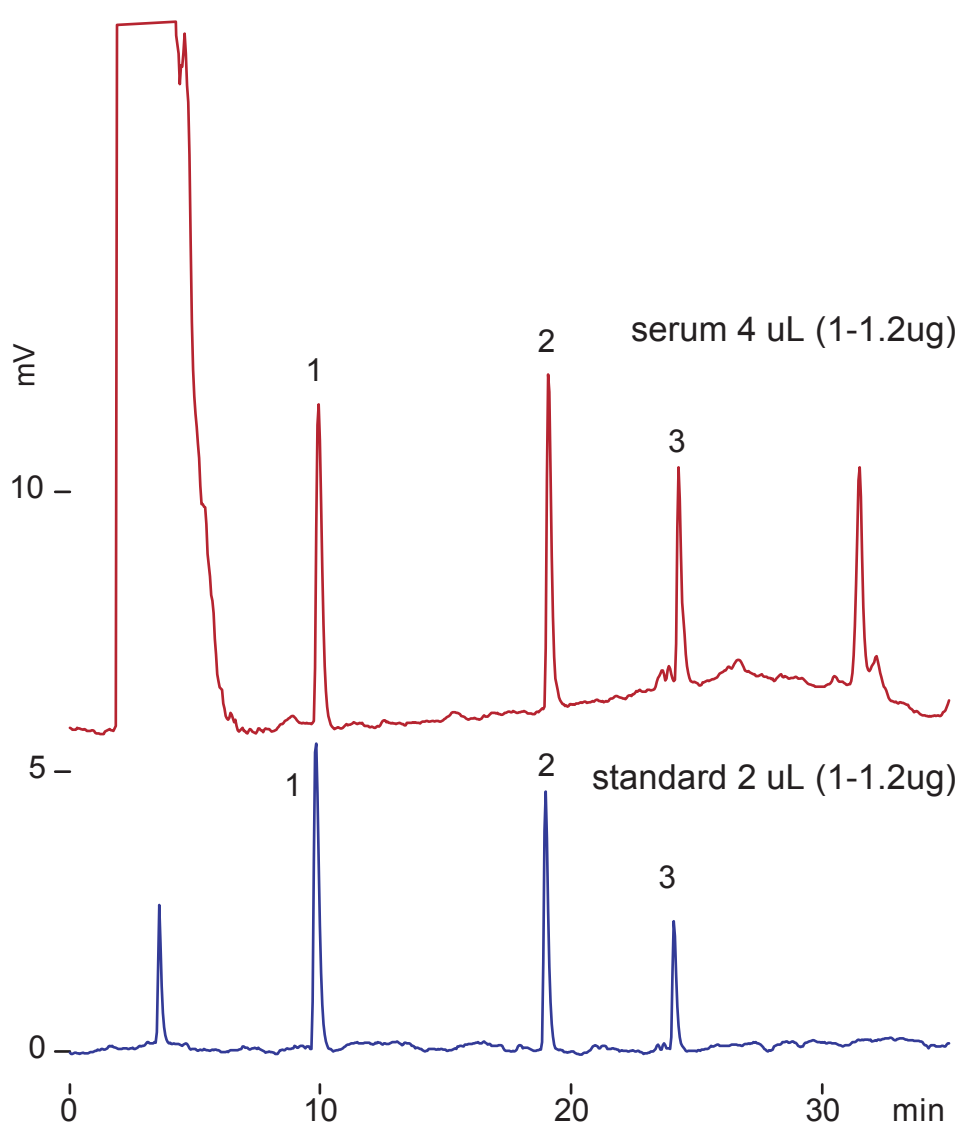
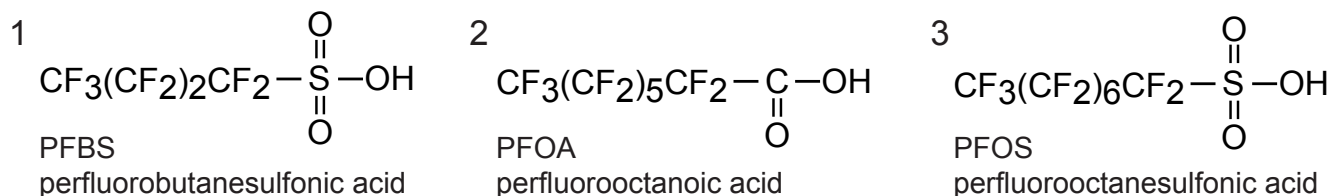
Cadenza HS-C18

250 x 3 mm

Application

**PFAAs in Bovine Serum**

ウシ血清中のパーフルオロアルキル酸



Cadenza HS-C18, 250 x 3 mm  
 A: 50mM ammonium acetate, B: acetonitrile  
 0-40 %B (0-30min), 0.4 mL/min (16MPa), 37 deg.C, ELSD

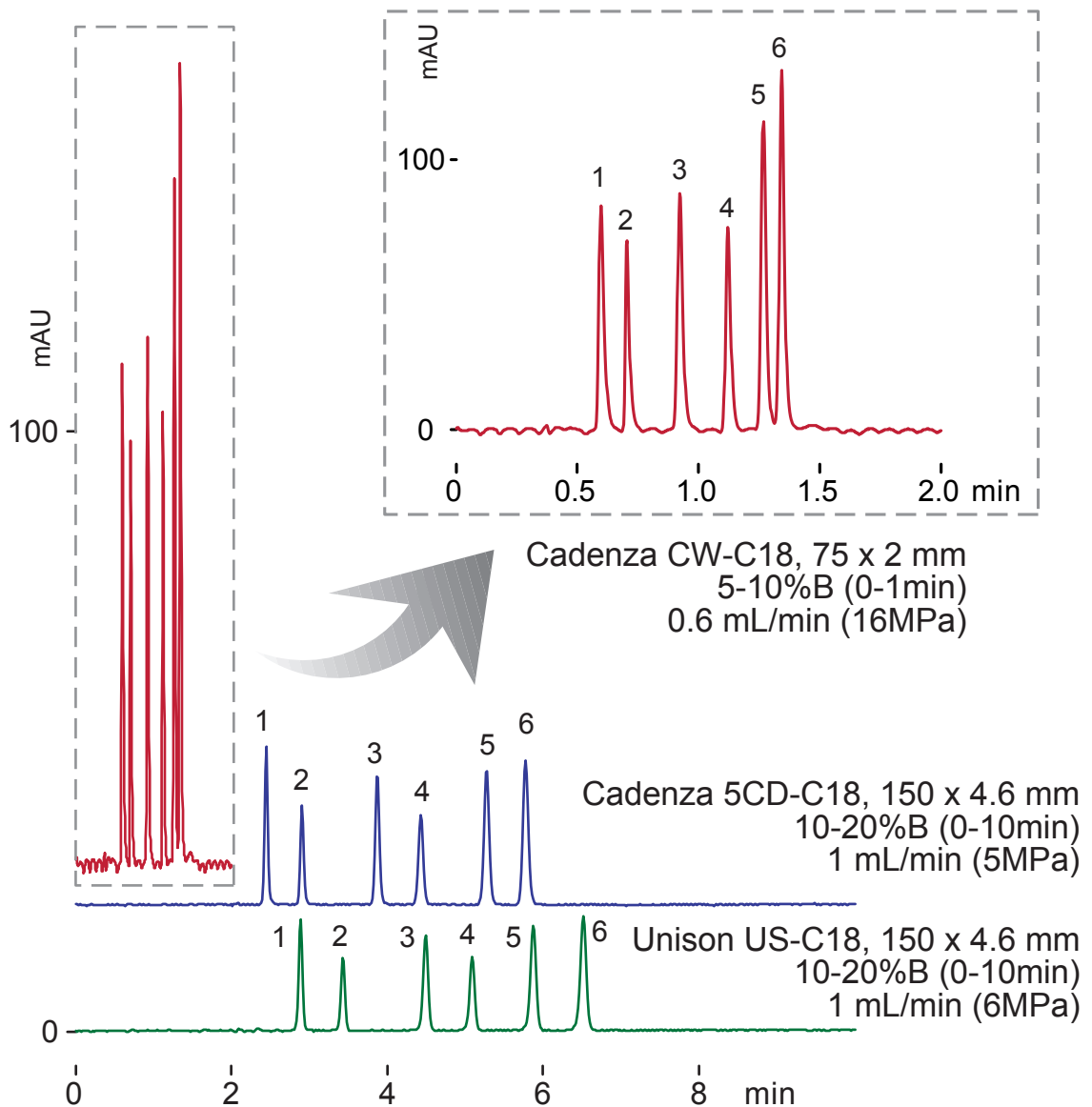
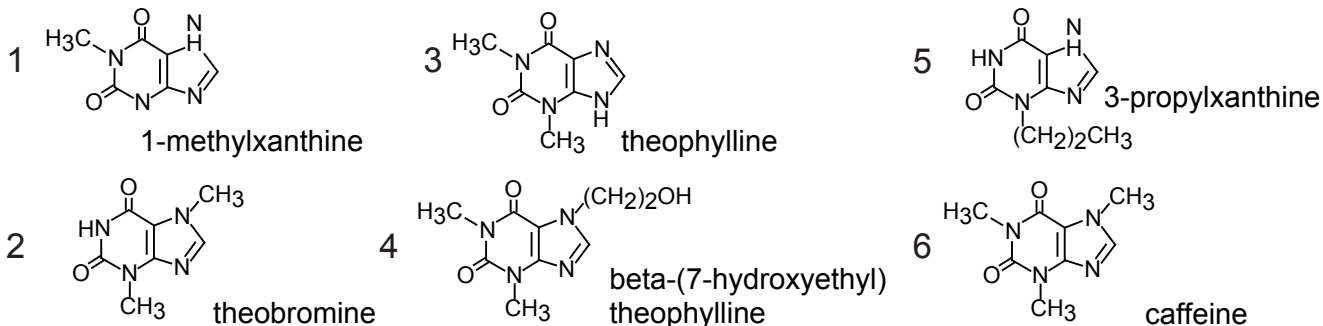
Cadenza CW-C18  
Cadenza 5CD-C18  
Unison US-C18

75 x 2 mm  
150 x 4.6 mm

Application

### Xanthines and Metabolites

キサンチン類とその代謝物



A: water / acetic acid = 100 / 0.1, B: acetonitrile / acetic acid = 100 / 0.1  
37 deg.C, 280 nm, 2 uL (100ng)

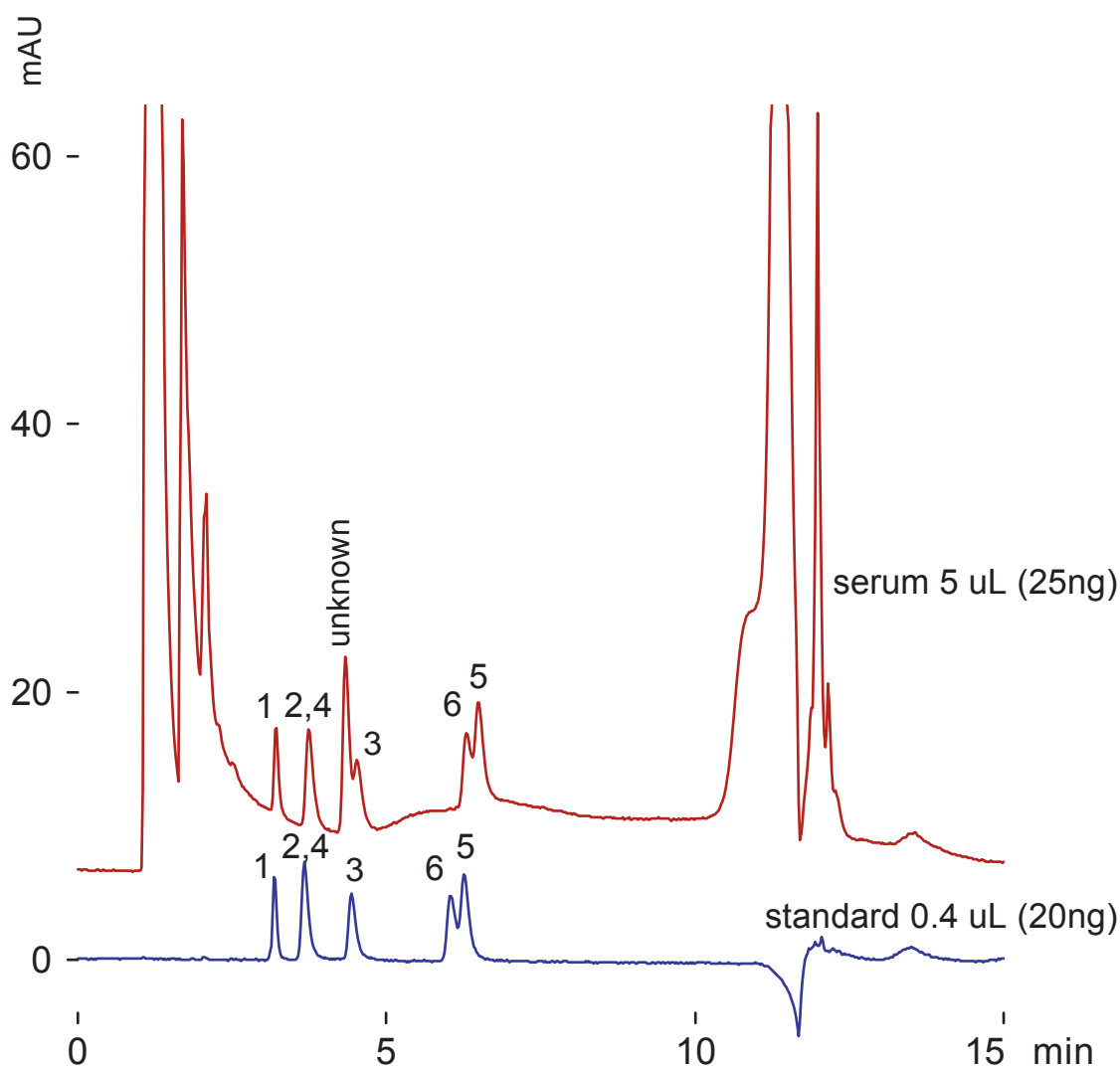
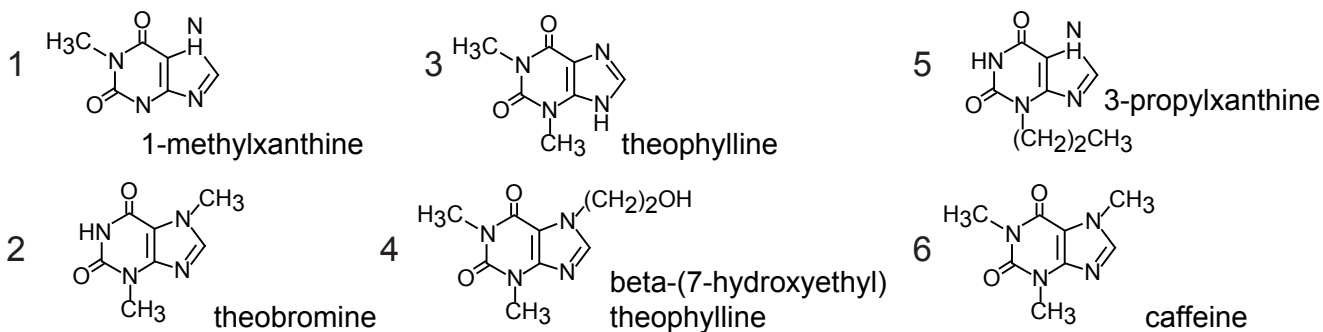
Cadenza HS-C18

150 x 3 mm

Application

## Xanthines and Metabolites in Bovine Serum

ウシ血清中のキサンチン類とその代謝物



Cadenza HS-C18, 150 x 3 mm

A: water / acetic acid = 100 / 0.1, B: acetonitrile / acetic acid = 100 / 0.1

0-10 %B (0-8min), 70 %B (8-10min), 0.4 mL/min (9MPa), 37 deg.C, 280 nm



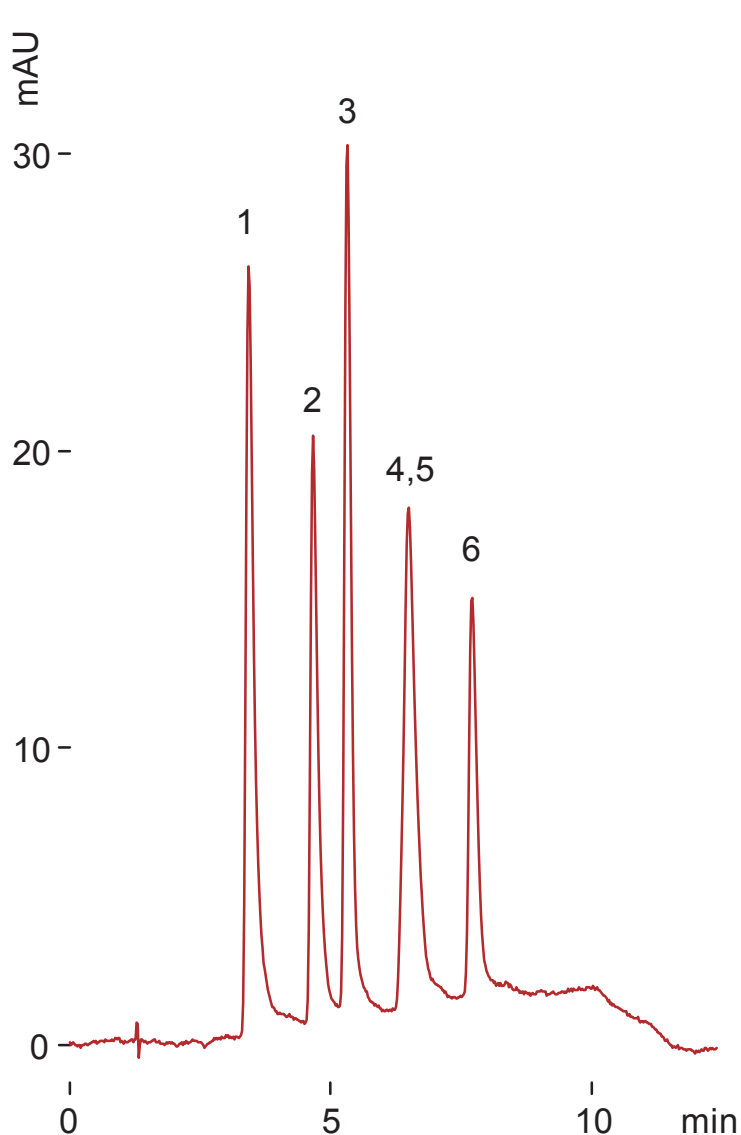
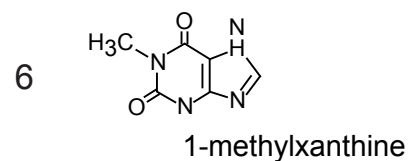
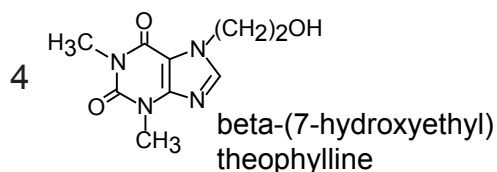
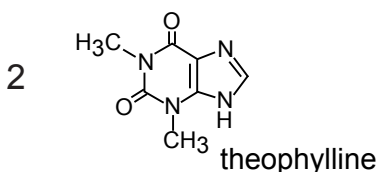
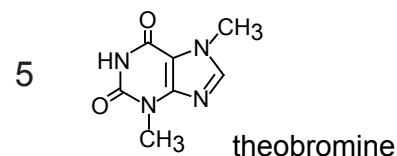
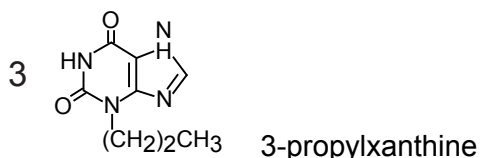
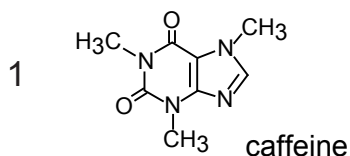
Unison UK-Amino

100 x 3 mm

Application

## Xanthines and Metabolites

キサンチン類とその代謝物



Unison UK-Amino, 100 x 3 mm  
 A: hexane / acetic acid = 100 / 0.1  
 B: THF / water / acetic acid  
 = 100 / 1 / 0.1  
 40-80 %B (0-8min)  
 0.4 mL/min (3MPa)  
 37 deg.C, 280 nm  
 2 uL (100ng)

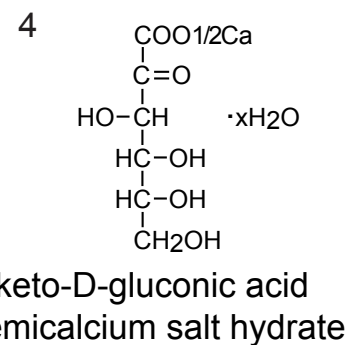
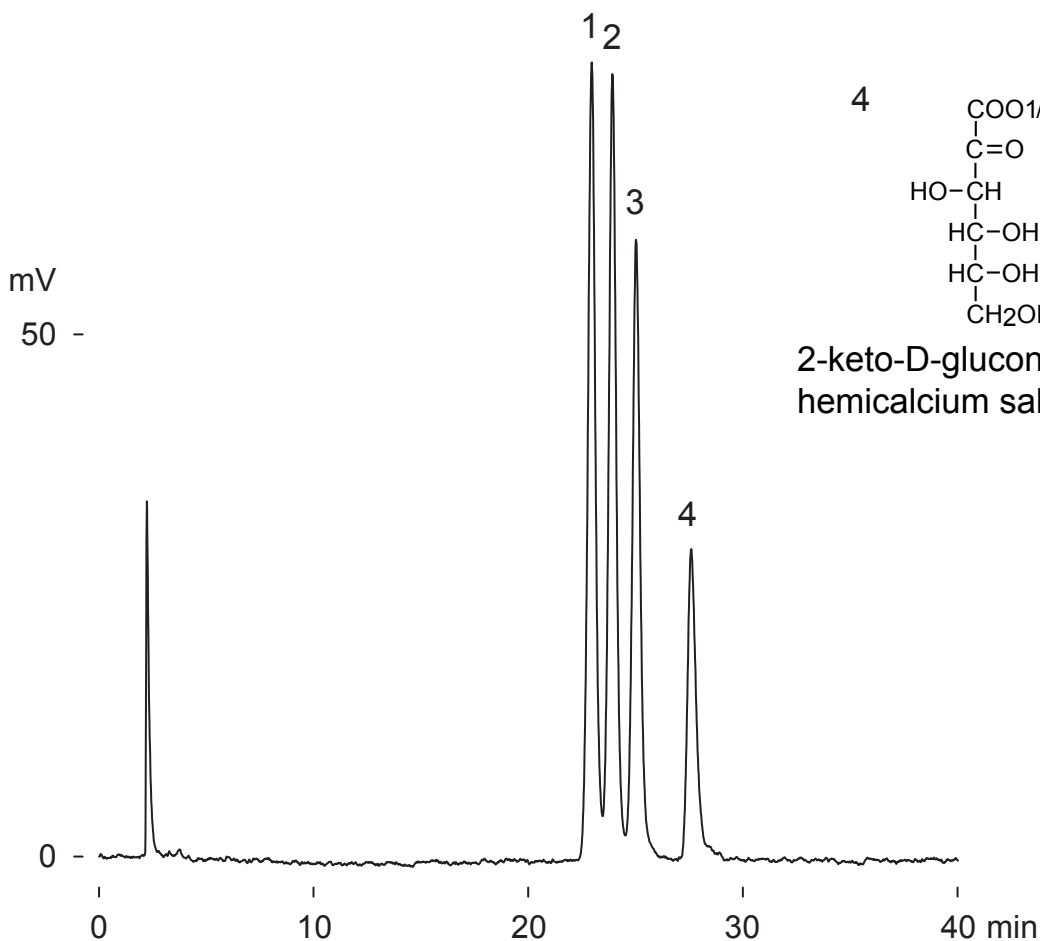
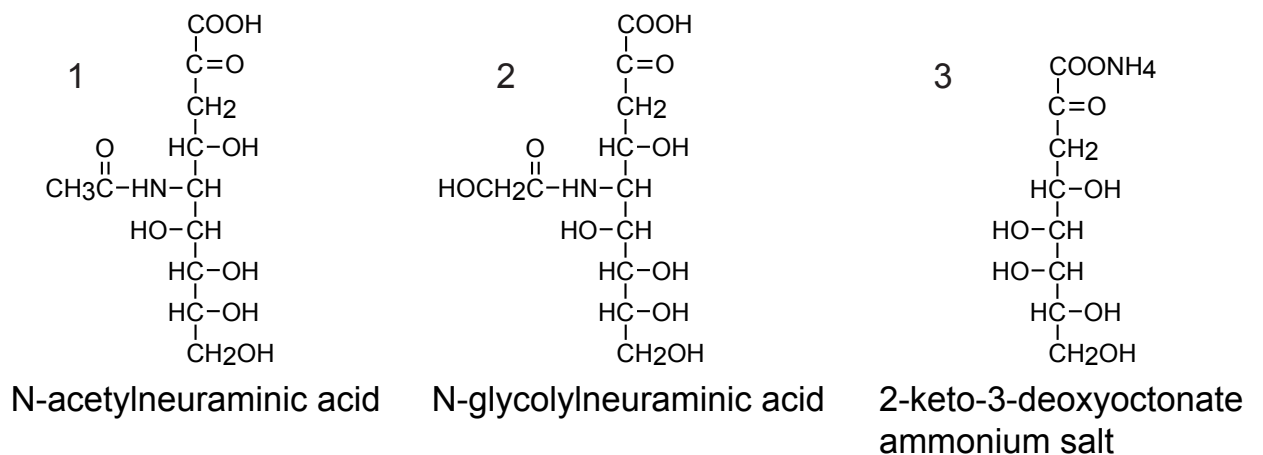
Unison UK-Amino

250 x 3 mm

Application

**Alpha-keto acids**

α-ケト酸



Unison UK-Amino, 250 x 3 mm  
 acetonitrile / 10mM ammonium formate = 40 / 60  
 0.4 mL/min (10MPa), 60 deg.C, ELSD, 2.6 uL (3ug)

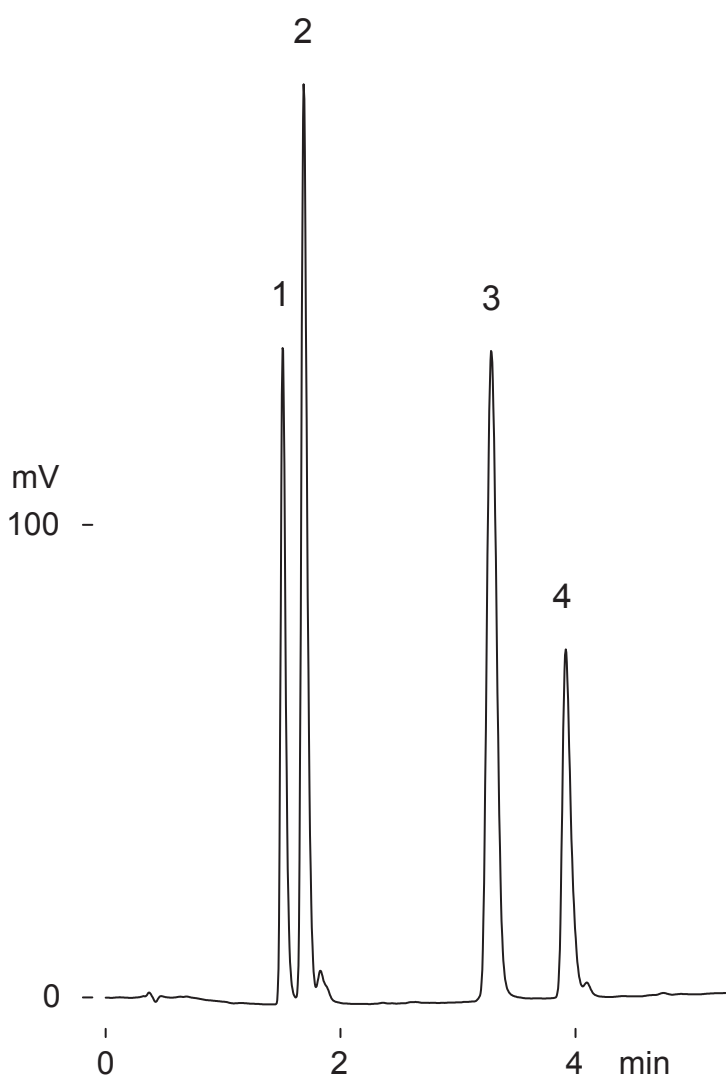
Unison UK-Amino

30 x 3 mm

Application

## Coenzymes (Nicotinamide adenine dinucleotides)

補酵素 (ニコチンアミド アデニン ジヌクレオチド)



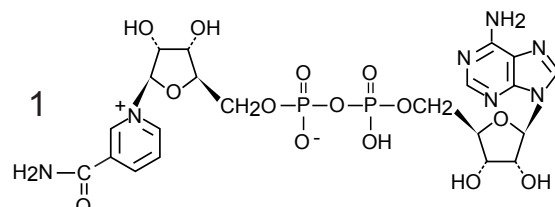
Unison UK-Amino, 30 x 3 mm

A: acetonitrile

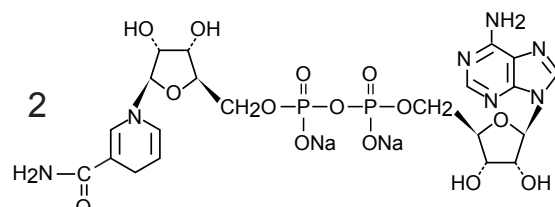
B: water /triethylamine /acetic acid  
= 100 /4.1 /1.6

20-85%B (0-5min), 0.6 mL/min (2MPa)

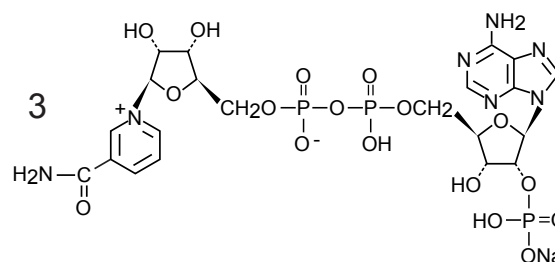
50 deg.C, 260 nm, 0.4 uL (0.5-1.3ug)



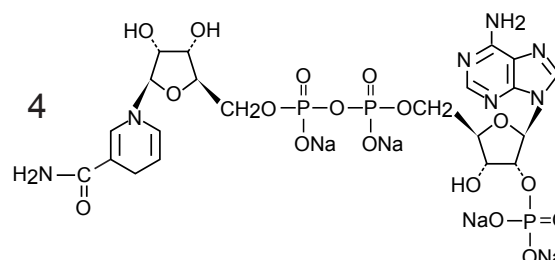
beta-nicotinamide adenine dinucleotide oxidized form (NAD)



beta-nicotinamide adenine dinucleotide reduced form, disodium (NADH)



beta-nicotinamide adenine dinucleotide phosphate, oxidized form, sodium (NADP)



beta-nicotinamide adenine dinucleotide phosphate, reduced form, tetrasodium (NADPH)

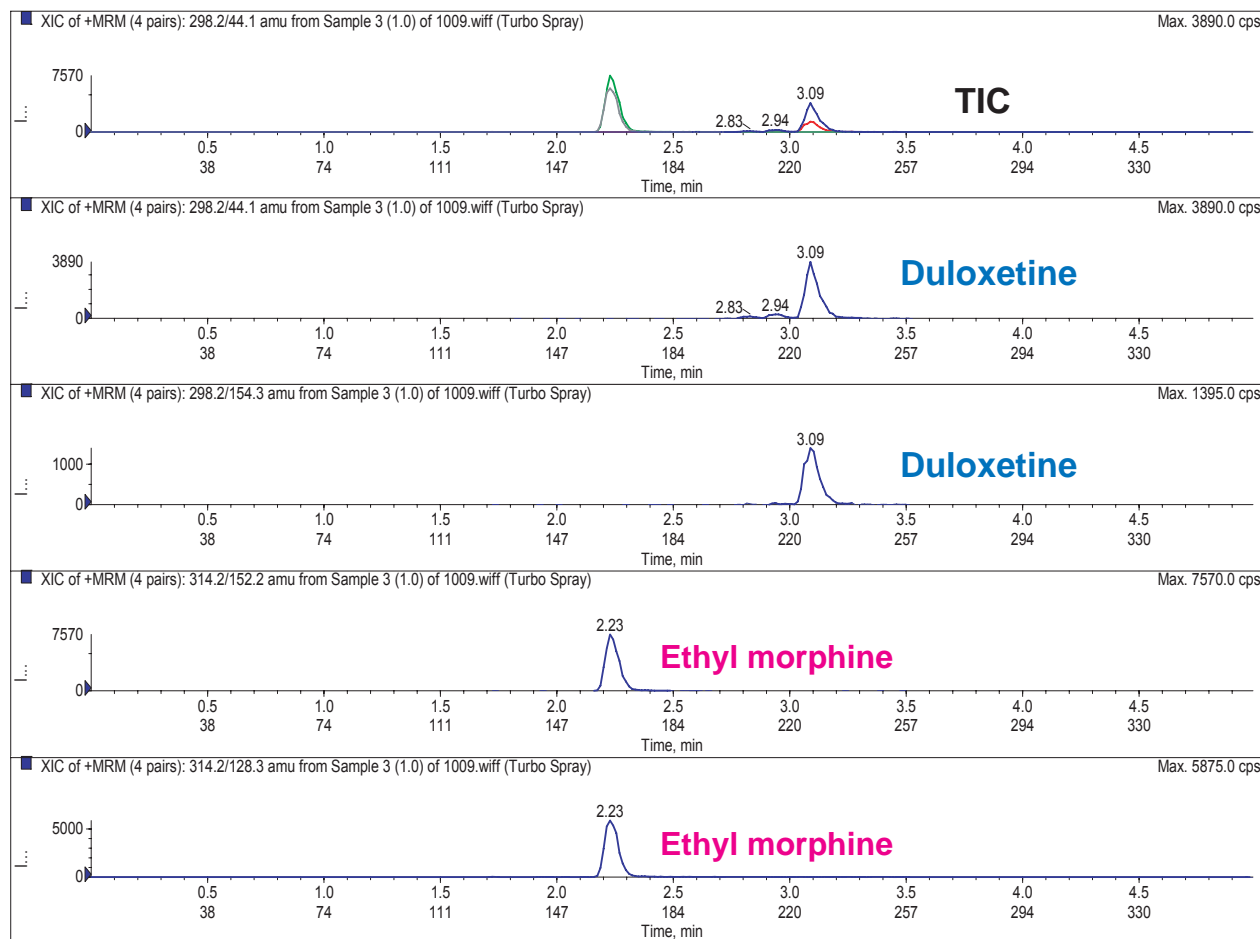
Unison US-C18

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

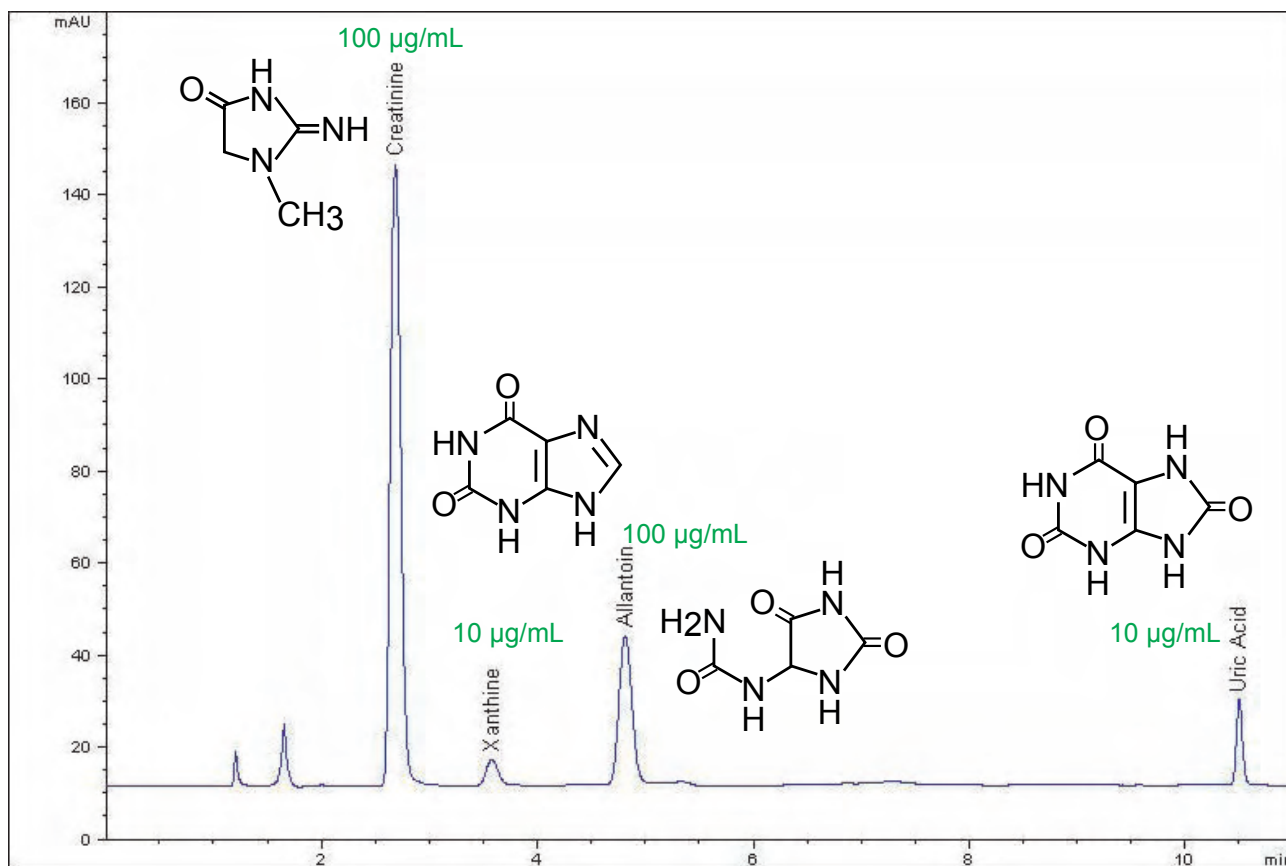
Unison UK-Amino

150 x 4.6 mm

Application

## Creatinine and Purine Metabolites

クレアチニンおよびプリン代謝物の順相分離



Unison UK-Amino, 150 x 4.6 mm

A: acetonitrile

B: 50mM ammonium formate

10% B (0-4min), 10-75%B (4-12min), 75%B (12-12.5min), 10%B (12.5-20min)

1.5 mL/min, 35 deg.C

multichannel acquisition (diode array) / wavelength switching (VWD)

creatinine (235nm), xanthine(265nm), allantoin (210nm), uric acid (290nm)

5 uL injection

Courtesy of Dr. Merlin K.L. Bicking, ACCTA, Inc., St. Paul, MN - USA

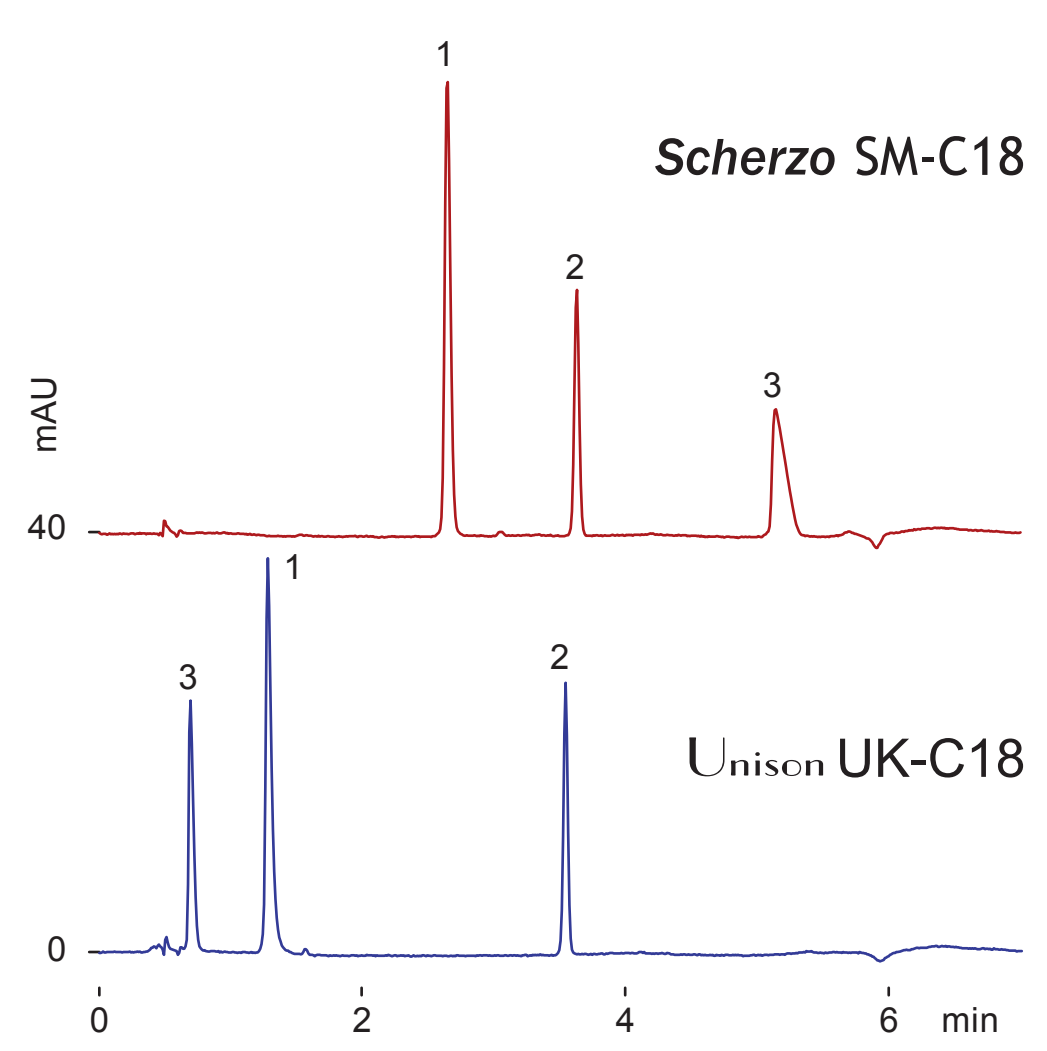
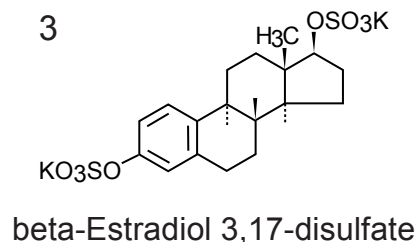
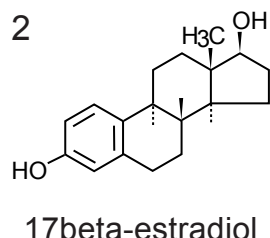
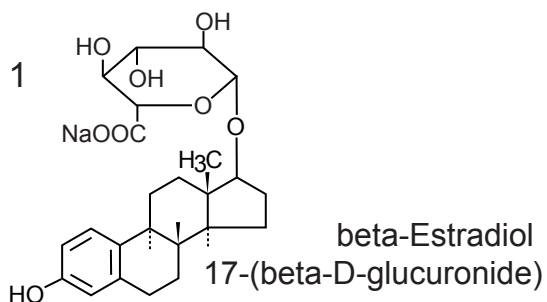
**Scherzo SM-C18**  
Unison UK-C18

50 x 3 mm

Application

**Estradiol and metabolites**

エストラジオールと代謝物



50 x 3 mm

A: 5mM ammonium acetate

B: 125mM ammonium acetate / acetonitrile = 20 / 80

30-100 %B (0-5min), 0.5 mL/min (5-9MPa)

37 deg.C, 280 nm ,1uL (0.5-2.5ng)

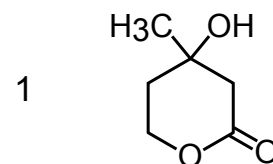
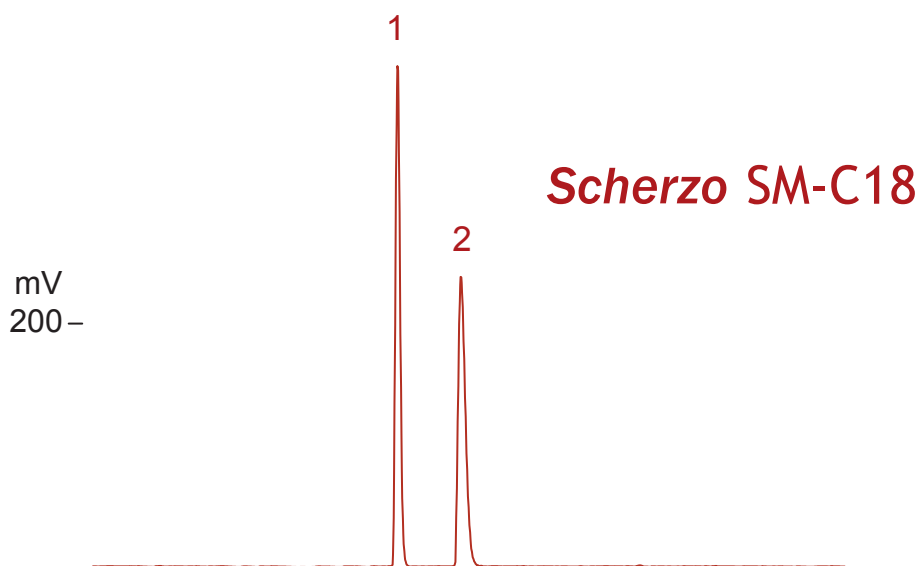
**Scherzo SM-C18**  
Unison UK-C18

150 x 3 mm

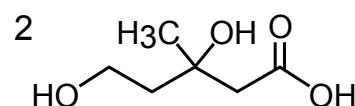
Application

**Mevalonolactone and Mevalonic acid**

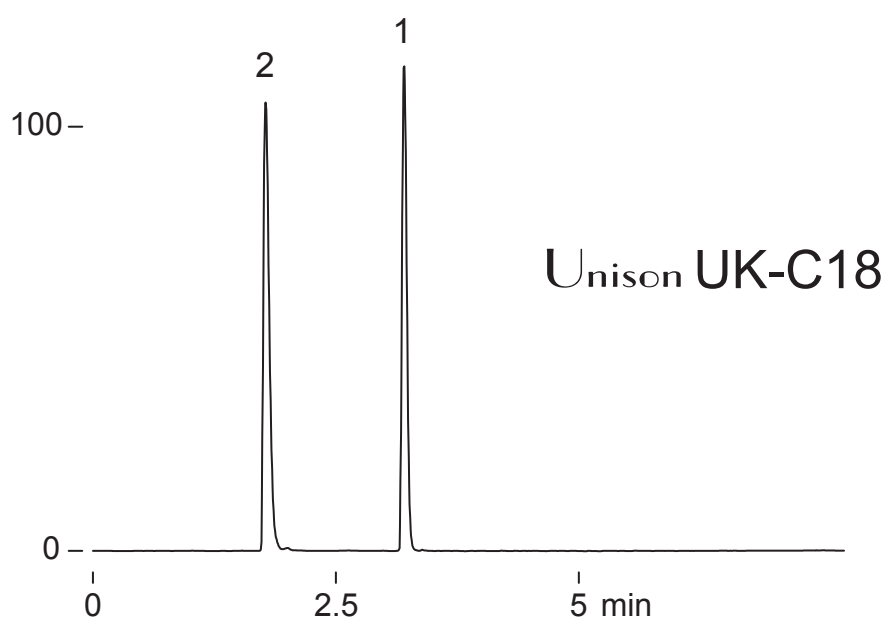
メバロノラクトン, メバロン酸



DL-mevalonolactone



DL-mevalonic acid



150 x 3 mm  
5mM ammonium formate / acetonitrile = 90 / 10  
0.4 mL/min (10MPa), 37 deg.C  
ELSD (spray chamber 20 deg.C, drift tube 45 deg.C)  
1 uL (10ug)

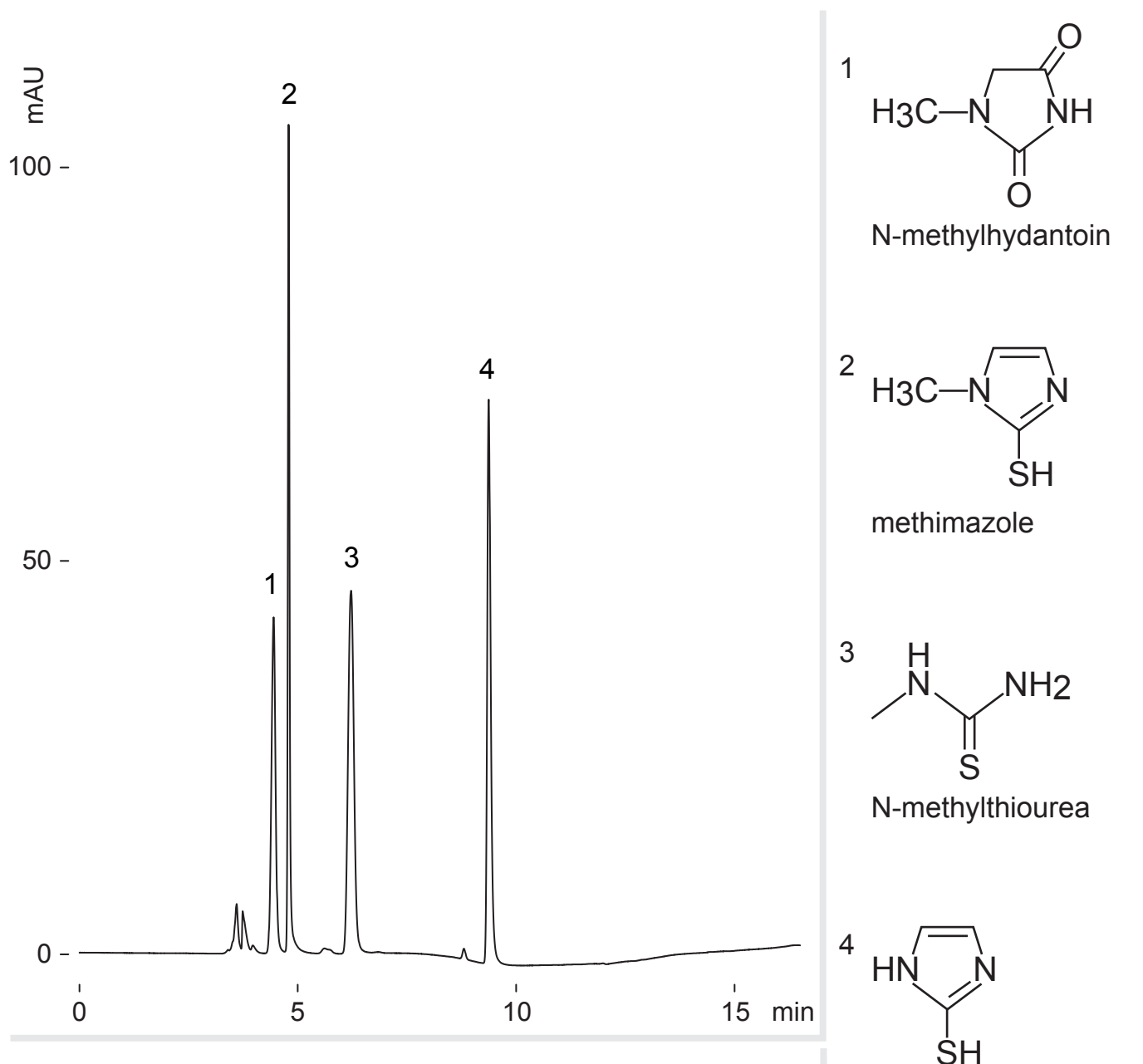
Unison UK-Amino

250 x 3 mm

Application

Methimazole and potential metabolites

メチマゾールと代謝物



Unison UK-Amino, 250 x 3 mm  
 A: acetonitrile, B: 10mM ammonium formate  
 1-25 %B (0-15min)  
 0.4 mL/min (5MPa), 50 deg.C, 230 nm  
 2.4 uL (0.07-0.35 ug, diluted with ethanol)

Courtesy of Takeo Sakuma, Ph.D, MDS Analytical Technologies (SCIEX), Canada

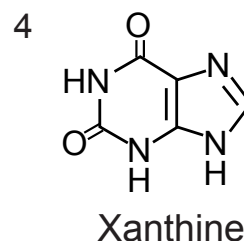
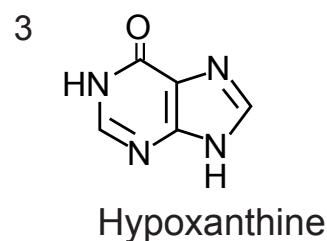
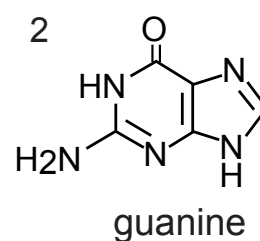
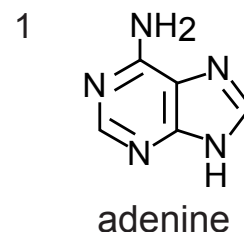
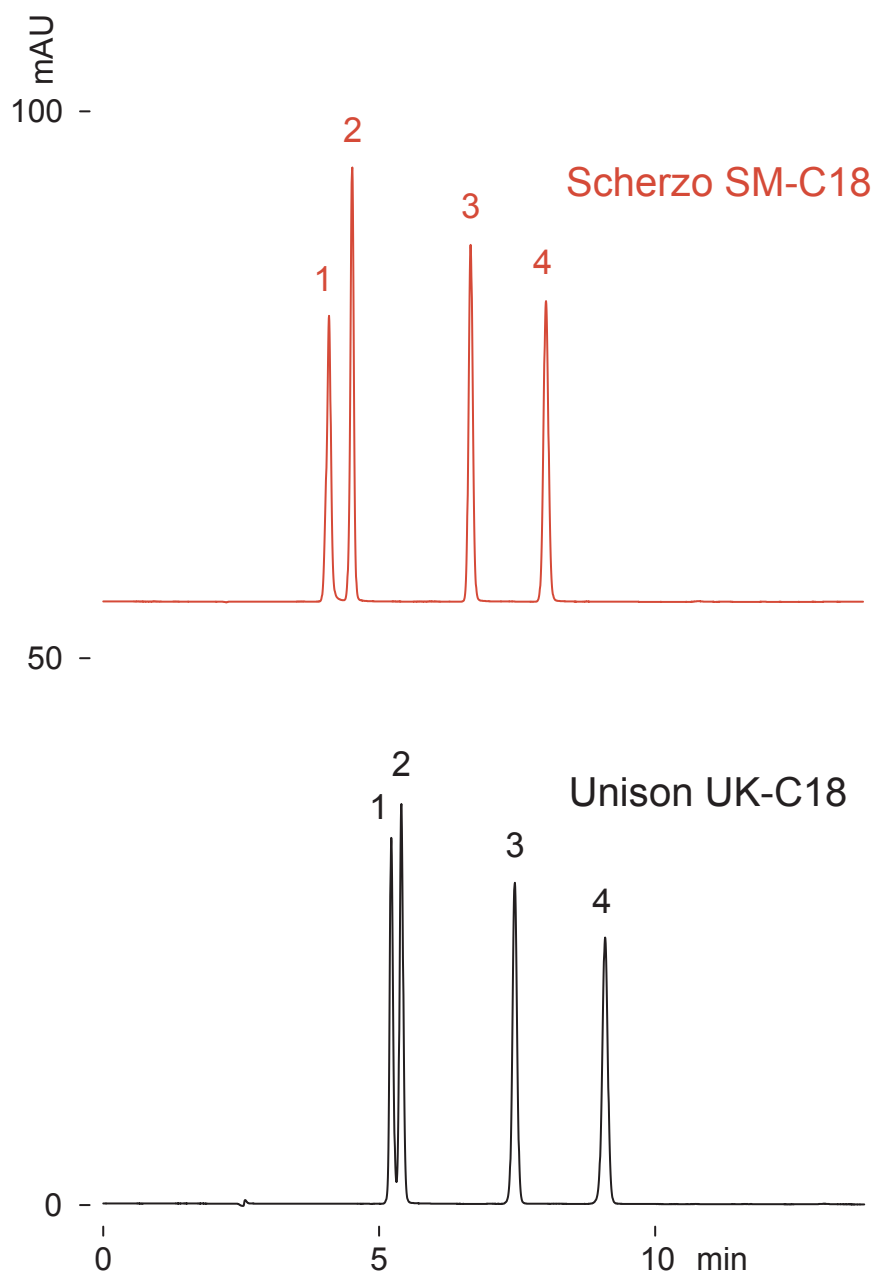


**Scherzo SM-C18**  
Unison UK-C18

250 x 4.6 mm

Application

**Purine bases**  
プリン塩基



250 x 4.6 mm  
 A: water / acetic acid = 100 / 1  
 B: acetonitrile / acetic acid = 100 / 1  
 0 %B (0-8min), 70 %B (8-13min)  
 1 mL/min (15MPa), 37 deg.C, 260 nm  
 0.6 uL (0.09-0.17ug)

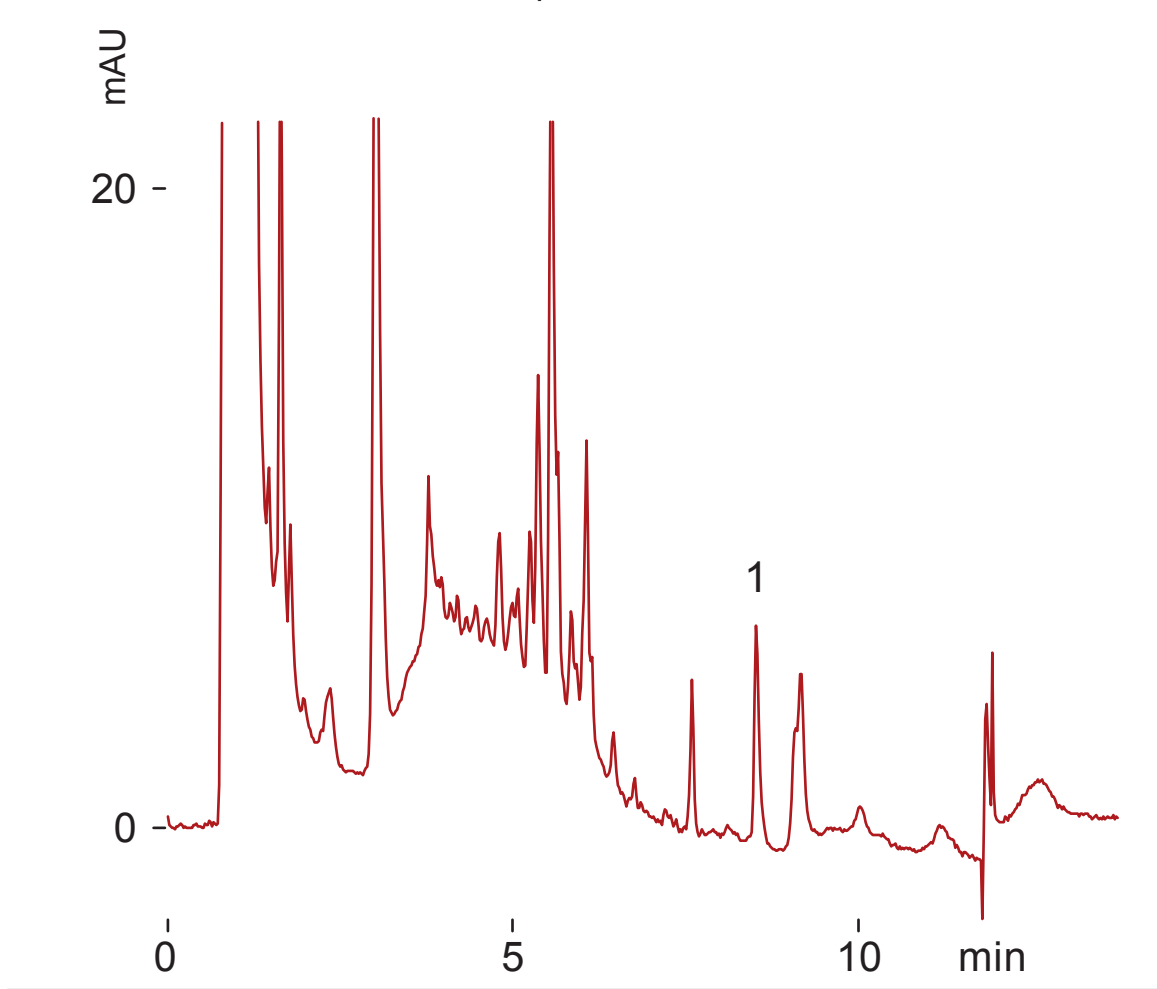
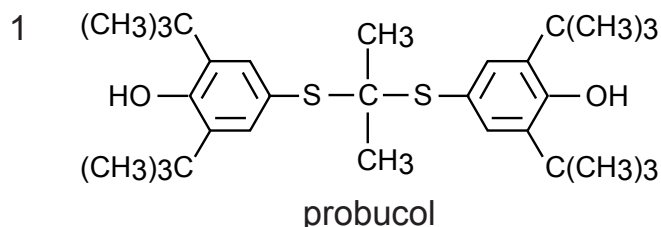
Cadenza HS-C18

150 x 3 mm

Application

Anti-hyperlipidemic drug in bovine serum (probucol)

血清中の脂質降下薬(プロブコール)



Cadenza HS-C18, 150 x 3 mm  
 A: 50mM ammonium formate, B: acetonitrile  
 0-80 %B (0-10min), 0.5 mL/min (14MPa)  
 37 deg.C, 280 nm, 5 uL (0.5ug)

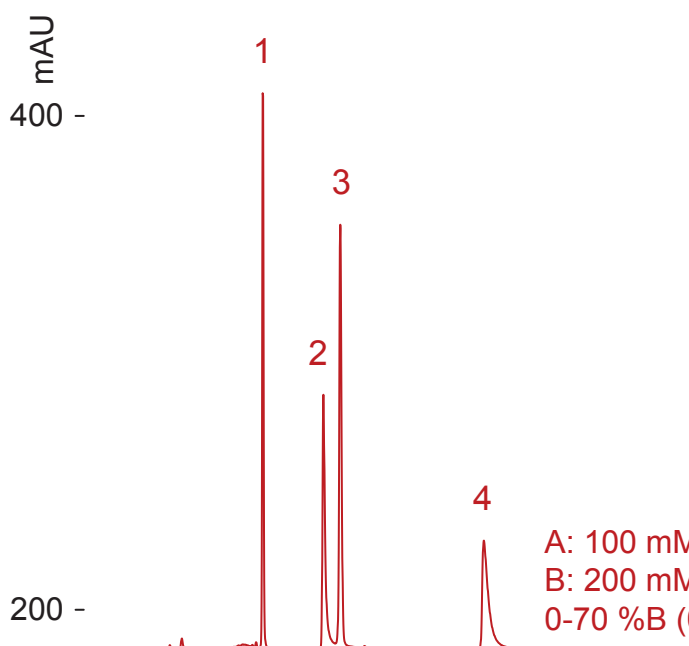
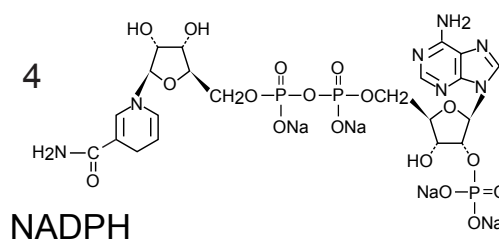
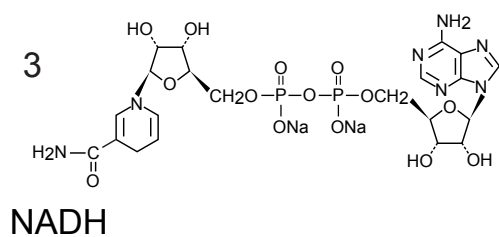
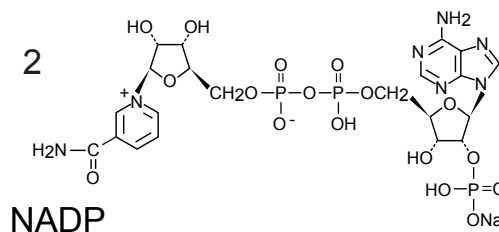
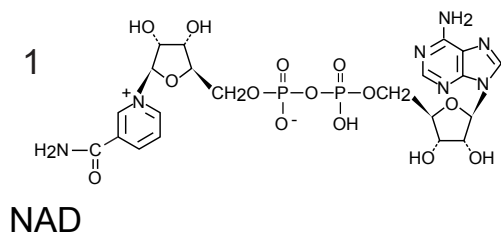
Scherzo SM-C18

150 x 3 mm

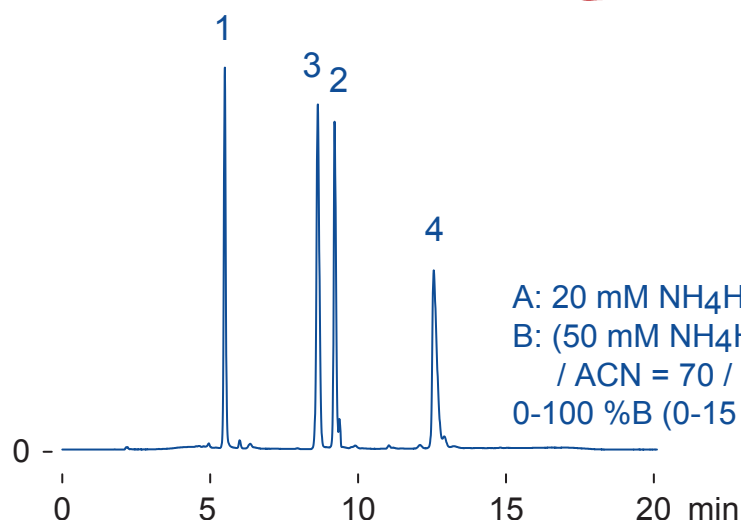
Application

Coenzymes (Nicotinamide adenine dinucleotides)

補酵素 (ニコチンアミド アデニン ジヌクレオチド)



A: 100 mM HCOOH  
 B: 200 mM HCOONH<sub>4</sub> / ACN = 70 / 30  
 0-70 %B (0-15 min), 8 MPa



A: 20 mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub>  
 B: (50 mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> : 50 mM (NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub> = 1 : 1)  
 / ACN = 70 / 30  
 0-100 %B (0-15 min), 9 MPa

Scherzo SM-C18, 150 x 3 mm

0.4 mL/min, 37 deg.C, 260 nm, 1.6 uL (0.3 - 0.6 ug, 1 % formic acid)

**Scherzo SM-C18**

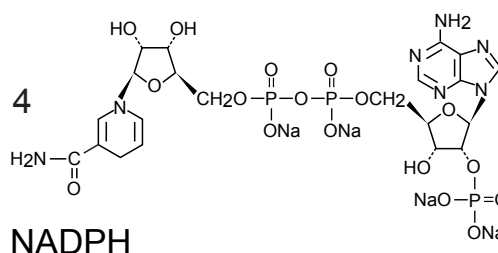
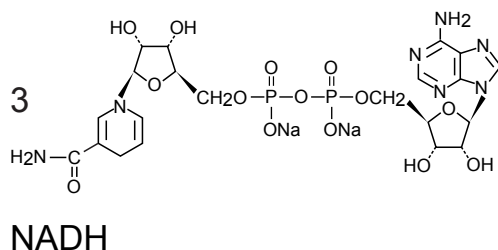
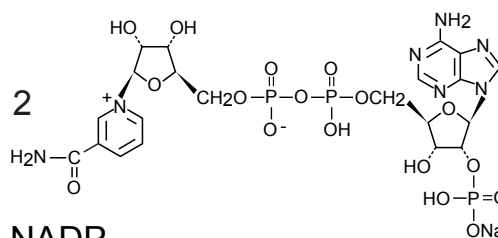
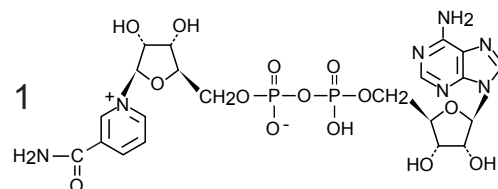
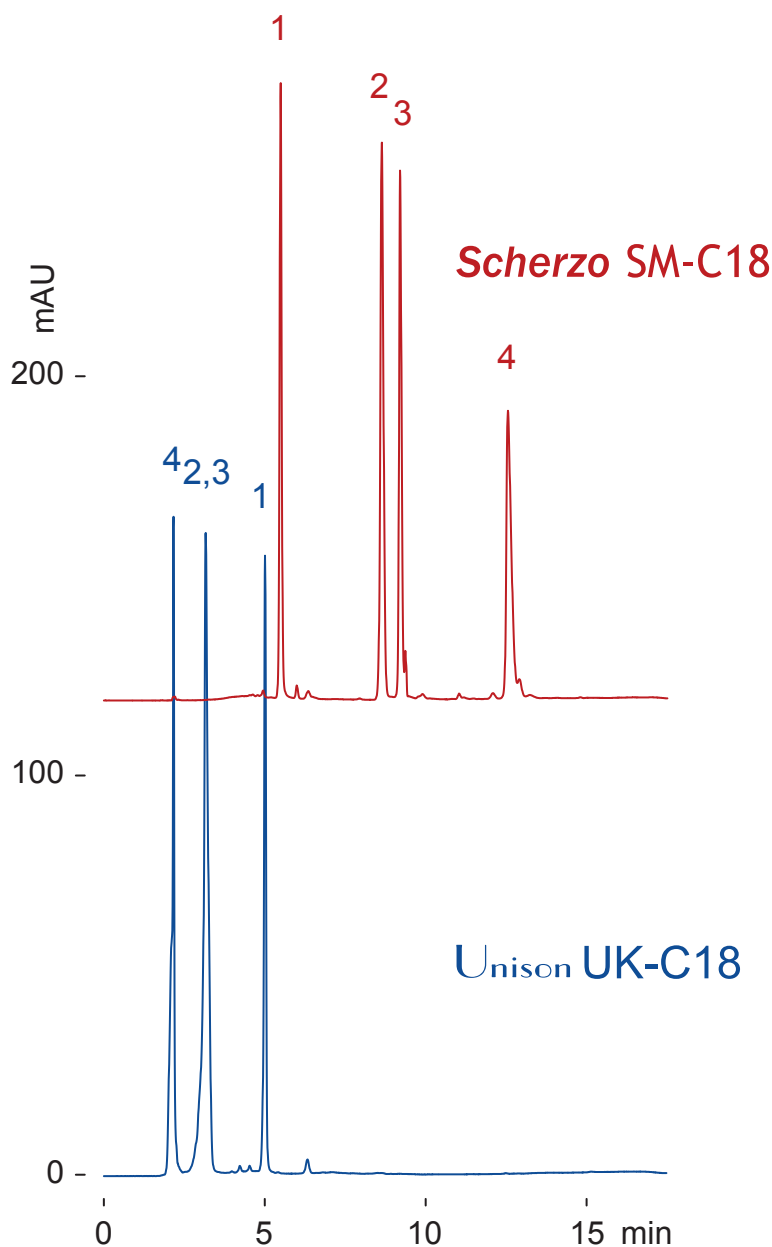
Unison UK-C18

150 x 3 mm

Application

**Coenzymes (Nicotinamide adenine dinucleotides)**

補酵素 (ニコチンアミド アデニン ジヌクレオチド)



150 x 3 mm

A: 20 mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub>

B: (50 mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> : 50 mM (NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub> = 1 : 1) / ACN = 70 / 30

0-100 %B (0-15 min)

0.4 mL/min (9 MPa), 37 deg.C, 260 nm, 1.6 uL (0.3 - 0.6 ug, 1 % formic acid)

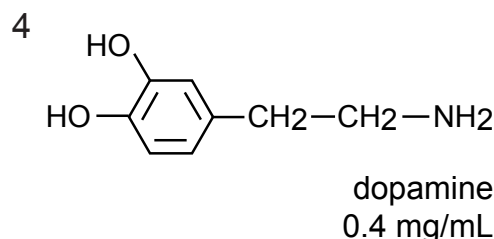
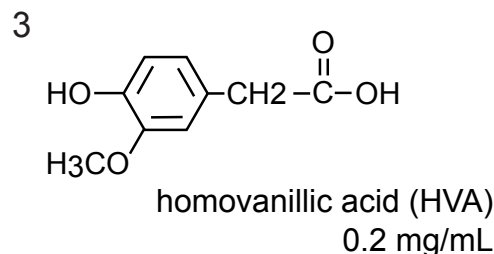
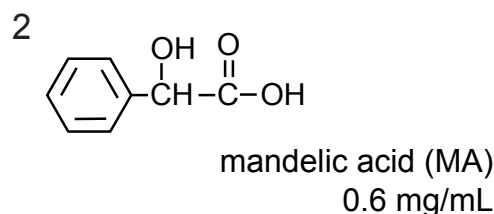
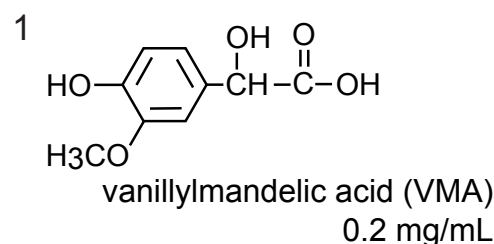
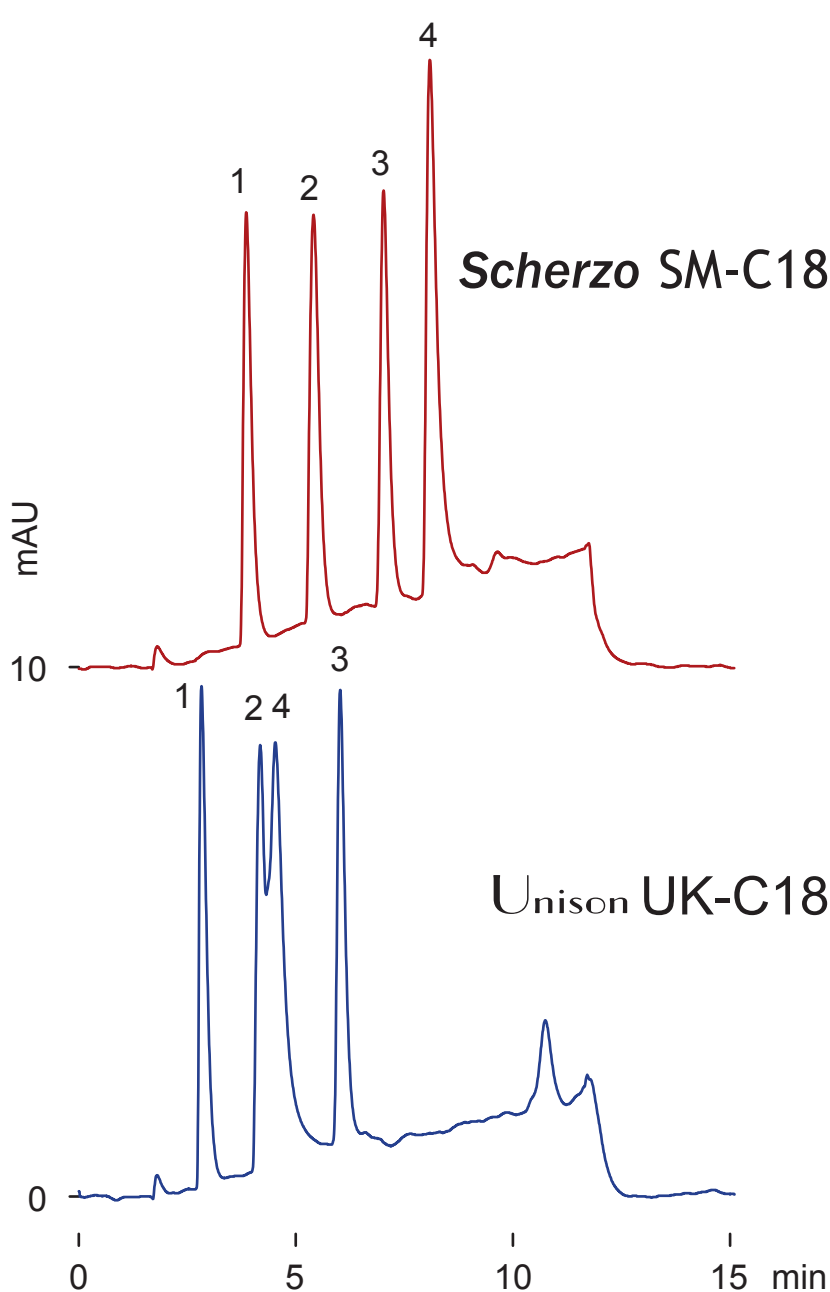
**Scherzo SM-C18**  
Unison UK-C18

150 x 4.6 mm

Application

**Catecholamine metabolites**

カテコールアミン代謝物



150 x 4.6 mm

A: 5mM ammonium acetate

B: 100mM ammonium acetate / methanol = 75 / 25

0-100 %B (0-10min)

1 mL/min (9MPa), 37 deg.C, 260 nm

3 uL (600mM ammonium acetate)

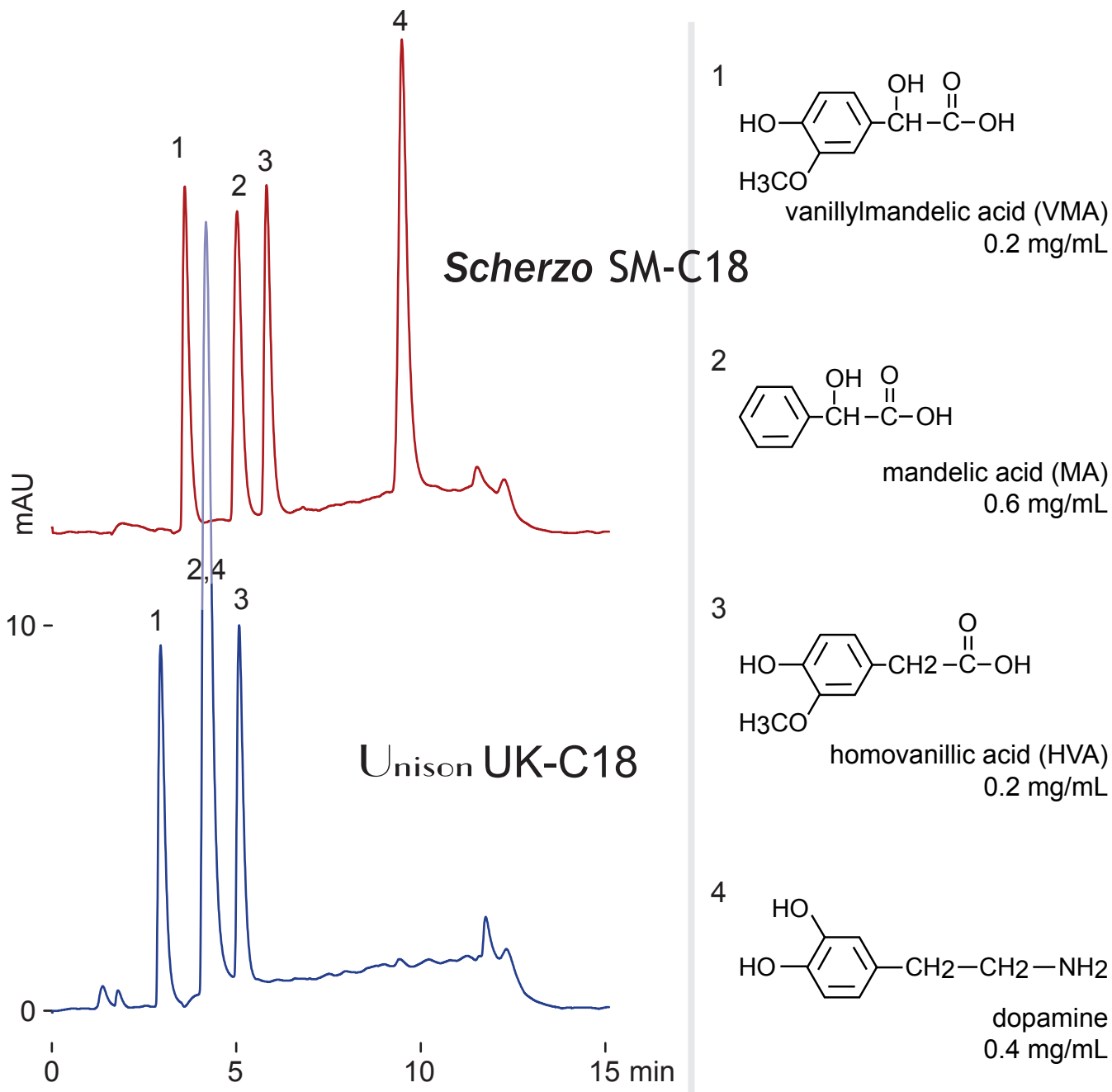
**Scherzo SM-C18**  
Unison UK-C18

150 x 4.6 mm

Application

**Catecholamine metabolites**

カテコールアミン代謝物



150 x 4.6 mm

A: 2 mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> : 2 mM (NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub> = 1 : 1

B: [20 mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> : 20 mM (NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub> = 1 : 1] / acetonitrile = 80 / 20

0-100 %B (0-10min)

1 mL/min (9MPa), 37 deg.C, 260 nm

3 uL (600mM ammonium acetate)

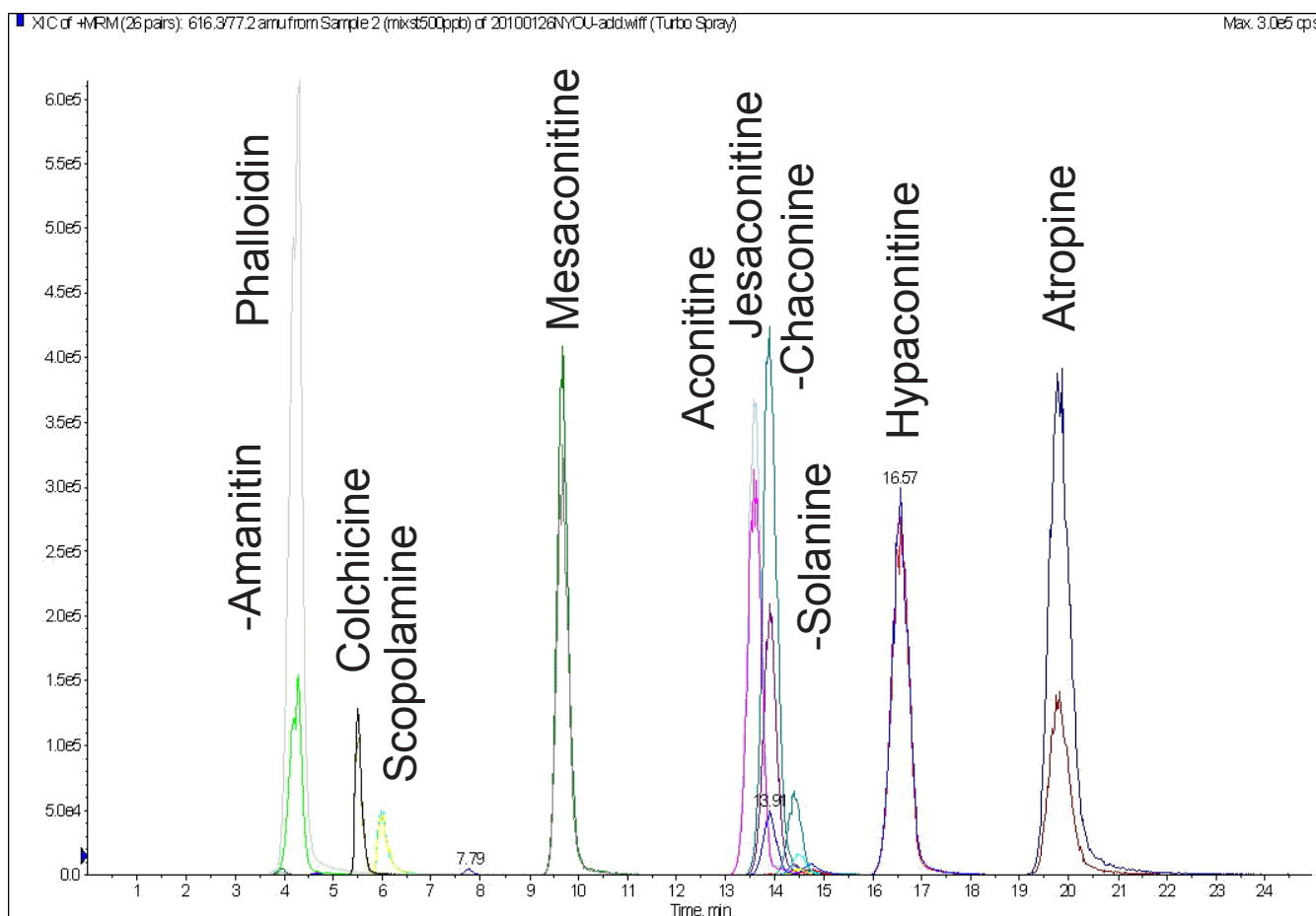
Scherzo SM-C18

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

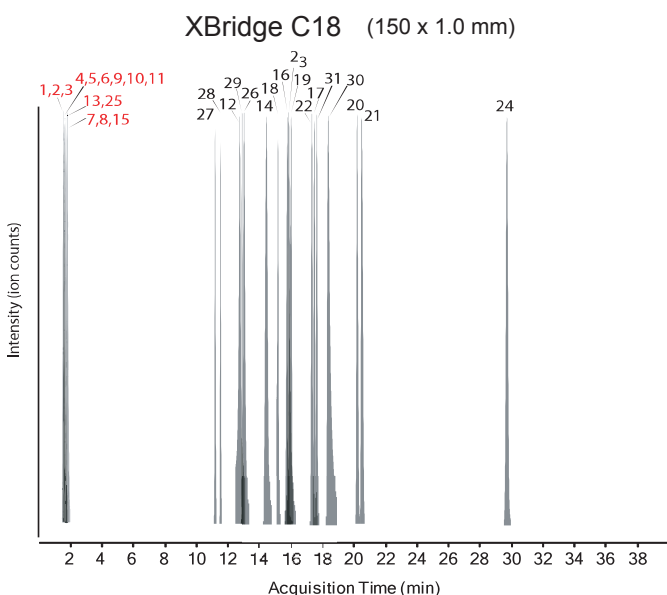
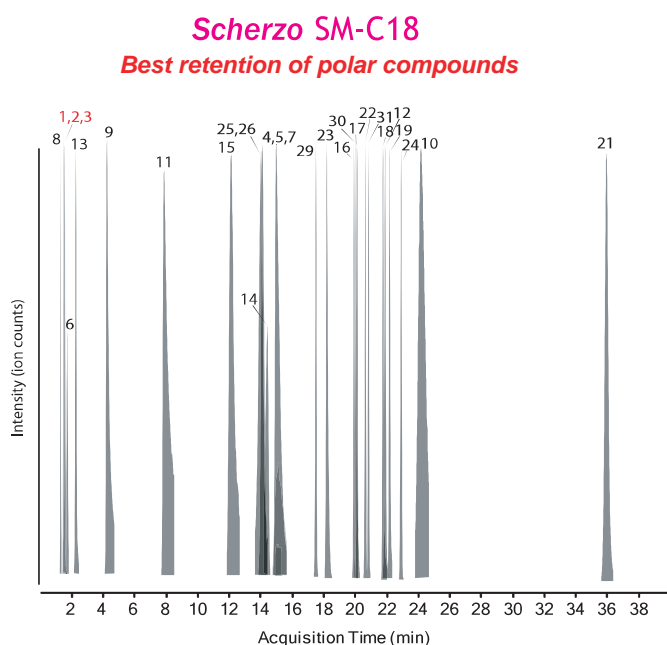
**Scherzo SM-C18**

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



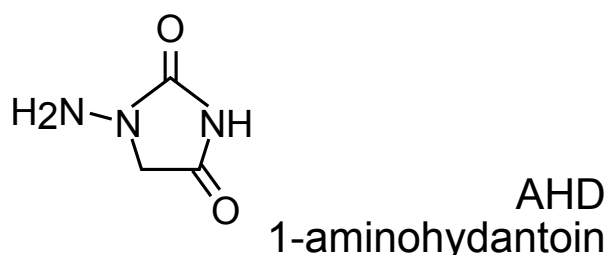
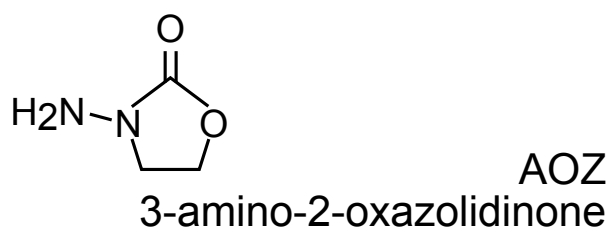
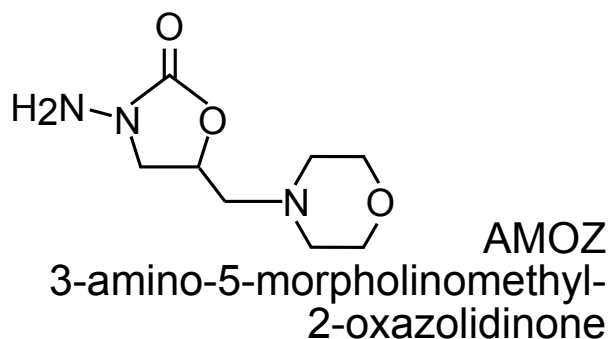
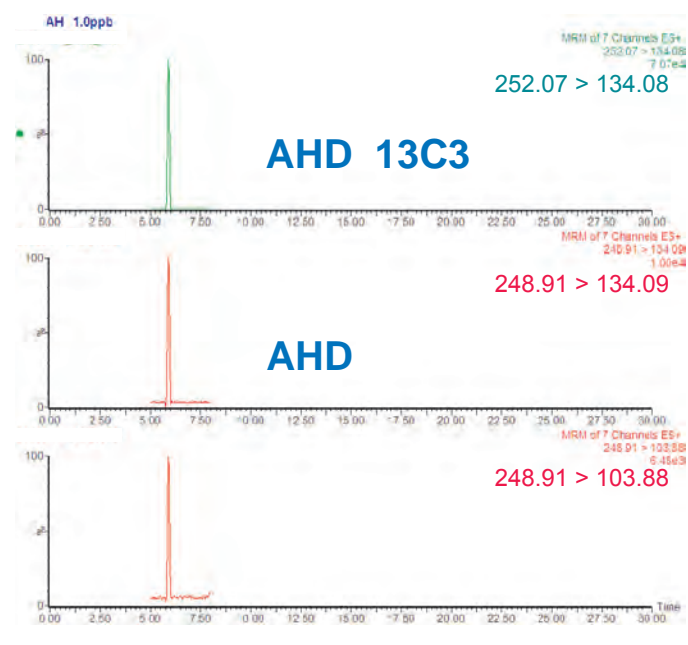
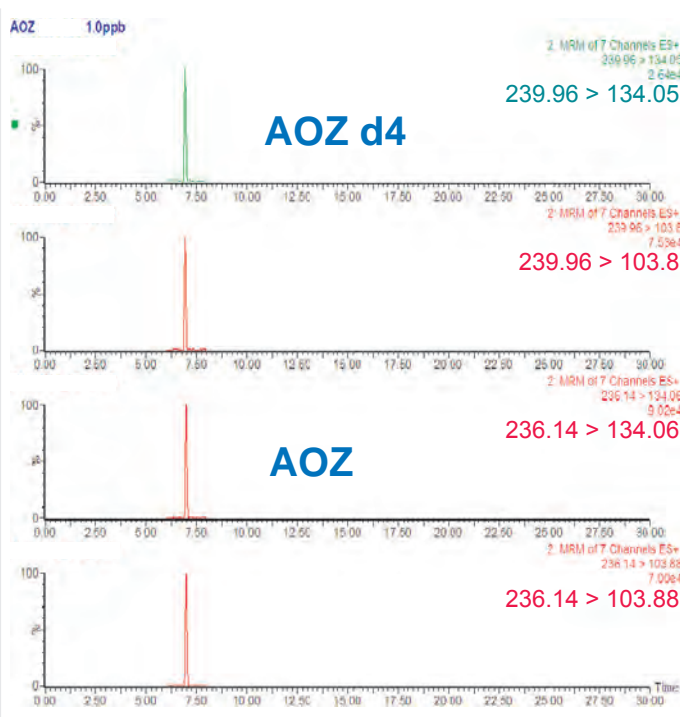
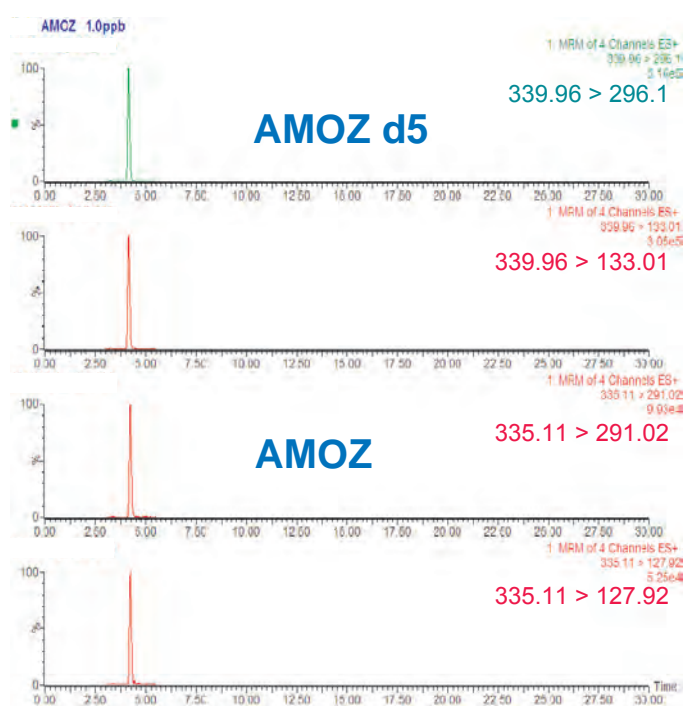
Cadenza CD-C18

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

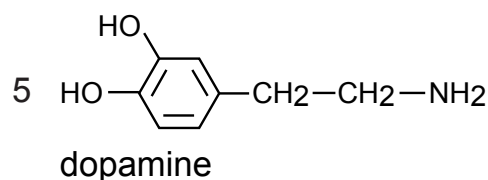
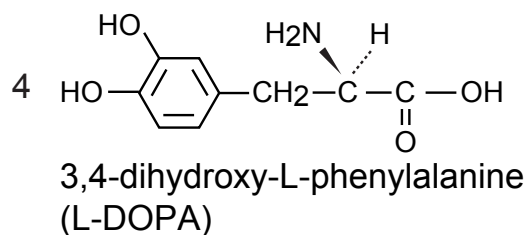
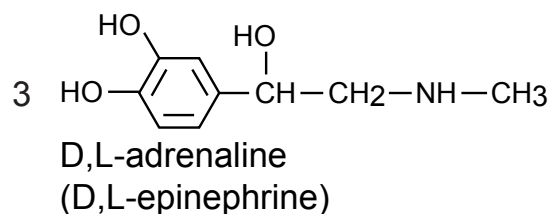
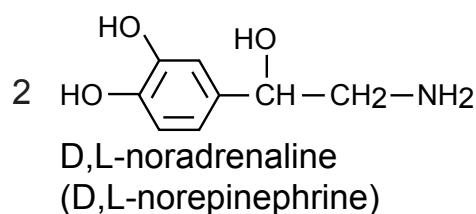
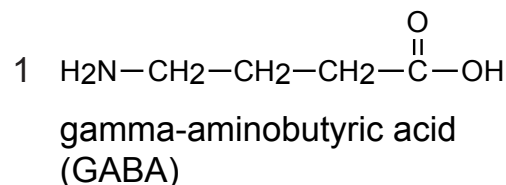
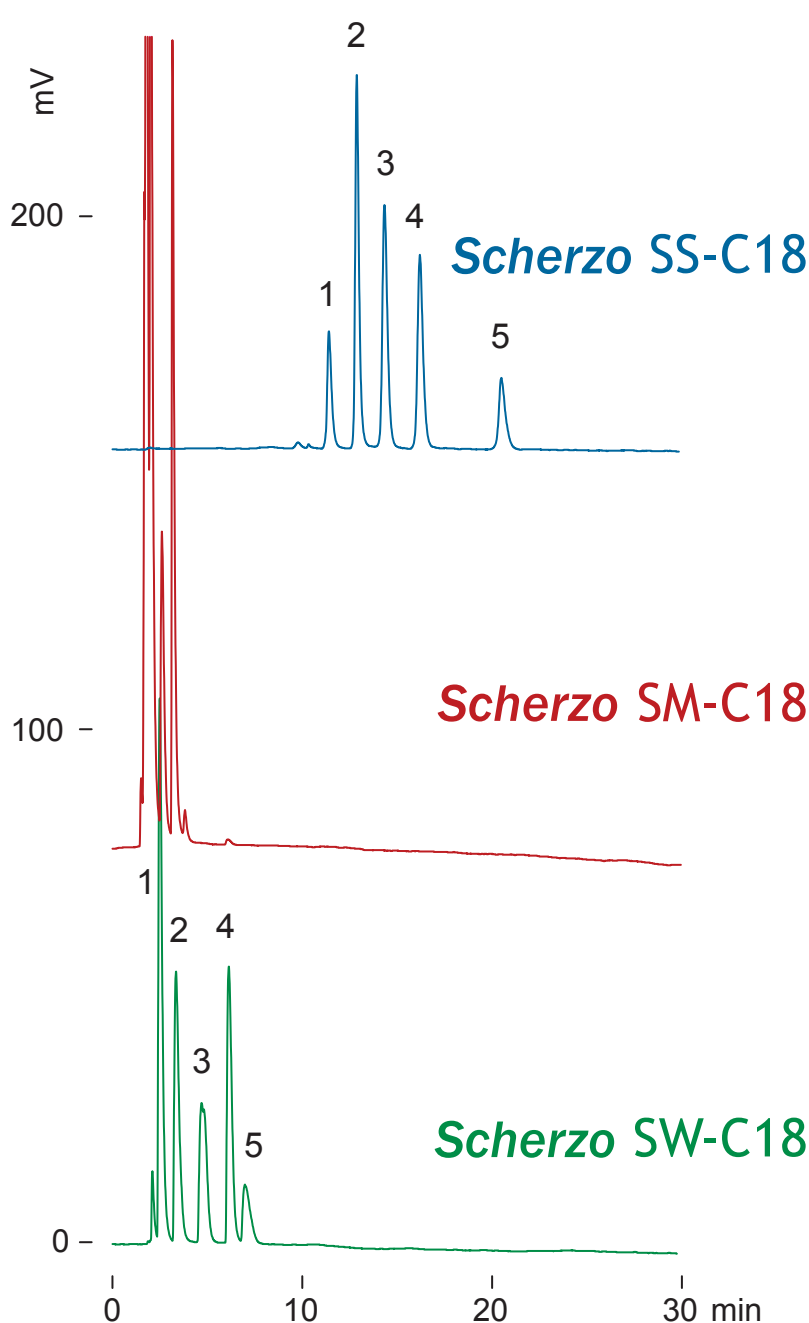
Scherzo SS-C18  
 Scherzo SM-C18  
 Scherzo SW-C18

150 x 3 mm

Application

**Catecholamines**

カテコールアミン類



150 x 3 mm

A: water / formic acid = 100 / 0.3

B: 100 mM ammonium formate / acetonitrile = 70 / 30

0-60 %B (0-30 min)

0.4 mL/min (9MPa), 37 deg.C

ELSD (spray chamber 50 deg.C, drift tube 100 deg.C), 2 uL (4-7 ug)

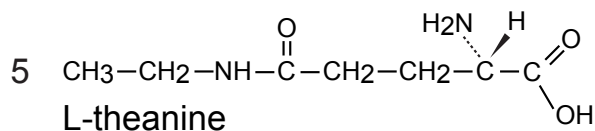
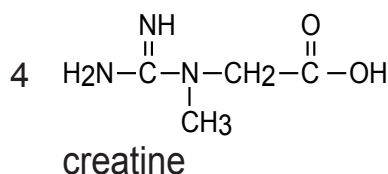
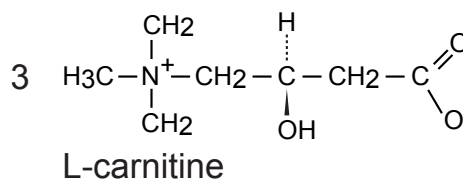
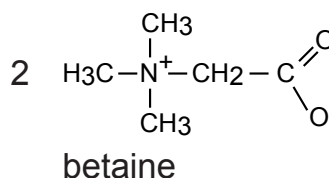
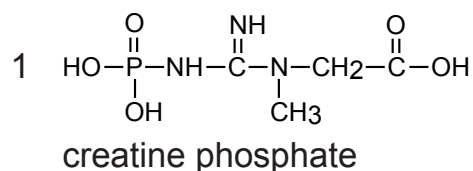
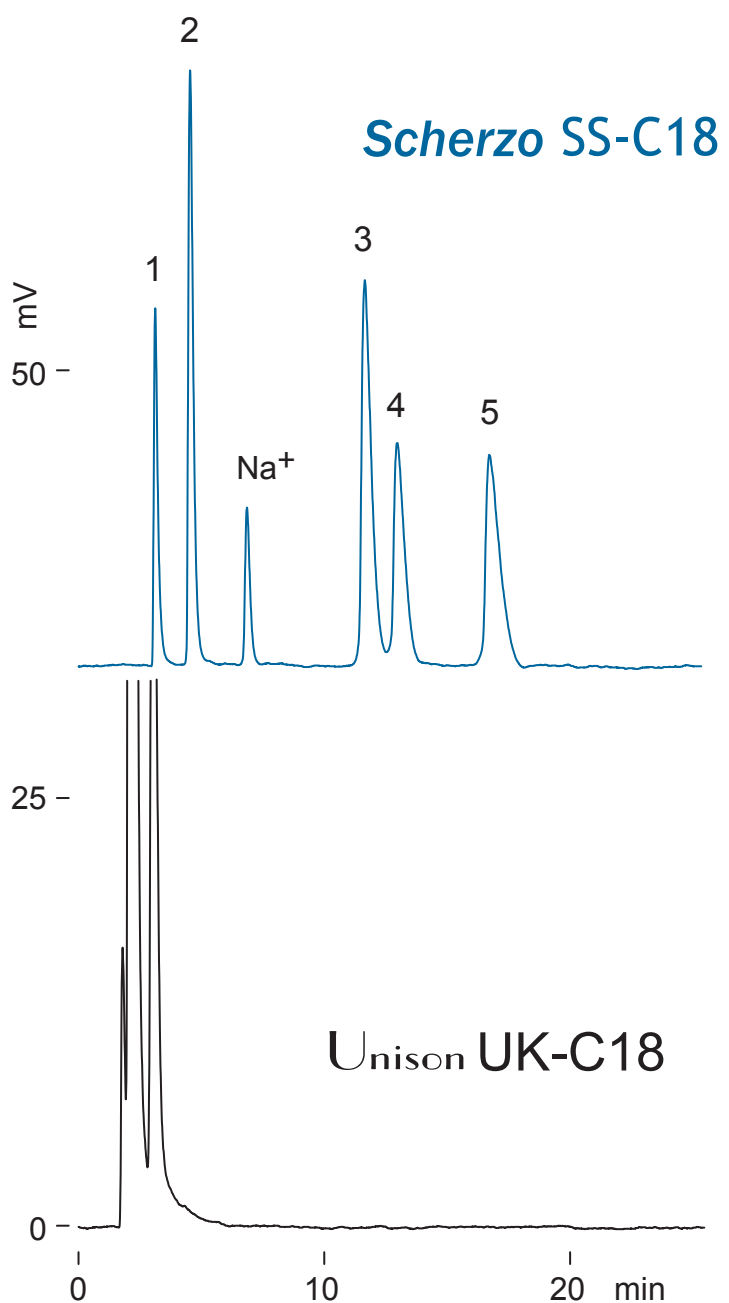
**Scherzo SS-C18**  
Unison UK-C18

150 x 3 mm

Application

Zwitterionic compounds

双性イオン化合物



150 x 3 mm

water / Methanol / formic acid = 98 / 2 / 0.6

0.4 mL/min (9 MPa), 37 deg.C

ELSD (spray chamber 50 deg.C, drift tube 100 deg.C)

2 uL (3-5 ug)

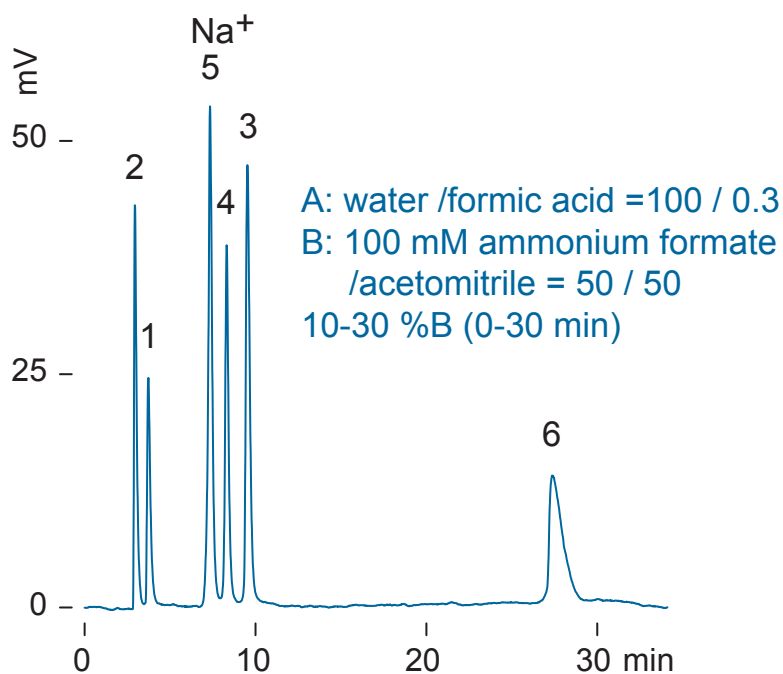
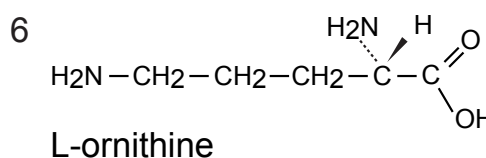
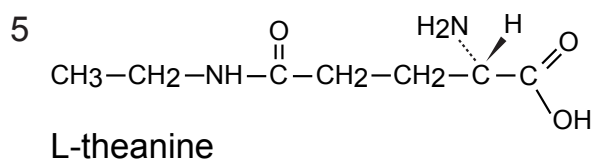
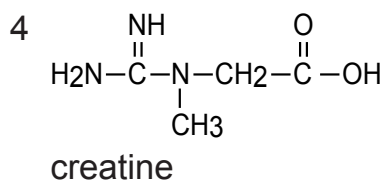
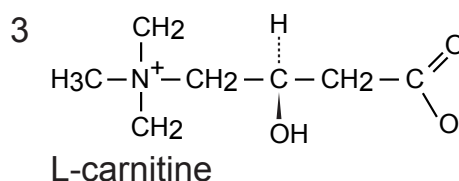
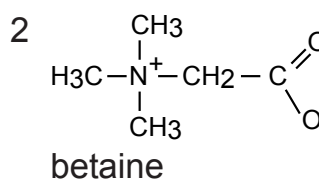
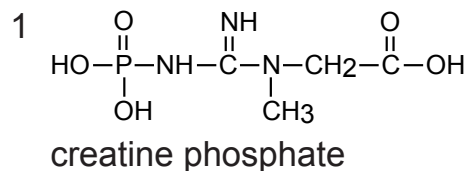
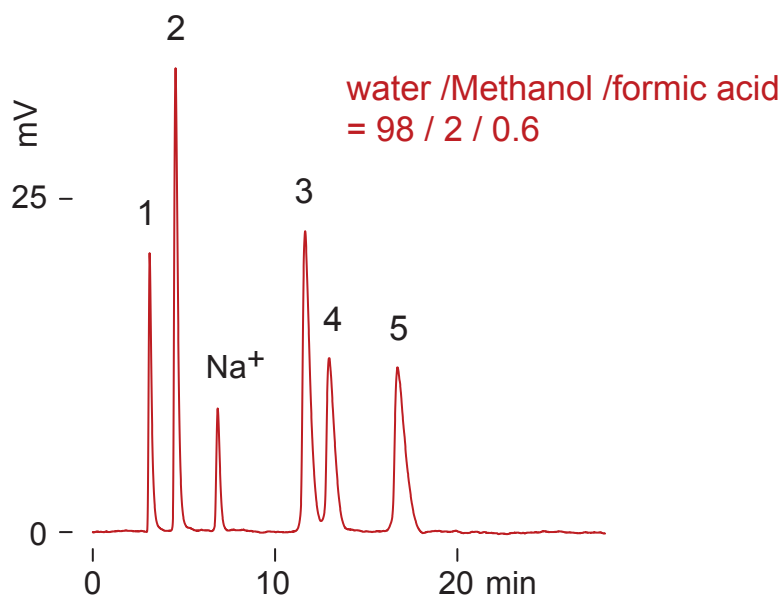
Scherzo SS-C18

150 x 3 mm

Application

Zwitterionic compounds

双性イオン化合物



Scherzo SS-C18, 150 x 3 mm

0.4 mL/min (9 MPa), 37 deg.C, ELSD (spray chamber 50 deg.C, drift tube 100 deg.C)

2 uL (1.5-5 ug)

Cadenza CD-C18 HT

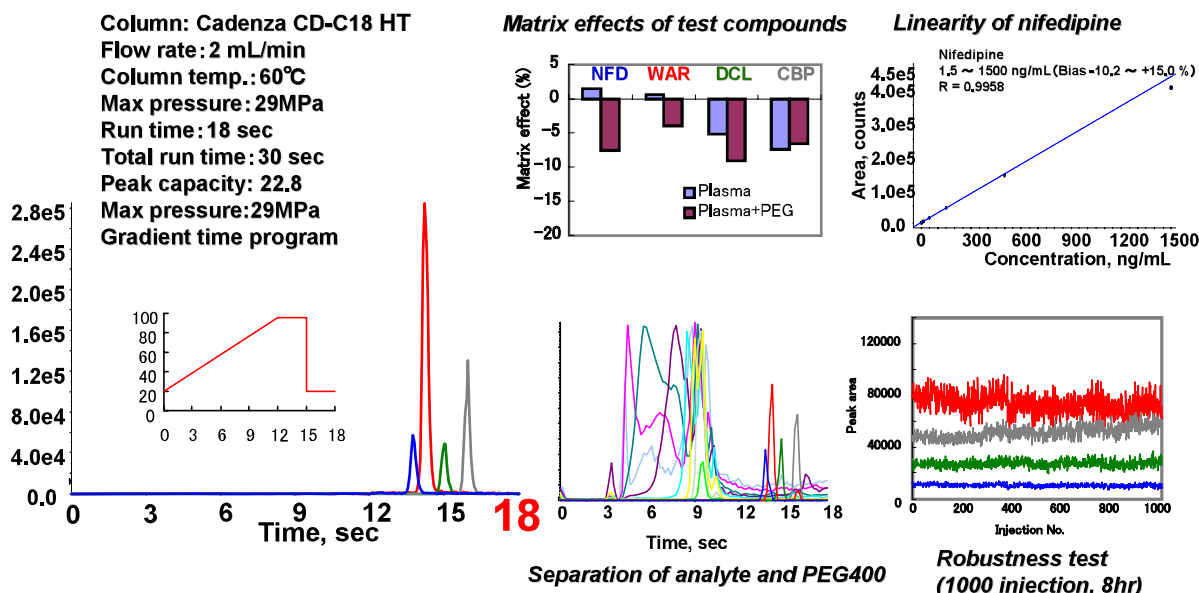
50 x 2 mm

Application

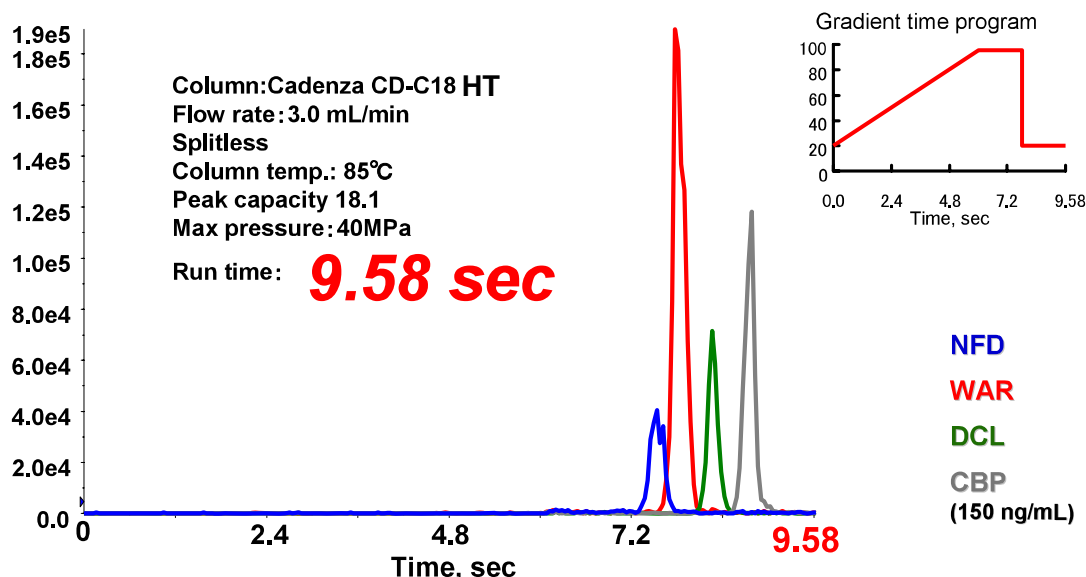
Ultra-high throughput LC-MS/MS analysis of drugs in blood plasma

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

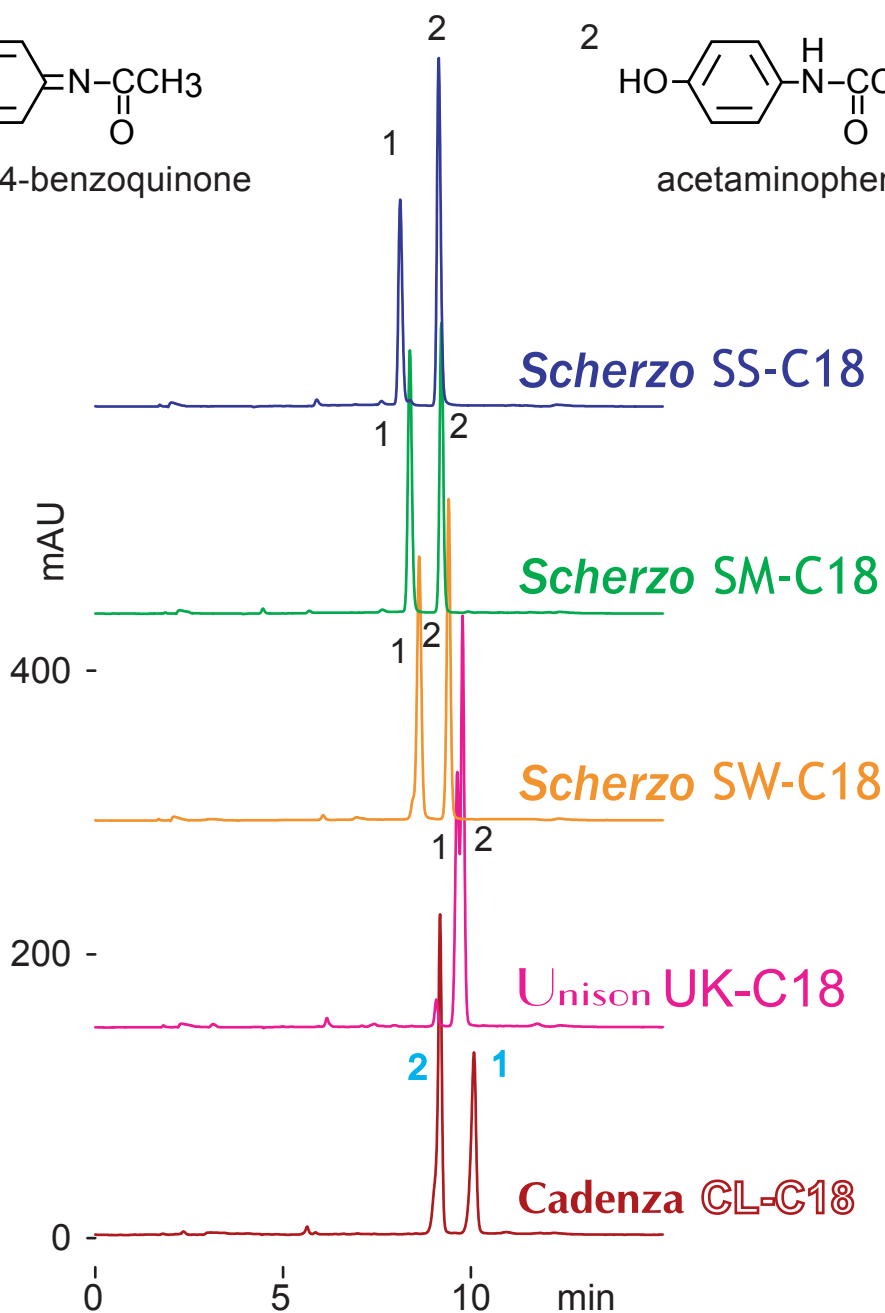
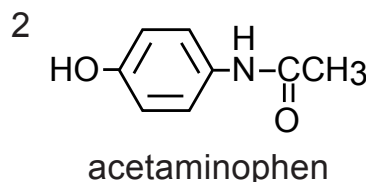
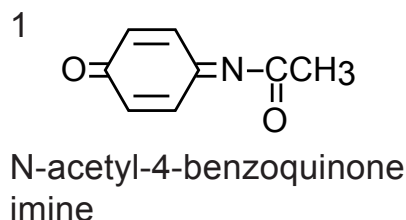
Scherzo SS-C18  
 Scherzo SM-C18  
 Scherzo SW-C18  
 Unison UK-C18  
 Cadenza CL-C18

150 x 3 mm

Application

### Acetaminophen and metabolite

アセトアミノフェンと代謝物(中性条件)



150 x 3 mm  
 A: 2mM ammonium acetate  
 B: 100mM ammonium acetate / acetonitrile = 50 / 50  
 0-20 %B (0-10min)  
 0.5 mL/min (9-11MPa), 37 deg.C, 260 nm, 1 uL (0.8 ug)

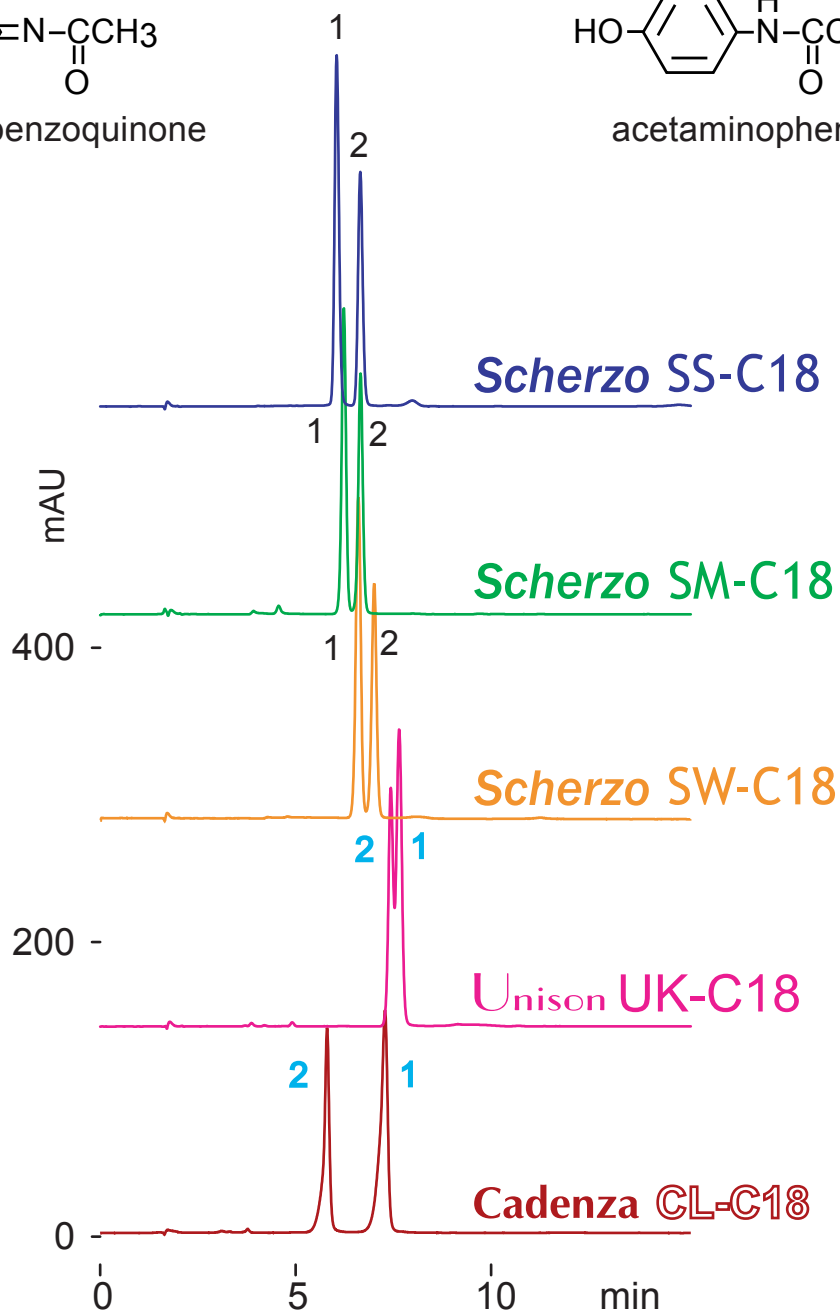
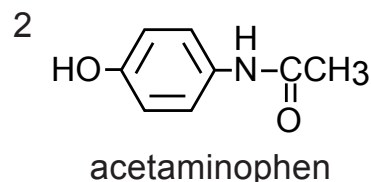
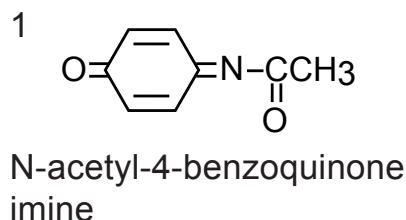
Scherzo SS-C18  
 Scherzo SM-C18  
 Scherzo SW-C18  
 Unison UK-C18  
 Cadenza CL-C18

150 x 3 mm

Application

### Acetaminophen and metabolite

アセトアミノフェンと代謝物(酸性条件)



150 x 3 mm  
 water / acetonitrile / formic acid = 95 / 5 / 0.1  
 0.5 mL/min (10-11MPa), 37 deg.C, 260 nm, 1 uL (0.8 ug)

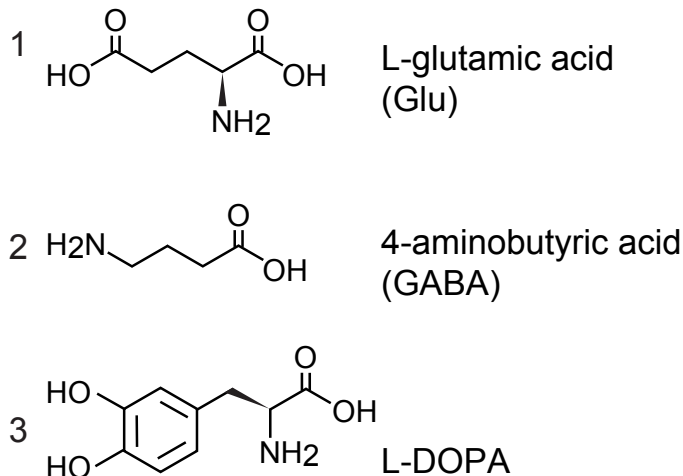
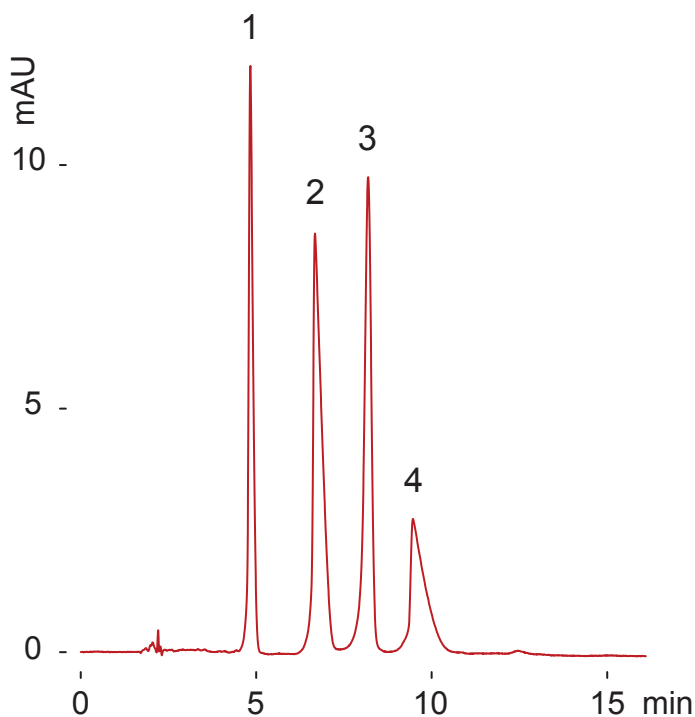
Scherzo SS-C18

150 x 3 mm  
250 x 3 mm

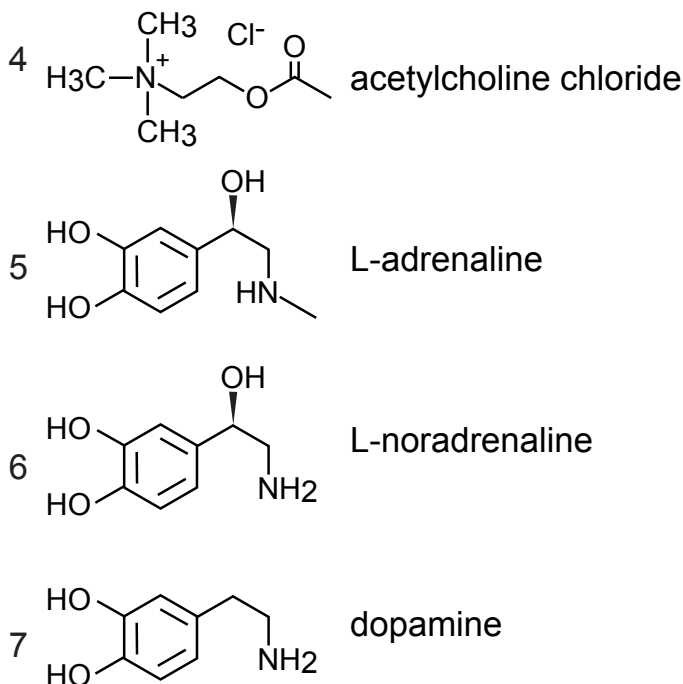
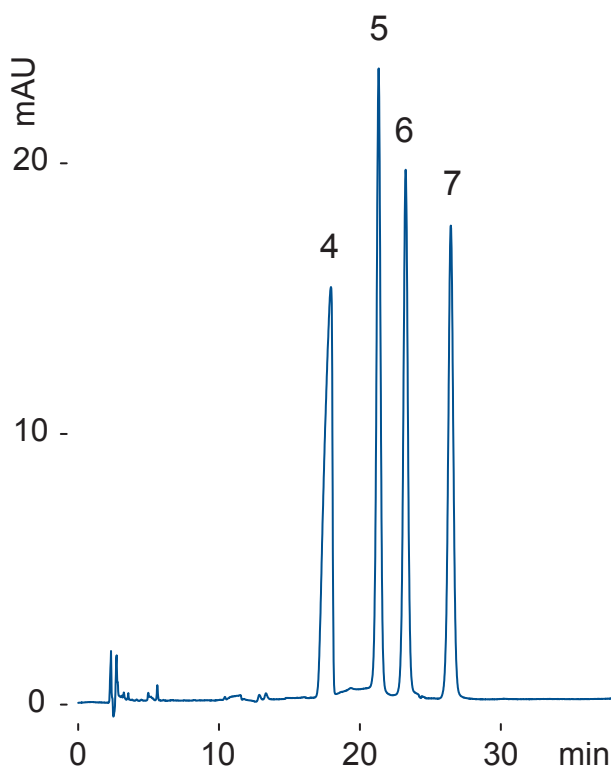
Application

Neurotransmitters

神経伝達物質



Scherzo SS-C18, 150 x 3 mm  
20 mM H<sub>3</sub>PO<sub>4</sub> / acetonitrile = 80 / 20  
0.4 mL/min (11 MPa), 37 deg.C, 220 nm  
5 uL ( 0.06-5 ug, 40 mM H<sub>3</sub>PO<sub>4</sub> )



Scherzo SS-C18, 250 x 3 mm  
10 mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> / acetonitrile = 40 / 60  
0.4 mL/min (12 MPa), 37 deg.C, 220 nm,  
4 uL ( 0.09-40 ug)



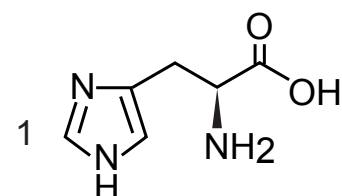
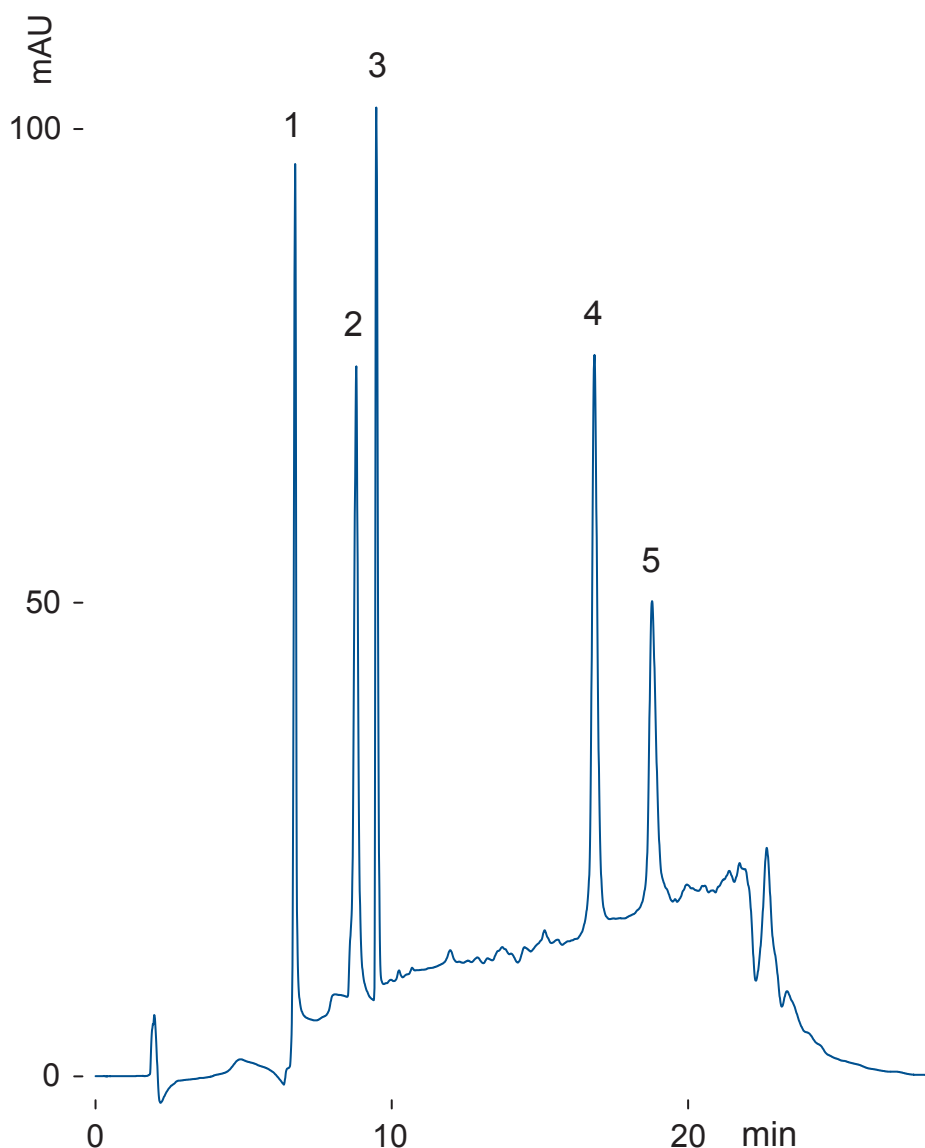
Scherzo SS-C18

150 x 3 mm

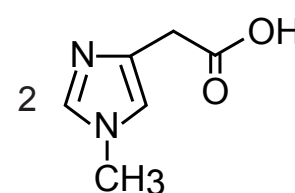
Application

Histamine related compounds

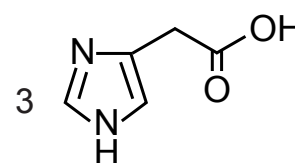
ヒスタミン関連化合物



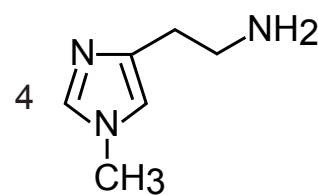
L-histidine



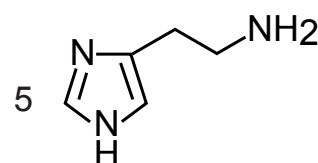
N-methyl-4-imidazoleacetic acid



4-imidazoleacetic acid



N-methylhistamine



histamine

Scherzo SS-C18, 150 x 3 mm

A: methanol

B: 100 mM ammonium formate : 100 mM ammonium hydroxide = 95 : 5 (pH8.1)

0-20 %B (0-20 min)

0.4 mL/min (6 MPa), 60 deg.C, 230 nm, 1.6 uL ( 0.6-2.8 ug, MeOH)

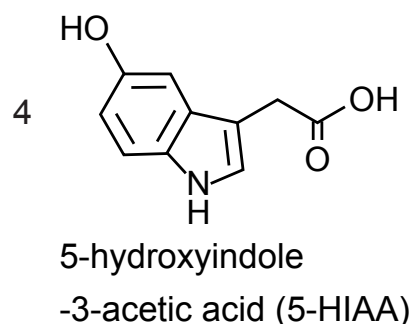
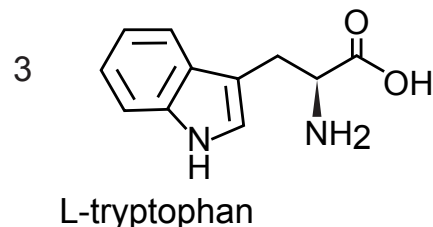
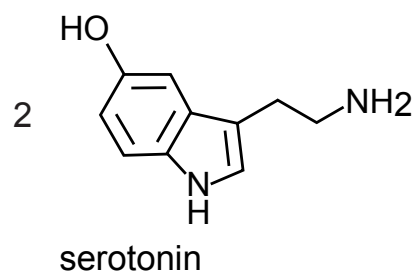
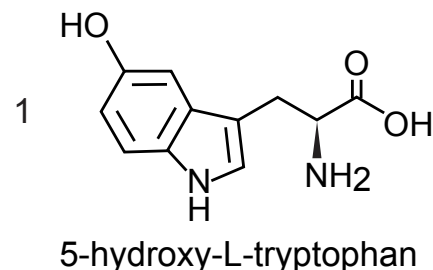
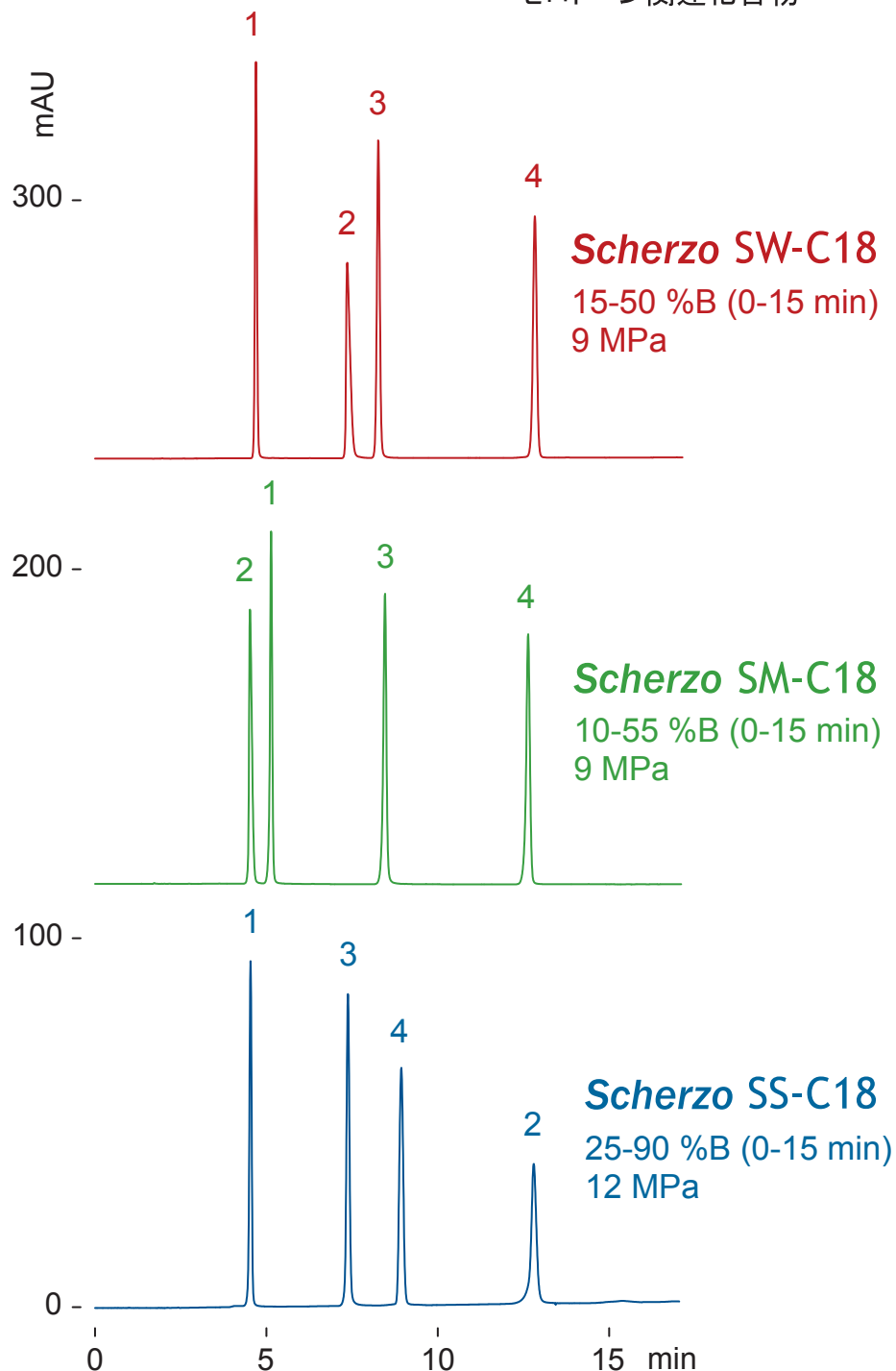
**Scherzo SW-C18**  
**Scherzo SM-C18**  
**Scherzo SS-C18**

150 x 3 mm

Application

Serotonin related compounds

セロトニン関連化合物



150 x 3 mm

A: water / formic acid = 100 / 0.1

B: 100 mM ammonium formate / acetonitrile = 70/ 30

0.4 mL/min, 37 deg.C, 260 nm, 1.2 uL ( 0.4 ug, 0.1% formic acid)