

Cannabinoids (Synthetic) by LC-MS/MS

Application #AN2540

Conditions

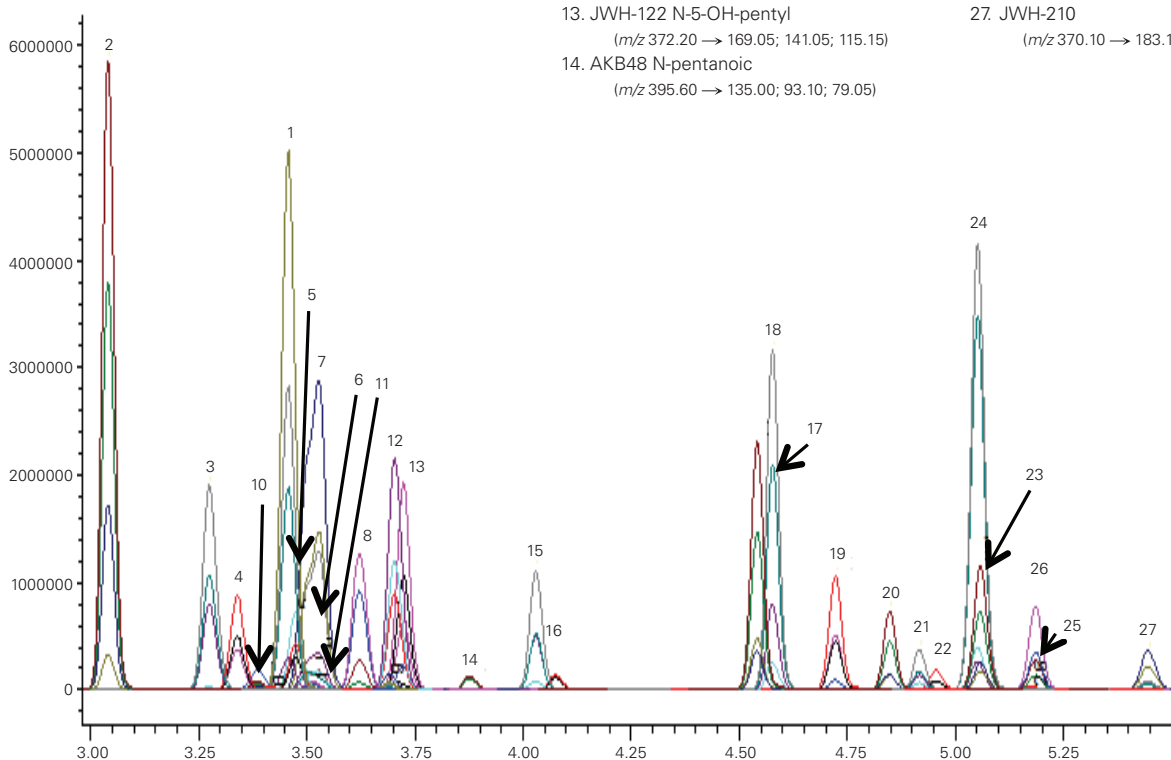
Column: ACE Excel 3 C18-AR
Dimensions: 100 x 3.0 mm
Part Number: EXL-119-1003U
Mobile Phase: A: 15 mM ammonium formate pH 4.0 in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.00 | 40 |
| 3.74 | 90 |
| 8.00 | 90 |
| 8.50 | 40 |

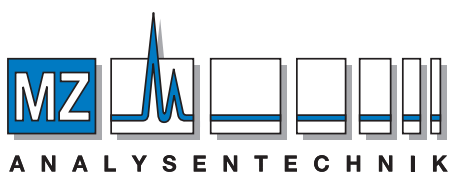
Flow Rate: 0.5 mL/min
Injection: 10 µL
Temperature: 40 °C
Detection: Shimadzu LCMS 8040 MS
 Positive ion ESI

Analytes

- JWH-018 N-5-OH-pentyl-d5
(*m/z* 362.90 → 155.05; 127.00; 128.05)
- JWH-250 N-5-OH-pentyl
(*m/z* 352.20 → 121.15; 91.10; 186.05)
- JWH-073 N-4-OH-butyl
(*m/z* 344.20 → 155.00; 127.10; 54.95)
- JWH-018 N-pentanoic
(*m/z* 372.20 → 155.05; 127.10)
- JWH-018 N-5-OH-pentyl
(*m/z* 357.80 → 155.05; 127.05)
- AM2201 N-4-OH-pentyl
(*m/z* 376.40 → 155.00; 127.00; 144.00)
- AM2201 5/6-OH-indole
(*m/z* 375.90 → 155.05; 127.05; 248.10)
- JWH-081 N-5-OH-pentyl
(*m/z* 388.20 → 185.05; 157.05; 114.15)
- MAM2201 N-4-OH-pentyl
(*m/z* 389.60 → 169.00; 141.05; 115.15)
- AB-CHMINACA
(*m/z* 356.70 → 241.05; 312.20; 340.15)
- UR-144 N-pentanoic
(*m/z* 341.60 → 125.10; 55.05; 57.10)
- JWH-019 N-6-OH-hexyl
(*m/z* 371.80 → 155.05; 127.00; 144.00)
- JWH-122 N-5-OH-pentyl
(*m/z* 372.20 → 169.05; 141.05; 115.15)
- AKB48 N-pentanoic
(*m/z* 395.60 → 135.00; 93.10; 79.05)
- JWH-018 5-OH-indole
(*m/z* 358.20 → 155.00; 127.05; 230.05)
- AKB48 N-5-OH-pentyl
(*m/z* 381.60 → 135.10; 93.10; 79.05)
- JWH-210 5-OH-indole
(*m/z* 386.10 → 183.05; 153.10; 155.05)
- PB-22
(*m/z* 358.80 → 214.05; 144.05; 116.00)
- JWH-073
(*m/z* 328.20 → 127.10; 155.05; 200.10)
- EAM2201
(*m/z* 387.70 → 183.10; 232.10; 155.10)
- JWH-122 N-4-pentyl
(*m/z* 353.70 → 169.05; 141.10; 115.10)
- JWH-018
(*m/z* 341.70 → 155.00; 127.05; 214.10)
- JWH-081
(*m/z* 372.10 → 185.05; 157.15; 127.10)
- AKB48F
(*m/z* 384.30 → 135.15; 107.10; 93.10)
- THJ-018
(*m/z* 342.60 → 215.10; 145.05; 90.00)
- JWH-122
(*m/z* 356.30 → 169.05; 141.10; 115.15)
- JWH-210
(*m/z* 370.10 → 183.10; 155.10; 153.10)



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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



Cannabinoids in Rat Plasma

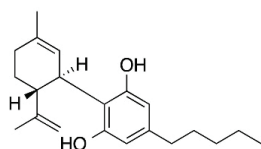
Application #AN2310

Conditions

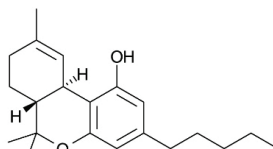
Column: ACE 3 C18-PFP
Dimensions: 150 x 4.6 mm
Part Number: ACE-1110-1546
Mobile Phase: H₂O/MeCN (38:62 v/v)
Flow Rate: 1 mL/min
Injection: 30 µL
Temperature: 55 °C
Detection: UV, 220 nm

Analytes

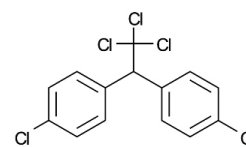
1. Cannabidiol (CBD)
2. Δ⁹-Tetrahydrocannabinol (THC)
3. 4,4-Dichlorodiphenyltrichloroethane (DDT) (IS)



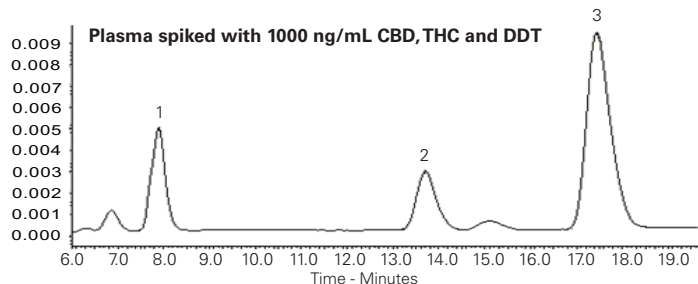
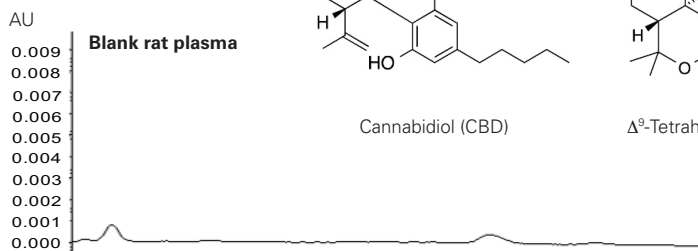
Cannabidiol (CBD)



Δ⁹-Tetrahydrocannabinol (THC)



4,4-Dichlorodiphenyltrichloroethane (DDT) (IS)



LLOQ 10 ng/mL for both cannabinoids
 Method linearity 10 – 10,000 ng/mL



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Carglumic Acid in Human Plasma by LC-MS/MS

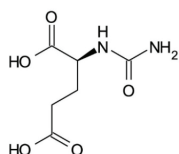
Application #AN3750

Conditions

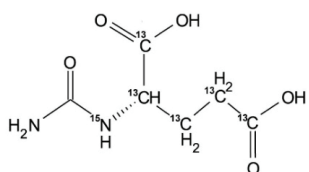
Column: ACE 5 CN
Dimensions: 150 x 4.6 mm
Part Number: ACE-124-1546
Mobile Phase: MeCN/MeOH/0.1% acetic acid pH 3.2 (40:40:20 v/v/v)
Flow Rate: 1 mL/min
Temperature: 40 °C
Detection: MDS Sciex API-4000 triple quad MS
 Negative ion mode ESI
 Ion source temperature: 500 °C
 Ion spray voltage: -4500 V
 20% split flow to ion spray interface

Analytes

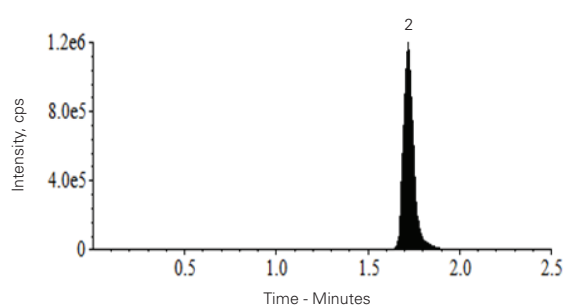
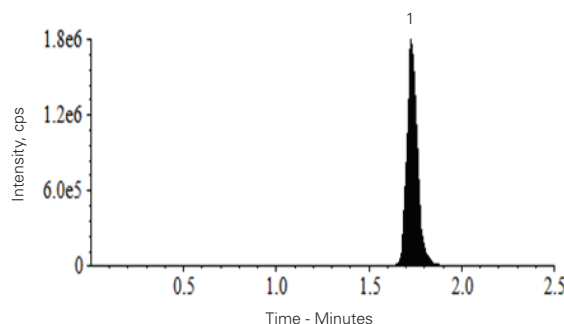
1. Carglumic acid
(*m/z* 189 → 146)
(LLOQ 6.0 ng/mL)
2. Carglumic acid-¹³C ¹⁵N (I.S.)
(*m/z* 195 → 152)



Carglumic acid



Carglumic acid-¹³C ¹⁵N (I.S.)



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Catechins

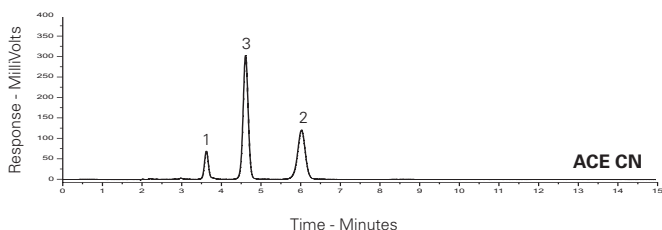
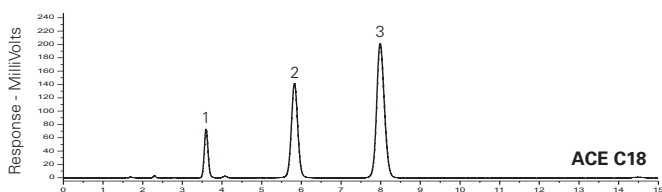
Application #AN3950

Conditions

Column: ACE 5 C18, ACE 5 CN
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546, ACE-124-1546
Mobile Phase: MeOH/0.1% formic acid in H₂O (25:75 v/v)
Flow Rate: 1 mL/min
Injection: 2 µL
Temperature: Ambient
Detection: UV, 280 nm

Analytes

1. Epigallocatechin
2. (+)-Epicatechin
3. Epigallocatechin gallate



Catecholamine Analysis (I)

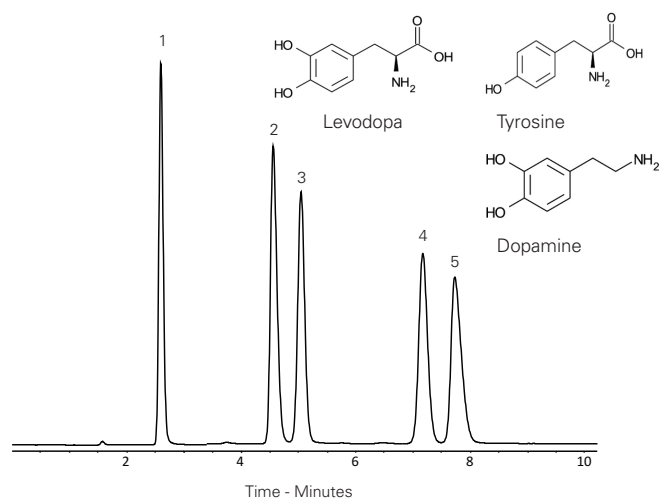
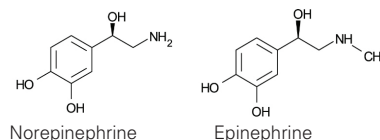
Application #AN2020

Conditions

Column: ACE 5 C18-PFP
Dimensions: 150 x 4.6 mm
Part Number: ACE-1210-1546
Mobile Phase: 12.5 mM ammonium formate pH 3.0 in H₂O
Flow Rate: 1 mL/min
Temperature: 22 °C
Detection: UV, 266 nm

Analytes

1. Norepinephrine
2. Epinephrine
3. Levodopa
4. Tyrosine
5. Dopamine



Catecholamine Analysis (II)

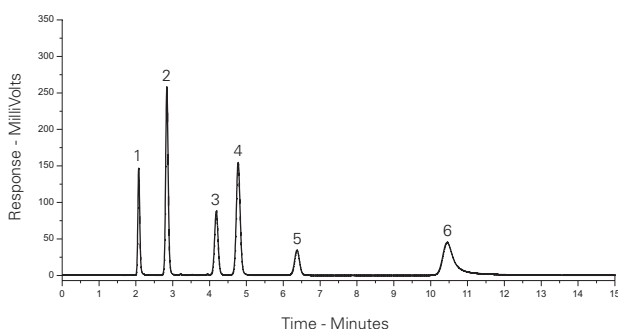
Application #AN3910

Conditions

Column: ACE 5 AQ
Dimensions: 150 x 4.6 mm
Part Number: ACE-126-1546
Mobile Phase: 50 mM KH₂PO₄ pH 3.0 in H₂O
Flow Rate: 1 mL/min
Injection: 2 µL
Temperature: Ambient
Detection: UV, 210 nm

Analytes

1. Noradrenaline (Norepinephrine)
2. Adrenaline (Epinephrine)
3. L-DOPA
4. Dopamine
5. L-Tyrosine
6. VMA (Vanillylmandelic acid)



Catecholamines by LC-MS/MS

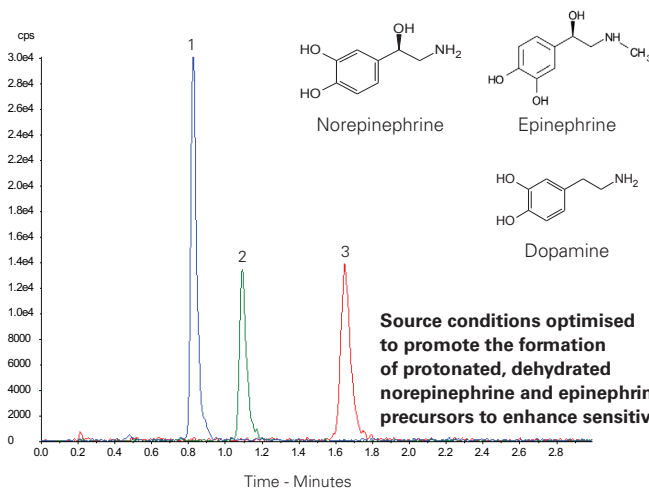
Application #AN2320

Conditions

Column: ACE Excel 2 C18-PFP
Dimensions: 100 x 2.1 mm
Part Number: EXL-1010-1002U
Mobile Phase: 2 mM ammonium formate pH 3.2/MeOH (98:2 v/v)
Flow Rate: 0.4 mL/min
Injection: 20 µL
Temperature: 40 °C
Detection: AB SCIEX triple quad 5500
 Positive ESI mode
 Source temperature: 700 °C
 IonSpray voltage: 5500 V

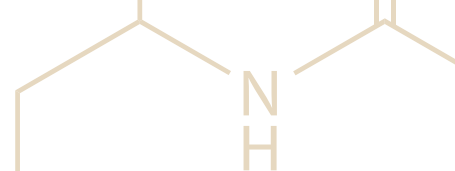
Analytes

1. Norepinephrine (*m/z* 152.1 → 107.1)
2. Epinephrine (*m/z* 166.1 → 107.1)
3. Dopamine (*m/z* 154.1 → 91.1)



Source conditions optimised to promote the formation of protonated, dehydrated norepinephrine and epinephrine precursors to enhance sensitivity.

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Catecholamines and their Metabolites in Urine by LC-MS/MS

Application #AN4040

Conditions

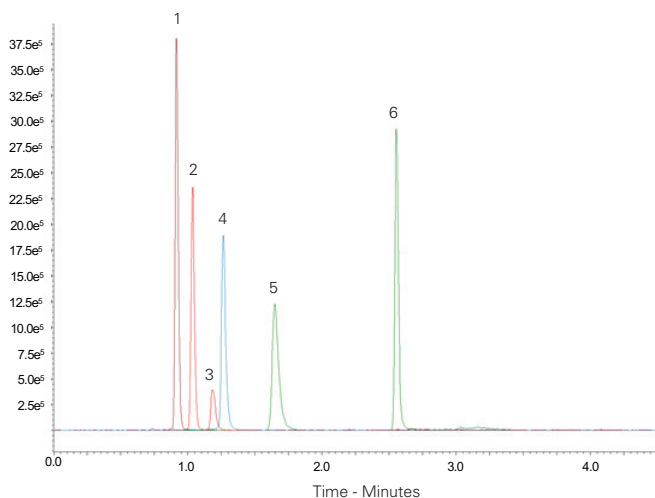
Column: ACE UltraCore 2.5 SuperPhenylHexyl
Dimensions: 100 x 2.1 mm
Part Number: CORE-25B-1002U
Mobile Phase: A: 2 mM ammonium formate + 0.05% formic acid in H₂O
 B: 2 mM ammonium formate + 0.05% formic acid in MeOH
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.00 | 0 |
| 1.00 | 70 |
| 1.10 | 70 |
| 1.11 | 0 |
| 4.50 | 0 |

Flow Rate: 0.3 mL/min
Injection: 10 µL
Temperature: 30 °C
Detection: Shimadzu LCMS-8040
 ESI in positive ion mode
Sample: Standard 100 ng/mL in urine (after SPE purification)

Analytes

1. Norepinephrine (*m/z* 170 → 107)
2. Epinephrine (*m/z* 184 → 166)
3. Normetanephrine (*m/z* 184 → 166)
4. Dopamine (*m/z* 154 → 91)
5. Metanephrine (*m/z* 198 → 180)
6. 3-Methoxytyramine (*m/z* 181 → 91)



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Catecholamines and Metanephrines Separation (Gradient)

Application #AN1480

Conditions

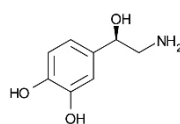
Column: ACE 5 C18-PFP
Dimensions: 150 x 4.6 mm
Part Number: ACE-1210-1546
Mobile Phase: A: 20 mM ammonium formate pH 3.0 in H₂O
 B: 20 mM ammonium formate pH 3.0 in MeOH/H₂O (90:10 v/v)
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 0 |
| 5 | 40 |
| 6 | 40 |
| 7 | 0 |
| 17 | 0 |

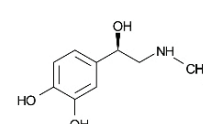
Flow Rate: 1 mL/min
Injection: 5 µL
Temperature: 25 °C
Detection: UV, 260 nm

Analytes

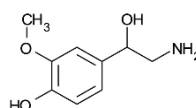
1. Norepinephrine
2. Epinephrine
3. Normetanephrine
4. Dopamine
5. Metanephrine



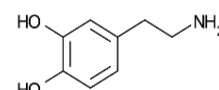
Norepinephrine



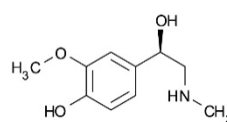
Epinephrine



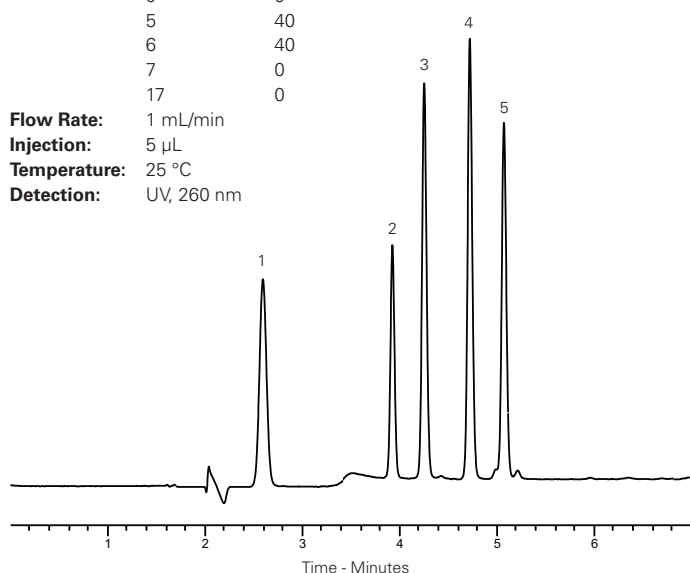
Normetanephrine



Dopamine



Metanephrine



Catecholamines and Metanephrines Separation (Isocratic)

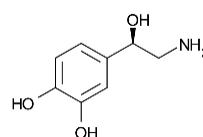
Application #AN1490

Conditions

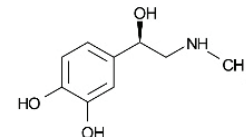
Column: ACE 5 C18-PFP
Dimensions: 150 x 4.6 mm
Part Number: ACE-1210-1546
Mobile Phase: 20 mM ammonium formate pH 3.0 in H₂O
Flow Rate: 1 mL/min
Injection: 5 µL
Temperature: 25 °C
Detection: UV, 260 nm

Analytes

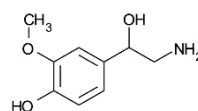
1. Norepinephrine
2. Epinephrine
3. Normetanephrine
4. Dopamine
5. Metanephrine



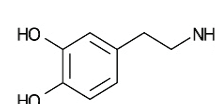
Norepinephrine



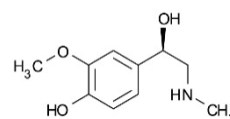
Epinephrine



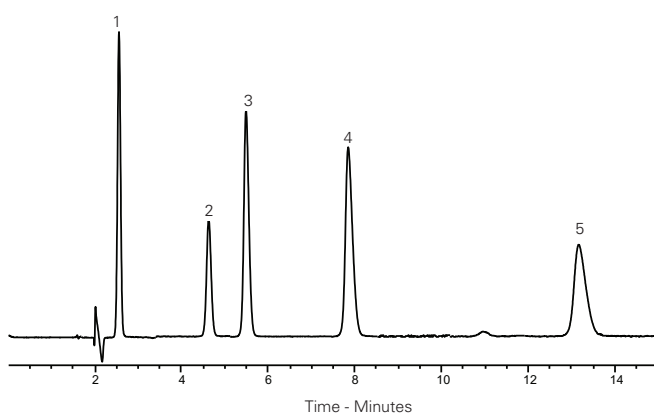
Normetanephrine



Dopamine



Metanephrine



Catecholamines from Plasma

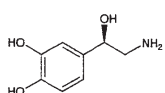
Application #AN3210

Conditions

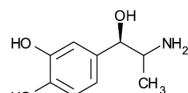
Column: ACE 5 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546
Mobile Phase: 50 mM sodium acetate
 pH 7.0/MeCN/MeOH (50:35:15 v/v/v)
Flow Rate: 0.9 mL/min
Temperature: Ambient
Detection: Fluorescence – λ_{Ex} 350 nm, λ_{Em} 480 nm
Sample: Ion pair extraction using diphenyl-borate-ethanolamine.
 Derivatisation using diphenyl-ethylenediamine as
 fluorescent probe

Analytes

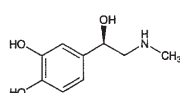
1. Noradrenaline (Norepinephrine)
2. 3,4-Dihydroxynorephedrine (l.S.)
3. Adrenaline (Epinephrine)



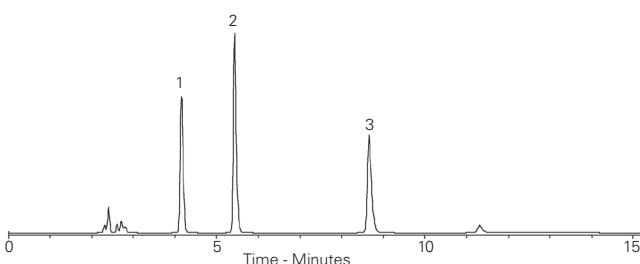
Noradrenaline



3,4-Dihydroxynorephedrine (l.S.)



Adrenaline



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Catecholamines from Urine

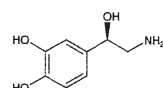
Application #AN3200

Conditions

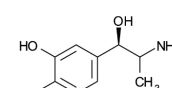
Column: ACE 5 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546
Mobile Phase: 50 mM sodium acetate
 pH 7.0/MeCN/MeOH
 (50:35:15 v/v/v)
Flow Rate: 0.9 mL/min
Temperature: Ambient
Detection: Fluorescence – λ_{Ex} 350 nm, λ_{Em} 480 nm
Sample: Ion pair extraction using diphenyl-borate-ethanolamine.
 Derivatisation using diphenyl-ethylenediamine as
 fluorescent probe

Analytes

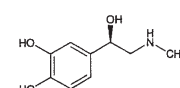
1. Noradrenaline (Norepinephrine)
2. 3,4-Dihydroxynorephedrine (l.S.)
3. Adrenaline (Epinephrine)
4. Dopamine



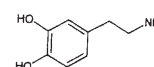
Noradrenaline



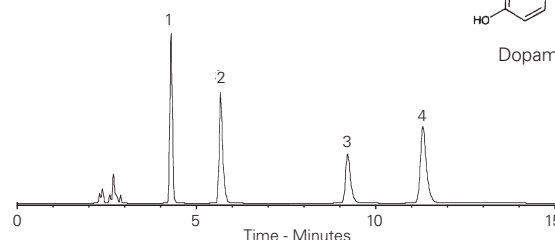
3,4-Dihydroxynorephedrine (l.S.)



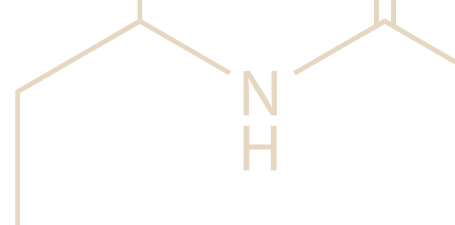
Adrenaline



Dopamine



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Catechols Mixture Separations (I) and (II)

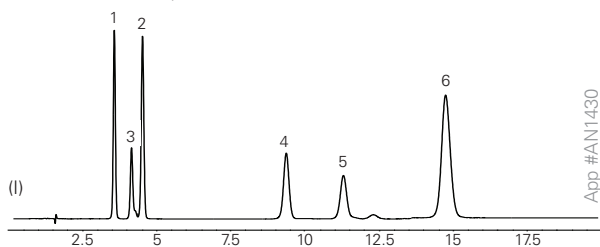
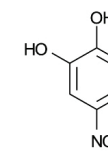
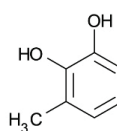
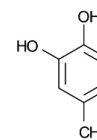
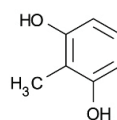
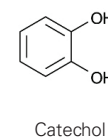
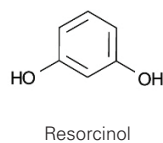
Application #AN1430 and #AN1440

Conditions

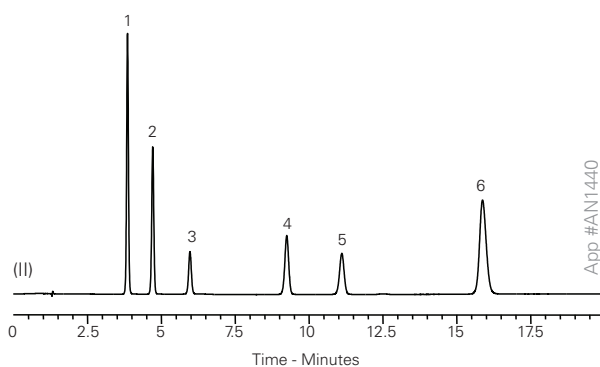
Column: (I) ACE Excel 3 CN-ES (II) ACE Excel 3 C18-Amide
Dimensions: 150 x 4.6 mm
Part Number: (I) EXL-1113-1546U (II) EXL-1112-1546U
Mobile Phase: (I) 20 mM H₃PO₄ in MeCN/H₂O (25:75 v/v)
 (II) 20 mM H₃PO₄ in MeCN/H₂O (10:90 v/v)
Flow Rate: 1.5 mL/min
Injection: 5 µL
Temperature: 30 °C
Detection: UV, 270 nm

Analytes

1. Resorcinol
2. Catechol
3. 2-Methylresorcinol
4. 4-Methylcatechol
5. 3-Methylcatechol
6. 4-Nitrocatechol



App #AN1430



App #AN1440

Cathinone Psychoactive Substances by LC-UV and LC-Amperometry

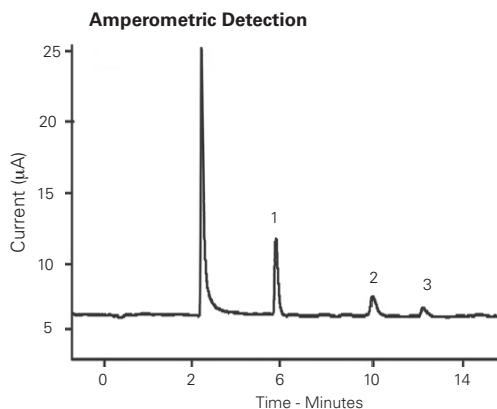
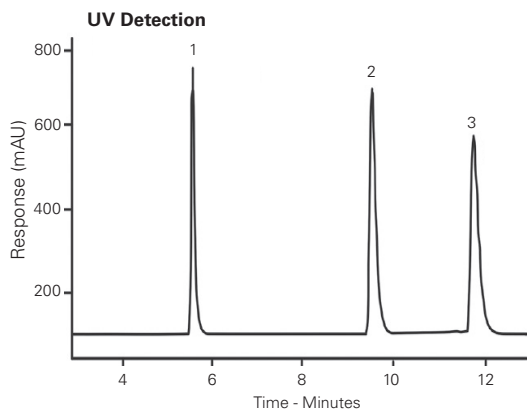
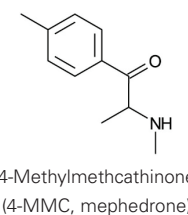
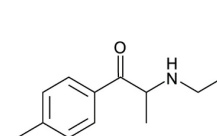
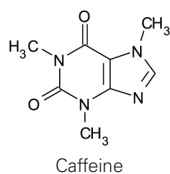
Application #AN3500

Conditions

Column: ACE 3 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-111-1546
Mobile Phase: 10 mM ammonium acetate-100 mM KCl pH 4.3/MeOH (70:30 v/v)
Flow Rate: 0.8 mL/min
Injection: 10 µL
Temperature: 22 °C
Detection: UV, 264 nm
 Amperometric Potential +1.4 V

Analytes

1. Caffeine
2. 4-Methylmethcathinone (4-MMC, mephedrone)
3. 4-Methylethcathinone (4-MEC)



Zuway K, Smith J, Foster C, Kapur N, Banks C, Sutcliffe O, (2015) Detection and quantification of new psychoactive substances (NPSs) within the evolved 'legal high' product, NRG-2, using high performance liquid chromatography-amperometric detection (HPLC-AD). Analyst 140, 6283. doi:10.1039/c5an01106j

Cefquinome by LC-MS

Application #AN3130

Conditions

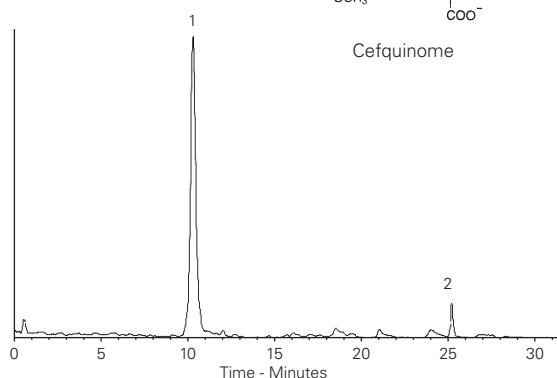
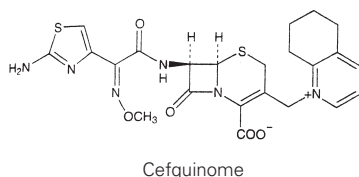
Column: ACE 5 C18
Dimensions: 150 x 2.1 mm
Part Number: ACE-121-1502
Mobile Phase: A: 2 mM formic acid in H₂O
 B: 2 mM formic acid in MeCN

| Gradient: | Time (mins) | %B |
|-----------|-------------|----|
| | 0 | 5 |
| | 1 | 5 |
| | 10 | 95 |
| | 30 | 95 |

Flow Rate: 0.2 mL/min
Temperature: 25 °C
Detection: ESI-MS (+)

Analytes

- Cefquinome
(*m/z* 529.2)
- Excipient



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Ciprofibrate from Human Plasma by LC-MS/MS

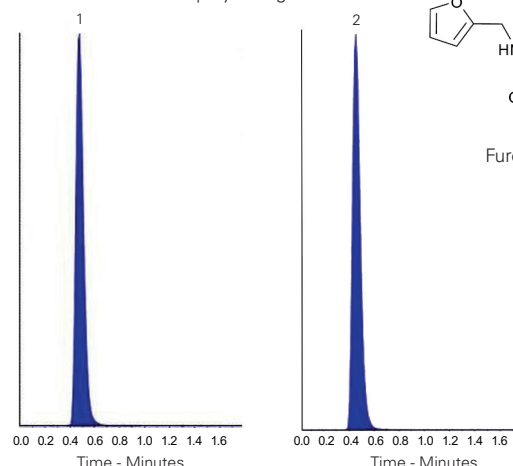
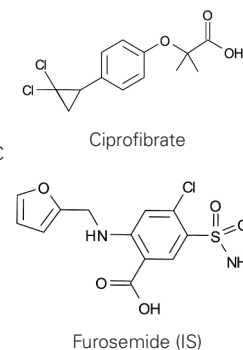
Application #AN2670

Conditions

Column: ACE 5 C18
Dimensions: 50 x 4.6 mm
Part Number: ACE-121-0546
Mobile Phase: 0.001% ammonia in MeOH/
 MeCN/H₂O (70:20:10 v/v/v)
Flow Rate: 1 mL/min
Injection: 20 µL
Temperature: Ambient
Detection: API 3200 triple quad MS
 ESI in negative ion mode
 Ion source temperature: 550 °C
 Ion spray voltage: 4500 V

Analytes

- Ciprofibrate
(*m/z* 287.0 → 85.0)
- Furosemide (IS)
(*m/z* 328.9 → 204.9)



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Chloramphenicol in Milk by LC-MS/MS

Application #AN2030

Conditions

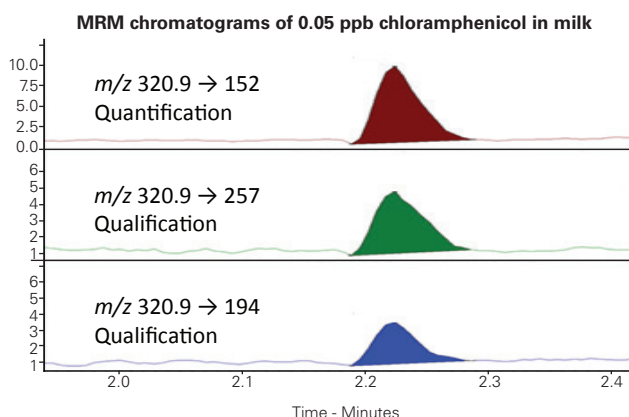
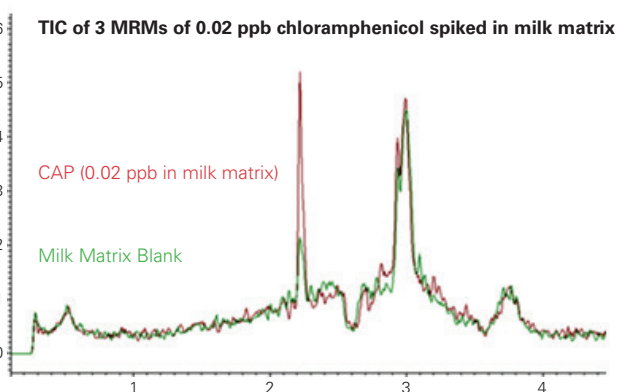
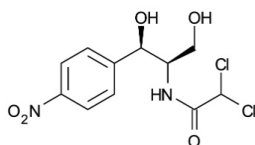
Column: ACE 3 C18
Dimensions: 50 x 2.1 mm
Part Number: ACE-111-0502
Mobile Phase: A: H₂O
 B: MeOH

| Gradient: | Time (mins) | %B |
|-----------|-------------|----|
| | 0.00 | 10 |
| | 0.05 | 10 |
| | 2.50 | 95 |
| | 3.00 | 95 |
| | 3.10 | 10 |
| | 4.50 | 10 |

Flow Rate: 0.5 mL/min
Injection: 10 µL
Detection: Bruker EVOQ Elite triple quad MS
 VIP heated-ESI temperature: 400 °C
 Cone gas temperature: 350 °C
 Spray voltage: -4500 V

Analyte

- Chloramphenicol



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Chocolate Analysis

Application #AN2040

Conditions

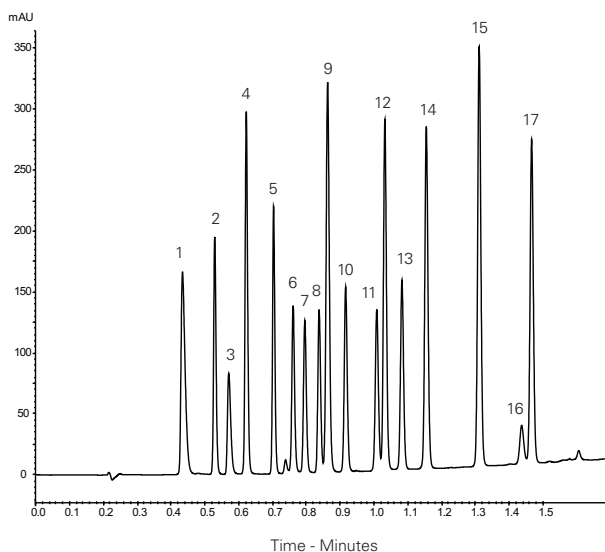
Column: ACE Excel 2 C18-Amide
Dimensions: 100 x 2.1 mm
Part Number: EXL-1012-1002U
Mobile Phase: A: 10 mM ammonium formate pH 2.8 in H₂O
 B: 10 mM ammonium formate pH 2.8 in MeCN/H₂O (90:10 v/v)
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.0 | 5 |
| 1.5 | 85 |

Flow Rate: 1.2 mL/min
Temperature: 42 °C
Detection: UV, 254 nm

Analytes

1. Acesulfame K
2. Theobromine
3. Saccharin
4. Theophylline
5. Caffeine
6. Chlorogenic acid
7. Catechin
8. Epicatechin
9. 4-Hydroxybenzoic acid
10. Vanillin
11. Guaiacol
12. Sorbic acid
13. Ethylvanillin
14. Methyl paraben
15. Ethyl paraben
16. Quercetin
17. Propyl paraben



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Clenbuterol in Equine Plasma by LC-MS/MS

Application #AN2050

Conditions

Column: ACE 3 C18
Dimensions: 100 x 2.1 mm
Part Number: ACE-111-1002
Mobile Phase: A: 0.2% formic acid in H₂O
 B: 0.2% formic acid in MeCN
Gradient:

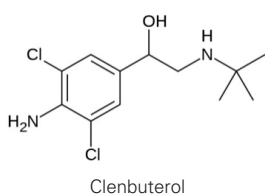
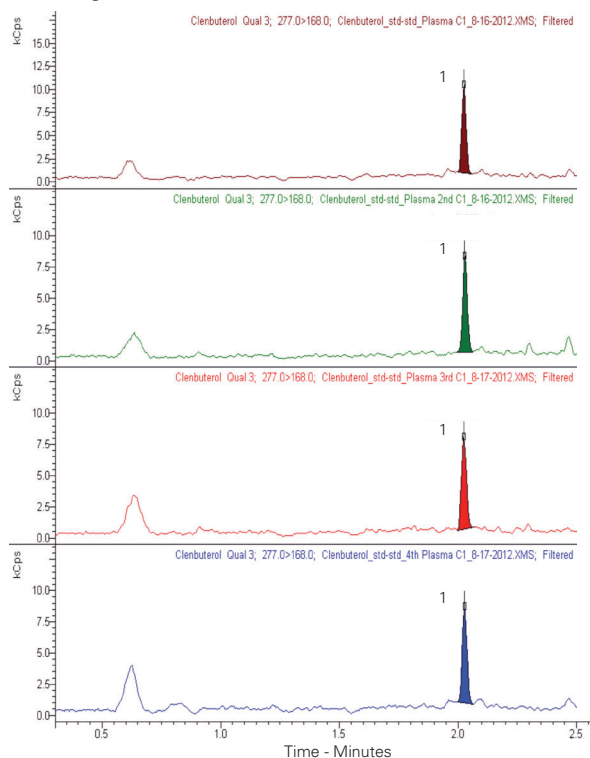
| Time (mins) | %B |
|-------------|----|
| 0.0 | 10 |
| 0.3 | 10 |
| 2.5 | 95 |
| 2.8 | 10 |
| 4.5 | 10 |

Flow Rate: 0.45 mL/min
Injection: 30 µL
Detection: Bruker EVOQ Elite triple quad MS
 VIP heated-ESI temperature: 300 °C
 Cone gas temperature: 300 °C
 Spray voltage: +3500 V

Analyte

1. Clenbuterol
 (*m/z* 277.1 → 168)
- d9-Clenbuterol (IS)
 (*m/z* 286.1 → 204)

Representative MRM chromatograms of 5 ppt clenbuterol (150 fg on-column)



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Clonidine Hydrochloride Oral Solution
Containing Preservatives

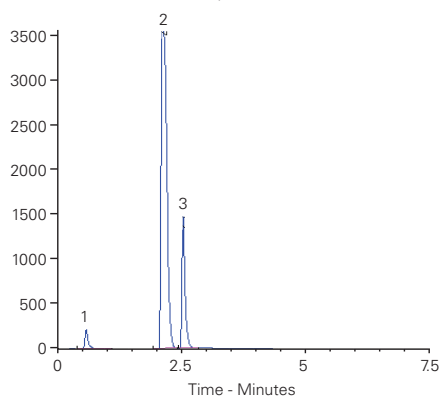
Application #AN2060

Conditions

Column: ACE UltraCore 2.5 SuperC18
Dimensions: 50 x 4.6 mm
Part Number: CORE-25A-0546U
Mobile Phase: A: 0.2% w/v phosphate buffer/
 MeOH/MeCN (80:10:10 v/v/v)
 B: MeCN

| Gradient: | Time (mins) | %B |
|-----------|-------------|----|
| | 0.0 | 0 |
| | 0.8 | 0 |
| | 2.1 | 70 |
| | 3.4 | 70 |
| | 3.5 | 0 |

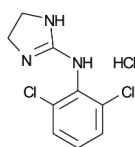
Flow Rate: 2 mL/min
Injection: 100 µL
Temperature: 20 °C
Detection: UV, 220 nm



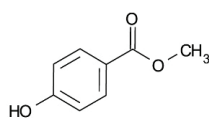
Reproduced with permission of Guy's Hospital, London, UK

Analytes

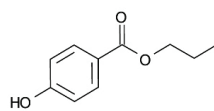
1. Clonidine HCl
(10 µg/mL)
2. Methyl paraben
(1.5 g/mL)
3. Propyl paraben
(1.5 g/mL)



Clonidine HCl



Methyl paraben



Propyl paraben

Clopidogrel and Photodegradation Products

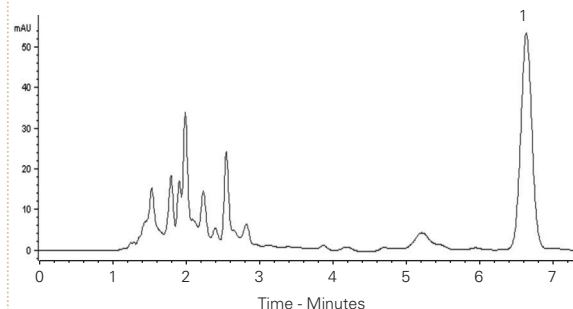
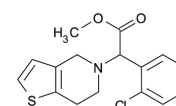
Application #AN3110

Conditions

Column: ACE 5 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546
Mobile Phase: MeOH/aqueous TEA
 (pH 5.3 with H₃PO₄) (75:25 v/v)
Flow Rate: 1.2 mL/min
Injection: 20 µL
Temperature: 25 °C
Detection: UV, 220 nm
Sample: Exposed to UV light for 3.5 hours

Analyte

1. Clopidogrel



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Please contact us for further
 information and advice on
 specific applications or for
 method development support

email: info@ace-hplc.com



Coffee Metabolite Profiling by LC-MS

Application #AN2590

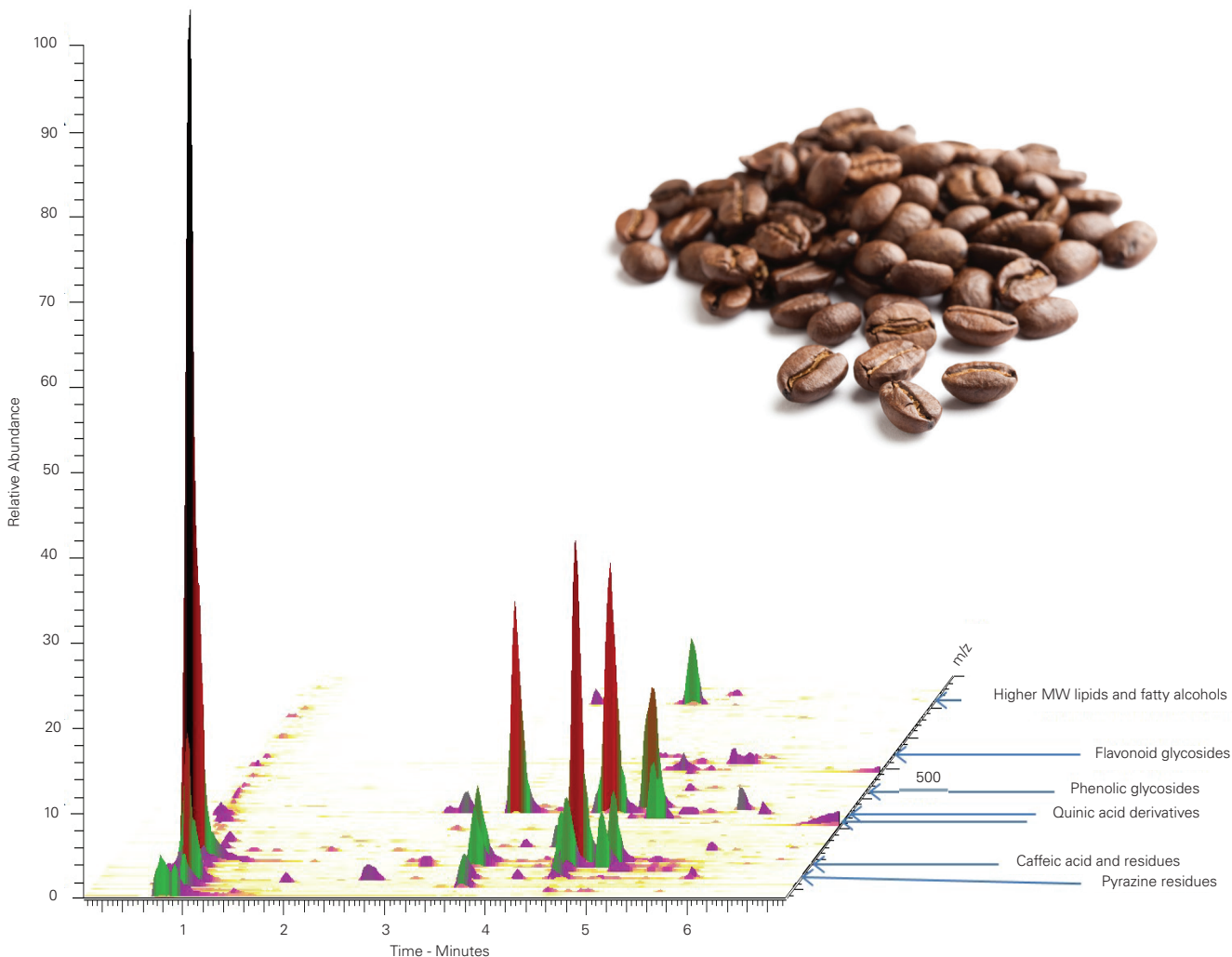
Conditions

Column: ACE Excel 1.7 C18-Amide
Dimensions: 100 x 2.1 mm
Part Number: EXL-1712-1002U
Mobile Phase: A: 0.01% formic acid in H₂O
 B: 0.01% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0.0 | 3 |
| 2.5 | 10 |
| 8.0 | 100 |
| 8.5 | 3 |
| 10.0 | 3 |

Flow Rate: 0.5 mL/min
Detection: Exacte accurate mass MS system
 ESI in negative ion mode

Analytes between *m/z* 70-800 monitored
Sample: Metabolites from coffee extracted into cold water by vortexing for 20 mins. Samples filtered prior to injection onto column and modular Accela LC system.



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Cold Medicine Analytes (I) and (II)

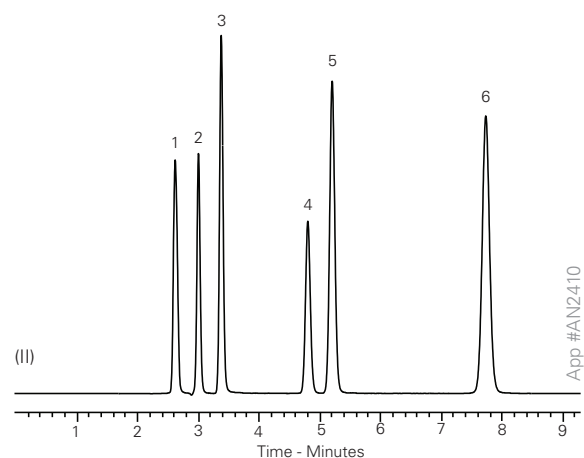
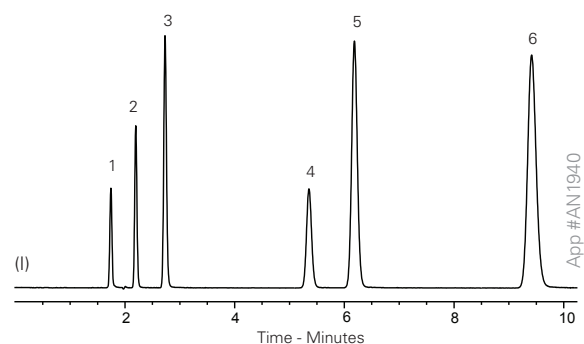
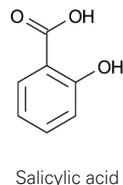
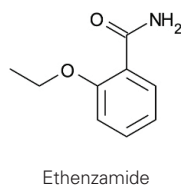
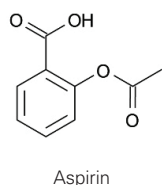
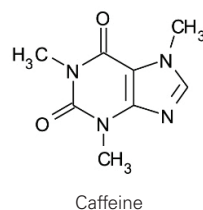
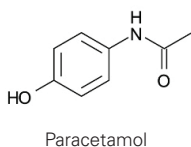
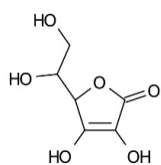
Application #AN1940 and #AN2410

Conditions

Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: (I) 20 mM phosphoric acid in MeOH/H₂O (25:75 v/v)
 (II) 0.1% formic acid in MeOH/H₂O (55:45 v/v)
Flow Rate: (I) 1.5 mL/min (II) 1.0 mL/min
Injection: 5 µL
Temperature: (I) 40 °C (II) 25 °C
Detection: (I) UV, 280 nm (II) UV, 275 nm

Analytes

1. Ascorbic acid
2. Paracetamol
3. Caffeine
4. Aspirin
5. Ethenzamide
6. Salicylic acid



Corticosteroids by LC-MS/MS

Application #AN1030

Conditions

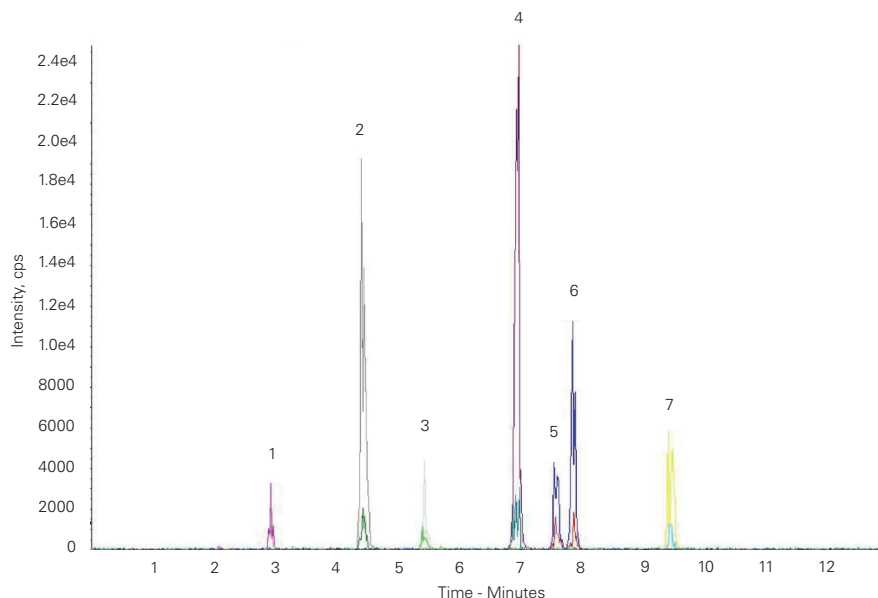
Column: ACE 3 C18-PFP
Dimensions: 150 x 2.1 mm
Part Number: ACE-1110-1502
Mobile Phase: A: 0.1% formic acid in H₂O
 B: MeCN/0.1% formic acid in H₂O (90:10 v/v)
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 30 |
| 14 | 50 |
| 17 | 95 |
| 20 | 30 |

Flow Rate: 0.3 mL/min
Injection: 25 µL
Temperature: 15 °C
Detection: Turbospray, MRM

Analytes

1. Triamcinolone
2. Prednisolone
3. Fluoroprednisolone
4. Methylprednisolone
5. Betamethasone
6. Dexamethasone
7. Flumethasone



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Cortisol in Urine by LC-MS/MS

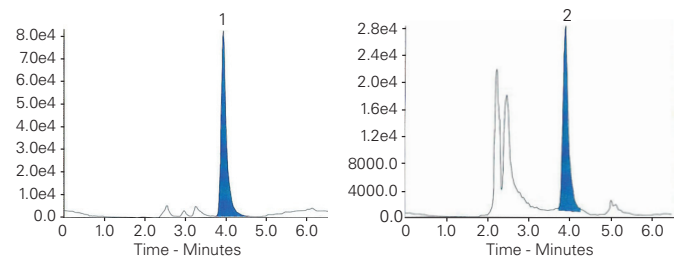
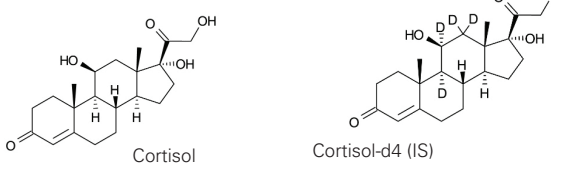
Application #AN2680

Conditions

Column: ACE Excel 2 C18
Dimensions: 100 x 2.1 mm
Part Number: EXL-101-1002U
Mobile Phase: 4 mM ammonium acetate in H₂O/0.2% (v/v) formic acid in MeOH (71.5:28.5 v/v)
Flow Rate: 0.7 mL/min
Injection: 50 µL
Temperature: 50 °C
Detection: Applied Biosystems 5000 MS/MS APCI in positive ion mode
Sample: BioRad Liquichek Urine Quality Control standard (16 nmol/L cortisol)

Analytes

1. Cortisol (m/z 363.5 → 121.3)
2. Cortisol-d4 (IS) (m/z 367.3 → 331.3)



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Cyclosporin Mixture

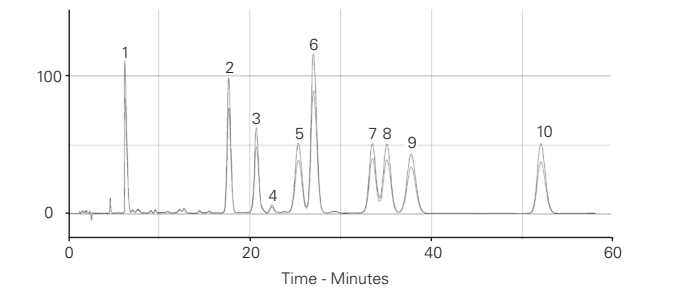
Application #AN3270

Conditions

Column: ACE 5 C18
Dimensions: 250 x 3.0 mm
Part Number: ACE-121-2503
Mobile Phase: H₂O/MeCN/MTBE/H₃PO₄ (46:51:3:0.1 v/v/v/v)
Flow Rate: 0.8 mL/min
Temperature: 80 °C
Detection: UV, 210 nm

Analytes

1. Isocyclosporin A
2. Cyclosporin C
3. Cyclosporin B
4. Cyclosporin L
5. Cyclosporin U
6. Cyclosporin A
7. Dihydrocyclosporin A
8. Cyclosporin G
9. Cyclosporin D
10. Cyclosporin E



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Cyclodextrin-Encapsulated Flavour Compounds in Beer

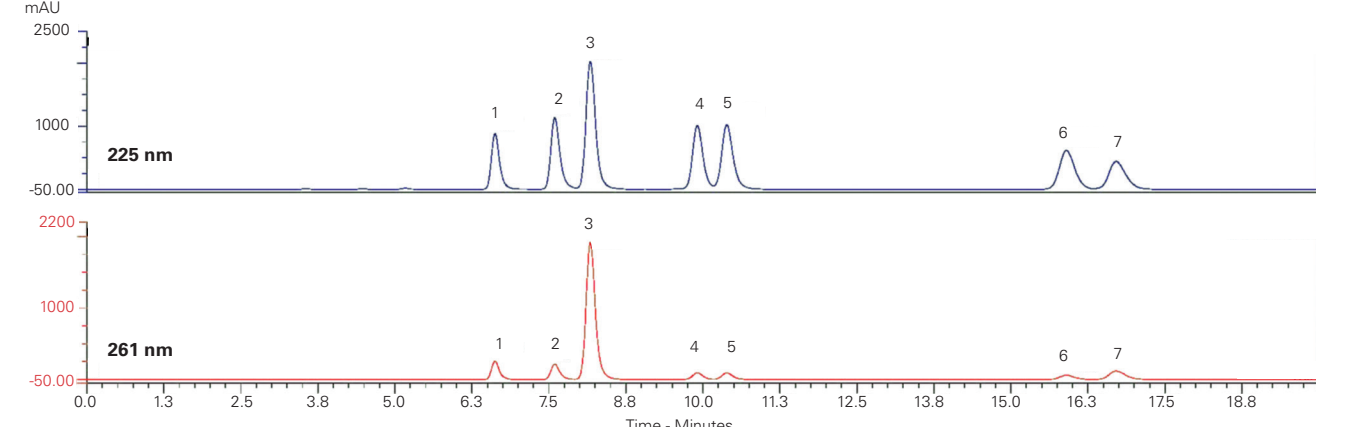
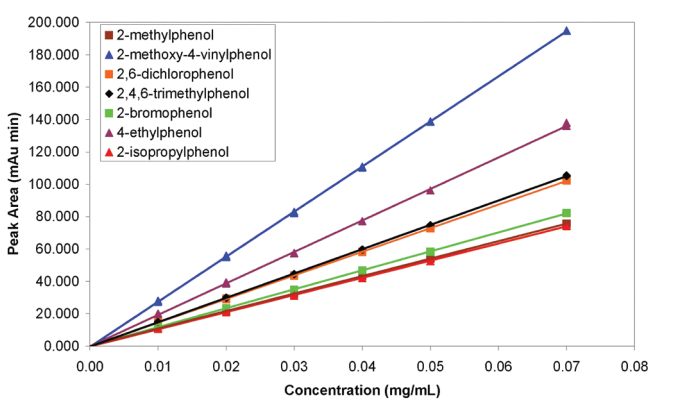
Application #AN2300

Conditions

Column: ACE 3 C18
Dimensions: 150 x 4.0 mm
Part Number: ACE-111-1504
Mobile Phase: 0.1% phosphoric acid in MeOH/H₂O (53:47 v/v)
Flow Rate: 0.5 mL/min
Injection: 20 µL
Temperature: 35 °C
Detection: UV, 225 nm and 261 nm

Analytes

1. 2-Methylphenol
2. 2-Bromophenol
3. 2-Methoxy-4-vinylphenol
4. 4-Ethylphenol
5. 2,4-Dichlorophenol
6. 2,4,6-Trimethylphenol
7. 2-Isopropylphenol



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Cytarabine Analogues by Ion-Pairing LC-MS/MS

Application #AN2070

Conditions

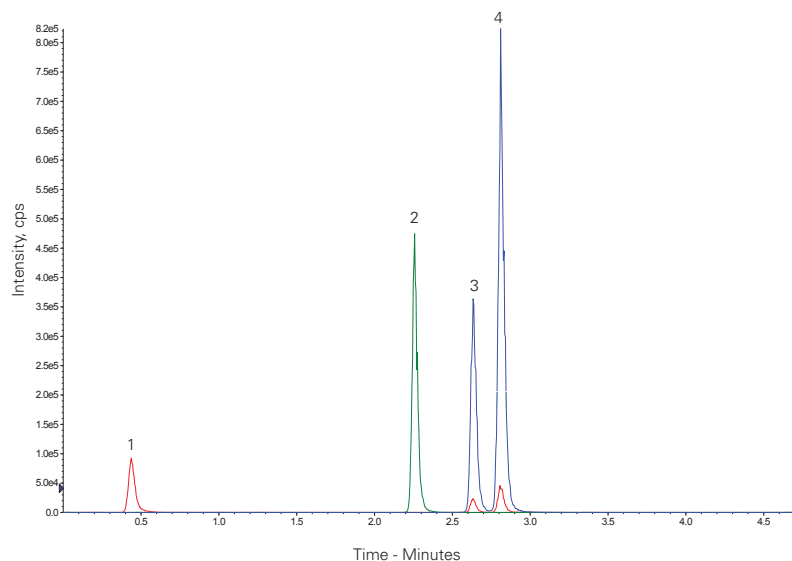
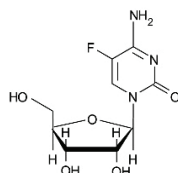
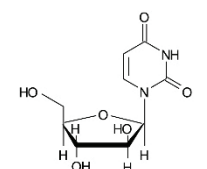
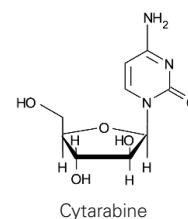
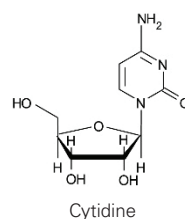
Column: ACE 3 C18
Dimensions: 50 x 2.1 mm
Part Number: ACE-111-0502
Mobile Phase: A: 0.1% perfluoropentanoic acid + 0.1% formic acid in H₂O
 B: 0.1% perfluoropentanoic acid + 0.1% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.0 | 0 |
| 0.5 | 0 |
| 3.0 | 13 |
| 4.0 | 90 |
| 5.0 | 0 |

Flow Rate: 0.7 mL/min
Detection: API 4000 MS
 TurbolonSpray, positive mode
 Source Temperature 550 °C

Analytes

1. Uracil arabinofuranoside
(*m/z* 245 → 113)
2. 5-Fluorocytidine (IS)
(*m/z* 262 → 130)
3. Cytidine
(*m/z* 244 → 112)
4. Cytarabine
(*m/z* 244 → 112)



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Cytotoxic Agents by UHPLC-MS/MS

Application #AN1070

Conditions

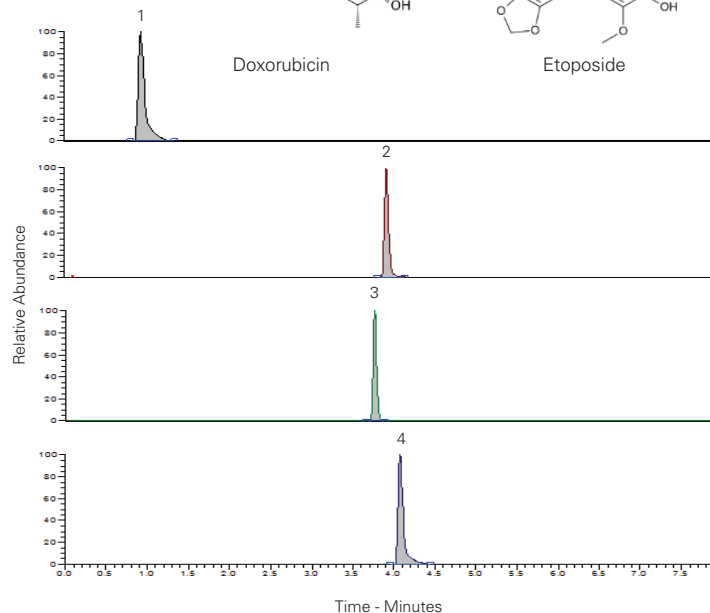
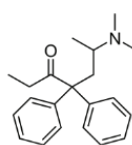
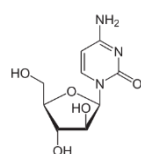
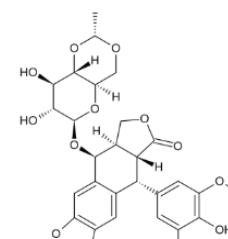
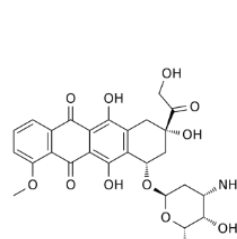
Column: ACE UltraCore 2.5 SuperC18
Dimensions: 100 x 2.1 mm
Part Number: CORE-25A-1002U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.0 | 2 |
| 1.0 | 2 |
| 3.0 | 80 |
| 5.0 | 80 |
| 5.1 | 2 |
| 8.0 | 2 |

Flow Rate: 0.25 mL/min
Detection: Thermo Vantage triple quadrupole MS
 MRM +ve ESI mode
 Spray voltage: 3500 V
 Nitrogen sheath and auxiliary gas
 CID with argon: 1.5 mTorr

Analytes

1. AraC
(*m/z* 244.1 → 112.2)
2. Methadone
(*m/z* 310.2 → 265.3)
3. Doxorubicin
(*m/z* 544.2 → 361.2)
4. Etoposide
(*m/z* 589.2 → 185.1)



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Decarboxylation of Sirohaem by Sirohaem Decarboxylase

Application #AN3830

Conditions

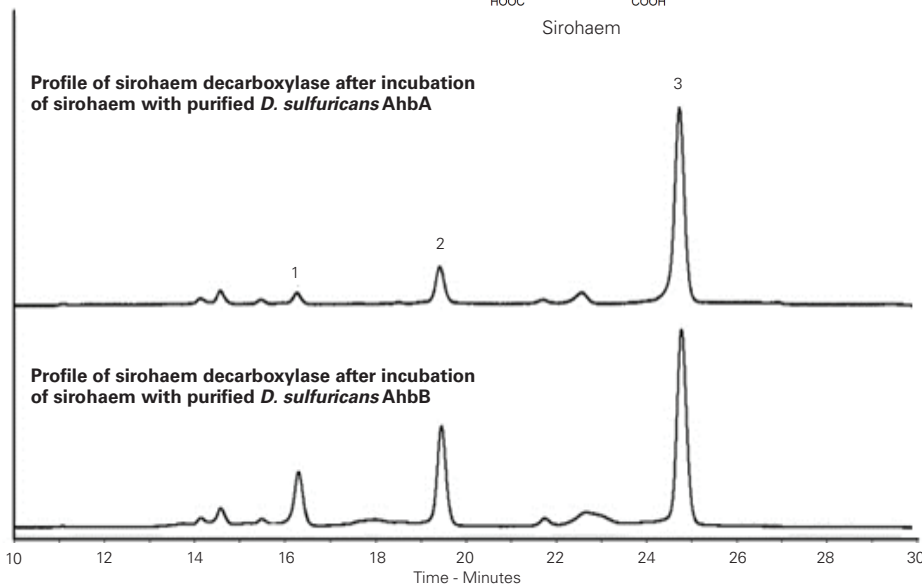
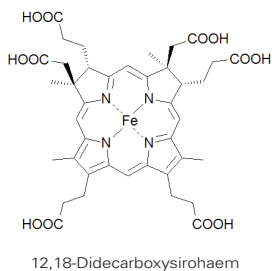
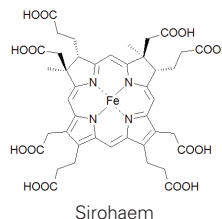
Column: ACE 5 AQ
Dimensions: 150 x 2.1 mm
Part Number: ACE-126-1502
Mobile Phase: A: 0.1% TFA in H₂O
 B: MeCN
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0 | 5 |
| 6 | 20 |
| 25 | 30 |
| 35 | 100 |
| 40 | 100 |

Flow Rate: 0.2 mL/min
Detection: DAD, 380 nm

Analytes

1. Sirohaem
2. Monodecarboxysirohaem
3. 12,18-Didecarboxysirohaem



Palmer DJ, Schroeder S, Lawrence AD, Deery E, Lobo SA, Saraiva LM, McLean KJ, Munro AW, Ferguson SJ, Pickersgill RW, Brown DG, Warren MJ. The structure, function and properties of sirohaem decarboxylase – an enzyme with structural homology to a transcription factor family that is part of an alternative haem biosynthesis pathway. *Molecular Microbiology* (2014) 93(2), 247-261. doi:10.1111/mmi.12656

Defensins (Human) in Saliva Matrix

Application #AN1270

Conditions

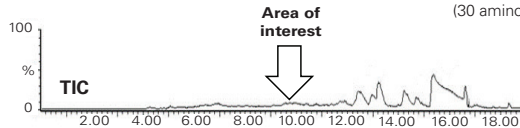
Column: ACE UltraCore 2.5 SuperC18
Dimensions: 50 x 3.0 mm
Part Number: CORE-25A-0503U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 2 |
| 2 | 2 |
| 17 | 50 |
| 19 | 95 |
| 20 | 95 |

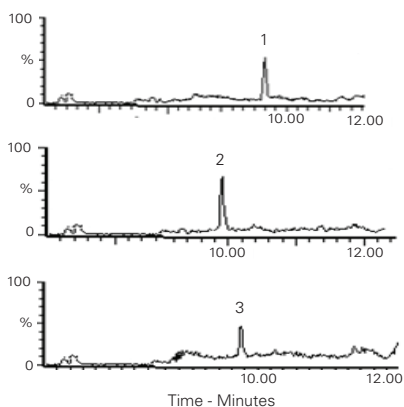
Flow Rate: 0.6 mL/min
Detection: Synapt G1 QToF +ESI MS
 Sampling cone voltage: 40 V
 Source temperature: 150 °C
 Capillary voltage: 4.8 kV
 Extraction cone voltage: 41 kV
 Desolvation temperature: 500 °C
 Acquisition: 100-2000 m/z
Sample: SPE on C18

Defensin Human Neutrophil Peptides

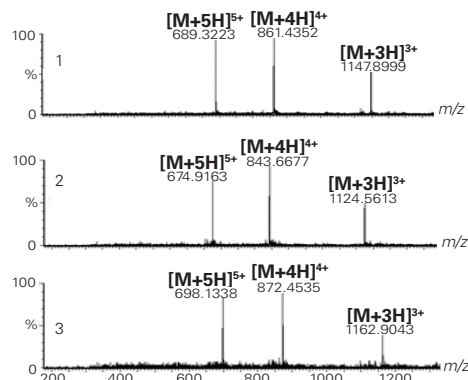
1. HNP-1 (30 amino acid residues)
2. HNP-2 (29 amino acid residues)
3. HNP-3 (30 amino acid residues)



Extracted ion current chromatograms (sum of multiply protonated ions [M+3H]³⁺, [M+4H]⁴⁺ and [M+5H]⁵⁺)



Mass spectra



Dermorphin in Equine Urine by LC-MS/MS Application #AN1040

Conditions

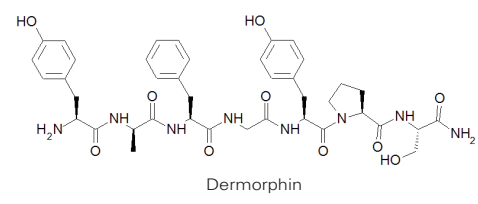
Column: ACE 3 C18
Dimensions: 100 x 2.1 mm
Part Number: ACE-111-1002
Mobile Phase: A: 0.2% formic acid in H₂O
 B: 0.2% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.00 | 5 |
| 0.20 | 5 |
| 8.00 | 95 |
| 8.50 | 95 |
| 8.51 | 5 |
| 12.50 | 5 |

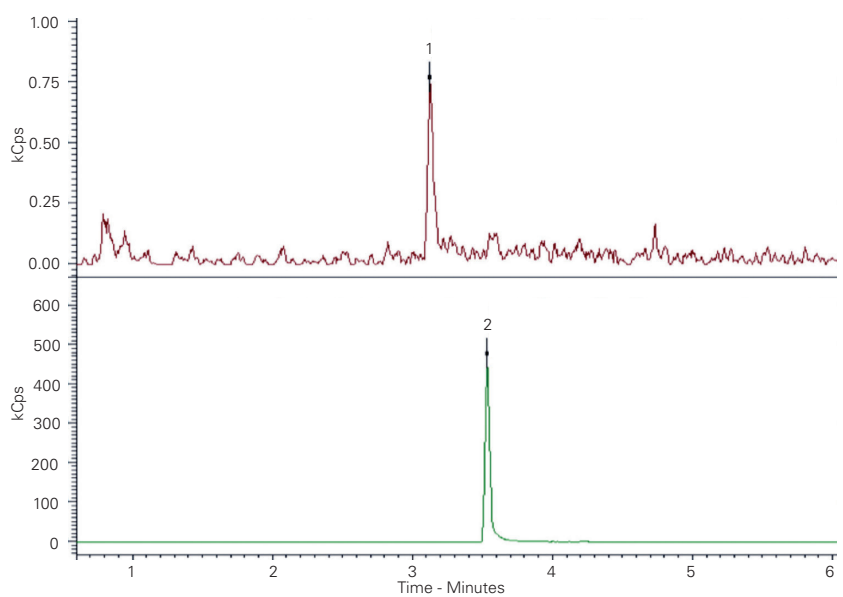
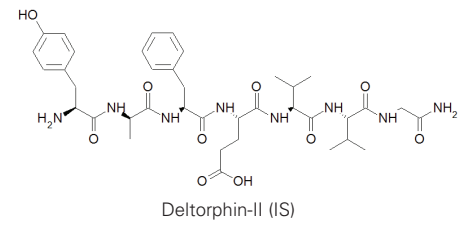
Flow Rate: 0.4 mL/min
Injection: 40 µL
Detection: Bruker EVOQ Elite triple quad MS
 VIP heated-ESI temperature: 350 °C
 Cone gas temperature: 250 °C
 Spray voltage: +4000 V

Analytes

- Dermorphin
 (m/z 803.4 → 602 (Quantifier ion))
 (m/z 803.4 → 202 (Qualifier ion))
- Deltorphin-II (IS)
 (m/z 783 → 277)



Accurate quantification of dermorphin in equine urine in range 0.05 – 100 ng/mL
 LLOQ = 0.05 ng/mL

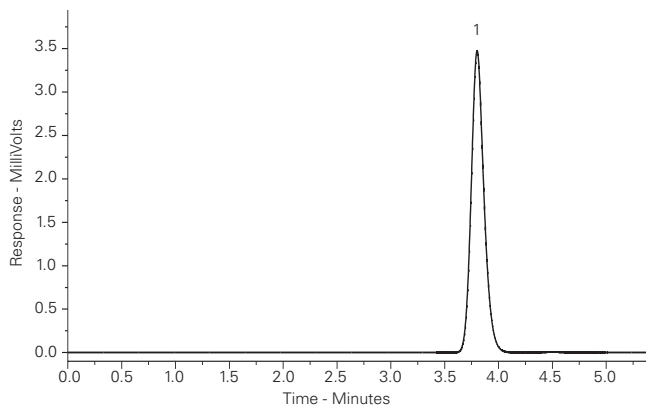
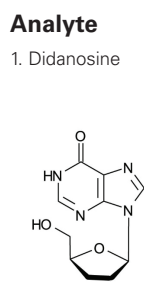


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Didanosine Application #AN3590

Conditions

Column: ACE 5 C18-HL
Dimensions: 250 x 4.6 mm
Part Number: ACE-321-2546
Mobile Phase: 50 mM ammonium acetate
 pH 8.0/MeOH (80:20 v/v)
Flow Rate: 1.5 mL/min
Temperature: Ambient
Detection: UV, 254 nm



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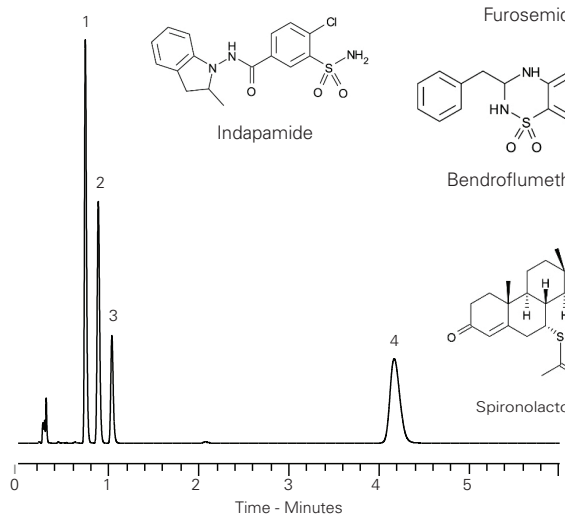
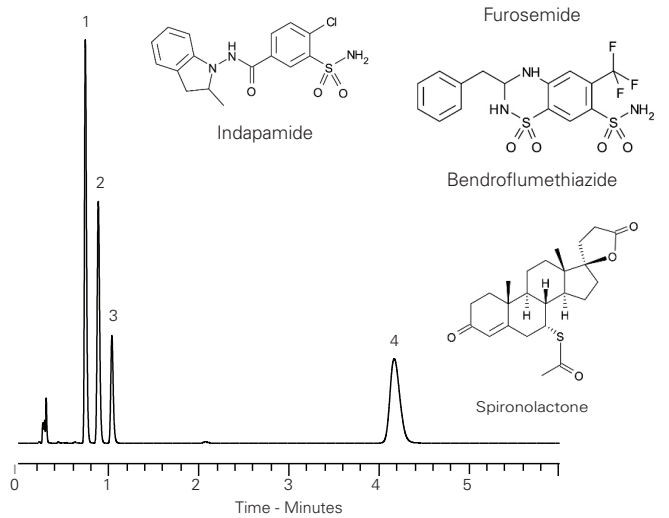
Diuretics (Isocratic) Application #AN2140

Conditions

Column: ACE Excel 2 C18-PFP
Dimensions: 50 x 3.0 mm
Part Number: EXL-1010-0503U
Mobile Phase: 10 mM ammonium formate
 pH 3.0 in MeOH/H₂O (45:55 v/v)
Flow Rate: 1 mL/min
Injection: 2 µL
Temperature: 60 °C
Detection: UV, 254 nm

Analytes

- Furosemide
- Indapamide
- Bendroflumethiazide
- Spirolactone





Diuretics

Application #AN1450

Conditions

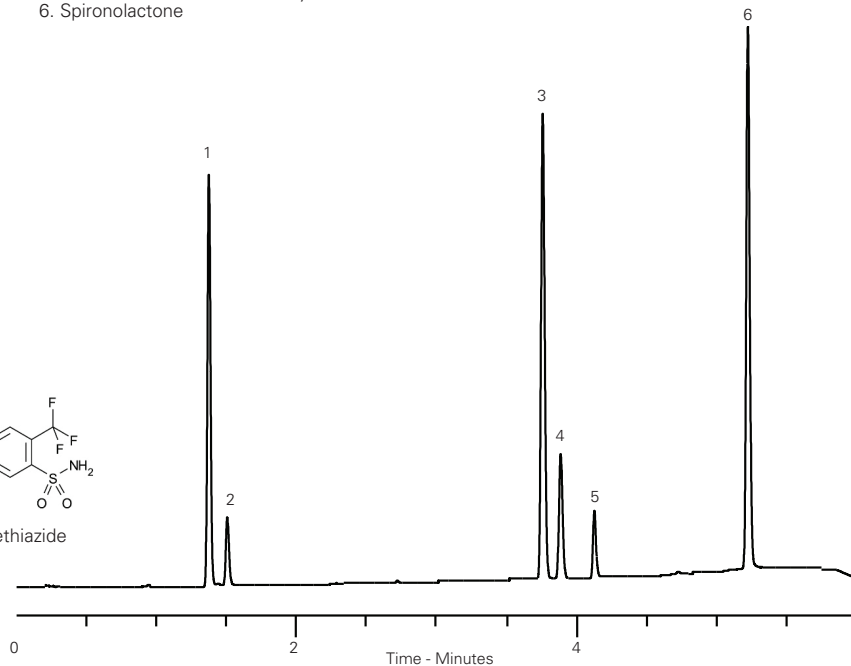
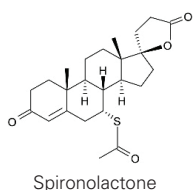
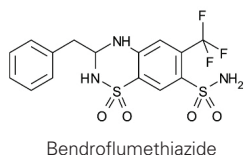
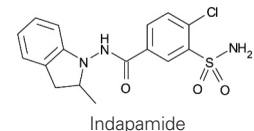
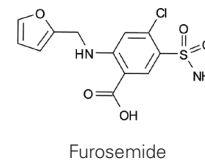
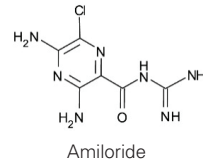
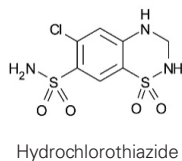
Column: ACE Excel 2 C18-PFP
Dimensions: 50 x 3.0 mm
Part Number: EXL-1010-0503U
Mobile Phase: A: 10 mM ammonium formate pH 3.0 in H₂O
 B: 10 mM ammonium formate pH 3.0 in MeOH/H₂O (9:1 v/v)
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.0 | 5 |
| 0.5 | 5 |
| 5.0 | 70 |
| 5.5 | 70 |
| 6.0 | 5 |

Flow Rate: 1 mL/min
Injection: 2 µL
Temperature: 60 °C
Detection: UV, 254 nm

Analytes

1. Hydrochlorothiazide
2. Amiloride
3. Furosemide
4. Indapamide
5. Bendroflumethiazide
6. Spironolactone



DOTATATE and Octreotide

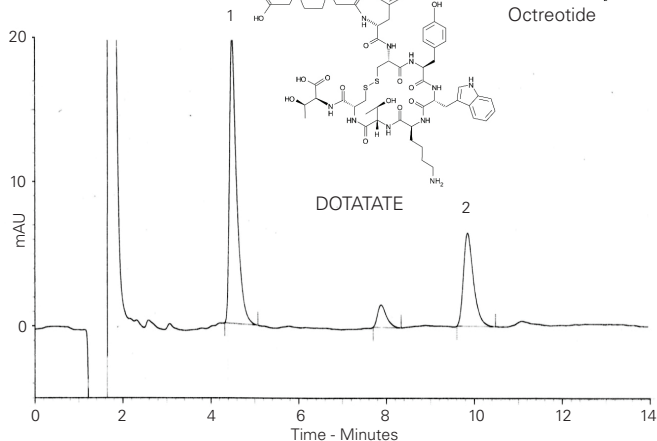
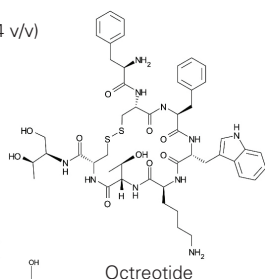
Application #AN2730

Conditions

Column: ACE 3 C18
Dimensions: 150 x 3.0 mm
Part Number: ACE-111-1503
Mobile Phase: 0.1% TFA in H₂O/MeCN (76:24 v/v)
Flow Rate: 0.6 mL/min
Injection: 20 µL
Detection: UV, 220 nm

Analytes

1. DOTATATE
2. Octreotide



⁶⁸Ga-DOTATATE QC Analysis by Radiometric Detection

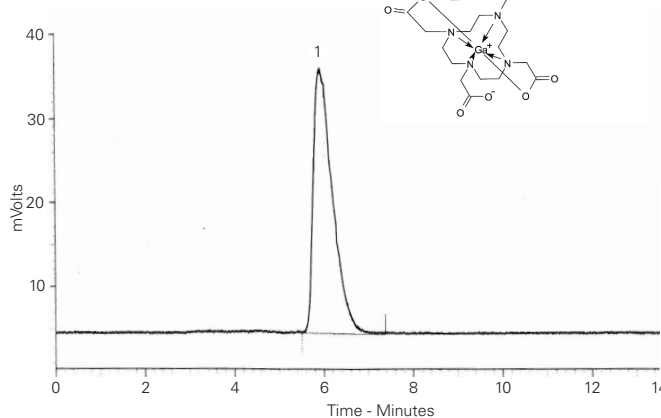
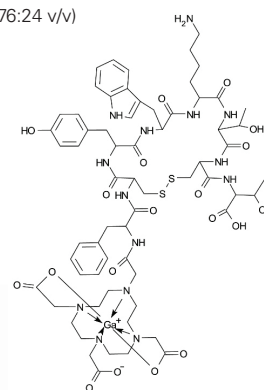
Application #AN2720

Conditions

Column: ACE 3 C18
Dimensions: 150 x 3.0 mm
Part Number: ACE-111-1503
Mobile Phase: 0.1% TFA in H₂O/MeCN (76:24 v/v)
Flow Rate: 0.6 mL/min
Injection: 20 µL
Detection: Radiometric

Analyte

1. ⁶⁸Ga-DOTATATE



⁶⁸Ga-DOTATATE PET Tracer by LC-MS/MS

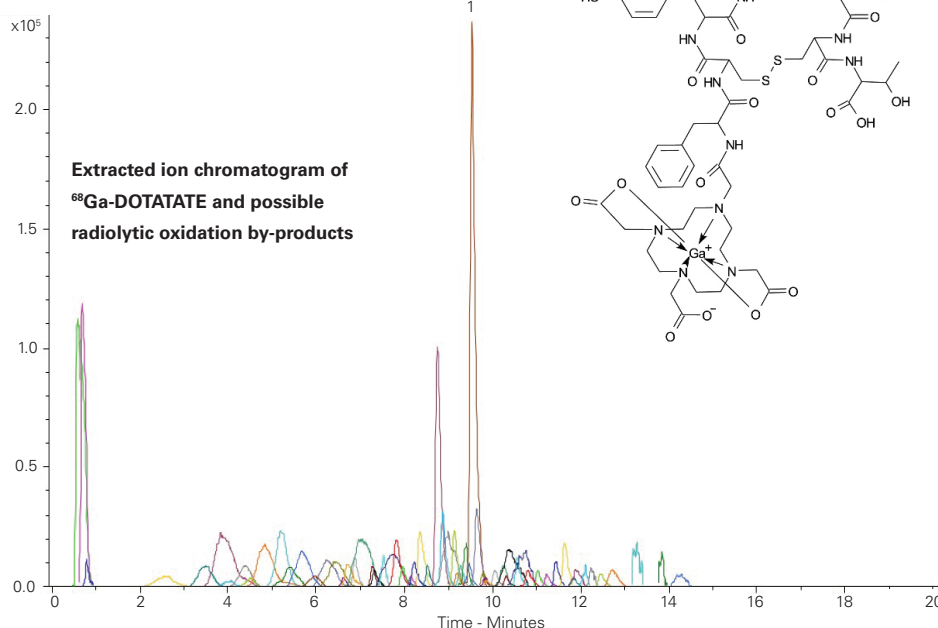
Application #AN2710

Conditions

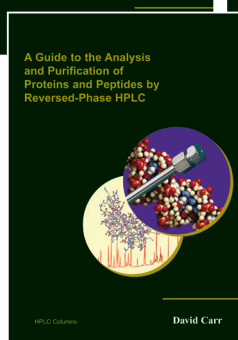
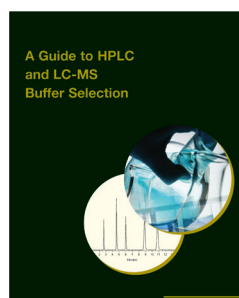
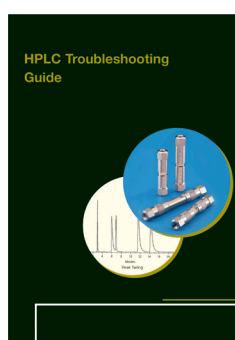
Column: ACE 3 C18
Dimensions: 50 x 4.6 mm
Part Number: ACE-111-0546
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 2 |
| 10 | 25 |
| 20 | 25 |

Flow Rate: 1 mL/min
Injection: 10 µL
Detection: Bruker ESI-Q-TOF
 ESI positive ion mode

Analyte1. ⁶⁸Ga-DOTATATE

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Drugs of Abuse Screen by UHPLC-MS/MS

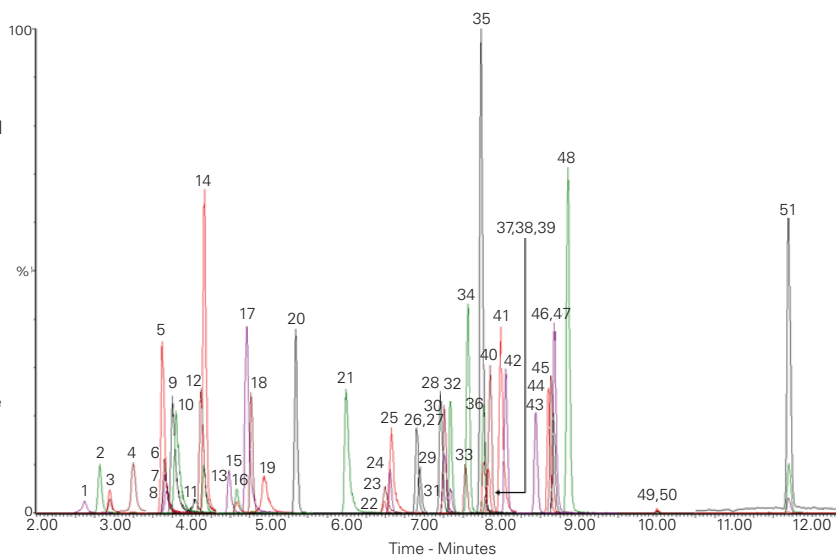
Application #AN2190

Conditions

Column: ACE Excel 1.7 C18
Dimensions: 100 x 2.1 mm
Part Number: EXL-171-1002U
Mobile Phase: A: 5 mM ammonium acetate in H₂O
 B: 5 mM ammonium acetate in MeOH
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.0 | 10 |
| 10.0 | 90 |
| 11.9 | 90 |
| 13.4 | 10 |
| 15.5 | 10 |

Flow Rate: 0.3 mL/min
Injection: 10 µL
Temperature: 40 °C
Detection: MS Quattro Premier XE triple quad
 MRM, positive and negative ESI mode
 Desolvation temperature: 450 °C
 Ion source temperature: 150 °C
 Collision gas pressure: 3.5 x 10⁻³ mbar



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| Peak | Analyte | R _t (Mins) | Q1 (Da) | Q3 (Da) | Peak | Analyte | R _t (Mins) | Q1 (Da) | Q3 (Da) |
|------|-----------------------|-----------------------|---------|---------|------|--------------------------|-----------------------|---------|---------|
| 1 | Oxymorphone | 2.62 | 302.2 | 198.1 | 27 | Bromazepam | 6.95 | 316.1 | 182.1 |
| 2 | Morphine-d3 | 2.82 | 289.2 | 201.0 | 28 | Ketamine | 7.21 | 238.1 | 124.9 |
| 3 | Morphine | 2.95 | 286.2 | 201.0 | 29 | Clonazepam | 7.26 | 316.1 | 270.1 |
| 4 | Hydromorphone | 3.25 | 286.2 | 185.1 | 30 | Nitrazepam | 7.26 | 282.2 | 236.1 |
| 5 | Amphetamine-d5 | 3.62 | 141.0 | 123.9 | 31 | α-Hydroxytriazolam | 7.34 | 359.1 | 331.1 |
| 6 | Amphetamine | 3.65 | 136.0 | 118.9 | 32 | Flunitrazepam | 7.34 | 314.2 | 268.2 |
| 7 | Dihydrocodeine | 3.66 | 302.2 | 199.1 | 33 | α-Hydroxyalprazolam | 7.54 | 325.2 | 297.1 |
| 8 | MDA | 3.67 | 180.1 | 105.0 | 34 | Estazolam | 7.56 | 295.2 | 267.2 |
| 9 | MDMA | 3.75 | 194.1 | 163.0 | 35 | Zolpidem | 7.73 | 308.2 | 235.1 |
| 10 | Methamphetamine | 3.80 | 150.0 | 90.9 | 36 | Triazolam | 7.77 | 343.0 | 308.1 |
| 11 | Oxycodone | 4.03 | 316.2 | 241.2 | 37 | 2-Hydroxyethylflurazepam | 7.77 | 333.2 | 109.0 |
| 12 | MDEA | 4.12 | 208.2 | 163.0 | 38 | Lorazepam | 7.80 | 321.1 | 275.1 |
| 13 | BZE-d3 | 4.15 | 293.1 | 171.0 | 39 | Oxazepam | 7.82 | 287.2 | 241.0 |
| 14 | BZE | 4.17 | 290.1 | 168.0 | 40 | Alprazolam | 7.85 | 309.2 | 281.2 |
| 15 | 6-MAM | 4.48 | 328.2 | 165.1 | 41 | Methadone | 7.99 | 310.2 | 265.2 |
| 16 | Codeine | 4.59 | 300.3 | 215.1 | 42 | Temazepam | 8.05 | 301.1 | 255.1 |
| 17 | Norfentanyl | 4.71 | 233.1 | 84.0 | 43 | Nordiazepam | 8.44 | 271.1 | 139.9 |
| 18 | 7-Amino-clonazepam | 4.77 | 286.2 | 121.0 | 44 | Midazolam | 8.61 | 326.2 | 291.2 |
| 19 | Hydrocodone | 4.94 | 300.2 | 199.1 | 45 | Diazepam-d5 | 8.63 | 290.2 | 154.0 |
| 20 | 7-Amino-flunitrazepam | 5.34 | 284.2 | 135.0 | 46 | Diazepam | 8.67 | 285.2 | 154.0 |
| 21 | Cocaine | 5.99 | 304.2 | 182.0 | 47 | Flurazepam | 8.68 | 388.2 | 315.1 |
| 22 | Norbuprenorphine | 6.47 | 414.3 | 101.0 | 48 | Fentanyl | 8.85 | 337.3 | 105.0 |
| 23 | PCP | 6.49 | 244.2 | 159.9 | 49 | THC-COOH-d3 | 9.98 | 348.2 | 302.2 |
| 24 | Zaleplon | 6.55 | 306.2 | 264.2 | 50 | THC-COOH | 10.01 | 345.2 | 299.2 |
| 25 | EDDP | 6.58 | 278.2 | 234.2 | 51 | Buprenorphine | 11.70 | 468.3 | 101.0 |
| 26 | Norketamine | 6.90 | 224.1 | 124.9 | | | | | |

Drugs of Abuse Screen (250 Analytes) in Urine by LC-MS/MS

Page 1 of 3

Application #AN4140

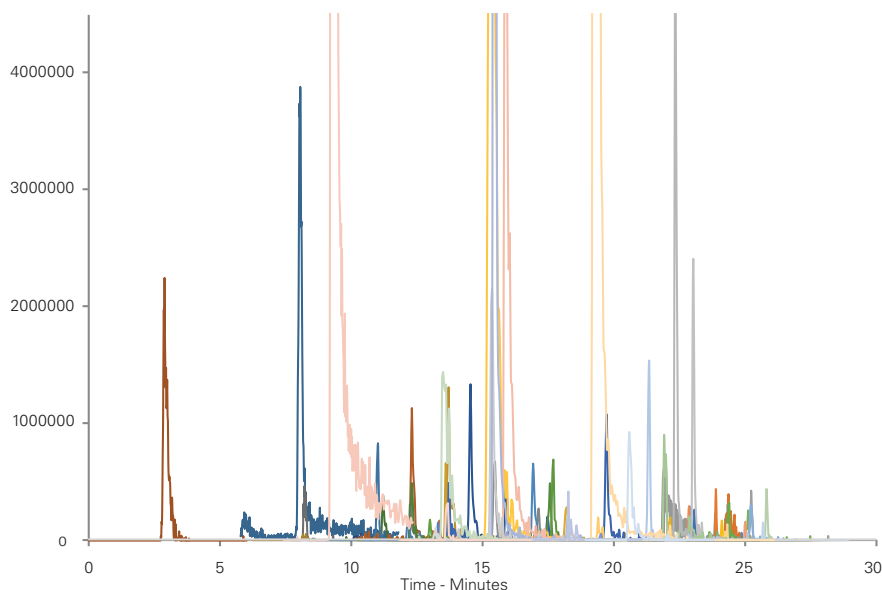
Conditions

Column: ACE Excel 2 C18-PFP
Dimensions: 100 x 2.1 mm
Part Number: EXL-1010-1002U
Mobile Phase: A: 2 mM ammonium acetate + 0.1% formic acid in H₂O
 B: 2 mM ammonium acetate + 0.1% formic acid in MeOH
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0 | 2 |
| 4 | 2 |
| 34 | 100 |
| 38 | 100 |
| 40 | 2 |

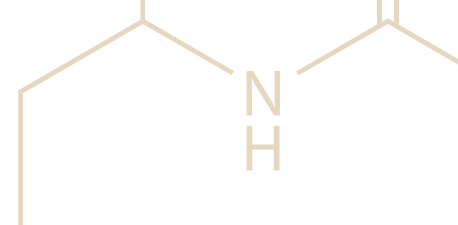
Flow Rate: 0.3 mL/min
Injection: 10 µL
Temperature: 37 °C
Detection: Thermo Quantum Ultra MS
 ESI in positive ion mode

Analytes in blue are included in
 Extracted Ion Chromatogram



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| Analyte | R _t (Mins) | MRM Transitions (m/z) | Analyte | R _t (Mins) | MRM Transitions (m/z) |
|------------------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| 6-Acetylcodeine | 16.9 | 342.2 > 165.1 | Buphedrone | 14.2 | 178.2 > 160.1 |
| Alfentanil | 21.1 | 417.4 > 197.2 | Buphedrone ephedrine | 13.5 | 180.4 > 162.2 |
| Alprazolam | 23.3 | 309.11 > 205.1 | Bupivacaine | 19.5 | 289.2 > 84.2 |
| Aminoclonazepam | 13.9 | 286.2 > 222.3 | Buprenorphine glucuronide | 18.1 | 644.4 > 468.4 |
| Aminodesmethylflunitrazepam | 20.0 | 270.1 > 121.1 | Bupropion | 19.5 | 240.1 > 131.1 |
| Aminoflunitrazepam | 16.2 | 284.1 > 135.1 | Butylone | 14.7 | 222.1 > 131.1 |
| Aminonitrazepam | 10.9 | 252.1 > 94.1 | Caffeine | 13.1 | 195.1 > 110.1 |
| Aminorex | 12.2 | 163 > 120.1 | Camfetamine | 18.7 | 202.2 > 67.1 |
| Amiodarone | 31.3 | 646.2 > 100 | Carbamazepine | 21.5 | 237.1 > 192.2 |
| Amisulpride | 16.2 | 370.1 > 242 | Carbamazepine 10,11-Epoide | 18.6 | 253.2 > 180.1 |
| Amitriptyline | 24.4 | 278.2 > 91.1 | Cathine | 20.0 | 134.2 > 91.1 |
| Amlodipine | 25.3 | 409.3 > 238.2 | Cathinone | 9.5 | 150.2 > 117.1 |
| Amlodipine met | 22.9 | 407 > 318 | 2C-B-FLY | 20.1 | 286 > 269.1 |
| Amphetamine | 11.6 | 136.1 > 65.2 | Chlordiazepoxide | 19.5 | 300.1 > 227.1 |
| Amphetamine-d6 | 11.6 | 142.2 > 67.2 | Chloroquine | 18.5 | 320.1 > 142.1 |
| Anhydroecgonine methyl ester | 9.8 | 182.2 > 91.1 | Chlorpheniramine | 20.4 | 275.1 > 167.2 |
| Aripiprazole | 25.5 | 448.1 > 285.1 | Chlorpromazine | 25.9 | 319.2 > 58.1 |
| Atenolol | 10.7 | 267.1 > 145.1 | Citalopram | 22.2 | 325.1 > 246.1 |
| Atomoxetine | 23.1 | 256.2 > 44.1 | Clobazam | 22.8 | 301.1 > 259.2 |
| Atomoxetine metabolite | 22.5 | 242.2 > 44.1 | Clomethiazole | 17.3 | 161.9 > 113 |
| Benzedrone | 21.7 | 254 > 65.1 | Clomipramine | 27.0 | 315.1 > 86.1 |
| Benzoylecgonine | 15.6 | 290.1 > 77.2 | Clonazepam | 23.1 | 316.1 > 214.2 |
| Benzoylecgonine-d3 | 15.6 | 293.2 > 77.2 | Clonidine | 13.2 | 230 > 44.2 |
| Benzylpiperazine | 5.1 | 177.2 > 65.1 | Clozapine | 21.7 | 327.1 > 192.1 |
| Bisoprolol | 19.9 | 326.3 > 116.1 | Cocaethylene | 19.5 | 318.2 > 82.2 |
| Bromazepam | 20.4 | 316 > 182.1 | Cocaine | 18.0 | 304.2 > 82.2 |



Drugs of Abuse Screen (250 Analytes) in Urine by LC-MS/MS

Page 2 of 3

Application #AN4140

| Analyte | R _t (Mins) | MRM Transitions (m/z) | Analyte | R _t (Mins) | MRM Transitions (m/z) |
|-------------------------------|-----------------------|-----------------------|--------------------------|-----------------------|-----------------------|
| Codeine | 11.9 | 300.2 > 153.2 | 4-Fluoromethcathinone | 20.0 | 182 > 148.1 |
| Cotinine | 2.5 | 177.1 > 80.1 | Fluoxetine | 25.3 | 310.1 > 44.2 |
| Creatinine | 1.3 | 114 > 44 | Fluphenazine | 28.1 | 438.3 > 143.1 |
| Cyclizine | 22.5 | 267.1 > 167.1 | Flurazepam | 21.6 | 388 > 315 |
| D2PM (Diphenylprolinol) | 7.3 | 254.1 > 130.1 | Fluvoxamine | 26.0 | 319.1 > 71 |
| Dehydroaripiprazole | 25.3 | 446.1 > 285.1 | Gabapentin | 10.5 | 172.1 > 67.2 |
| Desipramine | 24.3 | 267.1 > 72.2 | Glibenclamide | 28.2 | 494.1 > 168.9 |
| N-Desmethyloclozapine | 21.0 | 313 > 192.1 | Gliclazide | 24.6 | 324.1 > 110 |
| Desmethylcitalopram | 22.4 | 311.1 > 109.1 | Glimepiride | 28.4 | 491.1 > 126 |
| Desmethylflunitrazepam | 22.5 | 300.1 > 254.2 | Glipizide | 24.5 | 446.1 > 286 |
| Desmethylfluoxetine | 25.4 | 296.2 > 134.1 | Haloperidol | 23.1 | 376.1 > 95.1 |
| N-Desmethylnortazepam | 16.1 | 252.1 > 195.1 | Hippuric acid | 10.9 | 180 > 77 |
| Desmethylolanzapine | 12.6 | 299.1 > 198.1 | Hydrocodone | 13.1 | 300.1 > 199.1 |
| N-Desmethyltramadol | 16.7 | 250.1 > 44.2 | Hydromorphone | 10.4 | 286.2 > 185.1 |
| O-Desmethyltramadol | 12.8 | 250.1 > 58.2 | Hydroxyalprazolam | 22.4 | 325.1 > 216.1 |
| Desmethylvenlafaxine | 15.5 | 264.3 > 58.1 | 4-Hydroxyamphetamine | 5.4 | 152.1 > 107.1 |
| N-Desmethylzopiclone | 20.0 | 375.1 > 245.1 | Hydroxybupropion | 18.5 | 253.1 > 130.1 |
| Desomorphine | 13.1 | 272.1 > 152.1 | 4-Hydroxymethamphetamine | 20.0 | 166.1 > 107.1 |
| Desoxypropadolol | 20.5 | 252.1 > 91.1 | 8-Hydroxymirtazapine | 15.6 | 282.1 > 211 |
| Dextromethorphan | 20.0 | 272.2 > 171.1 | 7-Hydroxymirtazapine | 18.2 | 415.3 > 175.1 |
| Diamorphine | 16.9 | 370.1 > 165.1 | 3-Hydroxyphenazepam | 23.3 | 366.9 > 320.8 |
| Diazepam | 25.5 | 285.1 > 154.1 | 7-Hydroxyquetiapine | 15.3 | 400.3 > 208.1 |
| Didesmethylcitalopram | 22.2 | 297 > 262.1 | 9-Hydroxyrisperidone | 19.5 | 427.2 > 69.1 |
| Digoxin | 24.2 | 781.2 > 97 | Imipramine | 24.2 | 281.1 > 86.2 |
| Dihydrocodeine | 11.7 | 302.2 > 128.1 | 5-Iodo-2-aminoindane | 18.4 | 260.1 > 115.1 |
| Diltiazem | 22.7 | 415.1 > 178.1 | Ketamine | 15.4 | 238.1 > 125.1 |
| Dimethocaine | 16.3 | 279.3 > 92.1 | Lamotrigine | 16.8 | 256.1 > 211.1 |
| Dinitrophenol | 18.4 | 183 > 109 | Levamisole | 13.3 | 205.1 > 91.1 |
| Diphenhydramine | 21.2 | 256.1 > 167.1 | Levetiracetam | 8.9 | 171.2 > 126.1 |
| Dipipanone | 25.0 | 350.2 > 265.2 | Lidocaine | 14.8 | 235.1 > 86.2 |
| Donepezil | 22.2 | 380.1 > 91 | Lorazepam | 22.8 | 321 > 229.1 |
| Dothiepin | 23.7 | 296.2 > 202.2 | Lormetazepam | 23.8 | 335 > 289.1 |
| Ecgonine ethyl ester | 2.5 | 214.1 > 196.1 | LSD | 20.1 | 324.3 > 223.1 |
| Ecgonine methyl ester | 1.0 | 200.1 > 182.1 | MCAT | 5.4 | 164.2 > 130.1 |
| EDDP | 21.4 | 278.2 > 219.2 | mCPP | 17.0 | 197.1 > 118.1 |
| Estazolam | 22.5 | 295.1 > 267.1 | MDA | 13.4 | 180.1 > 133.1 |
| Ethylamphetamine | 14.5 | 164.1 > 91.2 | MDAI | 12.3 | 178.19 > 161.1 |
| Ethylmethcathinone | 15.8 | 192.2 > 131.2 | MDEA | 15.2 | 208.1 > 135.1 |
| Ethylphenidate | 19.2 | 248.1 > 56.2 | MDMA | 14.1 | 194.1 > 135.2 |
| Etizolam | 23.5 | 343.1 > 314.2 | MDPV | 18.1 | 276.1 > 135.1 |
| Fenfluramine | 20.3 | 232.1 > 159.1 | MEGX | 13.4 | 207.1 > 58.1 |
| Fentanyl | 21.4 | 337.2 > 105.1 | MeOPP | 13.3 | 193.2 > 133.1 |
| Flubromazolam | 23.2 | 371.1 > 223.1 | Mephedrone | 14.6 | 178.1 > 144.2 |
| Flunitrazepam | 23.5 | 314.1 > 269.3 | Mescaline | 12.7 | 212.1 > 165.1 |
| 2-Fluoroamphetamine | 13.2 | 154.1 > 83.1 | Metformin | 2.5 | 130 > 60.1 |
| Fluoroamphetamine interferent | 10.6 | 154 > 67.1 | Methadone | 24.0 | 310.2 > 105.1 |
| 3-Fluoromethcathinone | 20.0 | 182.1 > 149.1 | Methadone-d3 | 24.0 | 313.2 > 268.2 |



Drugs of Abuse Screen (250 Analytes) in Urine by LC-MS/MS Page 3 of 3
Application #AN4140

| Analyte | R _t (Mins) | MRM Transitions (m/z) | Analyte | R _t (Mins) | MRM Transitions (m/z) |
|------------------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|
| Methamphetamine | 12.8 | 150.1 > 91.2 | Paracetamol | 7.8 | 152.1 > 65.1 |
| Methaqualone | 22.8 | 251.2 > 91.1 | PCP | 20.5 | 244.3 > 86.2 |
| Methedrone | 13.9 | 194.1 > 146.1 | Pentazocine | 19.5 | 286.3 > 175.2 |
| Methiopropamine | 10.6 | 156.1 > 97 | Pentedrone | 16.0 | 192.2 > 131.1 |
| Methocarbamol | 16.8 | 242.1 > 118.1 | Phenazepam | 24.5 | 350.9 > 206 |
| Methoxetamine | 17.2 | 248.2 > 121.1 | Pheniramine | 15.1 | 241.2 > 196.2 |
| 3-Methoxytyramine | 6.6 | 168 > 91 | Phenytoin | 20.0 | 253.1 > 77 |
| Methylethcathinone | 20.0 | 192.1 > 144.2 | Pholcodine | 9.2 | 399.2 > 114.1 |
| Methylhexanamine | 13.4 | 116.1 > 57.3 | PMA | 13.8 | 149.2 > 91.1 |
| Methylone | 12.7 | 208.1 > 132.1 | PMMA | 14.6 | 180.2 > 121.1 |
| Methylphenidate | 16.5 | 234.1 > 56.2 | Powder 20140730 | 18.7 | 248.3 > 84.2 |
| 5-Methyltryptamine | 16.9 | 175.1 > 143 | Prazepam | 27.0 | 325 > 140 |
| Metoclopramide | 17.2 | 300.1 > 227.1 | Pregabalin | 10.4 | 160.1 > 97.2 |
| Midazolam | 20.9 | 326.1 > 249.1 | Procyclidine | 22.4 | 288.3 > 42 |
| Mirtazapine | 16.6 | 266.1 > 72.2 | Promethazine | 20.0 | 285.1 > 86.2 |
| Mitragynine | 22.6 | 399.3 > 174.1 | Propofol | 23.9 | 179 > 137 |
| Modafinil | 21.1 | 296.1 > 129 | Propofol glucuronide | 20.1 | 372.2 > 148.1 |
| 6-Monoacetylmorphine | 12.9 | 328.1 > 165.1 | Propoxyphene | 23.6 | 340.2 > 58.2 |
| Mono-N-desethylamiodarone | 30.8 | 618.2 > 547.2 | Propranolol | 23.0 | 260.1 > 157.1 |
| Morphine | 7.7 | 286.1 > 152.2 | Quetiapine | 21.7 | 384.1 > 221.1 |
| Morphine glucuronide | 2.7 | 462.2 > 201.1 | Remifentanil | 18.4 | 377.3 > 113.1 |
| Morphine-d3 | 7.7 | 289.2 > 152.2 | Risperidone | 20.4 | 411.1 > 190.8 |
| Naloxone | 20.0 | 328.3 > 212.1 | Ritalinic acid | 14.4 | 220.2 > 56.1 |
| Naphyrone | 23.2 | 282.2 > 141.1 | Sertraline | 25.6 | 306.1 > 159 |
| Nefopam | 19.5 | 254.9 > 166.1 | Sildenafil | 23.6 | 475.4 > 58.1 |
| Nifoxipam | 20.9 | 316.05 > 298.1 | Sildenafil N-oxide | 23.9 | 491.4 > 312.3 |
| Nimetazepam | 23.6 | 296.1 > 250.2 | Sufentanil | 22.9 | 387.3 > 140.2 |
| Nitrazepam | 22.8 | 282.1 > 236.1 | Temazepam | 24.2 | 301.1 > 177.1 |
| Noralfentanil/sufentanil | 19.4 | 277.1 > 245.1 | Temazepam-d5 | 24.1 | 306.1 > 260.2 |
| Norbuprenorphine glucuronide | 15.5 | 590.3 > 414.3 | Tetrazepam | 24.5 | 289.2 > 225.2 |
| Norcyclizine | 21.9 | 253.2 > 167.1 | TFMPP | 7.9 | 231.1 > 118.1 |
| Nordiazepam | 24.4 | 271.1 > 140.1 | Theophylline | 11.2 | 181.1 > 124.1 |
| Nordothiepin | 24.4 | 282.1 > 202.1 | Tramadol | 16.9 | 264.2 > 58.2 |
| Norfentanyl | 15.6 | 233.2 > 56.2 | Trazodone | 23.9 | 372.2 > 179.2 |
| Norketamine | 14.8 | 224.1 > 125.1 | Trifluoperazine | 28.8 | 408.2 > 113.2 |
| Normorphine | 3.8 | 272.1 > 165.2 | Trihexyphenidyl | 23.7 | 302.1 > 70.1 |
| Nornefopam | 19.7 | 240.9 > 166.1 | Varenicline | 12.3 | 212.2 > 168.1 |
| Noroxycodone | 13.0 | 302.1 > 284.1 | Venlafaxine | 19.1 | 278.2 > 58.2 |
| Norpropoxyphene | 23.0 | 308 > 44.2 | Verapamil | 23.9 | 455.2 > 150.1 |
| Norsertraline | 20.0 | 275.3 > 159 | Vigabatrin | 2.5 | 130.1 > 71.1 |
| Nortriptyline | 24.6 | 264.1 > 91.1 | Warfarin | 25.7 | 309.1 > 251.1 |
| Olanzapine | 13.4 | 313.1 > 84.1 | Zaleplon | 21.5 | 306.1 > 236.2 |
| Orphenadrine | 23.4 | 270.1 > 181.1 | Zolpidem | 18.8 | 308.2 > 235.2 |
| Oxazepam | 23.5 | 287.1 > 104.1 | Zolpidem phenyl COOH | 15.3 | 338 > 265.1 |
| Oxybutynin | 24.6 | 358.1 > 141.9 | Zopiclone | 16.5 | 389.1 > 217.1 |
| Oxycodone | 12.9 | 316.1 > 241.1 | Zopiclone N-oxide | 17.6 | 405.2 > 217.1 |
| Oxymorphone | 20.0 | 302 > 227 | | | |



Echinacea

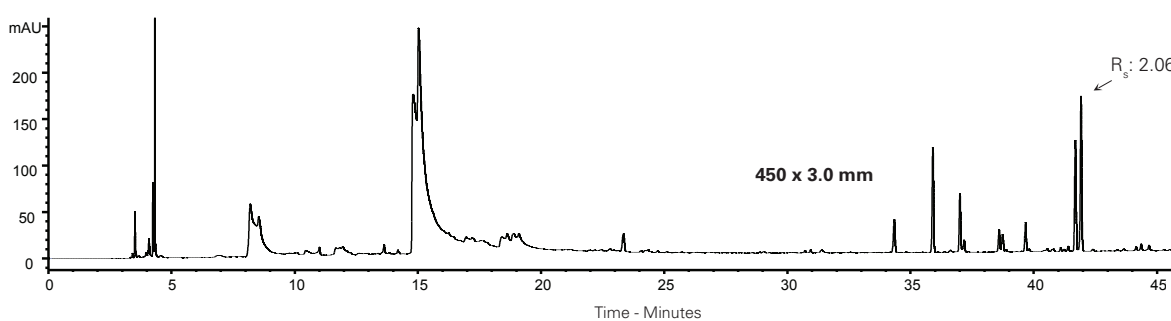
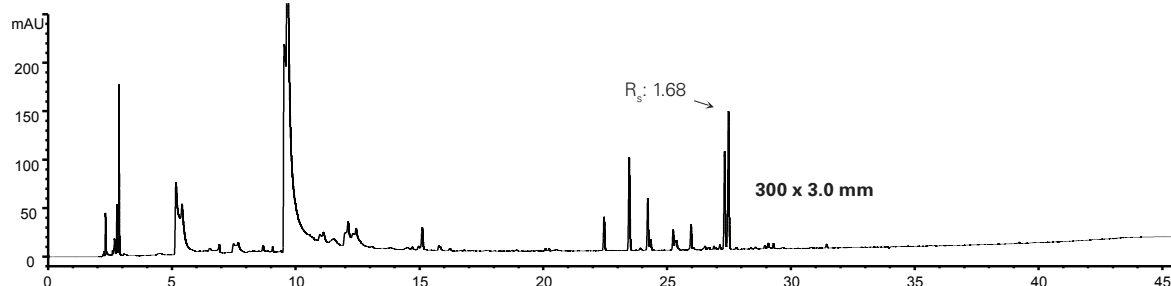
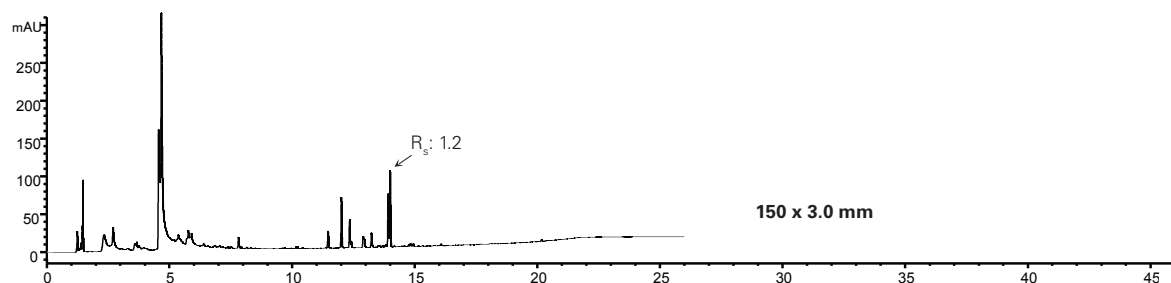
Application #AN4270

Conditions

Column: ACE UltraCore 2.5 SuperC18
Dimensions: 150 x 3.0 mm; 2 x 150 x 3.0 mm (coupled); 3 x 150 x 3.0 mm (coupled)
Part Number: CORE-25A-1503U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| | Time (mins) | | | |
|-----------|--------------|--------------|--------------|-----|
| Gradient: | 150 x 3.0 mm | 300 x 3.0 mm | 450 x 3.0 mm | %B |
| - | 0.00 | 0.00 | 0.00 | 5 |
| 0.00 | 0.47 | 0.47 | 0.94 | 5 |
| 20.00 | 40.47 | 60.94 | 60.94 | 100 |
| 25.00 | 45.47 | 75.94 | 75.94 | 100 |
| 26.00 | 46.47 | 76.94 | 76.94 | 5 |
| 46.00 | 86.47 | 136.94 | 136.94 | 5 |

Flow Rate: 0.43 mL/min
Temperature: 80 °C
Detection: UV, 254 nm



Entacapone

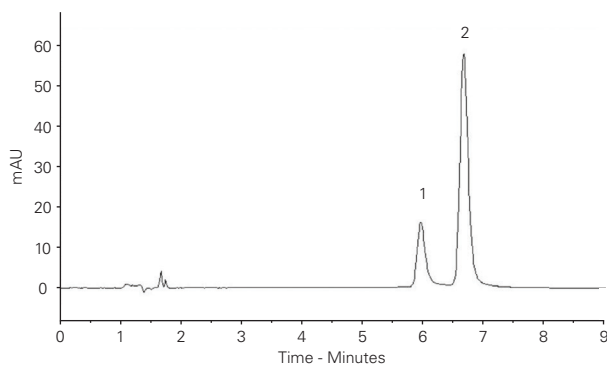
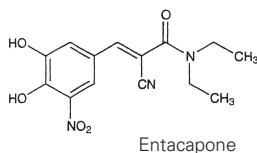
Application #AN3600

Conditions

Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: Phosphoric acid pH 3.0/MeCN (65:35 v/v)
Flow Rate: 2.0 mL/min
Injection: 20 µL
Temperature: 25 °C
Detection: UV, 305 nm
Sample: Entacapone standard in MeOH solution exposed to direct UV radiation (254 nm)

Analytes

- Degradation Product
- Entacapone



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Epanolol

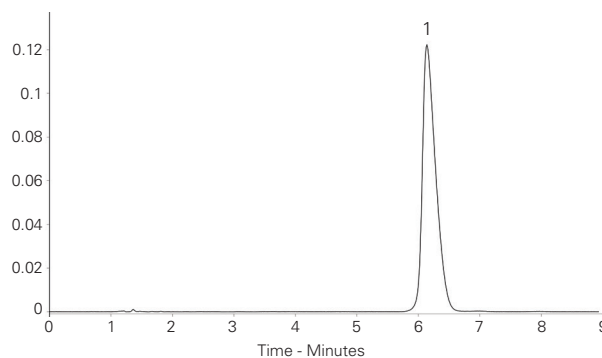
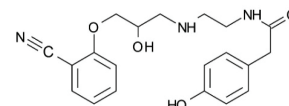
Application #AN3610

Conditions

Column: ACE 5 CN
Dimensions: 150 x 4.6 mm
Part Number: ACE-124-1546
Mobile Phase: 20 mM ammonium formate pH 3.0/MeOH (85:15 v/v)
Flow Rate: 1 mL/min
Injection: 20 µL
Temperature: Ambient
Detection: UV, 254 nm

Analyte

- Epanolol



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Epinastine

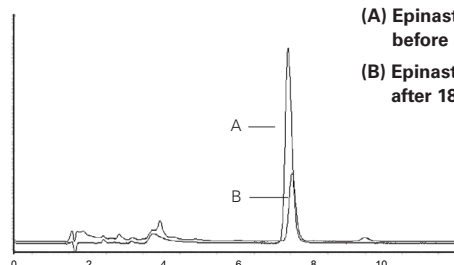
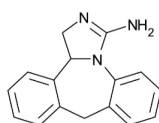
Application #AN3620

Conditions

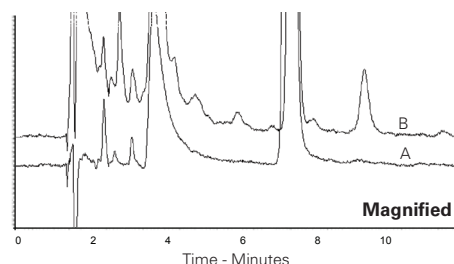
Column: ACE 5 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546
Mobile Phase: 0.3% TEA pH 4.0 with phosphoric acid/MeOH (60:40 v/v)
Flow Rate: 1 mL/min
Injection: 20 µL
Temperature: 25 °C
Detection: UV, 254 nm

Analyte

- Epinastine



(A) Epinastine Hydrochloride before UV radiation
 (B) Epinastine Hydrochloride after 18 hours UV radiation



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Ethanol Extract from Seed Cover (*Acacia Farnesiana*)

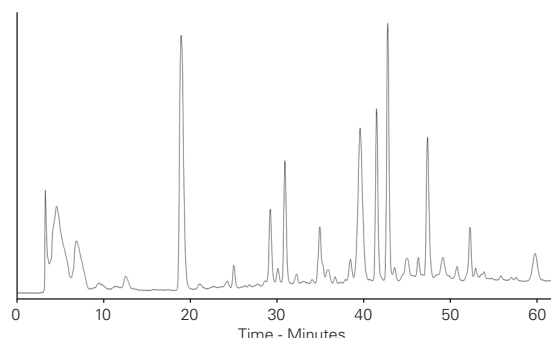
Application #AN2900

Conditions

Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: A: MeOH
 B: H₂O

| Gradient: | Time (mins) | %B |
|-----------|-------------|----|
| | 0.0 | 85 |
| | 2.5 | 85 |
| | 60.0 | 50 |
| | 62.5 | 50 |
| | 70.0 | 85 |

Flow Rate: 2.0 mL/min
Temperature: Ambient
Detection: UV, 230 nm



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Ethyl Glucuronide in Water by LC-MS/MS

Application #AN1100

Conditions

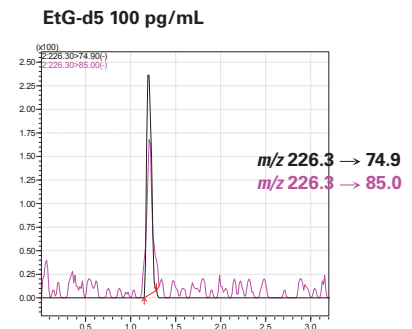
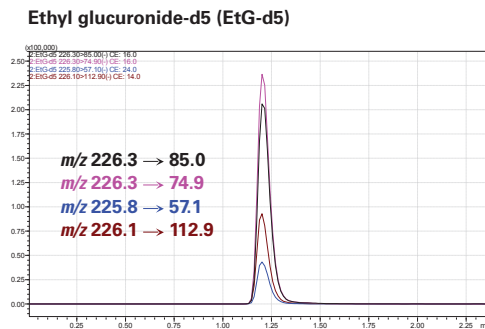
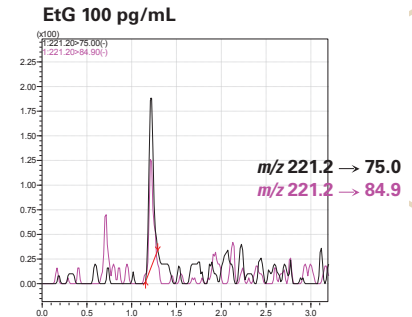
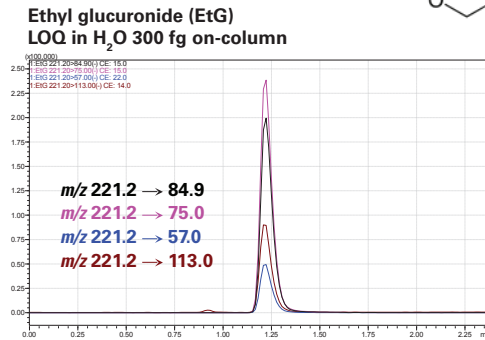
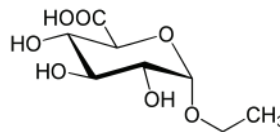
Column: ACE Excel 2 C18-PFP
Dimensions: 100 x 2.1 mm
Part Number: EXL-1010-1002U
Mobile Phase: A: 0.05% formic acid in H₂O
 B: MeOH
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.00 | 5 |
| 4.00 | 70 |
| 6.00 | 95 |
| 7.00 | 95 |
| 7.01 | 5 |

Flow Rate: 0.4 mL/min
Injection: 3 µL
Temperature: 40 °C
Detection: Shimadzu LCMS-8050
 ESI voltage: -3 kV
 Desolvation line: 250 °C
 Interface heater: 380 °C
 Nebulizing gas: 3 L/min
 Heat block: 400 °C

Analyte

1. Ethyl glucuronide



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Exploiting Selectivity by Adjusting pH

Application #AN2440

Conditions

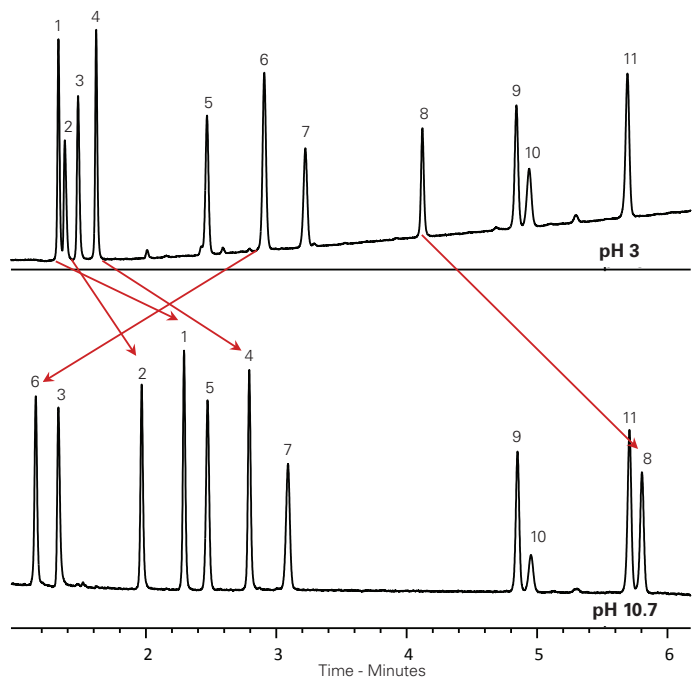
Column: ACE Excel 2 SuperC18
Dimensions: 50 x 2.1 mm
Part Number: EXL-1011-0502U
Mobile Phase: A1: 10 mM ammonium formate pH 3.0 in H₂O
 A2: 0.1% ammonia pH 10.7 in H₂O
 B1: 10 mM ammonium formate pH 3.0 in MeCN/H₂O (90:10 v/v)
 B2: 0.1% ammonia pH 10.7 in MeCN/H₂O (90:10 v/v)
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0.0 | 3 |
| 7.0 | 100 |
| 8.0 | 100 |
| 8.5 | 3 |
| 12.5 | 3 |

Flow Rate: 0.42 mL/min
Injection: 2 µL
Temperature: 40 °C
Detection: UV, 254 nm

Analytes

1. Nizatidine
2. Salbutamol
3. Amiloride
4. N-Acetylprocainamide
5. Quinoxaline
6. Methyl paraben
7. p-Cresol
8. Reserpine
9. Piperine
10. Toluene
11. Felodipine



Explosive Analytes (I)

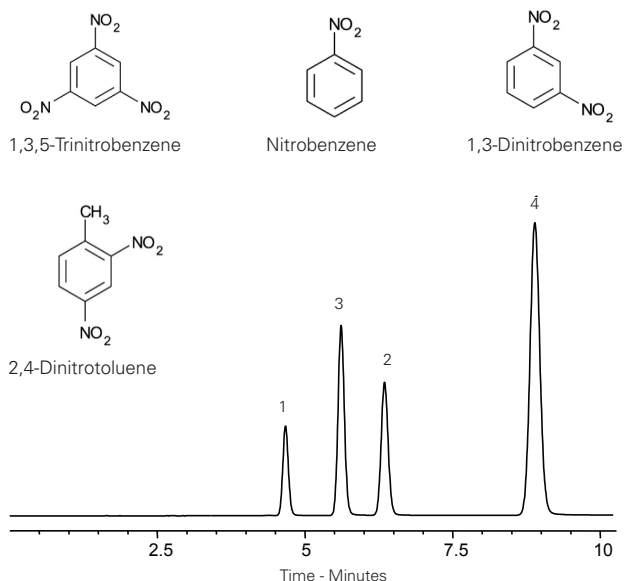
Application #AN1460

Conditions

Column: ACE 5 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546
Mobile Phase: MeOH/H₂O (50:50 v/v)
Flow Rate: 1 mL/min
Injection: 5 µL
Temperature: 20 °C
Detection: UV, 254 nm

Analytes

- 1,3,5-Trinitrobenzene
- Nitrobenzene
- 1,3-Dinitrobenzene
- 2,4-Dinitrotoluene



Explosive Analytes (II)

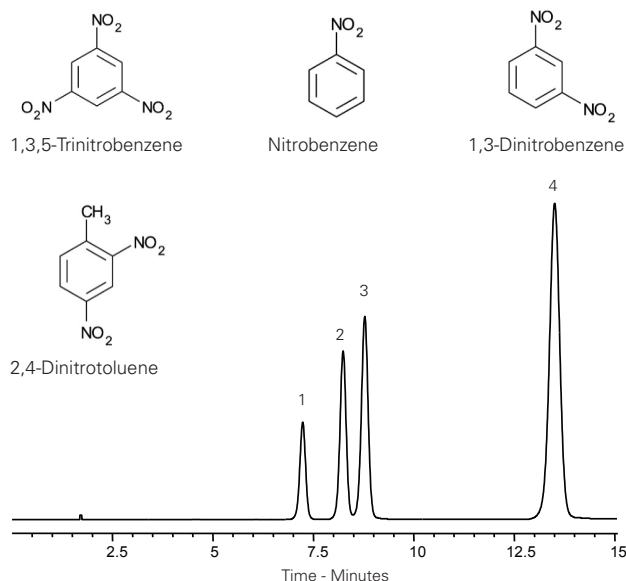
Application #AN1470

Conditions

Column: ACE 5 CN-ES
Dimensions: 150 x 4.6 mm
Part Number: EXL-1213-1546U
Mobile Phase: MeOH/H₂O (50:50 v/v)
Flow Rate: 1 mL/min
Injection: 5 µL
Temperature: 20 °C
Detection: UV, 254 nm

Analytes

- 1,3,5-Trinitrobenzene
- Nitrobenzene
- 1,3-Dinitrobenzene
- 2,4-Dinitrotoluene



Fingerprinting of *Cuscuta Chinensis* Flavonoids

Application #AN4250

Conditions

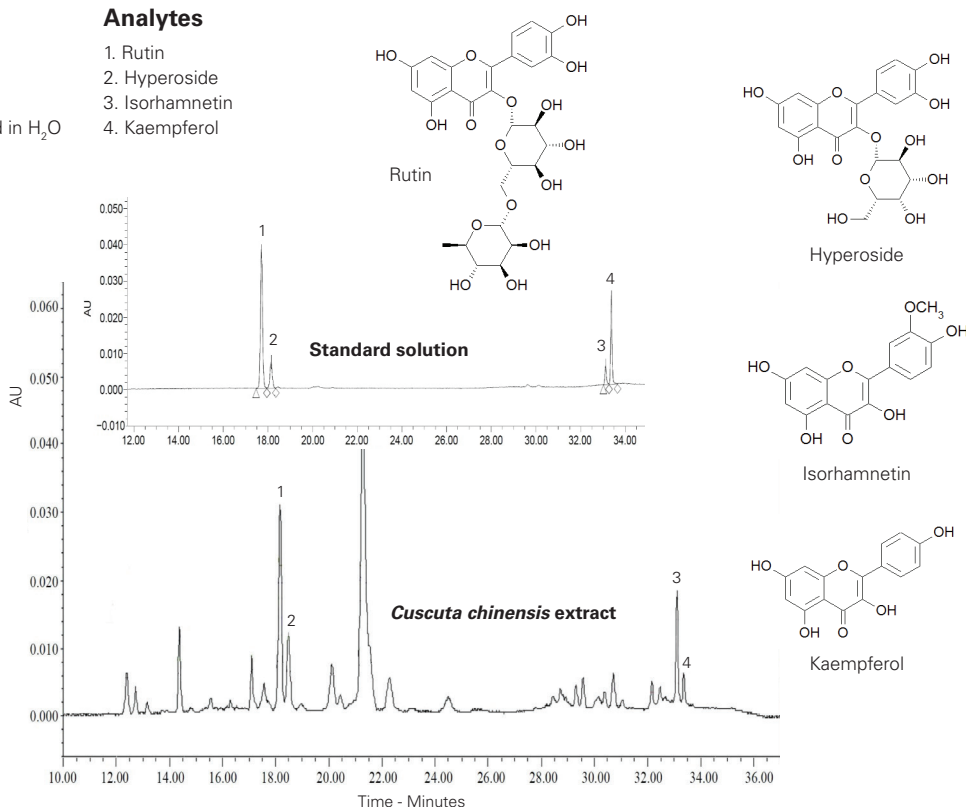
Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: A: 0.25% o-phosphoric acid in H₂O
 B: MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 5 |
| 2 | 5 |
| 7 | 10 |
| 10 | 15 |
| 23 | 20 |
| 28 | 30 |
| 32 | 50 |

Flow Rate: 1 mL/min
Injection: 10 µL
Detection: UV, 360 nm

Analytes

1. Rutin
2. Hyperoside
3. Isorhamnetin
4. Kaempferol



Cuscuta chinensis is used in traditional medicines in eastern and southern Asia

Shekarchi M, Kondori BM, Hajimehdipoor H, Abdi L, Naseri M, Pourfarzib M, Amin G. (2014) Finger Printing and Quantitative Analysis of *Cuscuta chinensis* Flavonoid Contents from Different Hosts by RP-HPLC. Food and Nutrition Sciences, 5, 914-921. <http://dx.doi.org/10.4236/fns.2014.510101>

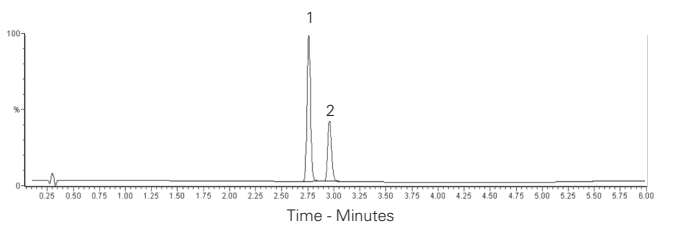
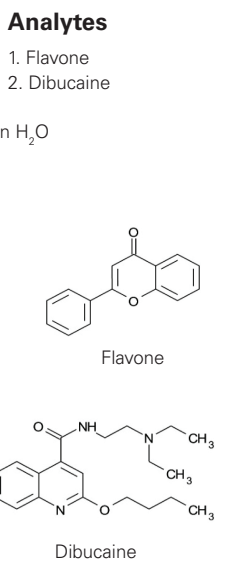


Flavone and Dibucaine
Application #AN2850

Conditions
Column: ACE 3 C18
Dimensions: 30 x 4.6 mm
Part Number: ACE-111-0346
Mobile Phase: A: 6.5 mM ammonium acetate in H₂O
 B: MeCN
 C: MeOH
Gradient:

| Time (mins) | %A | %B | %C |
|-------------|----|----|-----|
| 0.0 | 80 | 10 | 10 |
| 5.2 | 0 | 50 | 50 |
| 5.6 | 0 | 0 | 100 |

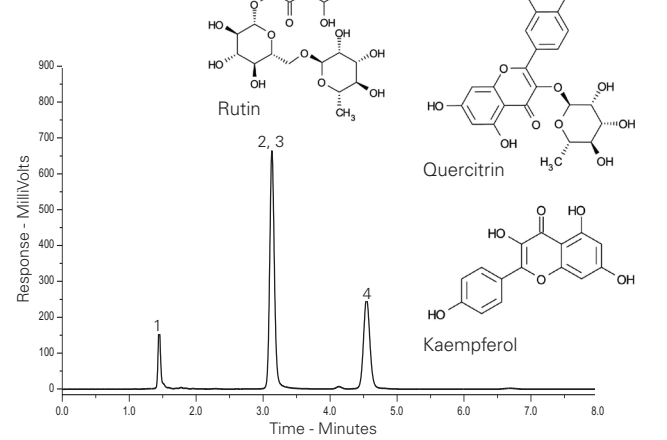
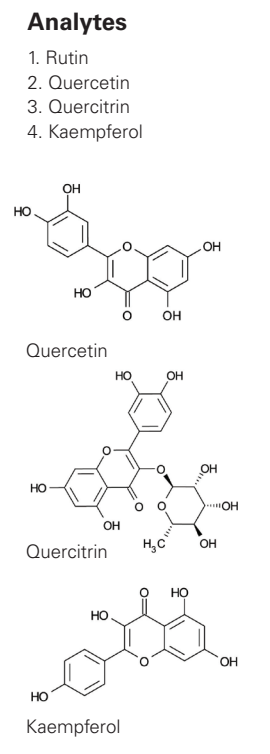
Flow Rate: 2 mL/min
Temperature: 60 °C
Detection: UV, 200-450 nm



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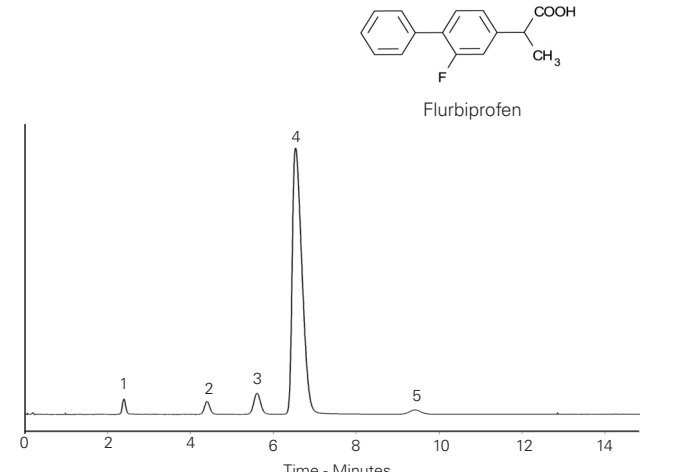
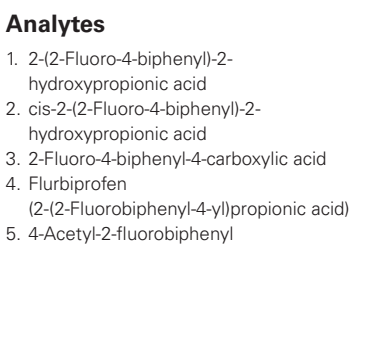
Flavonoids
Application #AN2810

Conditions
Column: ACE 5 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546
Mobile Phase: MeCN/0.1% formic acid in H₂O (40:60 v/v)
Flow Rate: 1 mL/min
Injection: 1 µL
Temperature: Ambient
Detection: UV, 254 nm



Flurbiprofen and Related Substances
Application #AN3630

Conditions
Column: ACE 3 C18
Dimensions: 50 x 4.6 mm
Part Number: ACE-111-0546
Mobile Phase: H₂O/MeCN/TFA (64:34:0.5 v/v/v)
Flow Rate: 2 mL/min
Injection: 20 µL
Temperature: 28 °C
Detection: UV, 254 nm



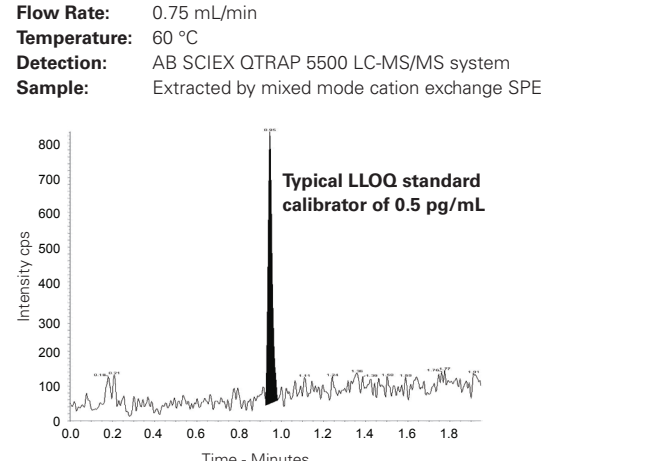
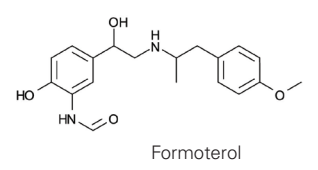
Reproduced with permission of School of Pharmacy, University of Sunderland, UK

Formoterol from Human Plasma by LC-MS/MS
Application #AN3100

Conditions
Column: ACE Excel 2 C18-AR
Dimensions: 50 x 2.1 mm
Part Number: EXL-109-0502U
Mobile Phase: A: 0.02% formic acid in H₂O
 B: 0.02% formic acid in H₂O/MeOH (2:98 v/v)
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0.00 | 10 |
| 0.20 | 10 |
| 2.00 | 40 |
| 2.01 | 100 |
| 3.50 | 100 |
| 3.51 | 10 |
| 4.00 | 10 |

Flow Rate: 0.75 mL/min
Temperature: 60 °C
Detection: AB SCIEX QTRAP 5500 LC-MS/MS system
Sample: Extracted by mixed mode cation exchange SPE



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Galanthamine

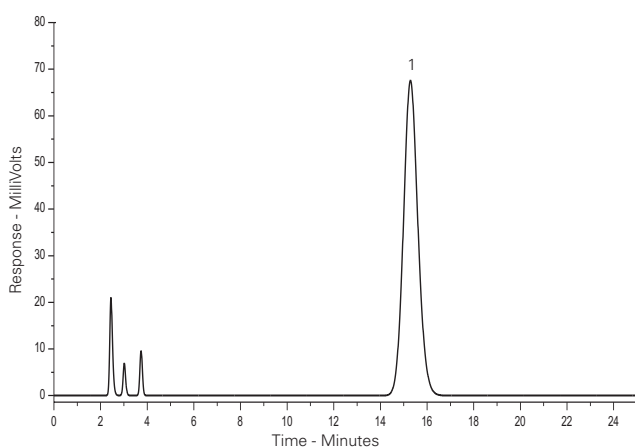
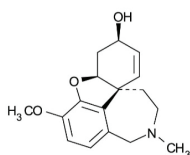
Application #AN3640

Conditions

Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: 0.1% TFA/MeCN (92:8 v/v)
Flow Rate: 1 mL/min
Injection: 10 µL
Temperature: 20 °C
Detection: UV, 210 nm

Analyte

1. Galanthamine



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Gamma Hydroxybutyric Acid (GHB) and Gamma Butyrolactone (GBL) Separation

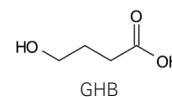
Application #AN1500

Conditions

Column: ACE Excel 2 C18-AR
Dimensions: 100 x 3.0 mm
Part Number: EXL-109-1003U
Mobile Phase: 20 mM KH₂PO₄ pH 2.5 in H₂O/MeCN (98:2 v/v)
Flow Rate: 0.43 mL/min
Injection: 2 µL
Temperature: 30 °C
Detection: UV, 215 nm

Analytes

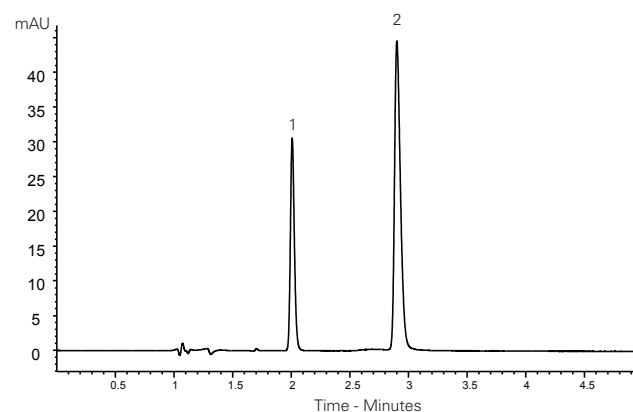
1. GHB
 2. GBL



GHB



GBL



Garlic Analysis (I)

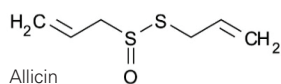
Application #AN2820

Conditions

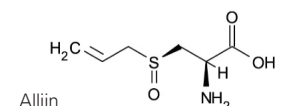
Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: H₂O/MeOH (50:50 v/v)
Flow Rate: 1 mL/min
Injection: 20 µL
Temperature: 30 °C
Detection: UV, 210 nm

Analytes

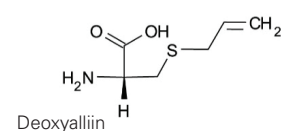
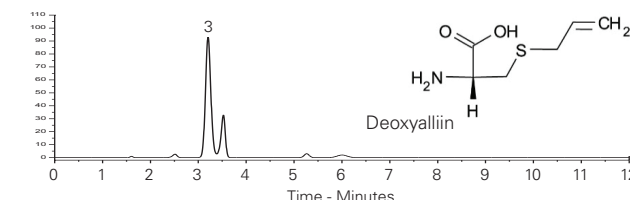
1. Allicin
 2. Alliin
 3. Deoxyalliin



Allicin



Alliin



Deoxyalliin

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Garlic Analysis (II)

Application #AN2830

Conditions

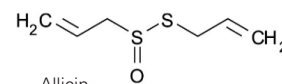
Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: A: H₂O
 B: MeCN
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0 | 40 |
| 20 | 100 |
| 25 | 100 |

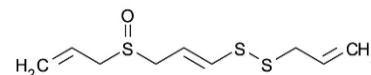
Flow Rate: 1 mL/min
Injection: 20 µL
Temperature: 30 °C
Detection: UV, 254 nm

Analytes

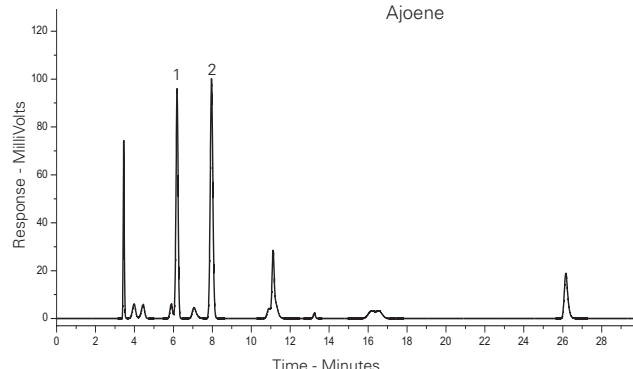
1. Allicin
 2. Ajoene



Allicin



Ajoene



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Ginkgo Biloba – Ultra Resolution

Application #AN2270

Conditions

Column: ACE Excel 1.7 C18-PFP
Dimensions: 2 x 100 x 3.0 mm (coupled)
Part Number: 2 x EXL-1710-1003U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

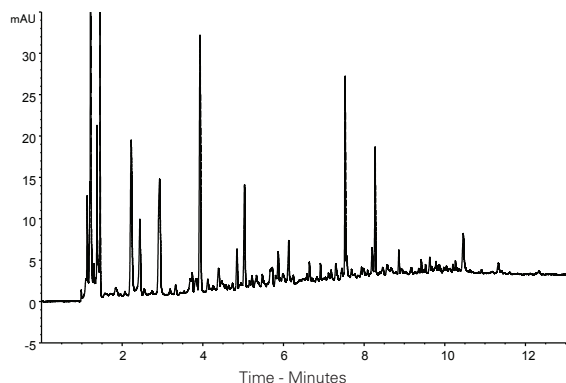
| Time (mins) | %B |
|-------------|-----|
| 0.00 | 5 |
| 0.72 | 5 |
| 15.72 | 50 |
| 18.72 | 100 |
| 20.72 | 100 |
| 22.72 | 5 |

Flow Rate: 0.8 mL/min
Injection: 2 µL
Temperature: 80 °C
Detection: UV, 254 nm
Sample: Extract of *Ginkgo Biloba*

Need a custom column for your application?

Please enquire

email: info@ace-hplc.com



Ginkgo Biloba - Used in traditional medicine and as a source of food

Ginsenosides from Chinese Medicine by UHPLC-MS/MS

Application #AN3540

Conditions

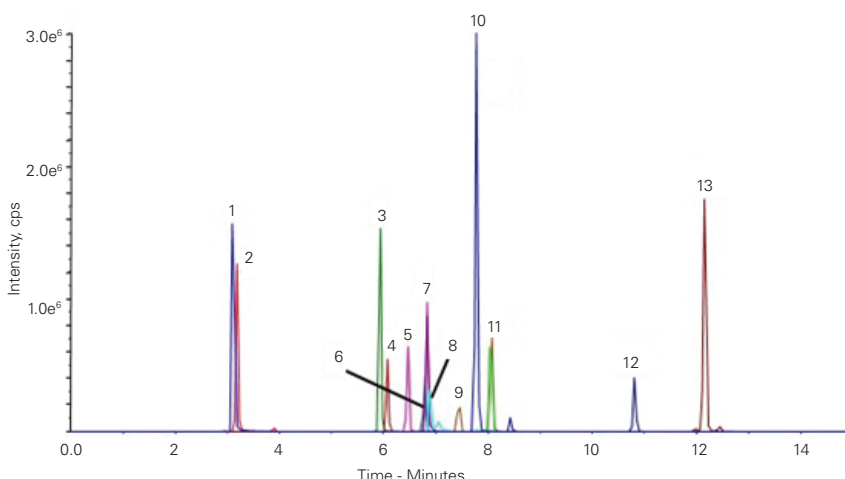
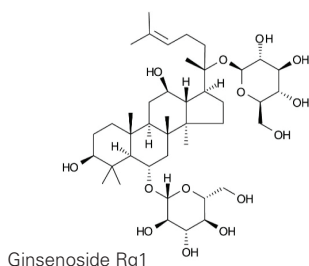
Column: ACE UltraCore 2.5 SuperC18
Dimensions: 150 x 3.0 mm
Part Number: CORE-25A-1503U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 25 |
| 13 | 60 |
| 15 | 95 |
| 17 | 95 |

Flow Rate: 0.4 mL/min
Injection: 2 µL
Temperature: 45 °C
Detection: AB SCIEX 5500 Qtrap MS
 ESI in negative ion mode
 Source temperature: 450 °C
 Sprayer voltage: -4500 V
 Stepwise MRM mode for [M + HCOO]⁻ > [M - H]⁻ ion transitions
 Mass range 501 – 1250 u (step size 2 u)

Analytes

- | | | |
|---|---|--|
| 1. Ginsenoside Re (<i>m/z</i> 991 → 945) | 6. Ginsenoside Ro (<i>m/z</i> 1001 → 955) | 11. Ginsenoside F1 (<i>m/z</i> 683 → 637) |
| 2. Ginsenoside Rg1 (<i>m/z</i> 845 → 799) | 7. Ginsenoside Rb2 (<i>m/z</i> 1123 → 1077) | 12. Ginsenoside F2 (<i>m/z</i> 829 → 783) |
| 3. Ginsenoside Rf (<i>m/z</i> 845 → 799) | 8. Ginsenoside Rg2 (<i>m/z</i> 829 → 783) | 13. Ginsenoside Rg3 (<i>m/z</i> 829 → 783) |
| 4. Ginsenoside Rb1 (<i>m/z</i> 1153 → 1107) | 9. Ginsenoside Rh1 (<i>m/z</i> 683 → 637) | |
| 5. Ginsenoside Rc (<i>m/z</i> 1123 → 1077) | 10. Ginsenoside Rd (<i>m/z</i> 991 → 945) | |



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Ginseng Extract

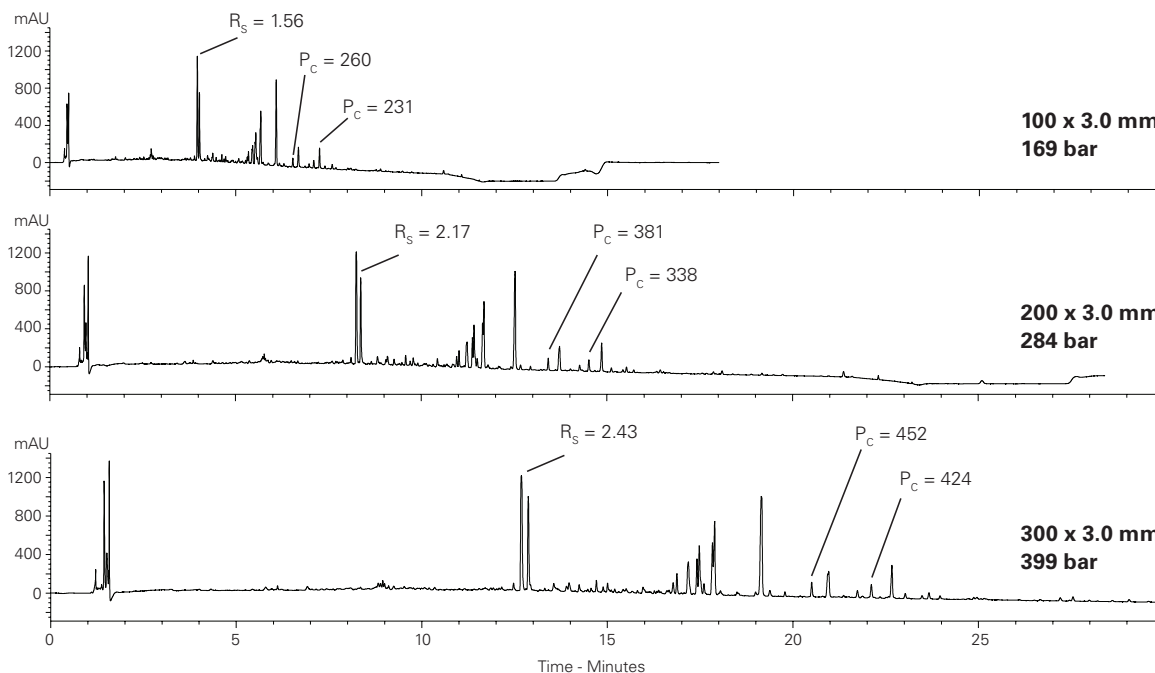
Application #AN4260

Conditions

Column: ACE UltraCore 2.5 SuperC18
Dimensions: 100 x 3.0 mm; 2 x 100 x 3.0 mm (coupled); 3 x 100 x 3.0 mm (coupled)
Part Number: CORE-25A-1003U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| Time (mins) | Time (mins) | | | %B |
|-------------|--------------|--------------|--------------|----|
| | 100 x 3.0 mm | 200 x 3.0 mm | 300 x 3.0 mm | |
| - | 0.00 | 0.00 | 0.00 | 5 |
| 0.00 | 0.36 | 0.71 | 0.71 | 5 |
| 10.00 | 20.36 | 30.71 | 30.71 | 70 |
| 11.00 | 22.36 | 33.71 | 33.71 | 95 |
| 13.00 | 26.36 | 39.71 | 39.71 | 95 |
| 14.00 | 28.36 | 42.71 | 42.71 | 5 |
| 22.00 | 44.36 | 66.71 | 66.71 | 5 |

Flow Rate: 0.8 mL/min
Injection: 2 µL (100 x 3.0 mm); 4 µL (200 x 3.0 mm); 6 µL (300 x 3.0 mm)
Temperature: 80 °C
Detection: UV, 203 nm
Sample: 5 x 75 mg tablets ground to fine powder and extracted with 10.0 mL MeCN/H₂O (1:1 v/v) for 15 minutes with ultrasonication. 100 µL supernatant diluted with 300 µL water and filtered using a Whatman Mini-Uniprep syringeless filter
System: Chromaster Ultra Rs





Gliotoxin from *Aspergillus Fumigatus* Liquid Culture

Application #AN3780

Conditions

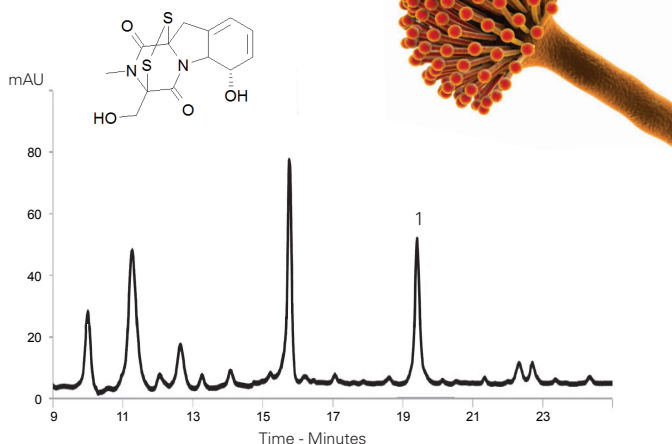
Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: A: 0.05% TFA in H₂O/MeCN (90:10 v/v)
 B: 0.05% TFA in H₂O/MeCN (40:60 v/v)
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0 | 10 |
| 21 | 100 |

Flow Rate: 1 mL/min
Detection: UV, 254 nm

Analyte

1. Gliotoxin



Svahn KS, Goransson U, Chryssanthou E, Olsen B, Sjolín J, Stromstedt A. Induction of Gliotoxin Secretion in *Aspergillus fumigatus* by Bacteria-Associated Molecules. PLoS ONE 9(4): e93685. doi:10.1371/journal.pone.0093685

Glyphosate and Related Compounds as FMOG Derivatives (Gradient)

Application #AN3850

Conditions

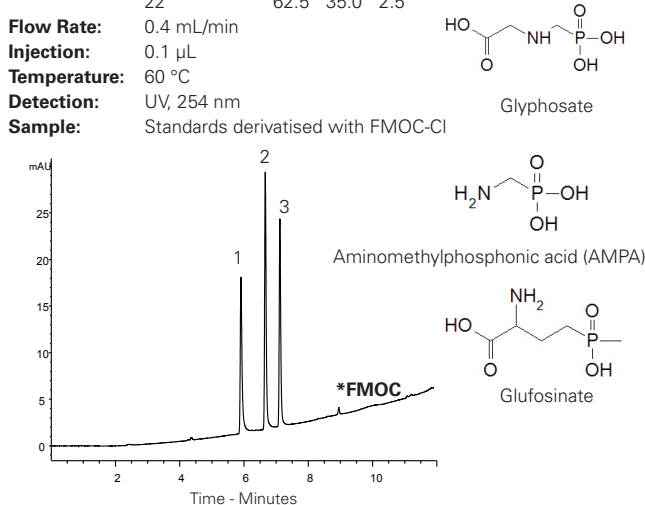
Column: ACE Excel 3 SuperC18
Dimensions: 150 x 2.1 mm
Part Number: EXL-1111-1502U
Mobile Phase: A: H₂O
 B: MeOH
 C: 200 mM ammonium formate pH 3.0
Gradient:

| Time (mins) | %A | %B | %C |
|-------------|------|------|-----|
| 0 | 62.5 | 35.0 | 2.5 |
| 10 | 2.5 | 95.0 | 2.5 |
| 11 | 2.5 | 95.0 | 2.5 |
| 12 | 62.5 | 35.0 | 2.5 |
| 22 | 62.5 | 35.0 | 2.5 |

Flow Rate: 0.4 mL/min
Injection: 0.1 µL
Temperature: 60 °C
Detection: UV, 254 nm
Sample: Standards derivatised with FMOG-Cl

Analytes

1. Glyphosate
2. Aminomethylphosphonic acid (AMPA)
3. Glufosinate



Glyphosate and Related Compounds as FMOG Derivatives (Isocratic)

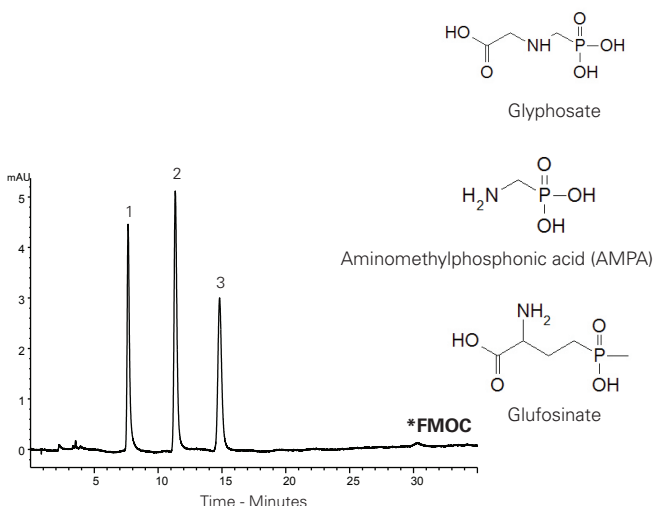
Application #AN3860

Conditions

Column: ACE Excel 3 SuperC18
Dimensions: 150 x 2.1 mm
Part Number: EXL-1111-1502U
Mobile Phase: 5 mM ammonium formate pH 3.0 in H₂O/MeOH (55:45 v/v)
Flow Rate: 0.4 mL/min
Injection: 0.1 µL
Temperature: 25 °C
Detection: UV, 254 nm
Sample: Standards derivatised with FMOG-Cl

Analytes

1. Glyphosate
2. Aminomethylphosphonic acid (AMPA)
3. Glufosinate



Green Tea Extract

Application #AN4280

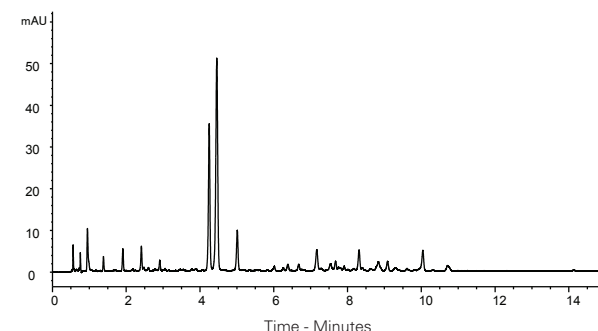
Conditions

Column: ACE Excel 1.7 SuperC18
Dimensions: 100 x 3.0 mm
Part Number: EXL-1711-1003U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 5 |
| 15 | 20 |
| 17 | 95 |
| 18 | 95 |
| 20 | 5 |
| 27 | 5 |

Flow Rate: 0.8 mL/min
Injection: 2 µL
Temperature: 80 °C
Detection: UV, 260 nm
Sample: Tablet ground to fine powder and extracted with MeCN/H₂O (1:1 v/v) with ultrasonication. Supernatant diluted with H₂O and filtered using Whatman Mini-Uniprep syringeless filter Chromaster Ultra Rs

System:



Green Tea Metabolite Profiling by LC-MS

Application #AN2580

Conditions

Column: ACE Excel 1.7 C18-Amide**Dimensions:** 100 x 2.1 mm**Part Number:** EXL-1712-1002U**Mobile Phase:** A: 0.01% formic acid in H₂O

B: 0.01% formic acid in MeCN

Gradient: **Time (mins)** **%B**

0.0 3

2.5 10

8.0 100

8.5 3

10.0 3

Flow Rate: 0.5 mL/min**Detection:** Exactive accurate mass MS system

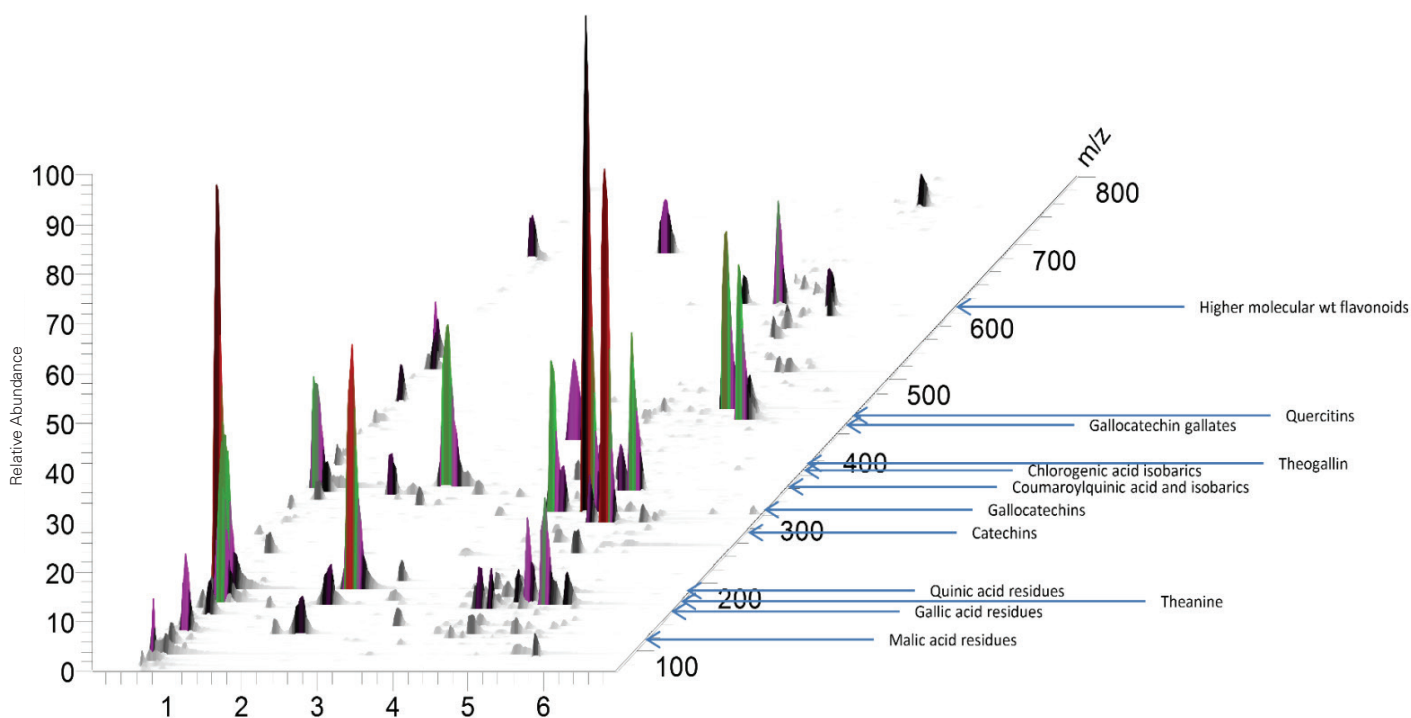
ESI in negative ion mode

Analytes between *m/z* 70-800 monitored**Sample:** Metabolites from green tea extracted into

cold water by vortexing for 20 mins.

Samples filtered prior to injection onto

column and modular Accela LC system



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Hair Dye Restricted Components (I)

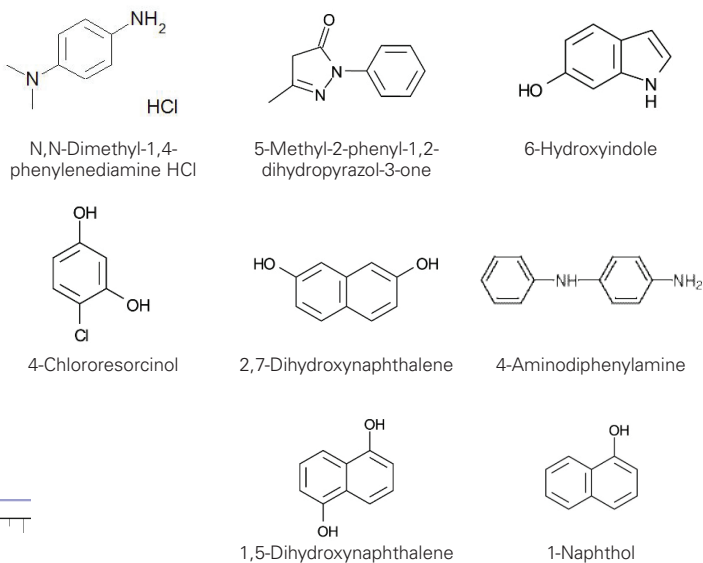
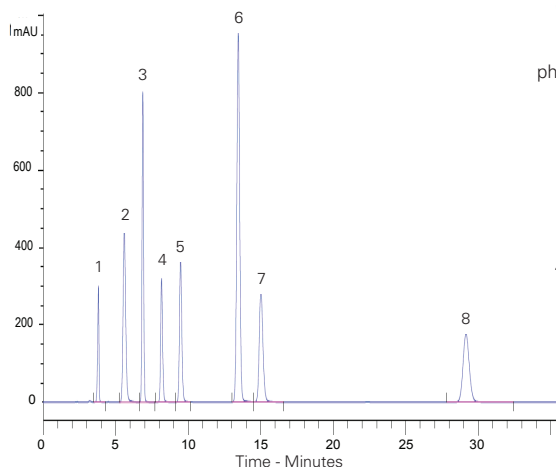
Application #AN2100

Conditions

Column: ACE Excel 5 C18-Amide
Dimensions: 250 x 4.6 mm
Part Number: EXL-1212-2546U
Mobile Phase: 1.8 g disodium phosphate dodecahydrate + 2.8 g potassium dihydrogen phosphate + 1.0 g sodium 1-heptanesulfonate (all diluted to 1.0 L with water)/ MeCN (60:40 v/v)
Flow Rate: 1 mL/min
Temperature: 60 °C
Detection: UV, 280 nm

Analytes

1. N,N-Dimethyl-1,4-phenylenediamine HCl
2. 5-Methyl-2-phenyl-1,2-dihydropyrazole-3-one
3. 6-Hydroxyindole
4. 4-Chlororesorcinol
5. 2,7-Dihydroxynaphthalene
6. 4-Aminodiphenylamine
7. 1,5-Dihydroxynaphthalene
8. 1-Naphthol



Hair Dye Restricted Components (II)

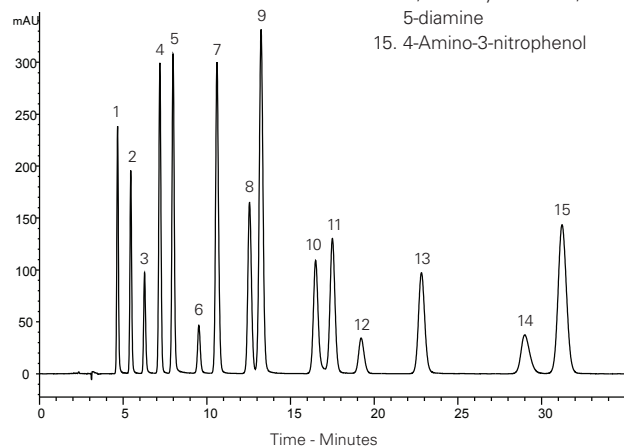
Application #AN2110

Conditions

Column: ACE Excel 5 C18-Amide
Dimensions: 250 x 4.6 mm
Part Number: EXL-1212-2546U
Mobile Phase: 1.8 g disodium phosphate dodecahydrate + 2.8 g potassium dihydrogen phosphate + 1.0 g sodium 1-heptanesulfonate (all diluted to 1.0 L with water)/MeCN (60:40 v/v)
Flow Rate: 1 mL/min
Temperature: 25 °C
Detection: UV, 280 nm

Analytes

1. p-Phenylenediamine
2. p-Aminophenol
3. Toluene-2,5-diamine
4. m-Aminophenol
5. o-Phenylenediamine
6. 2-Chloro-p-phenylenediamine
7. o-Aminophenol
8. Resorcinol
9. 2-Nitro-p-phenylenediamine
10. Toluene-3,4-diamine
11. 4-Amino-2-hydroxytoluene
12. 2-Methylresorcinol
13. 6-Amino-m-cresol
14. N,N-Diethyltoluene-2,5-diamine
15. 4-Amino-3-nitrophenol



Halogenated Positional Isomer Separations

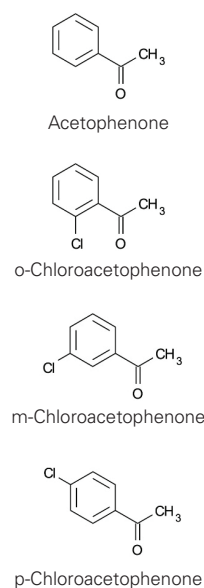
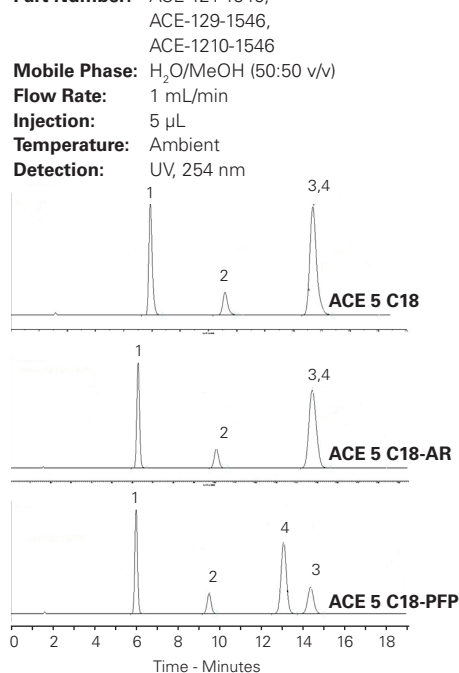
Application #AN1510

Conditions

Column: ACE 5 C18
 ACE 5 C18-AR
 ACE 5 C18-PFP
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546, ACE-129-1546, ACE-1210-1546
Mobile Phase: H₂O/MeOH (50:50 v/v)
Flow Rate: 1 mL/min
Injection: 5 µL
Temperature: Ambient
Detection: UV, 254 nm

Analytes

1. Acetophenone
2. o-Chloroacetophenone
3. m-Chloroacetophenone
4. p-Chloroacetophenone



Hepcidin-25 and Truncated Isoforms by LC-HRMS

Application #AN3090

Conditions

Column: ACE 3 C18
Dimensions: 100 x 2.1 mm
Part Number: ACE-111-1002
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0 | 15 |
| 5 | 100 |
| 6 | 100 |

Flow Rate: 0.25 mL/min**Injection:** 100 µL**Temperature:** 60 °C**Detection:** ThermoFisher Scientific Q-Exactive™ high resolution MS

Heated electrospray ionisation (positive mode)

Spray voltage: 4.5 kV

Vaporiser temperature: 200 °C

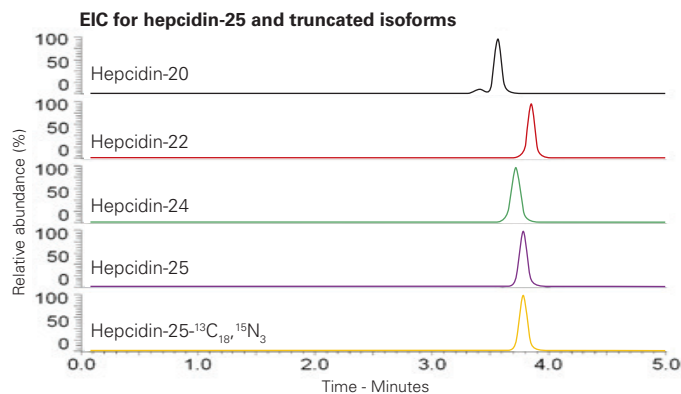
Capillary temperature: 320 °C

Detection: Full scan m/z 400 – 1000

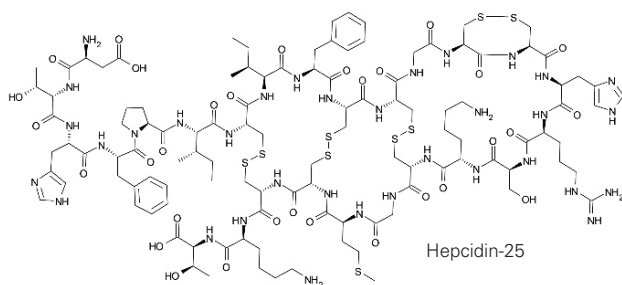
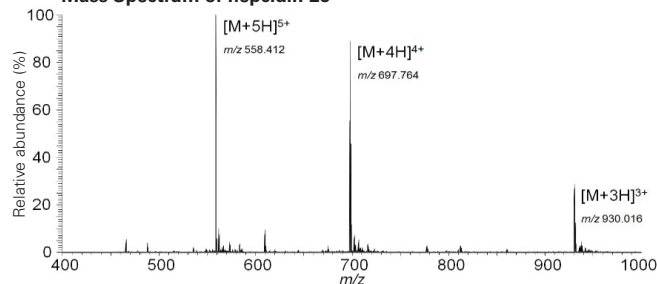
Extracted ion chromatogram from sum of 6 most abundant isotopes of +3, +4 and +5 charge states

Analyte

1. Hepcidin-25
 (MW 2789)



Mass Spectrum of hepcidin-25



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Herbicide – Benfluralin

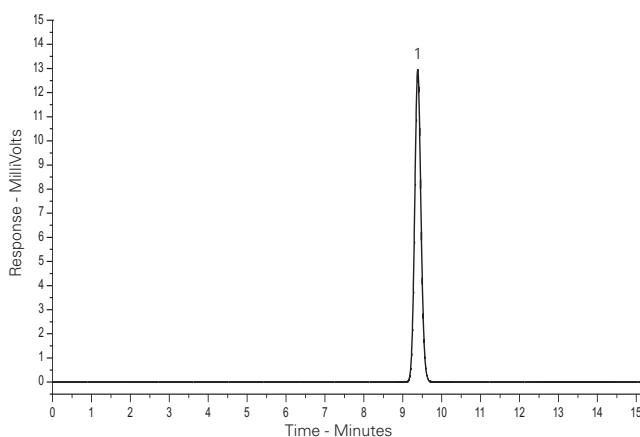
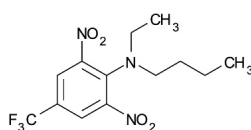
Application #AN2880

Conditions

Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: H₂O/MeOH (15:85 v/v)
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV, 254 nm

Analyte

1. Benfluralin



Herbicide – Trifluralin

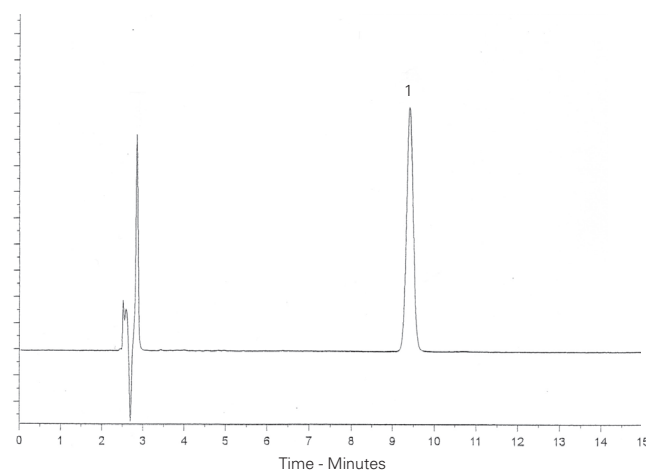
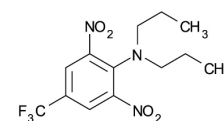
Application #AN2890

Conditions

Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: H₂O/MeOH (15:85 v/v)
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV, 254 nm

Analyte

1. Trifluralin





Herbicide Impurity Profile

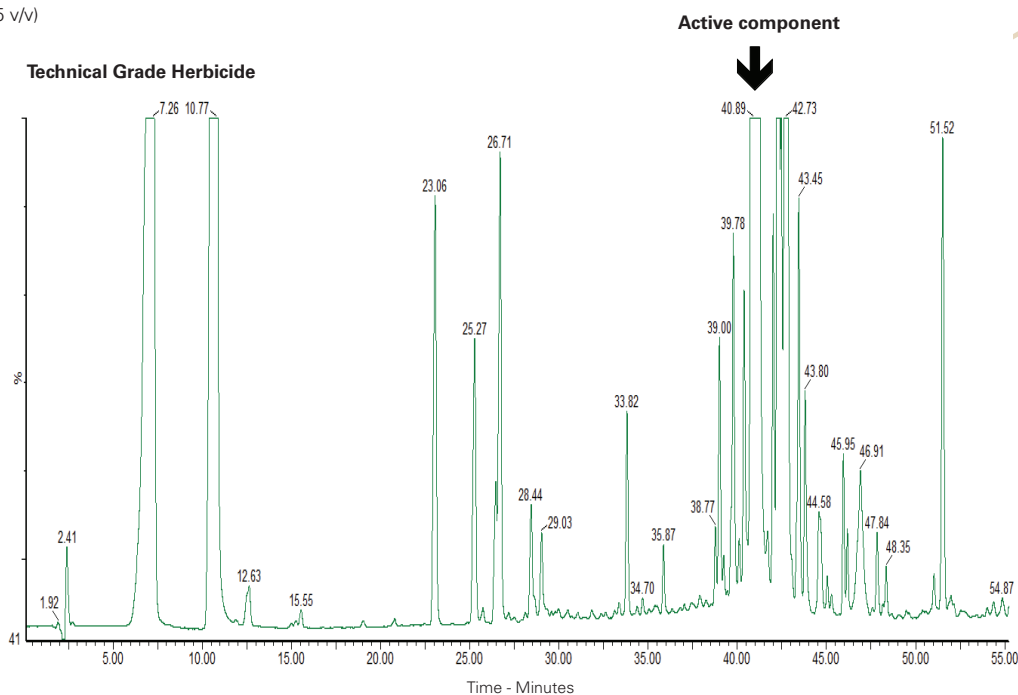
Application #AN2130

Conditions

Column: ACE UltraCore 2.5 SuperC18
Dimensions: 150 x 4.6 mm
Part Number: CORE-25A-1546U
Mobile Phase: A: MeCN/H₂O/TFA (5:95:0.05 v/v/v)
 B: MeCN/TFA (99.9:0.05 v/v)
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0 | 10 |
| 3 | 10 |
| 35 | 100 |
| 55 | 100 |
| 56 | 10 |
| 60 | 10 |

Flow Rate: 0.6 mL/min
Injection: 10 µL
Temperature: 25 °C
Detection: UV, 240 nm



Hippuric Acid

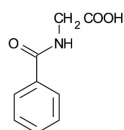
Application #AN2760

Conditions

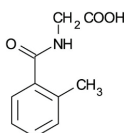
Column: ACE 5 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546
Mobile Phase: 10 mM KH₂PO₄ pH 3.5 in
 H₂O/MeCN (15:85 v/v)
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV, 254 nm

Analytes

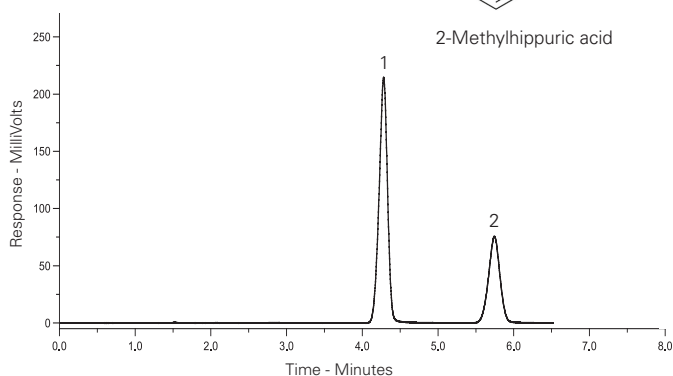
- Hippuric acid
- 2-Methylhippuric acid



Hippuric acid



2-Methylhippuric acid



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 our chromatography training,
 technical advice, applications support,
 batch reservation service and custom
 packing facility

email: info@ace-hplc.com

Human Urine Metabolite Profiling by LC-MS

Application #AN2600

Conditions

Column: ACE Excel 1.7 C18-Amide**Dimensions:** 100 x 2.1 mm**Part Number:** EXL-1712-1002U**Mobile Phase:** A: 0.01% formic acid in H₂O

B: 0.01% formic acid in MeCN

Gradient: **Time (mins)** **%B**

0.0 3

2.5 10

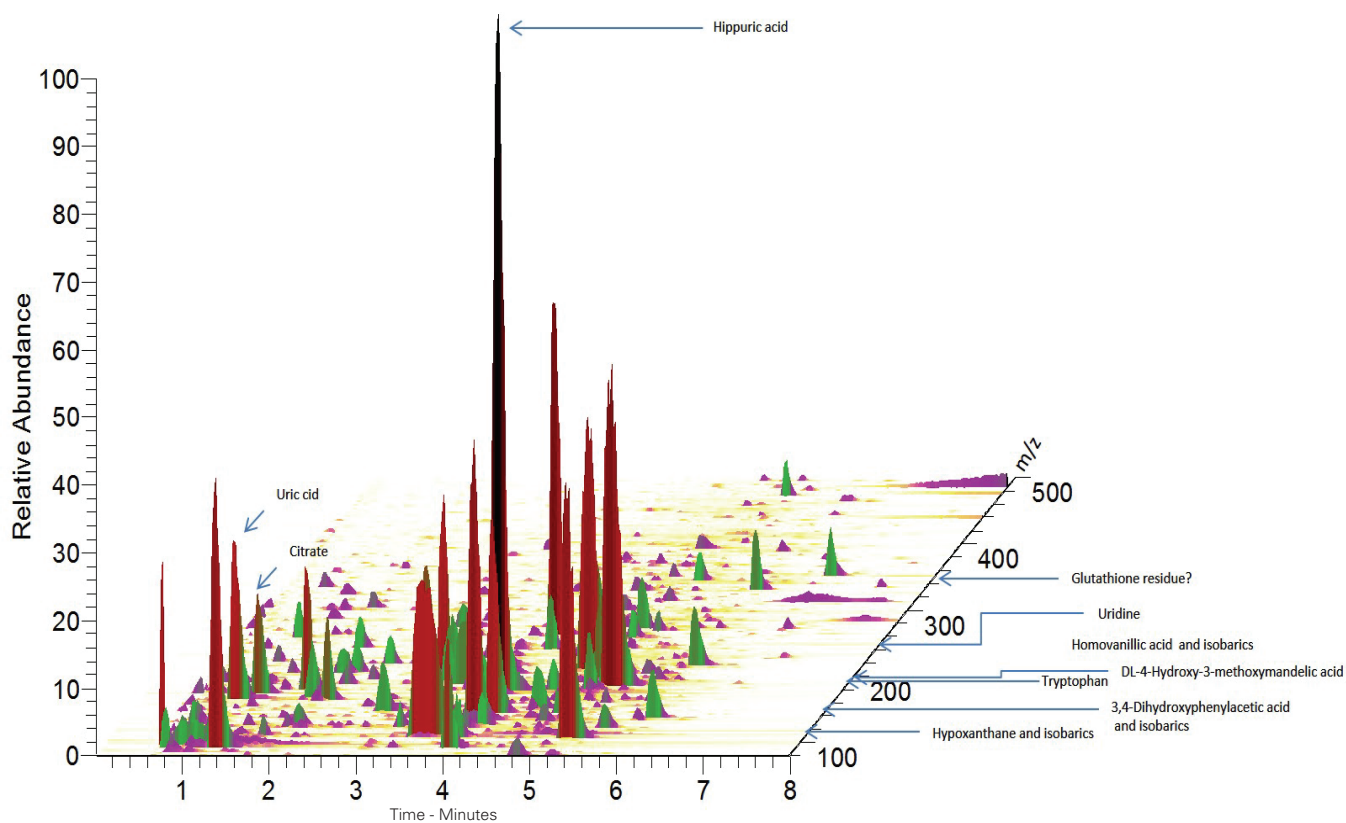
8.0 100

8.5 3

10.0 3

Flow Rate: 0.5 mL/min**Detection:** Exactive accurate mass MS system

ESI in negative ion mode

Analytes between *m/z* 70-800 monitored**Sample:** Urine of healthy adult volunteer, filtered prior to injection onto column and modular Accela LC system.

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Human Urine Metabolite Profiling by LC-MS



Hydroxychloroquine in Whole (EDTA) Blood by LC-MS/MS

Application #AN1120

Conditions

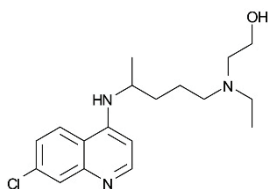
Column: ACE Excel 2 SuperC18
Dimensions: 50 x 2.1 mm
Part Number: EXL-1011-0502U
Mobile Phase: A: 0.5% Ammonium hydroxide pH 10 in H₂O
 B: 0.5% Ammonium hydroxide in MeCN
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0.00 | 30 |
| 1.50 | 100 |
| 2.50 | 100 |
| 2.51 | 30 |

Flow Rate: 0.4 mL/min
Injection: 5 µL
Temperature: 40 °C
Detection: MS/MS detection with Waters TQD
 ESI +ve ion mode

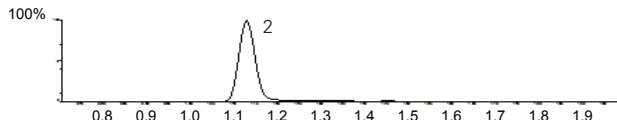
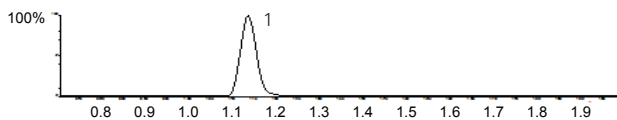
Analytes

1. Hydroxychloroquine
(*m/z* 336 → 247)
2. d4-Hydroxychloroquine (IS)
(*m/z* 340 → 251)
3. Desethylhydroxychloroquine
(*m/z* 308 → 247)

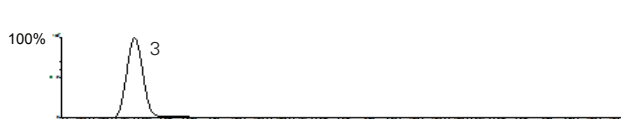
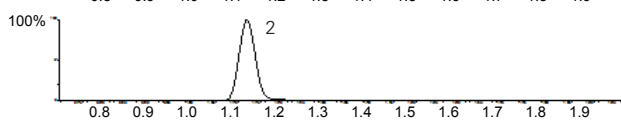
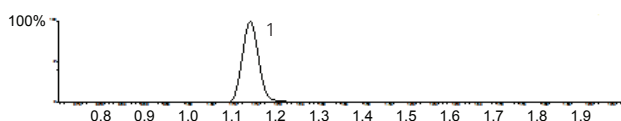


Hydroxychloroquine

Typical chromatogram for lowest calibrator (0.09 mg/L hydroxychloroquine)



Typical chromatogram for whole (EDTA) blood samples from patient with systemic lupus



Time - Minutes

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Combined Hypertension Therapy Drugs

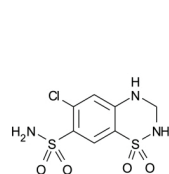
Application #AN4210

Conditions

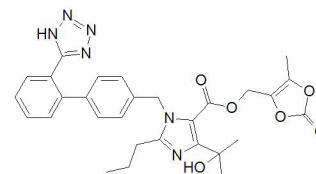
Column: ACE 5 CN
Dimensions: 200 x 4.6 mm
Part Number: ACE-124-2046
Mobile Phase: 10 mM phosphoric acid in H₂O,
 pH 2.5/MeCN/MeOH (80:7:13 v/v/v)
Flow Rate: 1 mL/min
Injection: 20 µL
Temperature: 30 °C
Detection: UV, 235 nm
Sample: 1 µg/mL each analyte

Analytes

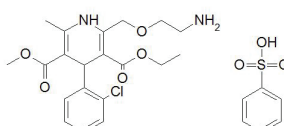
1. Hydrochlorothiazide
2. Olmesartan medoxomil
3. Amlodipine besylate
4. Valsartan



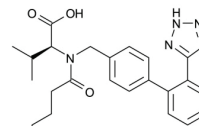
Hydrochlorothiazide



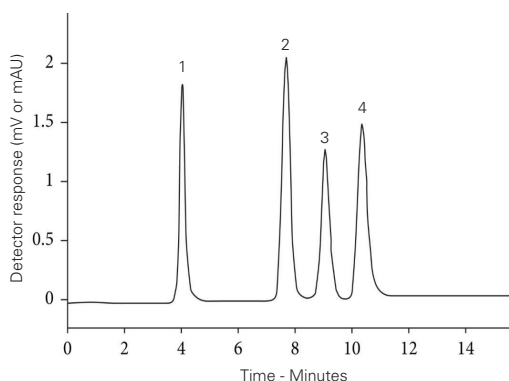
Olmesartan medoxomil



Amlodipine besylate



Valsartan



Tekkeli SEK. Development of an HPLC-UV Method for the Analysis of Drugs used for Combined Hypertension Therapy in Pharmaceutical Preparations and Human Plasma. Journal of Analytical Methods in Chemistry (2013) <http://dx.doi.org/10.1155/2013/179627>

Ibuprofen and Related Impurities

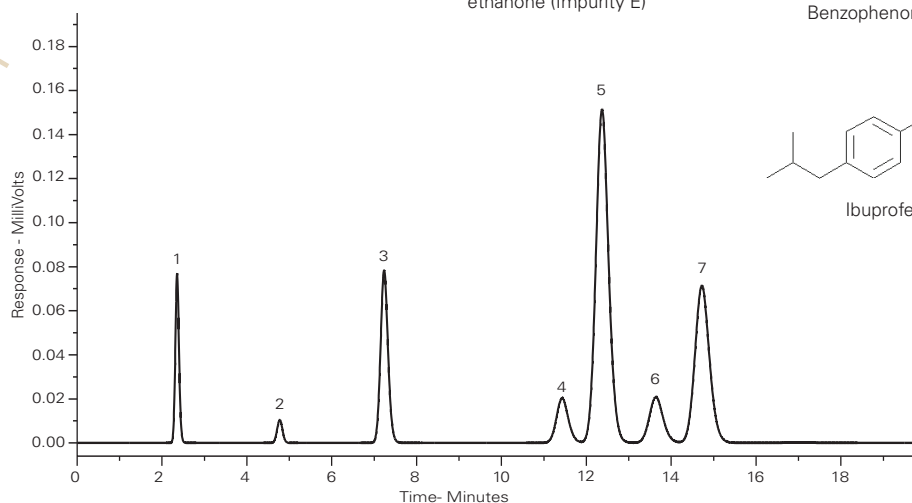
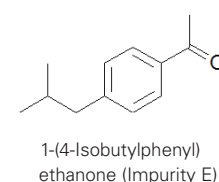
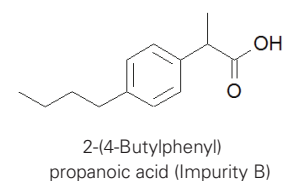
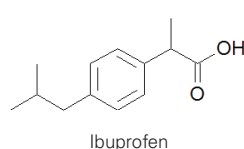
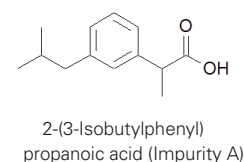
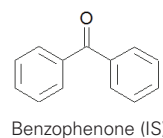
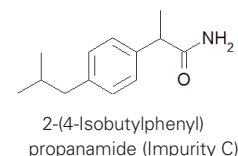
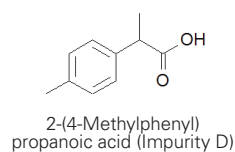
Application #AN4000

Conditions

Column: ACE 5 C18
Dimensions: 150 x 3.0 mm
Part Number: ACE-121-1503
Mobile Phase: 0.1% TFA in H₂O/MeCN (64:36 v/v)
Flow Rate: 1.5 mL/min
Temperature: 40 °C
Detection: UV, 214 nm

Analytes

- 2-(4-Methylphenyl) propanoic acid (Impurity D)
- 2-(4-Isobutylphenyl) propanamide (Impurity C)
- Benzophenone (IS)
- 2-(3-Isobutylphenyl) propanoic acid (Impurity A)
- Ibuprofen
- 2-(4-Butylphenyl) propanoic acid (Impurity B)
- 1-(4-Isobutylphenyl) ethanone (Impurity E)



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Ibuprofen in Combination with Antihistamine and Decongestant

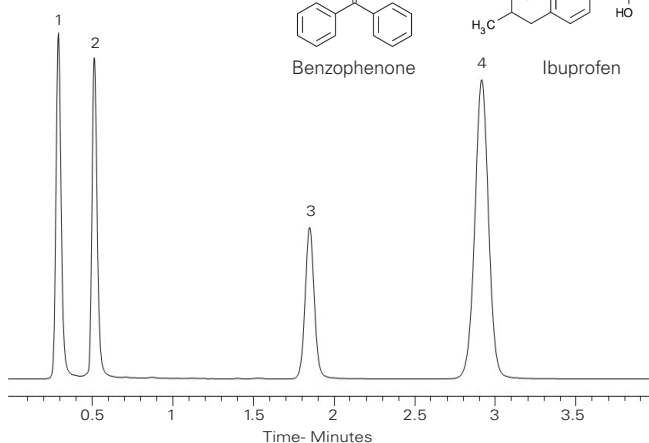
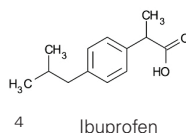
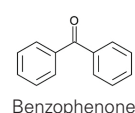
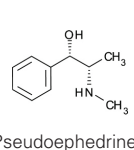
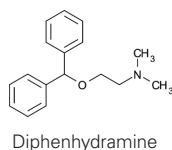
Application #AN2120

Conditions

Column: ACE Excel 3 C18-Amide
Dimensions: 150 x 4.6 mm
Part Number: EXL-1112-1546U
Mobile Phase: 0.01% potassium dihydrogen phosphate/MeCN (60:40 v/v)
Flow Rate: 0.6 mL/min
Injection: 0.5 µL
Temperature: 45 °C
Detection: UV, 214 nm

Analytes

- Diphenhydramine
- Pseudoephedrine
- Benzophenone
- Ibuprofen



Alternative column dimensions available

Please enquire
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Illegal Dyes in Spices

Application #AN2910

Conditions

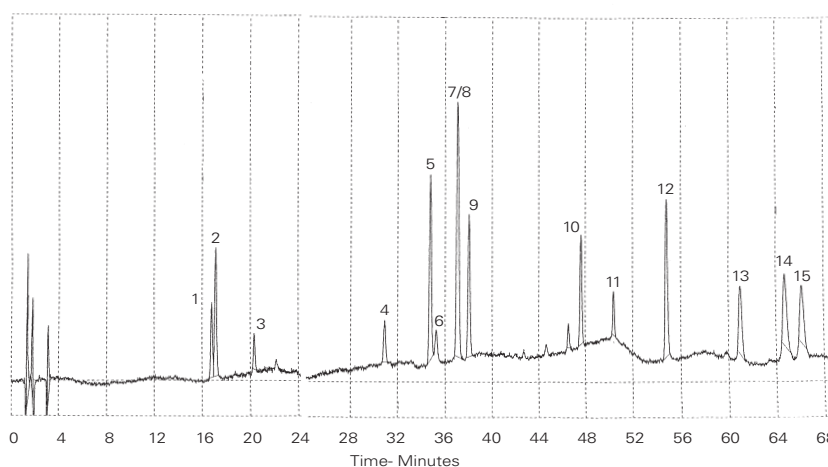
Column: ACE 3 C18
Dimensions: 100 x 4.6 mm
Part Number: ACE-111-1046
Mobile Phase: A: H₂O
 B: MeOH
 C: 0.06 M Tetrabutylammonium bromide and 0.5 M KH₂PO₄ in H₂O pH 2.55
Gradient:

| Time (mins) | %A | %B | %C | Curve |
|-------------|----|----|----|-------|
| 0 | 45 | 50 | 5 | |
| 45 | 3 | 92 | 5 | 6 |
| 65 | 3 | 92 | 5 | 11 |
| 66 | 45 | 50 | 5 | 1 |
| 75 | 45 | 50 | 5 | 1 |

Flow Rate: 1 mL/min
Injection: 10 µL
Temperature: Ambient
Detection: UV-Vis, 420 nm, 520 nm and 600 nm

Analytes

- | | | |
|-------------------|-------------------|------------------|
| 1. Rhodamine B | 6. Sudan Orange G | 11. Sudan Black |
| 2. Orange II | 7. Toluidine Red | 12. Sudan III |
| 3. Metanil Yellow | 8. Sudan I | 13. Sudan Red 7B |
| 4. Butter Yellow | 9. Sudan Red G | 14. Sudan Red B |
| 5. Para Red | 10. Sudan II | 15. Sudan IV |



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Insulin Analogues in Clinical and Post-Mortem Analyses

Application #AN3350

Conditions

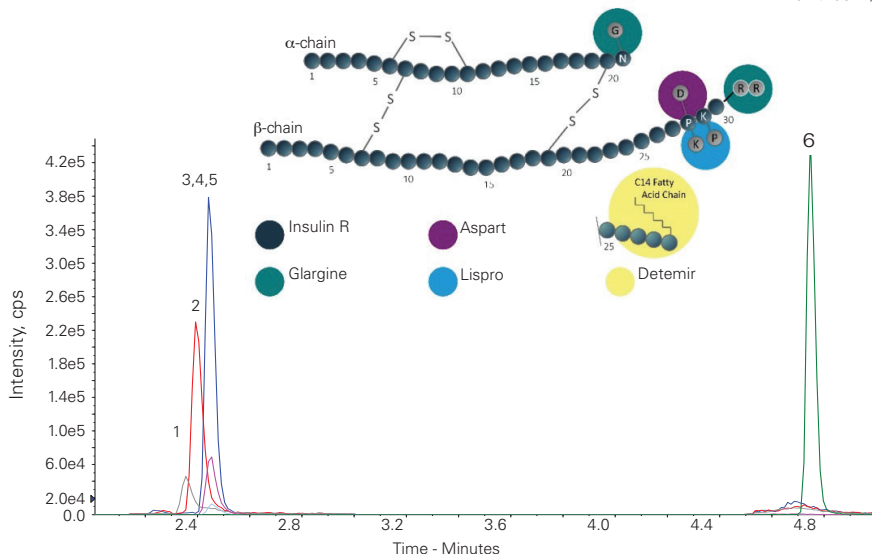
Column: ACE 5 C18-300
Dimensions: 50 x 2.1 mm
Part Number: ACE-221-0502
Mobile Phase: A: 0.1% acetic acid in H₂O
 B: 0.1% acetic acid in IPA/MeCN (25:75 v/v)
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.0 | 22 |
| 0.5 | 22 |
| 1.0 | 34 |
| 3.0 | 36 |
| 4.0 | 98 |
| 6.2 | 98 |
| 6.3 | 22 |

Flow Rate: 0.55 mL/min
Injection: 40 µL
Detection: AB Sciex QTRAP 5500
 ESI positive ion mode
 Ion spray voltage: 5500 V
 Temperature: 600 °C
Sample: 100 µU/mL insulin analogues in steroid-free serum

Analytes

- | | | |
|--|---|---|
| 1. Glargine MW 6063 Quantifier (<i>m/z</i> 867.2 → 136) Qualifier (<i>m/z</i> 1011.4 → 1164.2) Qualifier (<i>m/z</i> 1011.4 → 1179.4) | 3. Aspart MW 5826 Quantifier (<i>m/z</i> 971.7 → 136) Qualifier (<i>m/z</i> 1166 → 219) Qualifier (<i>m/z</i> 971.7 → 226.1) | 5. Insulin R MW 5808 Quantifier (<i>m/z</i> 1162.4 → 345.2) Qualifier (<i>m/z</i> 1162.3 → 65.2) Qualifier (<i>m/z</i> 1162.4 → 226.1) |
| 2. Bovine insulin (IS) MW ~5800 Quantifier (<i>m/z</i> 956.5 → 136.1) Qualifier (<i>m/z</i> N/A) | 4. Lispro MW 5808 Quantifier (<i>m/z</i> 1162.4 → 217) Qualifier (<i>m/z</i> 968.6 → 217) | 6. Detemir MW 5917 Quantifier (<i>m/z</i> 1184 → 454.4) Qualifier (<i>m/z</i> 987 → 454.4) Qualifier (<i>m/z</i> 1184.0 → 357.4) |



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Insulins

Application #AN2770

Conditions

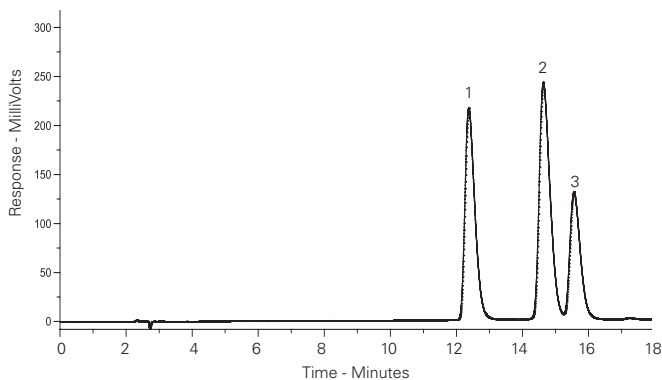
Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: A: 0.1% TFA in H₂O/MeCN (71:29 v/v)
 B: 0.1% TFA in H₂O/MeCN (68:32 v/v)
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 10 |
| 16 | 90 |

Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV, 215 nm

Analytes

1. Bovine insulin
2. Human insulin
3. Porcine insulin



Isoflavones

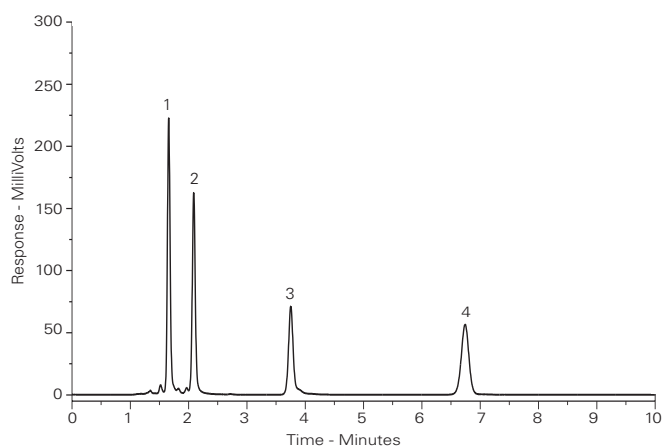
Application #AN2970

Conditions

Column: ACE 5 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-121-1546
Mobile Phase: MeCN/0.1% formic acid in H₂O (35:65 v/v)
Flow Rate: 1 mL/min
Injection: 1 µL
Temperature: Ambient
Detection: UV, 254 nm

Analytes

1. Daidzin
2. Genistin
3. Daidzein
4. Genistein



Isoflavones in Red Clover and Soy Extract

Application #AN1130

Conditions

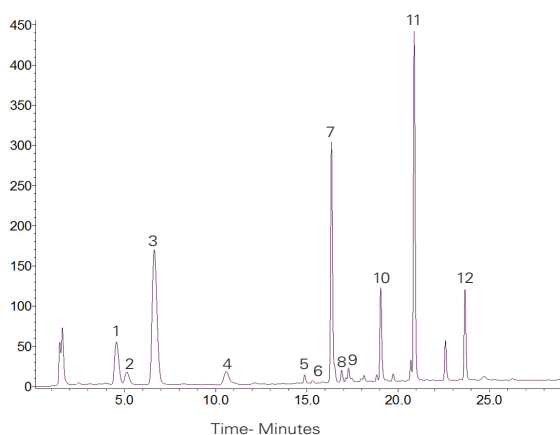
Column: ACE 3 C18-AR
Dimensions: 150 x 2.1 mm
Part Number: ACE-119-1502
Mobile Phase: A: Acetic acid in H₂O pH 2.8
 B: 0.6% Acetic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 15 |
| 7 | 15 |
| 27 | 75 |

Flow Rate: 0.35 mL/min
Injection: 3 µL
Temperature: 25 °C
Detection: UV, 254 nm

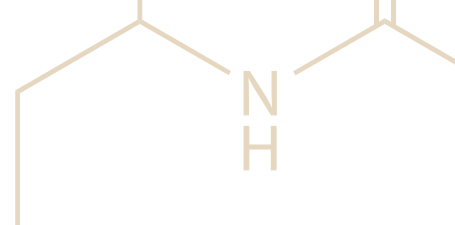
Analytes

1. Daidzin
2. Glycitin
3. Rutin (Int. Standard)
4. Genistin
5. Acetyldaidzin
6. Acetylglycitin
7. Daidzein
8. Glycitein
9. Acetylgenistin
10. Genistein
11. Formononetin
12. Biochanin A



Red clover is a perennial herb that commonly grows wild in meadows throughout Europe and Asia.

K. Weinfurter et al. Forsch. Komplementmed. 21 (Suppl.1): 45 (2014)



Itraconazole and Hydroxyitraconazole in Human Whole Blood by LC-MS/MS

Application #AN3380

Conditions

Column: ACE 3 C18-AR
Dimensions: 50 x 2.1 mm
Part Number: ACE-119-0502
Mobile Phase: A: 10 mM ammonium acetate in H₂O
 B: 10 mM ammonium acetate in MeOH

Gradient:

| Time (mins) | %B |
|-------------|----|
| 0 | 75 |
| 2 | 98 |
| 3 | 98 |

Flow Rate: 0.7 mL/min

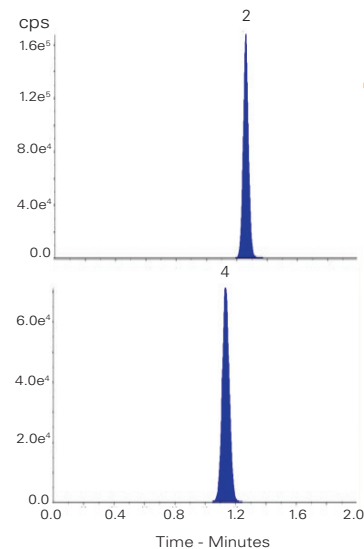
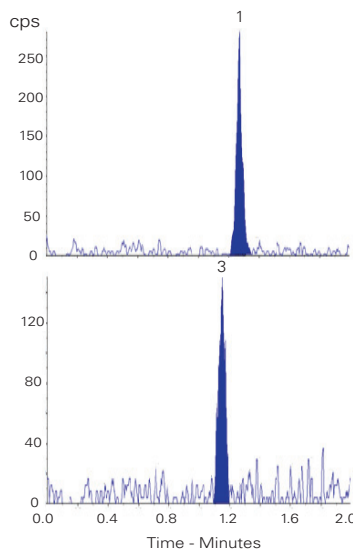
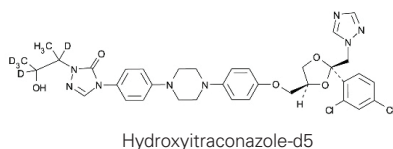
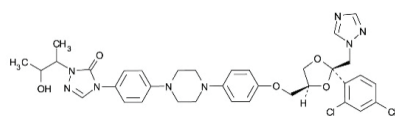
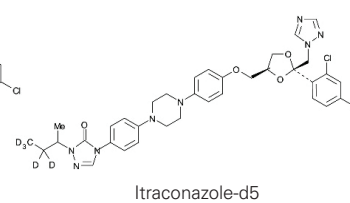
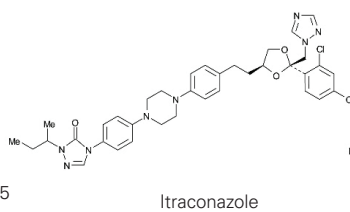
Temperature: 45 °C

Detection: AB Sciex 4000
 ESI positive ion mode

Sample: 1.0 ng/mL human whole blood (LLOQ)

Analytes

1. Itraconazole
(*m/z* 705.3 → 392.3)
2. Itraconazole-d5
(*m/z* 710.4 → 397.4)
3. Hydroxyitraconazole
(*m/z* 721.3 → 408.2)
4. Hydroxyitraconazole-d5
(*m/z* 726.4 → 413.3)



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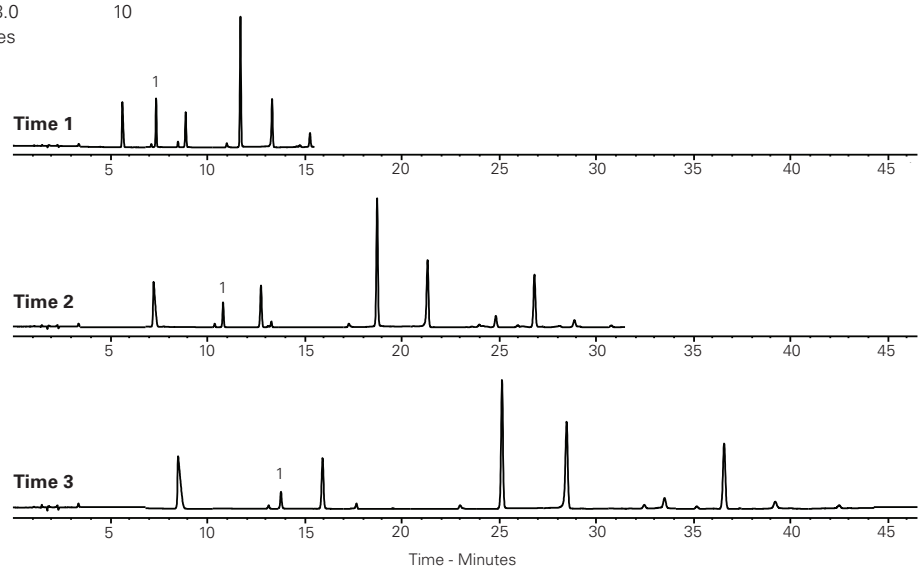
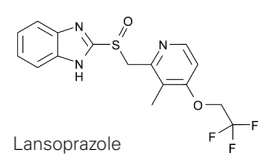
Lansoprazole and Degradation Products after Acidic Hydrolysis in 0.1 M HCl Application #AN1520

Conditions
Column: ACE Excel 5 SuperC18
Dimensions: 150 x 4.6 mm
Part Number: EXL-1211-1546U
Mobile Phase: A: 0.1% ammonia in H₂O
 B: 0.1% ammonia in MeCN/H₂O (90:10 v/v)
Gradient:

| Time 1 (mins) | Time 2 (mins) | Time 3 (mins) | %B |
|---------------|---------------|---------------|----|
| 0.0 | 0.0 | 0.0 | 10 |
| 15.0 | 30.0 | 45.0 | 90 |
| 15.5 | 30.5 | 45.5 | 90 |
| 18.0 | 33.0 | 48.0 | 10 |

Post time 10 minutes
Flow Rate: 1 mL/min
Injection: 5 µL
Temperature: 30 °C
Detection: UV, 280 nm

Analyte
 1. Lansoprazole



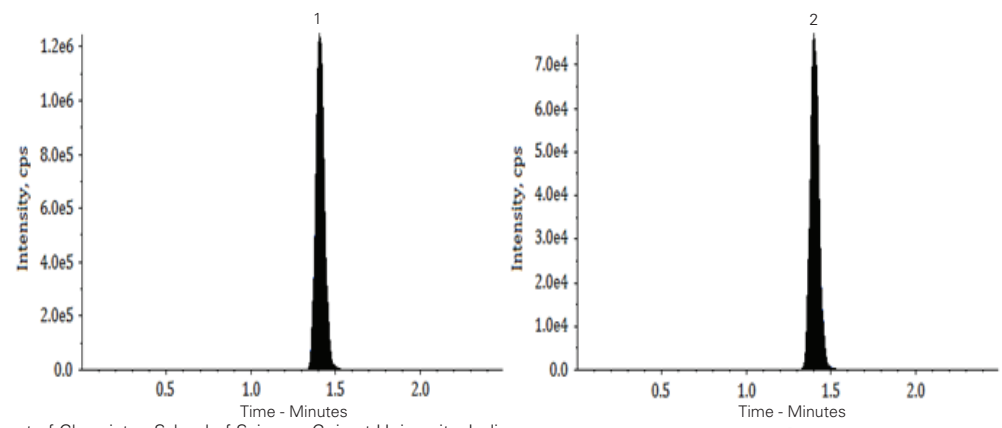
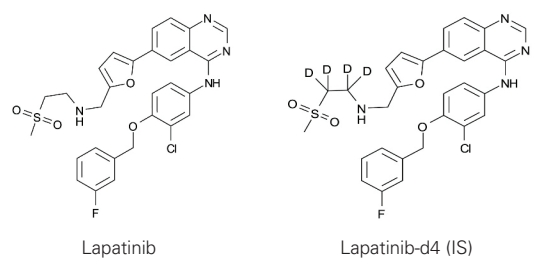
Lapatinib Anticancer Drug in Human Plasma by LC-MS/MS Application #AN3360

Conditions
Column: ACE 5 C18
Dimensions: 100 x 4.6 mm
Part Number: ACE-121-1046
Mobile Phase: 10 mM ammonium formate
 pH 3.5/MeCN (10:90 v/v)
Flow Rate: 1 mL/min
Injection: 0.5 µL
Temperature: 40 °C
Detection: API 4000 triple quad MS
 Positive ion mode ESI
 Ion spray voltage: 5500 V
 Temperature: 400 °C

Analytes
 1. Lapatinib
 (m/z 581.1 → 365.2)
 Concentration 1000 ng/mL
 2. Lapatinib-d4 (IS)
 (m/z 585.1 → 365.0)
 Concentration 100 ng/mL

Sample: Extracted from 100 µL plasma using liquid-liquid extraction

LLOQ 2.5 ng/mL
 LOD 1.0 ng/mL
 Method Linearity 2.5 – 2500 ng/mL



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Lidocaine in Saliva by LC-MS/MS

Application #AN2570

Conditions

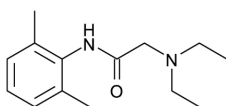
Column: ACE 3 C18
Dimensions: 100 x 3.0 mm
Part Number: ACE-111-1003
Mobile Phase: A: 0.1% formic acid in MeCN/H₂O (20:80 v/v)
 B: 0.1% formic acid in MeCN/H₂O (80:20 v/v)
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.0 | 20 |
| 1.0 | 20 |
| 3.0 | 80 |
| 4.5 | 80 |

Flow Rate: 0.3 mL/min
Injection: 10 µL
Detection: Quattro-Micro triple quad MS
 Positive ion mode ESI

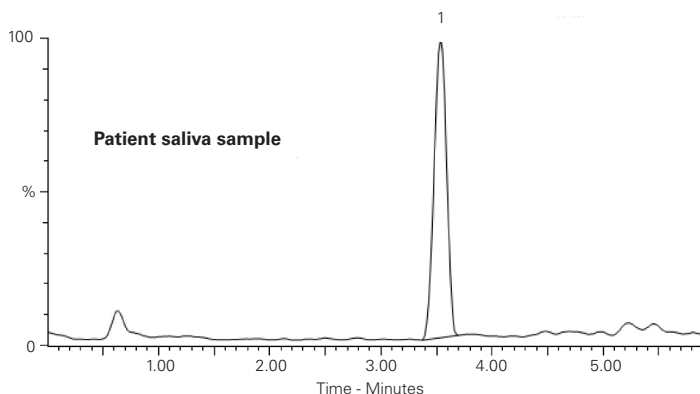
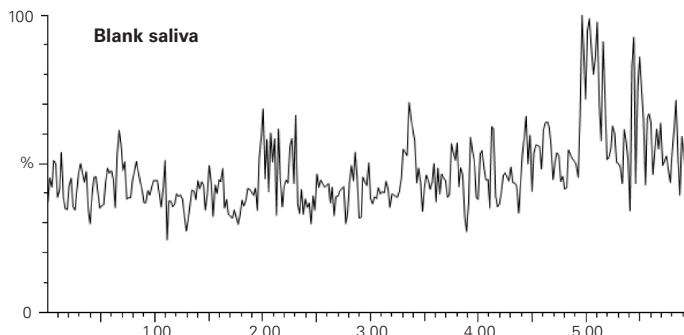
Analyte

1. Lidocaine
 (m/z 235 → 86)



1. Lidocaine

Saliva samples taken after "Emla 5 %" application to skin



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Lincosamide Antibiotics

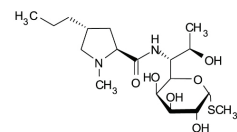
Application #AN2650

Conditions

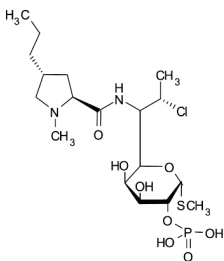
Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: 0.02 M sodium phosphate dibasic pH 3.0/MeCN (70:30 v/v)
Flow Rate: 1 mL/min
Injection: 25 µL
Temperature: 25 °C
Detection: UV, 205 nm

Analytes

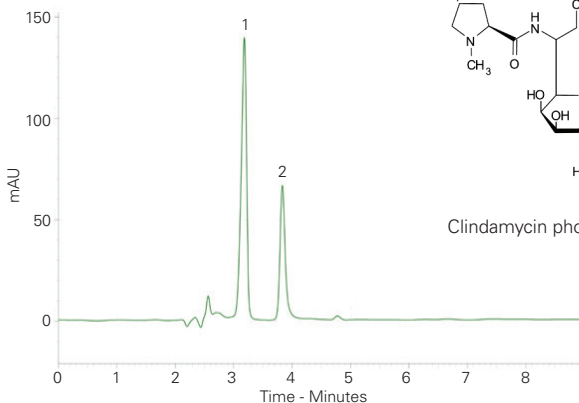
1. Lincomycin HCl
 2. Clindamycin phosphate



Lincomycin HCl



Clindamycin phosphate



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Lipid Classes Separation from *Drosophila Melanogaster*

Application #AN1530

Conditions

Column: ACE 3 SIL
Dimensions: 150 x 3.0 mm
Part Number: ACE-117-1503
Mobile Phase: A: IPA/MeCN (20:80 v/v)
 B: IPA/0.02 M ammonium formate (20:80 v/v)
Gradient:

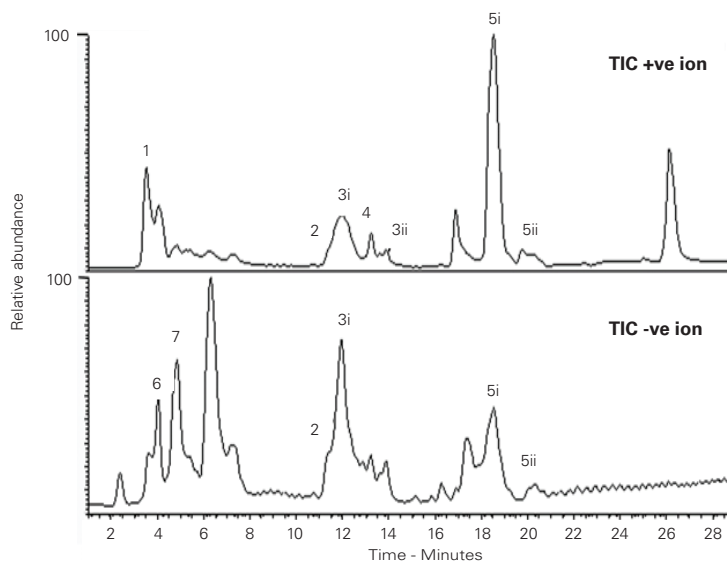
| Time (mins) | %B |
|-------------|----|
| 0.0 | 8 |
| 1.0 | 8 |
| 5.0 | 9 |
| 10.0 | 20 |
| 16.0 | 25 |
| 23.0 | 35 |
| 26.0 | 8 |

Flow Rate: 0.3 mL/min
Detection: LTQ Orbitrap MS
 Positive and negative ion mode

*Drosophila Melanogaster*

Analytes

1. Triglyceride (TG)
2. Phosphoserine (PS)
- 3i. Phosphoethanolamine (PE)
- 3ii. Lyso phosphoethanolamine (Lyso PE)
4. Sphingomyelin phosphoethanolamine (SMPE)
- 5i. Phosphatidylcholine (PC)
- 5ii. Lyso phosphatidylcholine (Lyso PC)
6. Glycerophosphoglycerol (GPG)
7. Phosphoinositol (PI)



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Liquorice Extracts Fingerprint

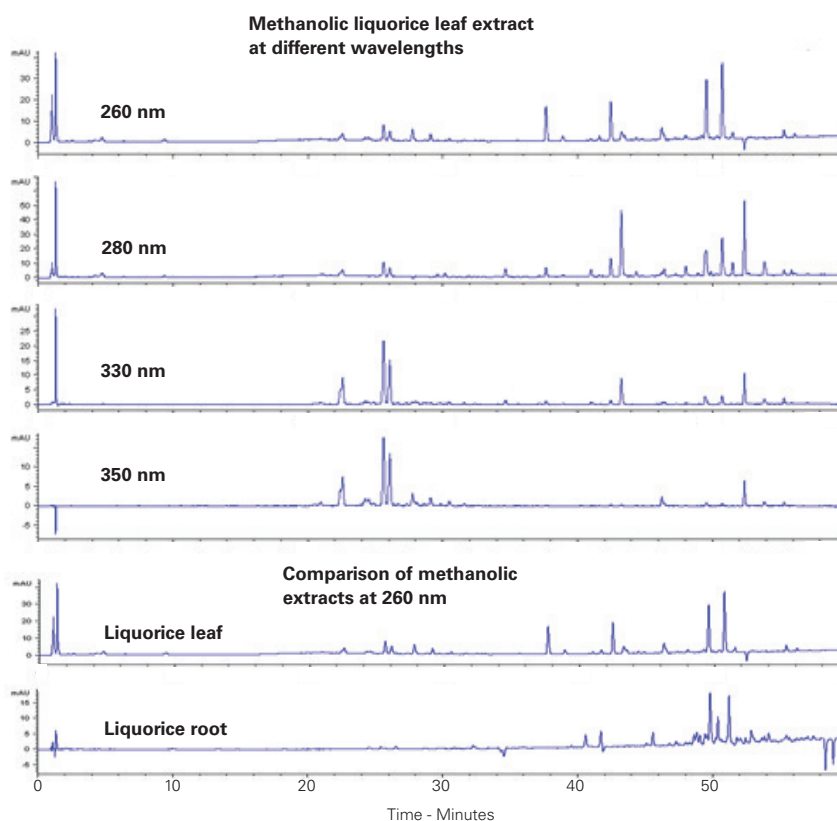
Application #AN2090

Conditions

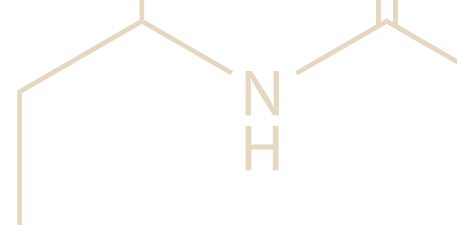
Column: ACE 3 C18-PFP
Dimensions: 150 x 2.1 mm
Part Number: ACE-1110-1502
Mobile Phase: A: Ammonium acetate in H₂O pH 4
 B: MeOH
Gradient:

| Time (mins) | %B |
|-------------|-----|
| 0 | 10 |
| 1 | 10 |
| 11 | 15 |
| 55 | 90 |
| 60 | 100 |

Flow Rate: 0.4 mL/min
Injection: 2 µL
Temperature: 40 °C
Detection: UV, 260, 280, 330 and 350 nm
Sample: Plant material ground to a fine powder in pestle and mortar. Powdered material extracted into methanol by ultrasonification for 30 minutes, followed by centrifugal filtration.



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Local Anaesthetics

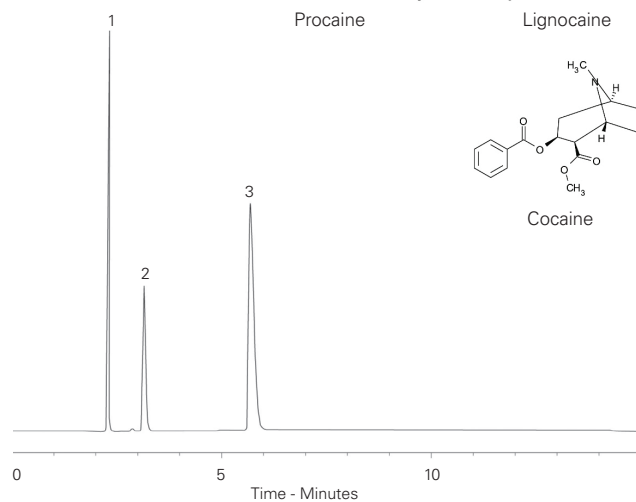
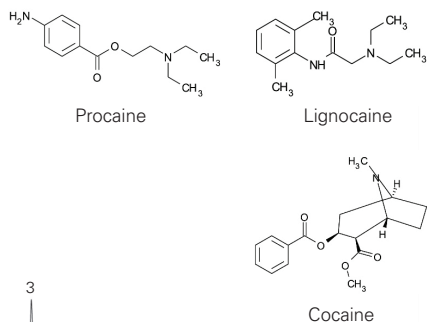
Application #AN3220

Conditions

Column: ACE 5 AQ
Dimensions: 250 x 4.6 mm
Part Number: ACE-126-2546
Mobile Phase: MeCN/H₂O/2.5 M H₂SO₄
 (21:79:0.1 v/v/v)
Flow Rate: 1.5 mL/min
Detection: UV

Analytes

1. Procaine
2. Lignocaine
3. Cocaine



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15-Hydroxy Lubiprostone in Human Plasma

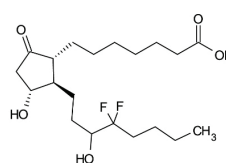
Application #AN1900

Conditions

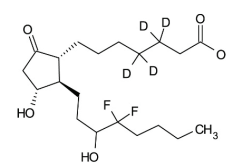
Column: ACE Excel 2 C18
Dimensions: 50 x 3.0 mm
Part Number: EXL-101-0503U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: MeCN
Flow Rate: 0.65 mL/min
Injection: 15 µL
Temperature: 35 °C
Detection: MDS Sciex API 5000
 TurbolonSpray negative mode
 IonSpray voltage -4500 V
 Source Temperature 450 °C

Analytes

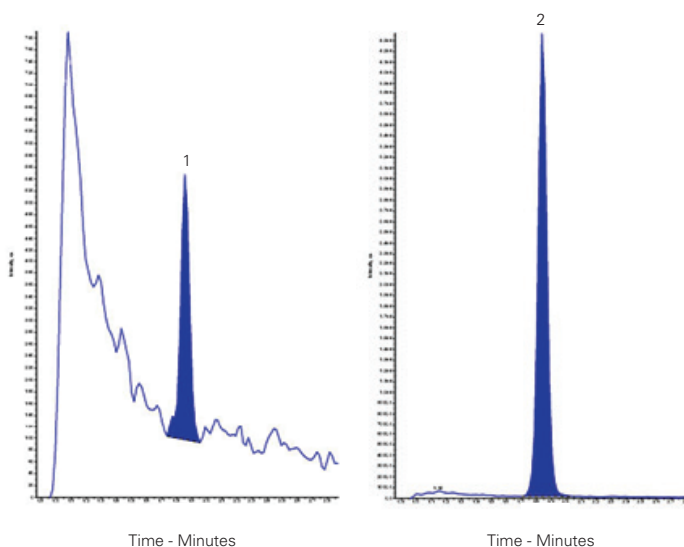
1. 15-Hydroxy lubiprostone
 (*m/z* 391.2 → 373.2)
2. 15-Hydroxy lubiprostone-d4 (IS)
 (*m/z* 395.2 → 377.2)



15-Hydroxy lubiprostone



15-Hydroxy lubiprostone-d4



Lowest calibration standard sample containing 2.0 pg/mL in human EDTA K3 plasma.
 Lubiprostone, a fatty acid derived from prostaglandin E1, is rapidly metabolised to 15-hydroxy lubiprostone. Quantitation is based on 15-hydroxy lubiprostone, with the d4 analogue as internal standard.

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Lubricant Additives: ADPA/OPNA Antioxidants

Application #AN1170

Conditions

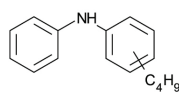
Column: ACE UltraCore 2.5 SuperC18
Dimensions: 150 x 4.6 mm
Part Number: CORE-25A-1546U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN/IPA (1:2 v/v)
Gradient:

| Time (mins) | %B |
|-------------|------|
| 0.0 | 65.0 |
| 15.0 | 97.5 |
| 25.0 | 97.5 |
| 25.1 | 65.0 |

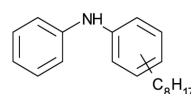
Flow Rate: 1 mL/min
Temperature: 60 °C
Detection: UV, 220 nm

Analytes

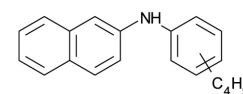
1. C4-ADPA
2. C8-ADPA
3. C4-OPNA
4. C12-ADPA
5. C16-ADPA



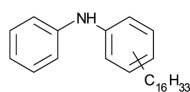
C4-ADPA



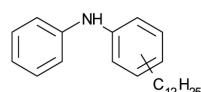
C8-ADPA



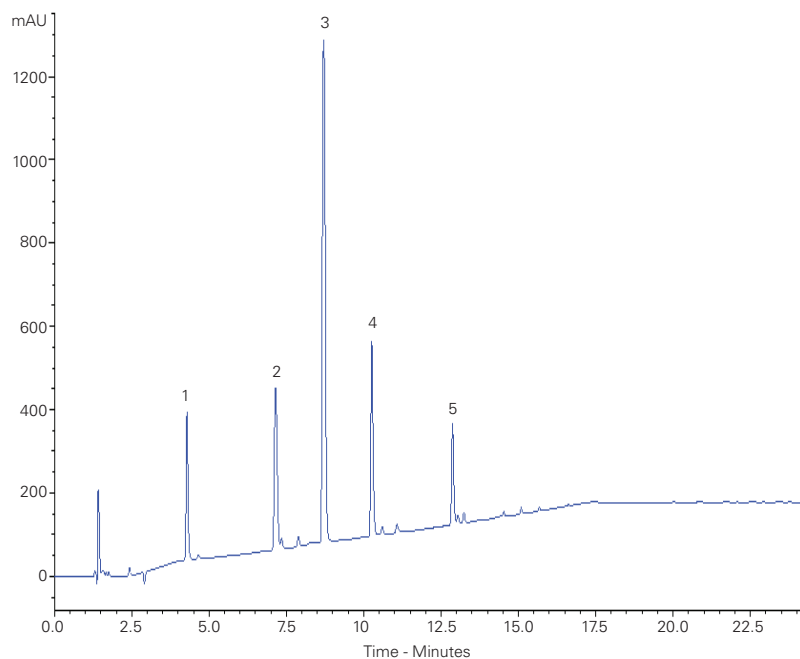
C4-OPNA



C16-ADPA



C12-ADPA



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Lurbinectin in Plasma by LC-MS/MS

Application #AN3810

Conditions

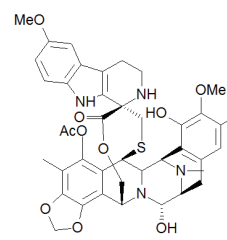
Column: ACE 3 C18-PFP
Dimensions: 30 x 2.1 mm
Part Number: ACE-1110-0302
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

| Time (mins) | %B |
|-------------|----|
| 0.0 | 10 |
| 2.5 | 90 |
| 3.5 | 90 |
| 3.6 | 10 |
| 5.0 | 10 |

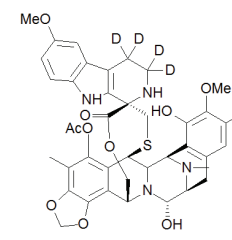
Flow Rate: 0.6 mL/min
Injection: 5 µL
Temperature: 50 °C
Detection: API 4000 triple quad
 TurbolonSpray, ESI positive ion mode
 Turbo Temperature: 650 °C
 Ion Spray Potential: 5000 V

Analytes

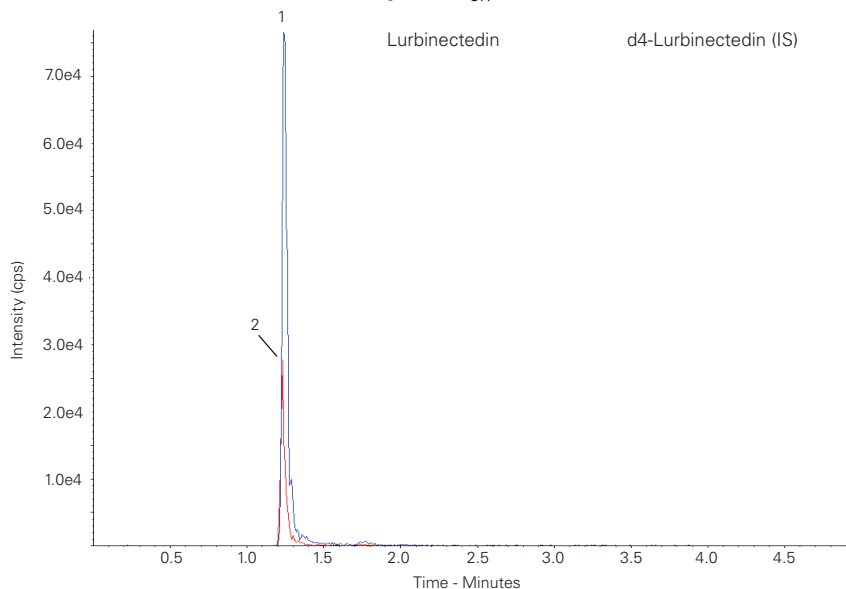
1. Lurbinectin
(m/z 767.3 *→* 273.0)
 (LLOQ 0.1 ng/mL)
2. d4-Lurbinectin (IS)
(m/z 771.4 *→* 277.0)



Lurbinectin



d4-Lurbinectin (IS)



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Malachite Green

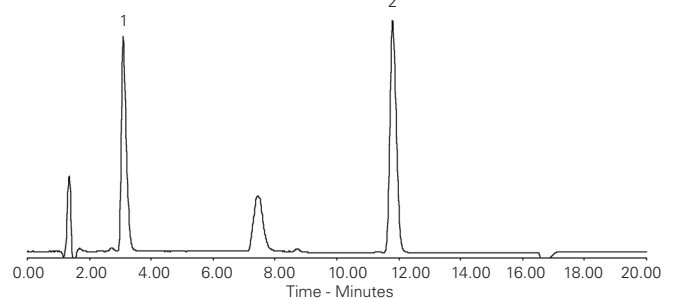
Application #AN2860

Conditions
Column: ACE 5 C18
Dimensions: 150 x 3.0 mm
Part Number: ACE-121-1503
Mobile Phase: 10 mM oxalic acid pH 2.9 in H₂O/MeCN (80:20 v/v)
Flow Rate: 0.4 mL/min
Temperature: Ambient
Detection: UV-Vis, 618 nm

Analytes
 1. Malachite green
 2. Leucomalachite green

CN(C)C1=CC=C(C=C1)C(=C2C=CC(=C2)N(C)C)C3=CC=CC=C3.[O-]
 Malachite green

CN(C)C1=CC=C(C=C1)C(=C2C=CC(=C2)N(C)C)C3=CC=CC=C3
 Leucomalachite green



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Maleic and Fumaric Acids

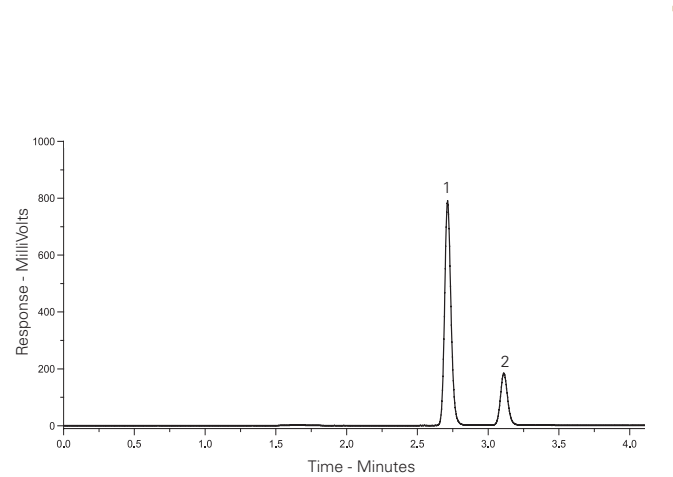
Application #AN3230

Conditions
Column: ACE 5 AQ
Dimensions: 250 x 4.6 mm
Part Number: ACE-126-2546
Mobile Phase: 50 mM KH₂PO₄ pH 7.0 in H₂O
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV, 210 nm

Analytes
 1. Fumaric acid
 2. Maleic acid

OC(=O)/C=C/C(=O)O
 Fumaric acid

OC(=O)C=CC(=O)O
 Maleic acid

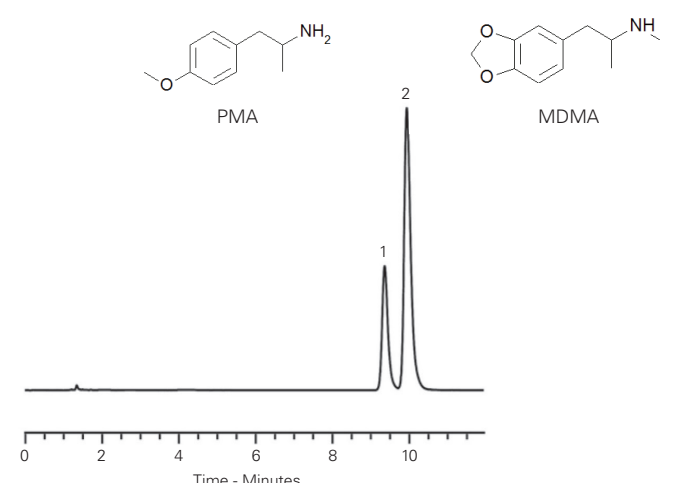


MDMA (Ecstasy) and PMA (Dr Death) Separation

Application #AN4220

Conditions
Column: ACE 3 C18
Dimensions: 150 x 4.6 mm
Part Number: ACE-111-1546
Mobile Phase: 0.05 M KH₂PO₄ pH 3.2 in H₂O/MeCN (90:10 v/v)
Flow Rate: 1.2 mL/min
Injection: 10 µL
Temperature: 22 °C
Detection: UV, 210 nm

Analytes
 1. PMA (4-Methoxyamphetamine)
 LOD 0.08 µg/mL
 LOQ 0.26 µg/mL
 2. MDMA (3,4-Methylenedioxy methamphetamine)
 LOD 0.04 µg/mL
 LOQ 0.12 µg/mL



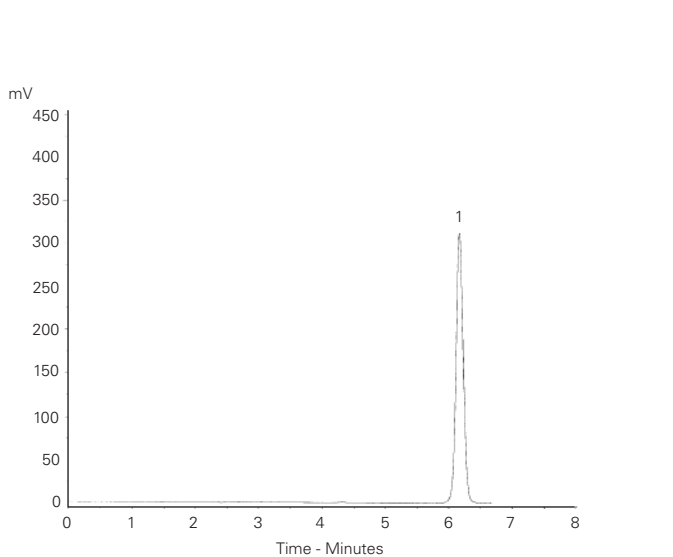
Melamine using Ion-Pairing Reagent

Application #AN2510

Conditions
Column: ACE 5 C8
Dimensions: 150 x 4.6 mm
Part Number: ACE-122-1546
Mobile Phase: 5 mM heptafluorobutyric acid/MeCN (95:5 v/v)
Flow Rate: 1 mL/min
Injection: 5 µL
Temperature: Ambient
Detection: UV, 240 nm

Analyte
 1. Melamine

NC1=NC(=N2C(=N1)N=CN2)N
 Melamine



Cumba LR, Smith JP, Zuway KY, Sutcliffe OB, do Carmo DR, Banks CE. Forensic electrochemistry: simultaneous voltammetric detection of MDMA and its fatal counterpart 'Dr Death' (PMA). Anal. Methods, 8, 142-152 (2016) doi: 10.1039/c5ay02924d

Metabolomic Analysis of Extracted Jurkat T Cells by LC-HRMS

Application #AN3980

Conditions

Column: ACE Excel 2 C18-PFP
Dimensions: 100 x 2.1 mm
Part Number: EXL-1010-1002U
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Gradient:

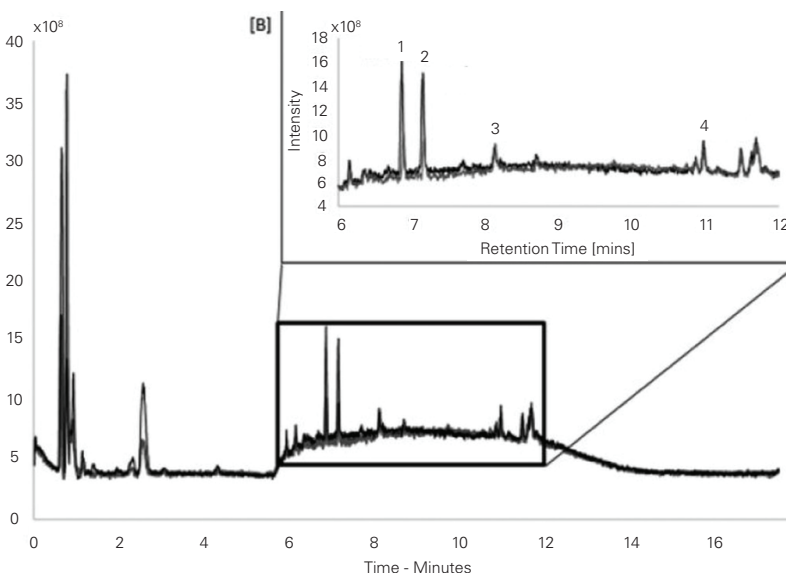
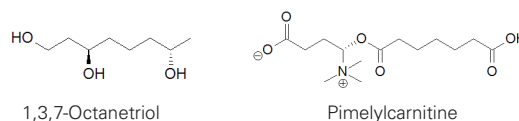
| Time (mins) | %B |
|-------------|----|
| 0 | 0 |
| 1 | 0 |
| 11 | 65 |
| 13 | 65 |
| 18 | 95 |
| 20 | 95 |

Flow Rate: 0.35 mL/min
Injection: 5 µL
Temperature: 35 °C
Detection: Thermo Scientific Q Exactive Orbitrap MS
 Heated electrospray ionisation in positive mode
 Spray Voltage: 3.3 kV
 Capillary Temperature: 300 °C
 Heater Temperature: 350 °C
 Mass Scan Range: *m/z* 70-1000
 Resolution: 70,000

TIC overlay for Jurkat T-lymphocyte cells rinsed with either 0.3% ammonium formate (darker line) or 0.3% ammonium acetate.

Analytes

1. Caffeine-d3 (IS)
2. Tryptophan-d3 (IS)
3. 1,3,7-Octanetriol
4. Pimelylcarnitine



Ulmer CZ, Yost RA, Chen J, Mathews CE, Garrett TJ. Liquid-Chromatography-Mass Spectrometry Metabolic and Lipidomic Sample Preparation Workflow for Suspension-Cultured Mammalian Cells using Jurkat T Lymphocyte Cells, *J. Proteomics Bioinform*, (2015), 8(6), 126-132. doi:10.4172/jpb.1000360

Metabolomic Biomarkers in Ethylmalonic Encephalopathy

Application #AN4130

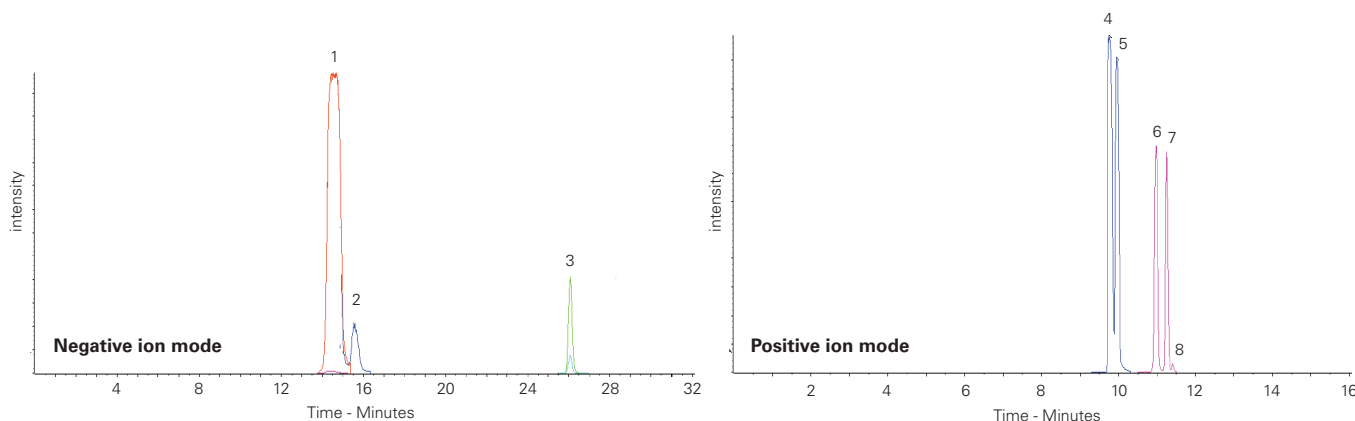
Conditions

Column: ACE 3 C18-PFP
Dimensions: 150 x 2.1 mm
Part Number: ACE-1110-1502
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Detection: Sciex API 4000 triple quad MS
 ESI in negative ion mode
Sample: Urine sample from patient with ethylmalonic encephalopathy is filtered and extracted with ice-cold methanol, evaporated to dryness and reconstituted in 0.1% formic acid in water

Analytes

1. Ethylmalonic acid (*m/z* 131 → 87)
2. Methylsuccinic acid (*m/z* 131 → 87)
3. Adipic acid (*m/z* 145 → 83)
4. Isobutyrylcarnitine (*m/z* 232 → 85)
5. Butyrylcarnitine (*m/z* 232 → 85)
6. 2-Methylbutyrylcarnitine (*m/z* 246 → 85)
7. Isovalerylcarnitine (*m/z* 246 → 85)
8. Valerylcarnitine (*m/z* 246 → 85)

Please contact info@ace-hplc.com for additional information on the chromatographic conditions used for this analysis.



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Metabolomics and Biochemical Genetics - Acylglycines

Application #AN4080

Conditions

Column: ACE 3 C18-PFP**Dimensions:** 150 x 2.1 mm**Part Number:** ACE-1110-1502**Mobile Phase:** A: 0.1% formic acid in H_2O

B: 0.1% formic acid in MeCN

Detection: Sciex API 4000 triple quad MS

ESI in negative ion mode

Sample: Urine / plasma sample is filtered and extracted with ice-cold methanol, evaporated to dryness and reconstituted in 0.1% formic acid in water

Analytes

1. Propionylglycine

 $(m/z\ 130 \rightarrow 74)$

2. Isobutyrylglycine

 $(m/z\ 144 \rightarrow 74)$

3. Butyrylglycine

 $(m/z\ 144 \rightarrow 74)$

4. 2-Methylbutyrylglycine

 $(m/z\ 158 \rightarrow 74)$

5. Isovalerylglycine

 $(m/z\ 158 \rightarrow 74)$

6. Tiglylglycine

 $(m/z\ 156 \rightarrow 112)$

7. Valerylglycine

 $(m/z\ 158 \rightarrow 74)$

8. 3-Methylcrotonylglycine

 $(m/z\ 156 \rightarrow 74)$

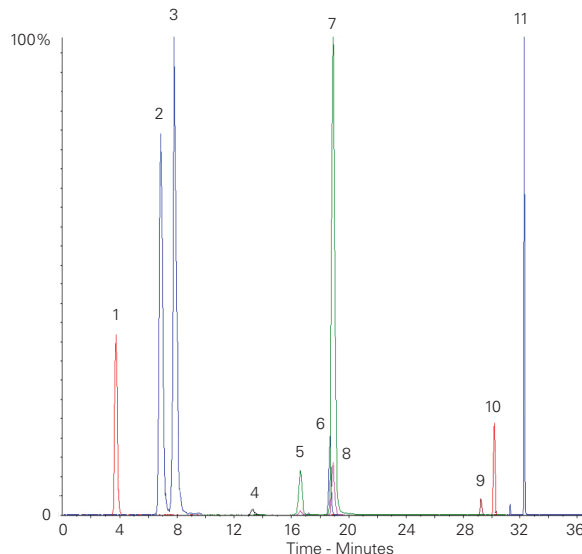
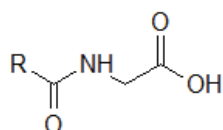
9. Suberylglycine

 $(m/z\ 230 \rightarrow 74)$

10. Hexanoylglycine

 $(m/z\ 172 \rightarrow 74)$

11. Trans-Cinnamoylglycine

 $(m/z\ 204 \rightarrow 160)$ Please contact info@ace-hplc.com for additional information on the chromatographic conditions used for this analysis.

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Metabolomics – C4 & C5 Hydroxy and Dicarboxylic Acids

Application #AN4110

Conditions

Column: ACE 3 C18-PFP**Dimensions:** 150 x 2.1 mm**Part Number:** ACE-1110-1502**Mobile Phase:** A: 0.1% formic acid in H_2O

B: 0.1% formic acid in MeCN

Detection: Sciex API 4000 triple quad MS

ESI in negative ion mode

Sample: Urine / plasma sample is filtered and extracted with ice-cold methanol, evaporated to dryness and reconstituted in 0.1% formic acid in water

Analytes

1. Isocitric acid

 $(m/z\ 191 \rightarrow 111)$

2. 2-Hydroxyglutaric acid

 $(m/z\ 147 \rightarrow 129)$

3. 3-Hydroxyglutaric acid

 $(m/z\ 147 \rightarrow 85)$

4. Maleic acid

 $(m/z\ 115 \rightarrow 71)$

5. Citric acid

 $(m/z\ 191 \rightarrow 111)$

6. Fumaric acid

 $(m/z\ 115 \rightarrow 71)$

7. Succinic acid

 $(m/z\ 117 \rightarrow 73)$

8. Methylmalonic acid

 $(m/z\ 117 \rightarrow 55)$

9. 3-Hydroxy-3-methylglutaric acid

 $(m/z\ 161 \rightarrow 99)$

10. 2-Hydroxyadipic acid

 $(m/z\ 161 \rightarrow 143)$

11. 3-Hydroxyisovaleric acid

 $(m/z\ 117 \rightarrow 59)$

12. 3-Hydroxy-2-methylbutyric acid

 $(m/z\ 117 \rightarrow 73)$

13. Glutaric acid

 $(m/z\ 131 \rightarrow 87)$

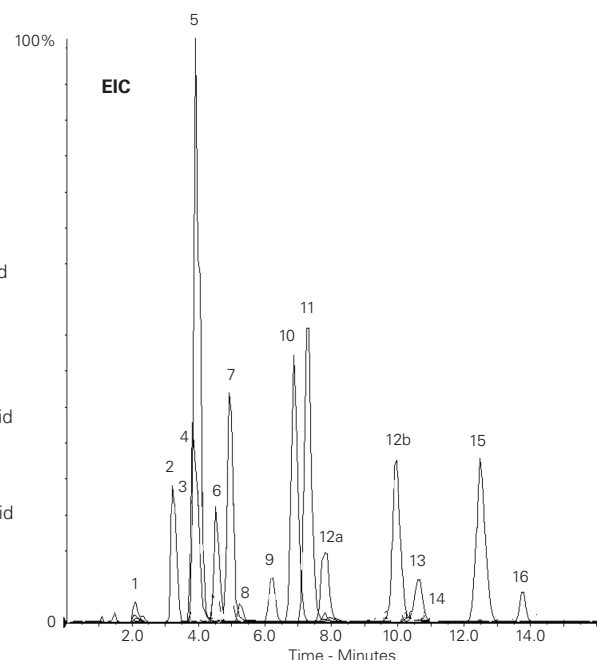
14. 2-Ethyl-3-hydroxypropionic acid

 $(m/z\ 117 \rightarrow 87)$

15. Ethylmalonic acid

 $(m/z\ 131 \rightarrow 87)$

16. Methylsuccinic acid

 $(m/z\ 131 \rightarrow 87)$ Please contact info@ace-hplc.com for additional information on the chromatographic conditions used for this analysis.

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Metabolomics – C4 Hydroxy Acids

Application #AN4120

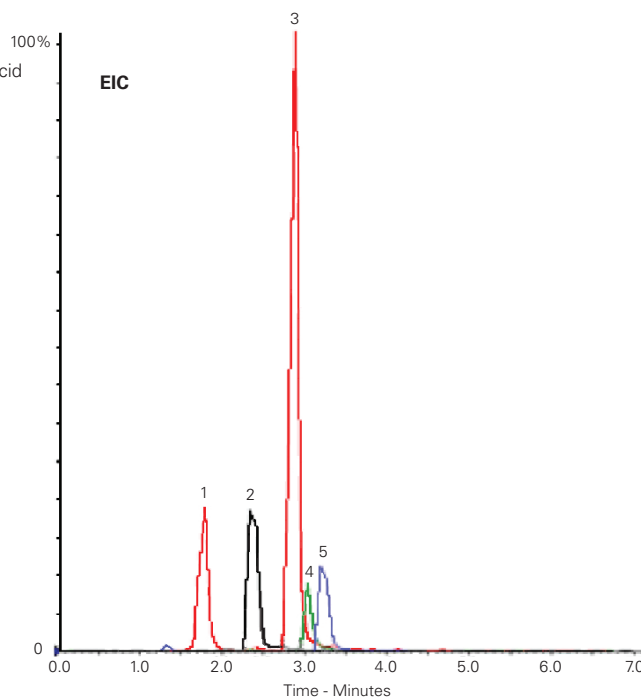
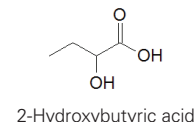
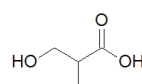
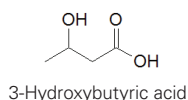
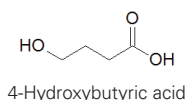
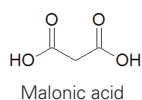
Conditions

Column: ACE 3 C18-PFP
Dimensions: 150 x 2.1 mm
Part Number: ACE-1110-1502
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Detection: Sciex API 4000 triple quad MS
 ESI in negative ion mode
Sample: Urine / plasma sample is filtered and extracted with ice-cold methanol, evaporated to dryness and reconstituted in 0.1% formic acid in water

Analytes

1. Malonic acid
(*m/z* 103 → 59)
2. 4-Hydroxybutyric acid
(*m/z* 103 → 57)
3. 3-Hydroxybutyric acid
(*m/z* 103 → 59)
4. 3-Hydroxyisobutyric acid
(*m/z* 103 → 73)
5. 2-Hydroxybutyric acid
(*m/z* 103 → 57)

Please contact info@ace-hplc.com for additional information on the chromatographic conditions used for this analysis.



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Metabolomics – C6 & C7 Hydroxy and Dicarboxylic Acids

Application #AN4100

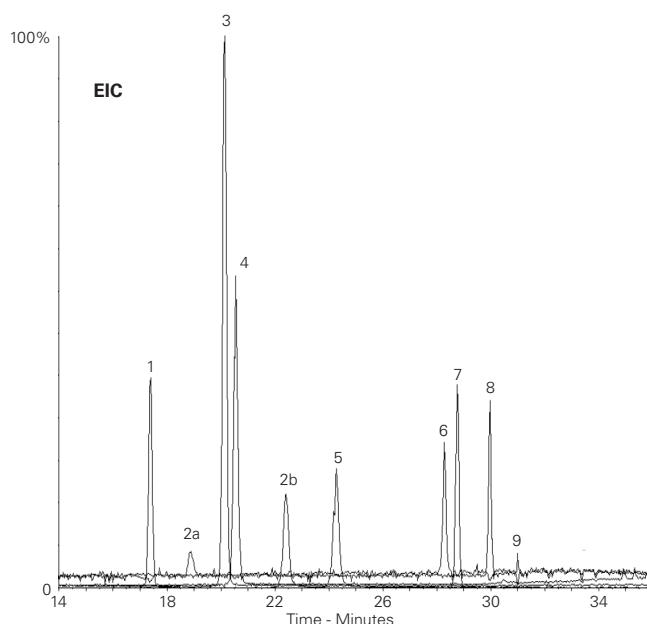
Conditions

Column: ACE 3 C18-PFP
Dimensions: 150 x 2.1 mm
Part Number: ACE-1110-1502
Mobile Phase: A: 0.1% formic acid in H₂O
 B: 0.1% formic acid in MeCN
Detection: Sciex API 4000 triple quad MS
 ESI in negative ion mode
Sample: Urine / plasma samples filtered and extracted with ice-cold methanol, evaporated to dryness and reconstituted in 0.1% formic acid in water.

Analytes

1. 5-Hydroxyhexanoic acid
(*m/z* 131 → 85)
2. 2-Hydroxy-3-methylvaleric acid
(*m/z* 131 → 73)
3. 3-Methylglutaric acid
(*m/z* 145 → 101)
4. Adipic acid
(*m/z* 145 → 83)
5. 2-Hydroxyisocaproic acid
(*m/z* 131 → 85)
6. 3-Methyladipic acid
(*m/z* 159 → 115)
7. Pimelic acid
(*m/z* 159 → 97)
8. 4-Hydroxyphenylacetic acid
(*m/z* 151 → 107)
9. 2-Hydroxyphenylacetic acid
(*m/z* 151 → 107)

Please contact info@ace-hplc.com for additional information on the chromatographic conditions used for this analysis.



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Methotrexate in K₃EDTA Human Plasma by LC-MS/MS

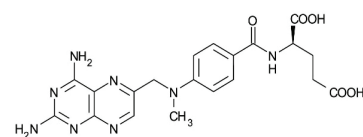
Application #AN3760

Conditions

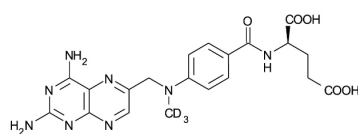
Column: ACE 5 CN
Dimensions: 150 x 4.6 mm
Part Number: ACE-124-1546
Mobile Phase: 10 mM ammonium formate
 pH 7.0/MeOH (60:40 v/v)
Flow Rate: 1 mL/min
Temperature: 40 °C
Detection: Quattro Premier XE triple quad MS
 Positive ion mode ESI
 Ion source temperature: 120 °C
 Desolvation temperature: 450 °C
Sample: Methotrexate and methotrexate-d3
 extracted using solid phase extraction

Analytes

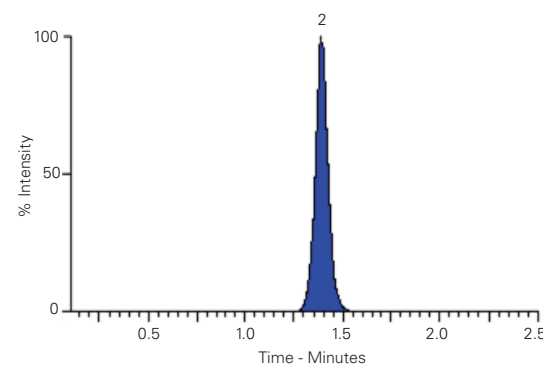
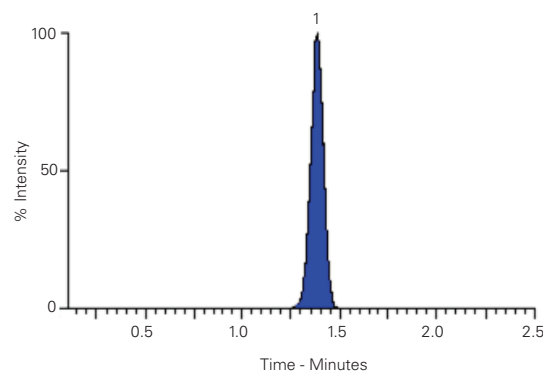
1. Methotrexate
 (m/z 455 → 308)
 (LLOQ 1.0 ng/mL)
 (Concentration 100 ng/mL)
2. Methotrexate-d3 (I.S.)
 (m/z 458 → 311)
 (Concentration 50 ng/mL)



Methotrexate



Methotrexate-d3 (I.S.)



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17 α -Methyltestosterone in Freshwater Tilapia Aquaculture

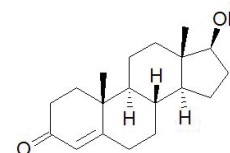
Application #AN4340

Conditions

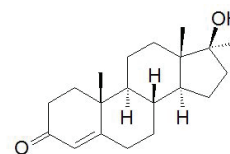
Column: ACE 5 C18
Dimensions: 250 x 4.6 mm
Part Number: ACE-121-2546
Mobile Phase: MeCN/H₂O (45:55 v/v)
Flow Rate: 1 mL/min
Injection: 20 μ L
Temperature: 25 °C
Detection: UV, 245 nm

Analytes

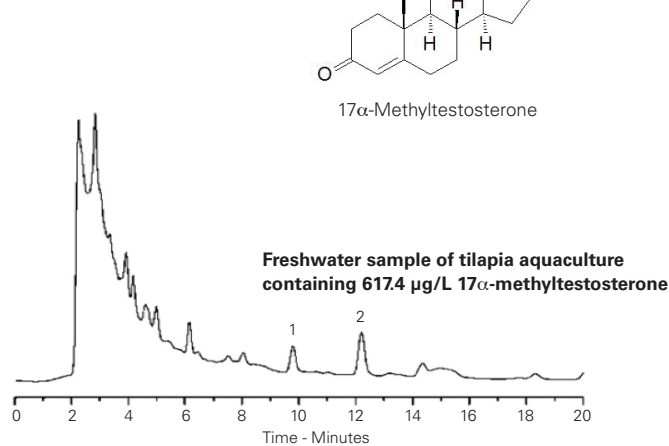
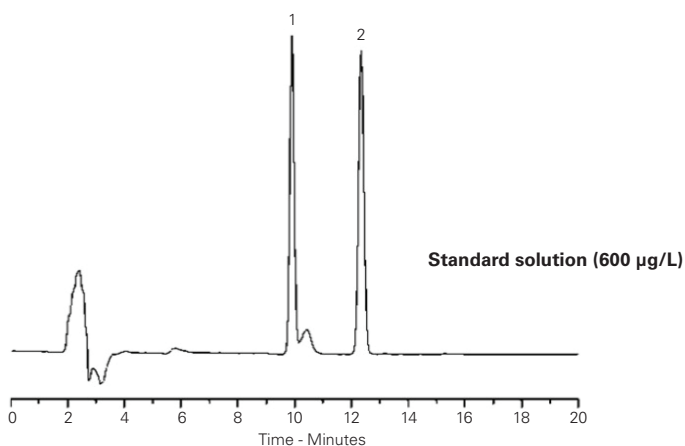
1. Testosterone (IS)
2. 17 α -Methyltestosterone



Testosterone (IS)

17 α -Methyltestosterone

17 α -Methyltestosterone is used for sex reversal of tilapia fish in order to avoid overpopulation in ponds. It therefore has to be monitored in aqueous matrices to prevent release into the environment.



Barbosa IR, Lopes S, Oliveira R, Domingues I, Soares AMVM, Nogueira AJA. Determination of 17 α -Methyltestosterone in Freshwater Samples of Tilapia Farming by High Performance Liquid Chromatography, American Journal of Analytical Chemistry, (2013), 4, 207-211. <http://dx.doi.org/10.4236/ajac.2013.44026>