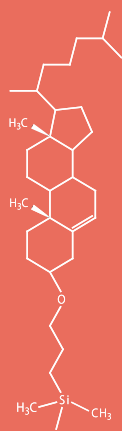
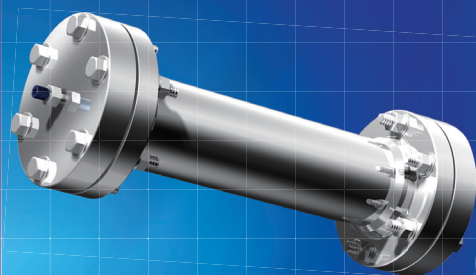
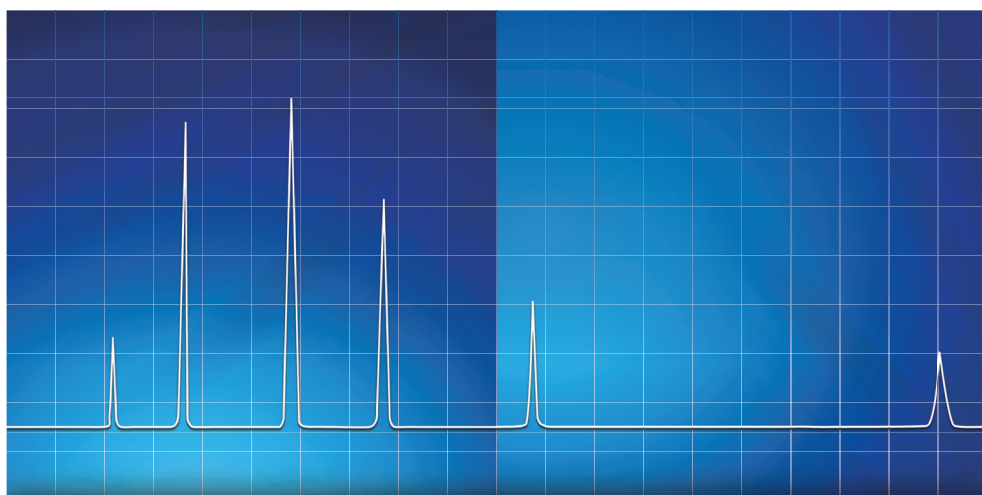
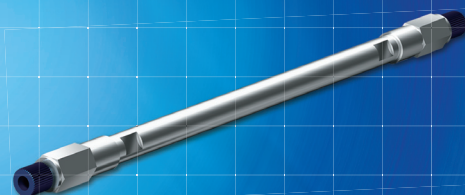
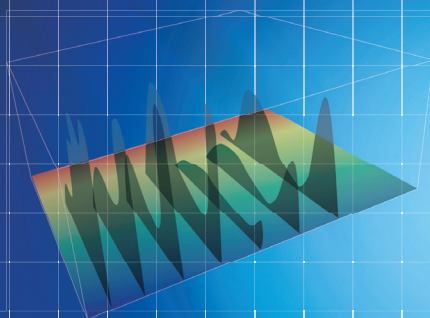
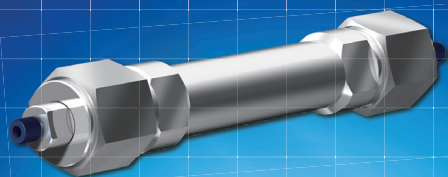


**COSMOSIL**



## COSMOSIL/COSMOCORE Cholester Series

Application Notebook and Reference List



# Contents

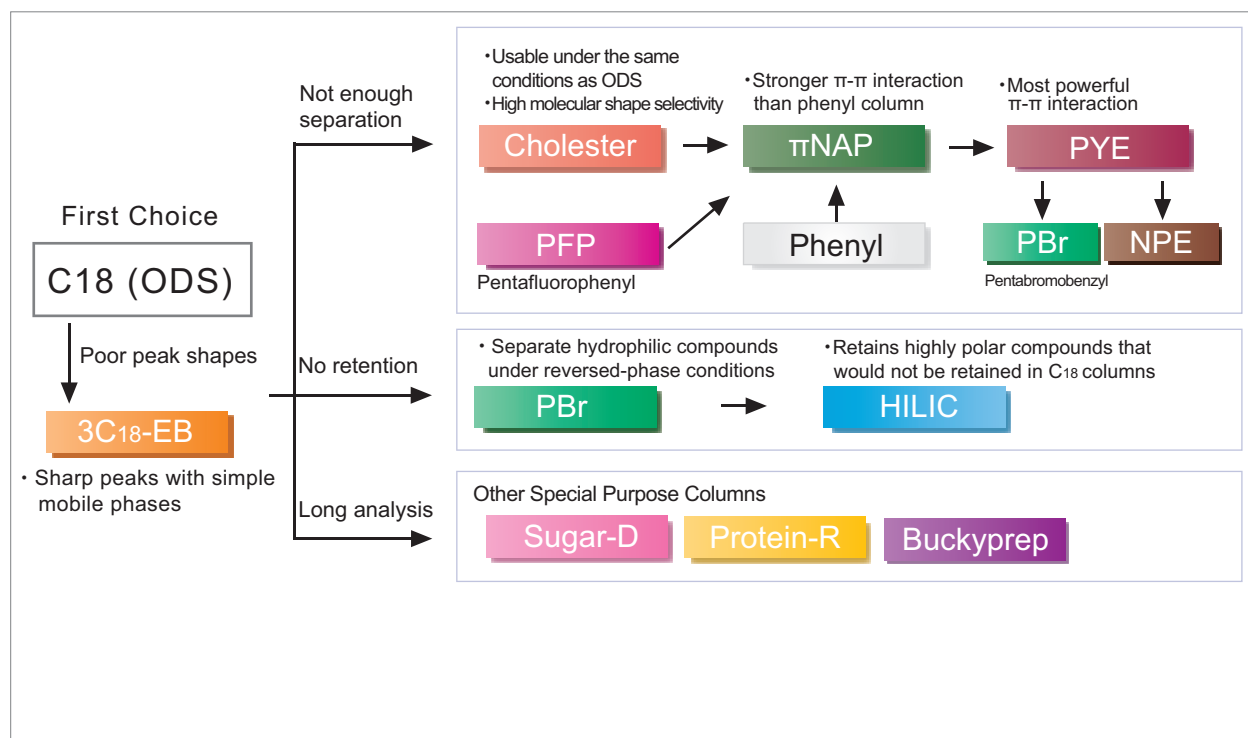
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## About Cholester

Cholester is a silica-based reversed-phase column using cholesterol as the bonded phase. It has similar hydrophobicity to C<sub>18</sub> (ODS) and, with superior stereoselectivity, it is suitable for compounds with similar hydrophobicity but slightly different molecular shape.

Our COSMOSIL series features many packing materials, such as  $\pi$ NAP, NPE, PYE and PBr, that can separate compounds difficult to separate using ODS. However, these materials utilize several kinds of molecular interaction, so it is necessary to reconsider analysis conditions. Designed for ease of use, Cholester can be used under solvent and other analytical conditions identical to ODS.

## Column Selection Guide by Stationary Phase

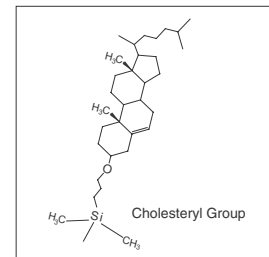




COSMOSIL

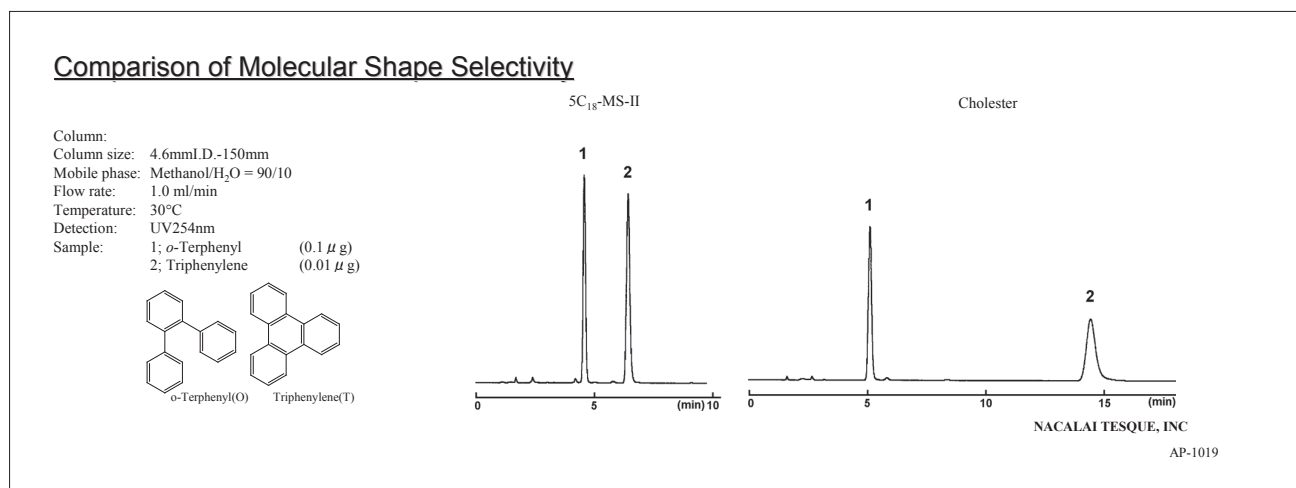
# Cholesterol-Bonded HPLC Column COSMOSIL / COSMOCORECholester

- Better selectivity for *cis-trans* isomers, polyphenols, and natural products
- Cholesterol-bonded reversed-phase column
- Usable under the same conditions as  $C_{18}$  columns
- Available particle sizes:  $5\ \mu\text{m}$ ,  $2.5\ \mu\text{m}$ ,  $2.6\ \mu\text{m}$  core-shell



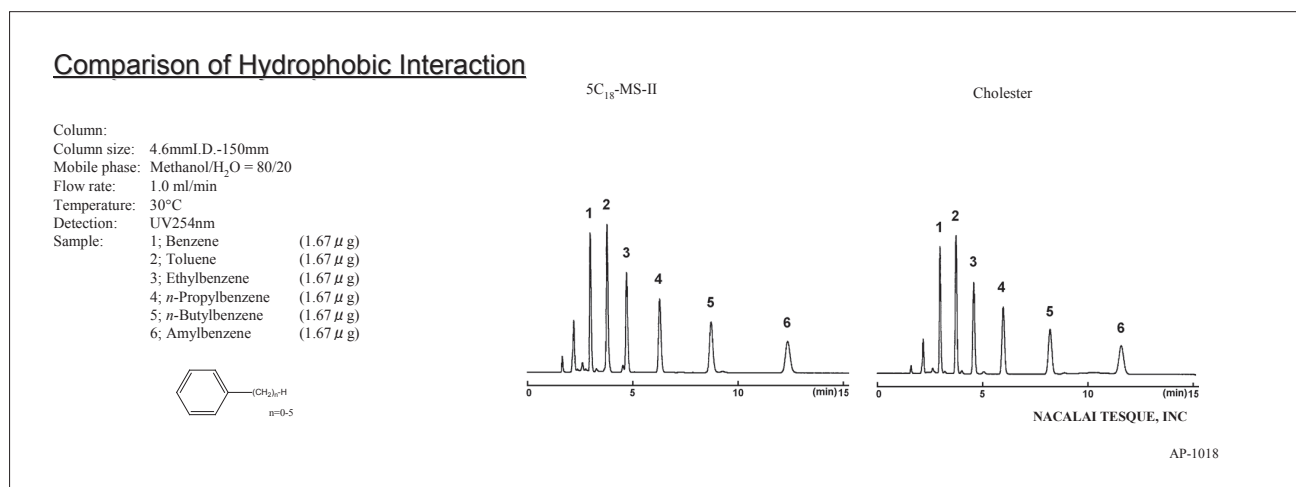
## Feature 1 : Greater planarity selectivity than $C_{18}$ columns

Cholester shows greater planarity selectivity. (Planarity: *o*-Terphenyl < Triphenylene)



## Feature 2 : Usable under the same conditions as $C_{18}$ columns

COSMOSIL Cholester provides the same hydrophobicity as ODS columns.

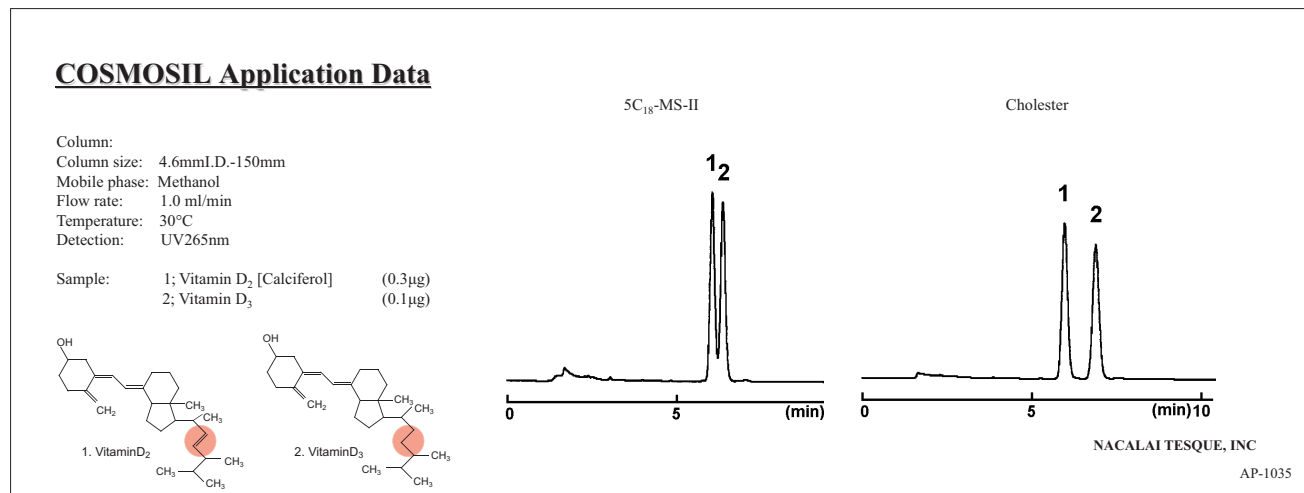


## Separation Characteristics

Cholester has superior molecular shape recognition and is suitable for compounds with different planarity or size.

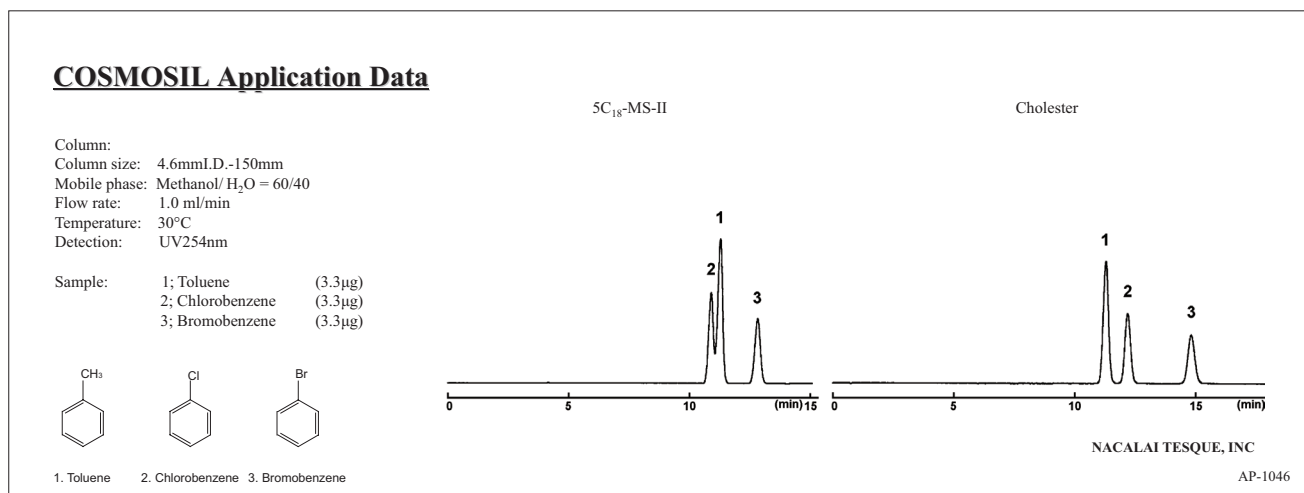
### • Stereoisomers like Vitamin D

Cholesteryl bonded groups are very rigid structures and offer improved separation of compounds that are difficult to analyze with alkyl group-bonded materials.



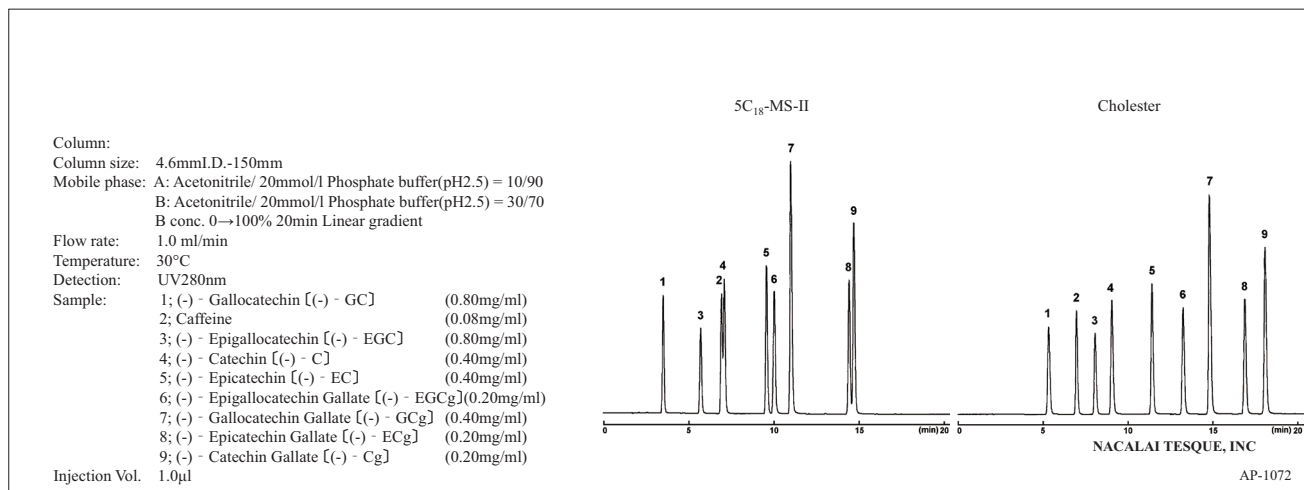
### • Organic Halides (Relative Strengths of Nucleophiles : Methyl < Chlorine < Bromine)

COSMOSIL Cholester is more selective for organic halides.



### • Catechins

Cholester exhibits greater retention for phenolic hydroxyl groups than C<sub>18</sub>. Therefore, it yields better separation for catechins.



## Available Phases

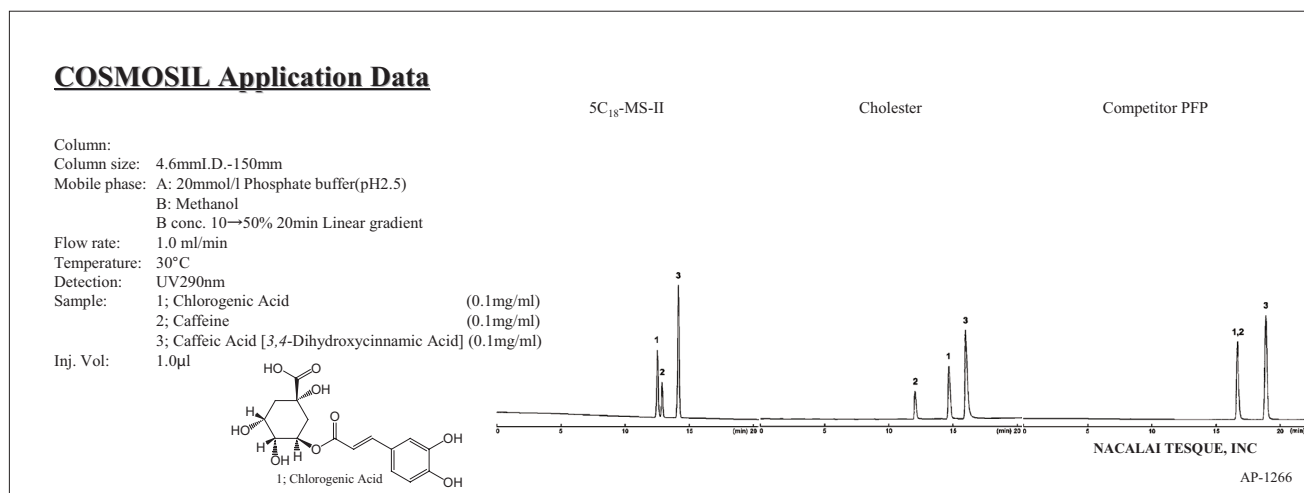
Packing Material	COSMOSIL 5Cholester	COSMOSIL 2.5Cholester	COSMOCORE 2.6Cholester
Silica gel	High purity porous spherical silica		Core-shell type silica gel
Average particle size	5 $\mu\text{m}$	2.5 $\mu\text{m}$	2.6 $\mu\text{m}$
Average pore size	approx. 120 $\text{\AA}$	approx. 130 $\text{\AA}$	approx. 90 $\text{\AA}$
Specific surface area	approx. 300 $\text{m}^2/\text{g}$	approx. 330 $\text{m}^2/\text{g}$	approx. 150 $\text{m}^2/\text{g}$
Stationary phase	Cholesteryl Group		
Endcapping treatment	Yes		
Usable pH range	2 - 7.5		1.5 - 10
Maximum puresure	20MPa	30MPa	60MPa

## HPLC Column (COSMOSIL Cholester)

COSMOSIL Cholester consists of cholesteryl group-bonded 5  $\mu\text{m}$  silica gel. Many column sizes, including preparative, are available.

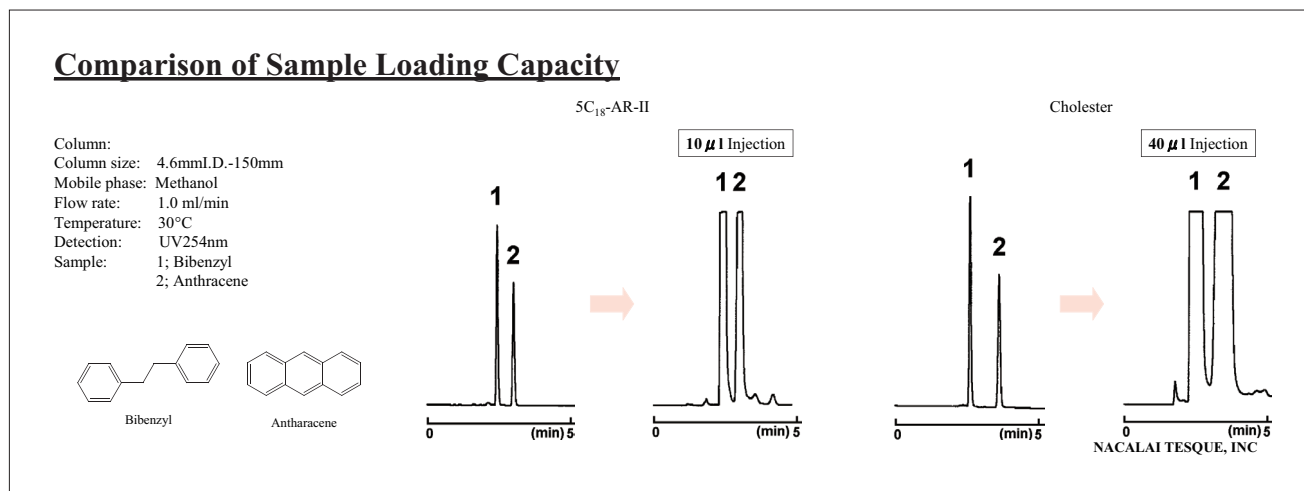
### • Comparison to competitor's PFP

PFP is frequently used when separation with  $\text{C}_{18}$  is insufficient. Compared to PFP, Cholester has superior stereoselectivity.



### • Preparative sizes

COSMOSIL Cholester is available in sizes for preparative chromatography. Better separation increases sample loading capacity, yielding more material in the same time.

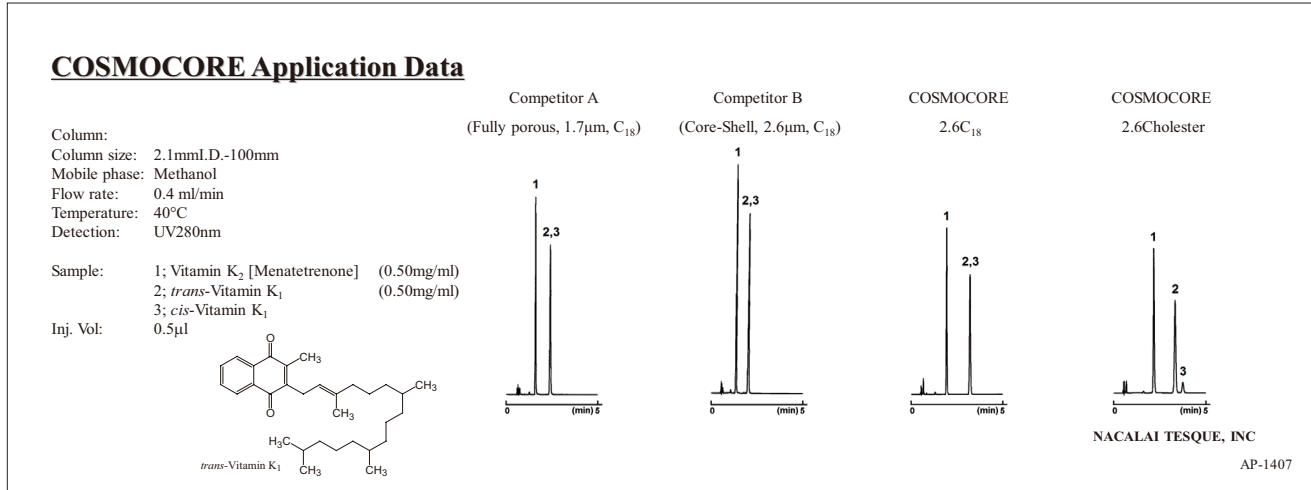


## Ultra-High Performance Columns (COSMOCORE 2.6Cholester / COSMOSIL 2.5Cholester)

Cholester is also available for UHPLC with two particle types: 2.6  $\mu\text{m}$  core-shell and 2.5  $\mu\text{m}$  fully-porous. These should be considered when separation using a UHPLC  $\text{C}_{18}$  column is insufficient.

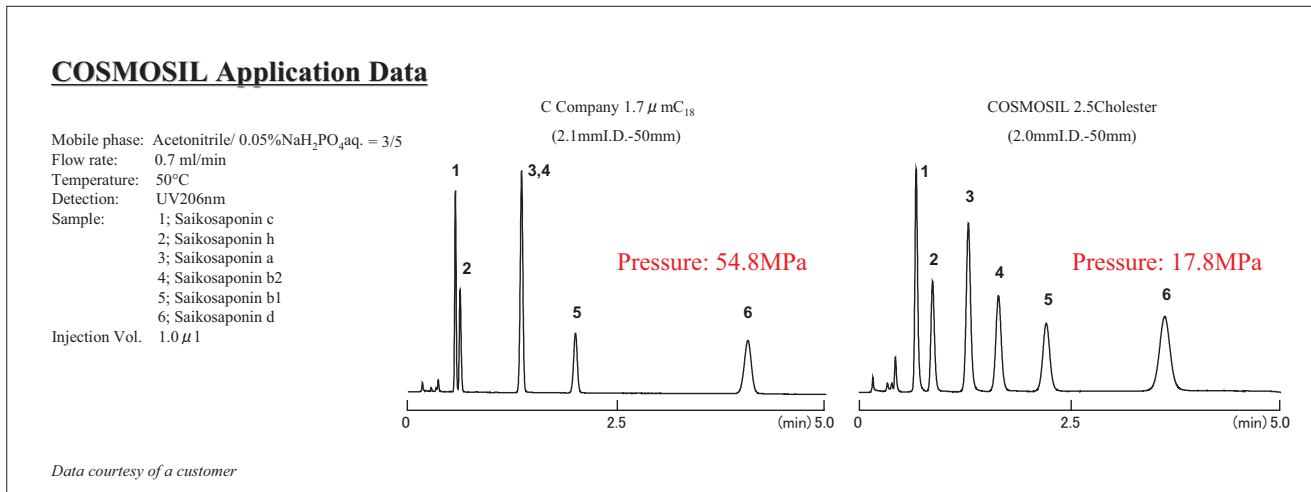
### COSMOCORE 2.6Cholester

Core-shell particles maintain the high efficiency of sub-2  $\mu\text{m}$  particles but exhibit lower backpressure.



### COSMOSIL 2.5Cholester

With fully porous particles, methods developed on these columns can be easily transferred to 5  $\mu\text{m}$  Cholester columns.



## Fittings and adapters

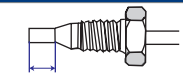
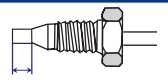
COSMOCORE columns use the same connectors as Waters UPLC® (UHPLC) columns. This is different from our conventional COSMOSIL columns, which use the conventional Waters HPLC-compatible connectors. (UPLC® is a registered trademark of Waters Corporation.)

### Differences between end fitting

Connection type		Column	
		HPLC(COSMOSIL)	UHPLC (COSMOCORE)
Instrument	HPLC	No adapter required	Adapter required
	UHPLC	Adapter required	No adapter required

HPLC: Conventional Waters-compatible connector

UHPLC: Waters UPLC®-compatible connector

	HPLC	UHPLC
Connector shape	 approx. 3.3 mm	 approx. 2.3 mm

The length of tubing that extends from the ferrule differs from HPLC to UHPLC.

## Ordering Information

### COSMOSIL Cholester Packed Column

Column Size	Product Number
1.0 mm I.D. x 150 mm	05968-71
1.0 mm I.D. x 250 mm	05969-61
2.0 mm I.D. x 30 mm	08565-51
2.0 mm I.D. x 50 mm	06352-91
2.0 mm I.D. x 100 mm	06948-01
2.0 mm I.D. x 150 mm	05971-11
2.0 mm I.D. x 250 mm	05972-01
3.0 mm I.D. x 150 mm	05973-91
3.0 mm I.D. x 250 mm	05974-81
4.6 mm I.D. x 150 mm*	05976-61

### COSMOSIL Cholester Guard Column

Column Size	Product Number
4.6 mm I.D. x 10 mm	05975-71
10.0 mm I.D. x 20 mm	05978-41
20.0 mm I.D. x 20 mm	05980-91
20.0 mm I.D. x 50 mm	05981-81
28.0 mm I.D. x 50 mm	05983-61

\* Validated columns

### COSMOCORE 2.6Cholester Packed Column

Column Size	Product Number
2.1 mm I.D. x 30 mm	12858-91
2.1 mm I.D. x 50 mm	12859-81
2.1 mm I.D. x 75 mm	12860-41
2.1 mm I.D. x 100 mm	12861-31
2.1 mm I.D. x 150 mm	12862-21

Column Size	Product Number
3.0 mm I.D. x 30 mm	12863-11
3.0 mm I.D. x 50 mm	12864-01
3.0 mm I.D. x 75 mm	12866-81
3.0 mm I.D. x 100 mm	12867-71
3.0 mm I.D. x 150 mm	12868-61

Column Size	Product Number
4.6 mm I.D. x 30 mm	12869-51
4.6 mm I.D. x 50 mm	12870-11
4.6 mm I.D. x 75 mm	12871-01
4.6 mm I.D. x 100 mm	12872-91
4.6 mm I.D. x 150 mm	12873-81
4.6 mm I.D. x 250 mm	12875-61

### COSMOSIL 2.5Cholester Packed Column

Column Size	Product Number
2.0 mm I.D. x 50 mm	11766-21
2.0 mm I.D. x 75 mm	11768-01
2.0 mm I.D. x 100 mm	11769-91
2.0 mm I.D. x 150 mm	11770-51

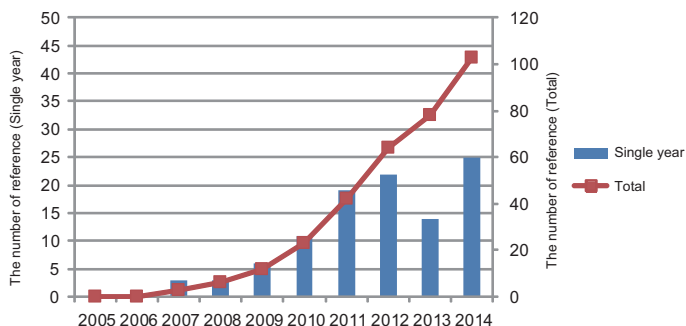
Column Size	Product Number
3.0 mm I.D. x 50 mm	11771-41
3.0 mm I.D. x 75 mm	11772-31
3.0 mm I.D. x 100 mm	11773-21
3.0 mm I.D. x 150 mm	11774-11

# Cholester Reference List

## The number of COSMOSIL Cholester reference

The number of COSMOSIL Cholester references has grown to over 100 since its introduction in 2005. (Reference Search: Google Scholar, as of July 2014)

### The number of references to COSMOSIL Cholester and 2.5Cholester



## Cholester Reference List

Analytes and analysis conditions are listed where available. For more details, please see the original article.

### Medicinal Chemistry

No	Title	Journal	Sample	Mobile Phase	Detection
1	Tobacco NUP1 transports both tobacco alkaloids and vitamin B6	Phytochemistry, 113,33-40,2015	Vitamin B6(Pyridoxamine/Pyridoxine/Pyridoxal)	25mmol/l Phosphate Buffer (pH4.0)	fluorescence detector (Ex.328nm, Em. 393nm)
			Adenine	20mmol/l Phosphate Buffer (pH7.0)	UV 254nm
2	Characterization of thechemical diversity of glycosylated mycosporine-likeamino acids in the terrestrialcyanobacterium Nostoc commune	J. Photochem. Photobiol. B.,142,154-168,2015	Mycosporine-like amino acids	Methanol/0.1% Acetic Acid-water = 10/90	UV 330nm
3	Elongation of amyloid fibrils through lateral binding of monomers revealed by total internal reflection fluorescence microscopy	Biochim. Biophys. Acta.,1844 (10),1881-1888,2014	IAPP-Alexa532	Acetonitrile/0.05%TFA-water=20/80→60/40 (Gradient,45min)	—
4	Operon for Biosynthesis of Lipstatin, the β-Lactone Inhibitor of Human Pancreatic Lipase	Appl. Environ. Microbiol.,80 (24),7473-7483,2014	Lipstatin	A:Water B:Methanol B conc. 80% (0-10min), 80→90% (10-11min), 90% (11-20min), 90→100% (20-21min), 100% (21-25min), 100→80% (25-26min), 80% (26-35min)	UV 210nm LC/MS
5	Oleo gum resin of Ferula assa-foetida L. ameliorates peripheral neuropathy in mice	J. Ethnopharmacol., 154(1),183-189,2014	Free Ferulic acid/ Umbelliferone/Foetidin	Methanol/Water=80/20	UV 290-310nm
6	Regulation of Cytochrome b5 Expression by miR-223 in Human Liver: Effects on Cytochrome P450 Activities	Pharm. Res.,31 (3),780-794 ,2014	6β-Hydroxytestosterone	Methanol/10mmol/l Potassium Phosphate Buffer (pH 7.4) = 50/50	UV 240nm
7	Development of a Practical and Scalable Synthesis of the Side Chain for ASP9726, a Successor of Micafungin	Org. Process Res. Dev.,17 (10),1252-1260,2013	cis/trans- Methyl 4-{5-[4-(4-Cyclohexyl-4-methoxypiperidin-1-yl)phenyl]-1,3,4-thiadiazol-2-yl}cyclohexane-1-carboxylate	Acetonitrile/50mmol/l Perchloric Acid Buffer (pH2.0) =75/25	UV 254nm
8	Structural Determinants in Protein Folding: A Single Conserved Hydrophobic Residue Determines Folding of EGF Domains	ACS Chem. Biol.,8 (1),161-169,2013	t-TMEGF4 peptides	Methanol/0.1%TFA-water ,gradient	—
			t-TMEGF4-Y25T	Methanol/10mmol/l Heptafluorobutyric Acid(HFBA)-water gradient	



## ■ Medicinal Chemistry (Continued)

No	Title	Journal	Sample	Mobile Phase	Detection
9	Chlorogenic acid from the Japanese herbal medicine Kinginka ( <i>Flos Lonicerae japonicae</i> ) suppresses the expression of inducible nitric oxide synthase in rat hepatocytes	HOAJ Biology,1,2012	Chlorogenic acid	A:5%Acetic Acid-water B:Acetonitrile B conc. 10→50% ,35min linear gradient	UV 254nm
10	Nobiletin improves hyperglycemia and insulin resistance in obese diabetic ob/ob mice	Biochem. Pharmacol.,79 (11),1674–1683,2010	Nobiletin	Methanol/0.1%TFA-water=75/25	UV 260nm
11	Oxidative Status of DJ-1-dependent Activation of Dopamine Synthesis through Interaction of Tyrosine Hydroxylase and 4-Dihydroxy-l-phenylalanine (l-DOPA) Decarboxylase with DJ-1	J. Biol. Chem.,284 (42),28832-28844,2009	L-DOPA	Methanol/50mmol/l Potassium Phosphate (pH2.6), 0.1mmol/l EDTA, 0.2mmol/l Heptane Sulfonic Acid=10/90	—

## ■ Radiochemistry

No	Title	Journal	Sample	Mobile Phase	Detection
12	Synthesis of <sup>11</sup> C-labeled retinoic acid, [ <sup>11</sup> C] ATRA, via an alkenylboron precursor by Pd(0)-mediated rapid C-[ <sup>11</sup> C]methylation	Bioorg. Med. Chem. Lett.,24 (15),3622-3625,2014	[ <sup>11</sup> C]ATRA ( <sup>11</sup> C-incorporated All-trans-retinoic Acid)	Acetonitrile/0.2%Formic Acid-water=90/10	UV 360nm
13	Binding potential of (E)-[ <sup>11</sup> C]ABP688 to metabotropic glutamate receptor subtype 5 is decreased by the inclusion of its <sup>11</sup> C-labelled Z-isomer	Nucl. Med. Biol,41 (1),17-23,2014	E/Z-[ <sup>11</sup> C]ABP688	Acetonitrile/Water=50/50	UV 310nm/ Radioation detector
14	Preparation and stability of ethanol-free solution of [ <sup>18</sup> F]florbetapir ([ <sup>18</sup> F]AV-45) for positron emission tomography amyloid imaging	J. Labelled Comp. Radiopharm.,56 (5),295-300,2013	[ <sup>18</sup> F]florbetapir ([ <sup>18</sup> F]AV-45)	Acetonitrile/50mmol/l Ammonium Acetate (pH4.6 with Acetic acid)/25% Ascorbic Acid-water = 260/238/2	UV 320nm
15	Dynamic Analysis of GI Absorption and Hepatic Distribution Processes of Telmisartan in Rats Using Positron Emission Tomography	Pharm. Res.,29 (9),2419-2431,2012	[ <sup>11</sup> C]Telmisartan	Acetonitrile/10mmol/l Ammonium Acetate (pH4.5 with Formic acid) = 55/45	—
16	Fully automated synthesis and purification of 4-(2'-methoxyphenyl)-1-[2'-(N-2"-pyridinyl)-p-[ <sup>18</sup> F]fluorobenzamido]ethylpiperazine	J. Labelled Comp. Radiopharm.,55 (3),120-124,2012	p-[ <sup>18</sup> F]MPPF/p-MPPNO2	Acetonitrile/25mmol/l Ammonium Acetate/Acetic Acid = 200/300/0.15	UV 274nm
17	The Involvement of Organic Anion transporting Polypeptide in the Hepatic Uptake of Telmisartan in Rats: PET Studies with [ <sup>11</sup> C]Telmisartan	Mol. Pharm.,8 (5),1789–1798,2011	[ <sup>11</sup> C]Telmisartan/ Telmisartan	Acetonitrile/10mmol/l Ammonium Acetate (pH4.5) = 55/45	—
18	First automatic radiosynthesis of <sup>11</sup> C labeled Telmisartan using a multipurpose synthesizer for clinical research use	Ann. Nucl. Med.,25 (5),333-337,2011	[ <sup>11</sup> C]Telmisartan	Acetonitrile/10mmol/l Sodium Dihydrogenphosphate Dihydrate=70/30	UV 254nm / Radioation detector
19	Practical synthesis of precursor of [N-methyl- <sup>11</sup> C]vorozole, an efficient PET tracer targeting aromatase in the brain	Bioorg. Med. Chem.,19 (4),1464-1470,2011	[N-methyl- <sup>11</sup> C] Vorozole/ Norvorozole	—	—

## ■ Microbial Chemistry

No	Title	Journal	Sample	Mobile Phase	Detection
20	5-Alkyl-1,2,3,4-tetrahydroquinolines, New Membrane-Interacting Lipophilic Metabolites Produced by Combined Culture of <i>Streptomyces nigrescens</i> and <i>Tsukamurella pulmonis</i>	Org. Lett., 17, 1918–1921, 2015	5-alkyl-1,2,3,4-tetrahydroquinolines (5aTHQs)	Methanol/Water=90/10	UV 254nm
21	Complete Stereochemistry and Preliminary Structure–Activity Relationship of Rakicidin A, a Hypoxia-Selective Cytotoxin from <i>Micromonospora</i> sp.	J. Nat. Prod.,77 (11),2561-2565,2014	Rakicidin A/Rakicidin B/ Rakicidin E TetrahydroRakicidin A	Acetonitrile/Water=70/30 Acetonitrile/Water, Gradient	UV 280nm UV 210nm

## ■ Herbal Medicine

No	Title	Journal	Sample	Mobile Phase	Detection
22	Grevillosides J–Q, Arbutin Derivatives from the Leaves of <i>Grevillea robusta</i> and Their Melanogenesis Inhibitory Activity	Chem. Pharm. Bull.,62 (4),364-372,2014	Grevillosides L	—	—
23	Inhibitory effect of chemical constituents from <i>Artemisia scoparia</i> Waldst. et Kit. on triglyceride accumulation in 3T3-L1 cells and nitric oxide production in RAW 264.7 cells	J. Nat. Med.,68 (2),414-420,2014	—	—	—
24	The supercritical CO <sub>2</sub> extract from the skin of <i>Bufo bufo</i> gargarizans Cantor blocks hepatitis B virus antigen secretion in HepG2.2.15 cells	BioSci. Trends,8 (1),38-44,2014	Resibufogenin/ Cinobufagin	Acetonitrile/Water=45/55	UV 200-400nm

■ Herbal Medicine (Continued)

No	Title	Journal	Sample	Mobile Phase	Detection
25	Schoepfiajasmins A–H: C-Glycosyl Dihydrochalcones, Dihydrochalcone Glycoside, C-Glycosyl Flavanones, Flavanone Glycoside and Flavone Glycoside from the Branches of Schoepfia jasminodora	Chem. Pharm. Bull.,61 (11),1136–1142,2013	Schoepfiajasmin F	Methanol/Water=30/70	–
26	Medicinal Flowers. XXXX. Structures of Dihydroisocoumarin Glycosides and Inhibitory Effects on Aldose Reductase from the Flowers of Hydrangea macrophylla var. thunbergii	Chem. Pharm. Bull.,61 (6),655-661,2013	Neochlorogenic acid/3-O-trans-p-coumaroyl-d-quinic acid/3-O-cis-p-coumaroyl-d-quinic acid/chlorogenic acid/ taxiphyllin/umbelliferone glucoside/α-morroniside hydrangenol 8-O-β-d-glucopyranoside/ chlorogenic acid methyl ester 4-hydroxythunberginol G 3'-O-β-d-glucopyranoside/hydrangenol 8-O-β-d-glucopyranoside/ trans-p-coumaric acid thunberginol G 8-O-β-d-glucopyranoside/ thunberginol C 8-O-β-d-glucopyranoside/(3R)-phyllodulcin 8-O-β-d-glucopyranoside florahydroside I/ florahydroside II/ thunberginol D 3'-O-β-d-glucopyranoside/ (3S)-phyllodulcin 8-O-β-d-glucopyranoside/ (+)-hydrangenol 4'-O-β-d-glucopyranoside/ thunberginol G 3'-O-β-d-glucopyranoside	Methanol/Water=20/80 Methanol/Water=30/70 Methanol/Water=40/60 Methanol/Water=40/60 Methanol/Water=40/60	–
27	Isolation of phenolic constituents and characterization of antioxidant markers from sunflower (Helianthus annuus) seed extract	Phytochemistry Letters,6 (2),302-305,2013	Benzyl alcohol β-D-apiofuranosyl-(1→6)-β-D-(4-O-caffeoyl) glucopyranoside hydrolyzed	10mmol/l Phosphoric Acid/10mmol/l Potassium Dihydrogenphosphate/ Methanol=37.5/37.5/25	UV 280nm
28	Occurrence of bergenin phenylpropanoates in Vatica bantamensis	Phytochemistry Letters,5 (4),743-746,2012	Bergenin 11-O-E-ferulate/ Bergenin 11-O-Z-ferulate	Methanol/Water=70/30	UV 260nm
29	New sesquiterpene lactone glucosides from the roots of Ferula varia	Phytochemistry Letters,5 (4),729-733,2012	*Please see the original article	Methanol/Water=30/70	–
30	Two secopregnane-type steroidal glycosides from Cynanchum stauntonii (Decne.) Schltr. ex Levl.	Phytochemistry Letters,5 (2),304-308,2012	Stauntosaponin A/ Hirundoside A/ Glaucogenin C mono-D-thevetoside/ Glaucogenin C/Cynatratoside A Stauntosaponin B/ anhydrohirundigenin monothevetoside	Methanol/Water = 60/40	UV 230nm
31	Isolation and Characterization of Phenolic Antioxidants from Plantago Herb	Molecules,17 (5),5459-5466,2012	2-(3,4-Dihydroxyphenyl) ethyl 3-O-b-D-allopyranosyl-6-O-D-(4-O-caffeoyl-b-D-glucopyranoside	Methanol/10mmol/l Phosphoric Acid/10mmol/l Potassium Dihydrogenphosphate =25/37.5/37.5	UV 280nm
32	Novel quinolinone alkaloids bearing a lignoid moiety and related constituents in the leaves of Melicope denhamii	Tetrahedron,68 (10),2421–2428,2012	Melicodin A/Melicodin B/ Isoevodionol/Evodionol methyl ether Melicodin C/Melicodenine B Melicodenine F Melicodenine D/ Melicobisquinolinone B	Acetonitrile/Water=42/58 Acetonitrile/Water=48/52 Methanol/Water=70/30 Acetonitrile/Water=50/50	–
33	Flavonol Acylglycosides from Flower of Albizia julibrissin and Their Inhibitory Effects on Lipid Accumulation in 3T3-L1 Cells	Chem. Pharm. Bull.,60 (1),129-136,2012	Flavonol Acylglycosides	–	–

## Herbal Medicine (Continued)

No	Title	Journal	Sample	Mobile Phase	Detection
34	Conjugates of betulin derivatives with AZT as potent anti-HIV agents	Bioorg. Med. Chem., 18 (17),6451-6469,2010	Betulin derivatives with AZT		—
			1-(3'-Azido-3'-deoxythymidine-5'-yl)-4-[3-O-(4'-benzhydryloxy-3',3'-dimethylsuccinyl)-lup-20(29)en-28-yl] 2,2-dimethylsuccinate [No.36]/4-(3'-Azido-3'-deoxythymidine-5'-yl)-1-[3-O-(4'-benzhydryloxy-3',3'-dimethylsuccinyl)-lup-20(29)en-28-yl] 2,2-dimethylsuccinate [No.37]	Methanol/Water=97/3	
			1-(3'-Azido-3'-deoxythymidine-5'-yl)-4-[3-O-(4'-benzhydryl-3',3'-dimethylsuccinyl)-lup-28-yl] 2,2-dimethylsuccinate [No.41]/4-(3'-Azido-3'-deoxythymidine-5'-yl)-1-[3-O-(4'-benzhydryl-3',3'-dimethylsuccinyl)-lup-28-yl] 2,2-dimethylsuccinate [No.42]	Methanol/Water=97/3	—
			1-(3'-Azido-3'-deoxythymidine-5'-yl)-4-[3-O-(4'-benzhydryloxyglutaryl)-lup-28-yl] 2,2-dimethylsuccinate [No.44]/4-(3'-Azido-3'-deoxythymidine-5'-yl)-1-[3-O-(4'-benzhydryloxyglutaryl)-lup-28-yl] 2,2-dimethylsuccinate [No.45]	Methanol/Water=97/3	
35	Apoptosis-inducing activity of compounds screened and characterized from cinobufacini by bioassay-guided isolation	Mol. Med. Rep,3 (4),717-722,2010	Resibufogenin/ Cinobufagin	Acetonitrile/Water=45/55	UV 296nm

## Public Health

No	Title	Journal	Sample	Mobile Phase	Detection
36	Development of an Analytical Method for Strong Mutagens/Carcinogens, 3,9-Dinitrofluoranthene and Dinitropyrene Isomers, in the Environment and Their Particle-Size Distribution in Airborne Particles	Chromatographia ,78 (1-2),55-63,2015	3,9-dinitrofluoranthene (DNF)/1,3-dinitropyrene (1,3-DNP)/1,8-dinitropyrene (1,8-DNP)/1,6-dinitropyrene (1,6-DNP)	Methanol/Water=80/20	UV 254nm

## Food Chemistry

No	Title	Journal	Sample	Mobile Phase	Detection
37	Evaluation and identification of potent angiotensin-I converting enzyme inhibitory peptide derived from dwarf gulper shark ( <i>Centrophorus atromarginatus</i> )	Journal of Food Processing and Preservation,39 (2),107-115,2015	Hippuric acid	Methanol/10mmol/l Potassium Dihydrogenphosphate (pH3.0) =50/50	UV 230nm
38	Lipase-Catalyzed Esterification of Triterpene Alcohols and Phytosterols with Oleic Acid	J. Am. Oil Chem. Soc.,91 (11),1885-1890,2014	Oleic acid esters of Phytosterols/Triterpene alcohols	Methanol Methanol 2-Propanol/Methanol=2/1	UV 205nm
39	Effect of oxygen absorber on accumulation of free fatty acids in brown rice and whole grain wheat during storage	LWT - Food Science and Technology,58 (1),222–229,2014	Fluorescence-labeled of Free Fatty Acids (C16:0/C18:0/C18:1/ C18:2)	Acetonitrile	fluorescence detector (Ex.365nm, Em 425nm)
40	Lycopene (Z) – isomers enrichment and separation	International Journal of Food Science & Technology,48 (10),2050–2056,2013	E/Z-Lycopene	Acetonitrile/THF=90/10	UV 472nm
41	Determination of Eight Kinds of Catechins in Bottled Green-tea Drinks by HPLC on a Cholesteryl Group Stationary Phase Column	BUNSEKI KAGAKU,62 (9),835-840,2013	Catechin/Epicatechin/ Gallocatechin/ Epigallocatechin/ Catechin gallate/ Epicatechin gallate/ Gallocatechin gallate/ Epigallocatechin gallate	Acetonitrile/20mmol/l Phosphoric Acid=10/90	UV 230nm

## Food Chemistry (Continued)

No	Title	Journal	Sample	Mobile Phase	Detection
42	Fermented Tea Improves Glucose Intolerance in Mice by Enhancing Translocation of Glucose Transporter 4 in Skeletal Muscle	J. Agric. Food Chem.,60 (45),11366–11371,2012	Catechin/Epicatechin/ Gallocatechin/ Epigallocatechin/ Catechin gallate/ Epicatechin gallate/ Gallocatechin gallate/ Epigallocatechin gallate/ Theaflavin/ Theaflavin-3-gallate/Theaflavin-3'-gallate/ Theaflavin-3,3'-digallate	A: 0.1%Formic Acid-water B: Acetonitrile B conc. 0% (0-2min), 0→30% (2-20min), 30→50% (20-30min), 50→100% (30-40min), 0% (40-41min), 0% (41-48min)	—
43	Triterpene saponins with hyaluronidase inhibitory activity from the seeds of <i>Camellia sinensis</i>	Chem. Pharm. Bull.,60 (5),612-623,2012	Camelliasaponin A1/ Theasaponin E5	Acetonitrile/0.05%TFA-water=42.5/57.5	UV 205nm
44	Identification of the metabolites of episesamin in rat bile and human liver microsomes.	Biol. Pharm. Bull.,35 (5),709-716,2012	Metabolites of Episesamin (7 $\alpha$ ,7 $\beta$ ,8 $\alpha$ ,8 $\alpha'$ )-3,4-dihydroxy-3',4'-methylenedioxy-7,9':7',9'-diepoxy lignane(EC-1-1)/ (7 $\alpha$ ,7 $\beta$ ,8 $\alpha$ ,8 $\alpha'$ )-3,4-methylenedioxy-3',4'-dihydroxy-7,9 :7',9'-diepoxy lignane (EC-1-2)	Methanol/0.1% Formic Acid-water =55/45	UV 280nm LC/MS
45	Caffeic Acid Oligomers with Hyaluronidase Inhibitory Activity from <i>Clinopodium gracile</i>	Chem. Pharm. Bull.,60 (4),499-507 ,2012	Apigenin-7-O-rutinoside	Acetonitrile/0.05%TFA-water=17.5/82.5	UV 280nm
			Salvianolic Acid B	Acetonitrile/0.05%TFA-water=25/75	
			Clinopodic Acid E	Acetonitrile/0.05%TFA-water=30/70	
			(2R)-3-(3,4-Dihydroxy phenyl)-2-hydroxypropionic acid/ (S)-PGME	Acetonitrile/0.05%TFA-water=15/85	
46	Effects of a <i>Citrus depressa</i> Hayata (shikuwasa) extract on obesity in high-fat diet-induced obese mice	Phytomedicine,18 (8-9),648-654,2011	Nobiletin/Tangeretin	Methanol/0.1%TFA-water=75/25	UV 215nm
47	Preparative Separation of cis- and trans-Isomers of Unsaturated Fatty Acid Methyl Esters Contained in Edible Oils by Reversed-Phase High-Performance Liquid Chromatography	Lipids ,44 (4),373-379,2009	Saturated or Unsaturated Fatty Acid Methyl Esters	Acetonitrile/Water=85/15	—
				Acetonitrile/Water=90/10	
				Acetonitrile	

## Environmental Chemistry

No	Title	Journal	Sample	Mobile Phase	Detection
48	Detoxification of microcystin-LR in water by <i>Portulaca oleracea</i> cv.	J. Biosci. Bioeng.,117 (3),330–332,2014	Microcystin-LR	Methanol/50mmol/ l Potassium Dihydrogenphosphate (pH 3) = 58/42	UV 238nm
49	Improvement of the Analytical Method for Quinoid Polycyclic Aromatic Hydrocarbons Using HPLC with In-line Reduction and Fluorescence Detection: Application to Soluble Organic Fraction of Airborne Particles	BUNSEKI KAGAKU ,62 (11),979-984,2013	PAHQs(7,12-BAQ/ 2,3-FIQ/1,6-PyQ/1,8-PyQ)	A:Water B:Methanol B conc. 50% (0-16min), 50→55% (16-35min), 55→60% (35-45min), 60→90% (45-75min), 90% (75-85min), 90-100% (85-90min), 100% (90-100min)	fluorescence detector

## Chemistry of Natural Compounds

No	Title	Journal	Sample	Mobile Phase	Detection
50	Inhibitory Effects of <i>Gymnema (Gymnema sylvestri)</i> Leaves on Tumour Promotion in Two-Stage Mouse Skin Carcinogenesis	Evid. Based Complement. Alternat. Med.,2014	*Please see the original article	—	—
51	<i>Aspergillus oryzae</i> CsyB Catalyzes the Condensation of Two $\beta$ -Ketoacyl-CoAs to Form 3-Acetyl-4-hydroxy-6-alkyl- $\alpha$ -pyrone	J. Biol. Chem.,289 (29),19976-19984,2014	CsyB	Methanol/0.1% Formic Acid-water, Gradient	UV 310nm
52	Bioactive Sesquiterpene Aryl Esters from the Culture Broth of <i>Armillaria</i> sp.	J. Nat. Prod.,78 (1),163-167,2015	Melleolide	Methanol/Water=60/40	—
			Armillarinin/Armillaridin/ Armillarikin	Methanol/Water=70/30	
			13-Hydroxymelleolide K/5'-O-Methylmelledonal	Methanol/Water=60/40	
			Melleolide D	Methanol/Water=60/40	
			13-Hydroxydihydro melleolide	Methanol/Water=60/40	

■ Chemistry of Natural Compounds (Continued)

No	Title	Journal	Sample	Mobile Phase	Detection
53	Nocapyrones: $\alpha$ - and $\gamma$ -Pyrone from a Marine-Derived Nocardiosis sp.	Mar. Drugs,12 (7),4110-4125,2014	Nocapyrone R/ Nocapyrone L	Acetonitrile/Water=55/45	—
54	Kurahamide, a Cyclic Depsipeptide Analog of Dolastatin 13 from a Marine Cyanobacterial Assemblage of Lyngbya sp.	Bull. Chem. Soc. Jpn., 87 (5),609-613,2014	Kurahamide	Acetonitrile/Water=40/60	UV 215nm
55	Biselyngbyolide B, a Novel ER Stress-inducer Isolated from the Marine Cyanobacterium Lyngbya sp.	Chem. Lett.,43 (3),287-289,2014	Biselyngbyolide B/ Biselyngbyaside B	Methanol/Water	—
56	Antiviral activity of extracts from Morinda citrifolia leaves and chlorophyll catabolites, pheophorbide a and pyropheophorbide a, against hepatitis C virus	Microbiol. Immunol.,58 (3),188-194,2014	Antiviral activity of extracts	—	UV 400nm
57	Kurahyne, an acetylene-containing lipopeptide from a marine cyanobacterial assemblage of Lyngbya sp.	RSC Adv.,4,12840-12843,2014	Kurahyne	Acetonitrile/Water	—
58	Nagelamide I and 2,2'-Didebromonagelamide B, New Dimeric Bromopyrrole-Imidazole Alkaloids from a Marine Sponge Agelas sp.	Chem. Pharm. Bull.,62 (2),213-216,2014	2,2'-Didebromo nagelamide B	Acetonitrile/0.1%TFA-water=25/75	UV 254nm
59	Fargesin, a component of Flos Magnoliae, stimulates glucose uptake in L6 myotubes	J. Nat. Med.,67 (2),320-326 ,2013	Kobusin/Epimagnolin	Acetonitrile/Water = 50/50	UV 215nm
60	Agelasines O-U, new diterpene alkaloids with a 9-N-methyladenine unit from a marine sponge Agelas sp.	Tetrahedron,68 (47),9738-9744,2012	Agelasines Q/Agelasines R	Methanol/0.1%TFA-water=75/25	UV 254nm
61	Induced production of mycotoxins in an endophytic fungus from the medicinal plant Datura stramonium L.	Bioorg. Med. Chem. Lett., 22 (20),6397-6400,2012	Alternariol/Alternariol-5-O-methyl ether/3'-hydroxyalternariol-5-O-Methyl ether/Altenusin/ Tenuazonic Acid/ Altetoxin II	A:0.1%TFA-water B:0.1%TFA-acetonitrile	UV 280nm
62	Fargesin improves lipid and glucose metabolism in 3T3-L1 adipocytes and high-fat diet-induced obese mice	BioFactors,38 (4),300-308,2012	Fargesin	Acetonitrile/Water=50/50	UV 215nm
63	Isolation and structures of biselyngbyasides B, C, and D from the marine cyanobacterium Lyngbya sp., and the biological activities of biselyngbyasides	Tetrahedron,68 (30),5984-5990,2012	Biselyngbyaside C	Acetonitrile/Water=65/35	UV 215nm
64	Makomotindoline from Makomotake, Zizania latifolia infected with Ustilago esculenta	Bioorg. Med. Chem. Lett.22 (13),4246-4248,2012	Makomotindoline	Methanol/Water=10/90	—
65	Thermally-induced geometrical isomerisation of lycopene and its potential influence on functional activity	Food Chemistry,132 (4),2112-2117,2012	E/Z-Lycopene	Acetonitrile/THF = 90/10	UV 472nm
66	Effects of veraguensin and galgravin on osteoclast differentiation and function	Cytotechnology,64 (3),315-322 ,2012	Veraguensin/Galgravin	Acetonitrile/Water=50/50	—
67	Biselyngbyolide A, a Novel Cytotoxic Macrolide from the Marine Cyanobacterium Lyngbya sp.	Chem. Lett.,41 (2),165-167,2012	Biselyngbyolide A	Methanol/Water	—
68	Calyxamides A and B, Cytotoxic Cyclic Peptides from the Marine Sponge Discodermia calyx	J. Nat. Prod.,75 (2),290-294,2012	Calyxamide A/ Calyxamide B	Acetonitrile/0.05%TFA-water=33/67	UV 280nm
69	Phenolic compounds from the cultured mycobionts of Graphis proserpens	Phytochemistry,72 (11-12),1431-1435,2011	cis-4,6-dihydroxymellein [No.8] mixture of (R,S)-and (S,R)-5,7-dihydroxy-3-(1-hydroxyethyl)phthalides [No.9] 5-Hydroxy-7-methoxy-3-(1-hydroxyethyl)phthalide [No.3]	Acetonitrile/Water=10/90	UV 250nm
70	Contribution of cinnamic acid analogues in rosmarinic acid to inhibition of snake venom induced hemorrhage	Bioorg. Med. Chem.,19 (7),2392-2396,2011	E/Z -Rosmarinic Acid	Acetonitrile/0.5%TFA-water= 20/80	UV 220nm
71	Pyripyropenes, Fungal Sesquiterpenes Conjugated with $\alpha$ -Pyrone and Pyridine Moieties, Exhibits Anti-angiogenic Activity against Human Umbilical Vein Endothelial Cells	Biol. Pharm. Bull.,32 (7),1261-1265 ,2009	Pyripyropene A/ Pyripyropene B/ Pyripyropene D	Acetonitrile/Water	—

## ■ Organic Chemistry

No	Title	Journal	Sample	Mobile Phase	Detection
72	Proton exchange reactions in isotope chemistry (II) synthesis of stable isotope-labeled LCQ908	J. Labelled Comp. Radiopharm.,57 (12),670-673,2014	cis/trans-[2H, 13C]-Ethyl 4-[4-(5-{[6-(trifluoro methyl) pyridin-3-yl]amino} pyridin-2-yl) phenyl] cyclohexyl} acetate	Methanol/Water=80/20	UV 328nm
73	Synthesis of $\alpha$ -Silylmethyl- $\alpha,\beta$ -Unsaturated Imines by the Rhodium-Catalyzed Silylimination of Primary-Alkyl-Substituted Terminal Alkynes	J. Org. Chem.,79 (17),8221–8227,2014	E/Z-4-Methyl-2-dimethylphenylsilylmethylpropenal	—	—
74	Production of 1,5-anhydro-d-fructose by an $\alpha$ -glucosidase belonging to glycoside hydrolase family 31	Biosci. Biotechnol. Biochem.,78 (12),2064-2068,2014	O-ethylxime-derivative of 1,5-Anhydro-D-fructose (AF-OH)	Acetonitrile/Water=0/100→55/45 Gradient	UV 207 nm
75	Synthesis and optical reactivity of 6,13- $\alpha$ -diketoprecursors of 2,3,9,10-tetraalkylpentacenes in solution, films and crystals	J. Mater. Chem. C., 2,986-993,2014	Tetraalkylpentacene derivative	Acetonitrile Acetonitrile/THF=80/20	—
76	Design and synthesis of novel 1,25-dihydroxyvitamin D3 analogues having a spiro-oxetane fused at the C2 position in the A-ring	Bioorg. Med. Chem.,21 (17),5209–5217,2013	(5Z,7E)-(1R,3R)-2,2-(Methyleneoxy) methano-9,10-seco-5,7,10(19)-cholestatriene 1,3,25-triol/(5Z,7E)-(1S,3S)-2,2-(Methyleneoxy)methano-9,10-seco-5,7,10(19)-cholestatriene 1,3,25-triol  (5Z,7E)-(1R,3S)-2,2-(Methyleneoxy) methano-9,10-seco-5,7,10(19)-cholestatriene 1,3,25-triol/(5Z,7E)-(1S,3R)-2,2-(Methyleneoxy)methano-9,10-seco-5,7,10(19)-cholestatriene 1,3,25-triol	Methanol/Water=75/25  Methanol/Water=75/25	—
77	Iridium-catalyzed direct borylation of phenacenes	Tetrahedron Letters,53 (9),1180–1182,2012	Diborylate chrysenes (2,8/2,9/3,9 positions)	—	—
78	Vertical orientation with a narrow distribution of helical peptides immobilized on a quartz substrate by stereocomplex formation	Soft Matter.,8,3387-3392,2012	DA16/LA16	—	—

## ■ Analytical Chemistry

No	Title	Journal	Sample	Mobile Phase	Detection
79	Cholesterol-based polymeric monolithic columns for capillary liquid chromatography	J. Chromatogr. A.,1373,114-123,2014	*Please see the original article	—	—
80	Evaluation of sphingomyelin, cholesterol, and phosphatidylcholine-based immobilized artificial membrane liquid chromatography to predict drug penetration across the blood-brain barrier	Anal. Bioanal. Chem.,406 (25),6179-6188 ,2014	*Please see the original article	Methanol/Dulbecco's Phosphate Buffered Saline (pH7.4 with Phosphoric Acid)=50/50	UV 210-300nm
81	Retention–property relationships of 1,2,4-triazoles by micellar and reversed-phase liquid chromatography	J. Sep. Sci.,37 (12),1419-1428,2014	1,2,4-triazole derivatives	Acetonitrile/Buffer	UV 230nm
82	Comparison of four cholesterol-based stationary phases for the separation of steroid hormones	J. Sep. Sci.,37 (4),345–351,2014	Estriol/Testosterone/Estrone/ $\alpha$ -Estradiol/ $\beta$ -Estradiol/progesterone	Methanol/Water=60/40	UV 220nm
83	Reversed-phase liquid chromatography with octadecylsilyl, immobilized artificial membrane and cholesterol columns in correlation studies with in silico biological descriptors of newly synthesized antiproliferative and analgesic active compounds	J. Chromatogr. A,1318,92–101,2013	*Please see the original article	Acetonitrile/Buffer Step Gradient	UV 254nm
84	Correlations between Chromatographic Parameters and Bioactivity Predictors of Potential Herbicides	J. Chromatogr. Sci,52 (7), 676-684,2014	*Please see the original article	Acetonitrile/Buffer	—
85	The use of methyl- $\beta$ -cyclodextrin to solubilize cholesterol prior to coating onto a C <sub>18</sub> stationary phase	J. Chromatogr. A,1266,69-75,2012	*Please see the original article	—	—
86	Extension of the carotenoid test to superficially porous C <sub>18</sub> bonded phases, aromatic ligand types and new classical C <sub>18</sub> bonded phases	J. Chromatogr. A., 1266,34-42,2012	*Please see the original article	—	—
87	The influence of the organic modifier in hydro-organic mobile phase on separation selectivity of steroid hormones separation using cholesterol-bonded stationary phases	J. Chromatogr. A,1245,90-97,2012	*Please see the original article	—	—
88	Chemometric methods to classify stationary phases for achiral packed column supercritical fluid chromatography	J. Chemometrics.,26 (3-4),52-65,2012	*Please see the original article	—	—

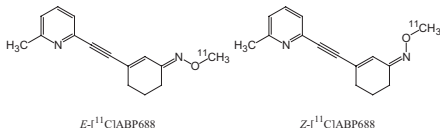
# Cholester Applications

## Radiopharmaceutical (PET)

### COSMOSIL Application Data

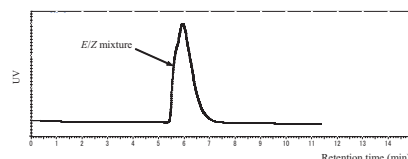
Column: COSMOSIL \*\*  
 Column size: 10mmI.D.-250mm  
 Mobile phase:  
 Flow rate:  
 Temperature: room temperature  
 Detection: UV310nm

Sample:  $E$ -[ $^{11}\text{C}$ ]ABP688 /  $Z$ -[ $^{11}\text{C}$ ]ABP688

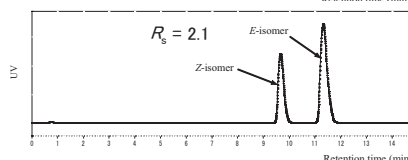


Data courtesy of a customer  
 ref. Nuclear Medicine and Biology, 41 (1), p17-23, 2014

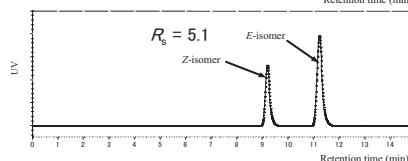
Competitor  $C_{18}$ -A  
 (Acetonitrile/ 0.1%  $\text{H}_3\text{PO}_4$   
 = 30/70, 6 ml/min)



Competitor  $C_{18}$ -B  
 (Acetonitrile/  $\text{H}_2\text{O}$  = 50/50,  
 5 ml/min)



COSMOSIL Cholester  
 (Acetonitrile/  $\text{H}_2\text{O}$  = 50/50,  
 7 ml/min)



NACALAI TESQUE, INC

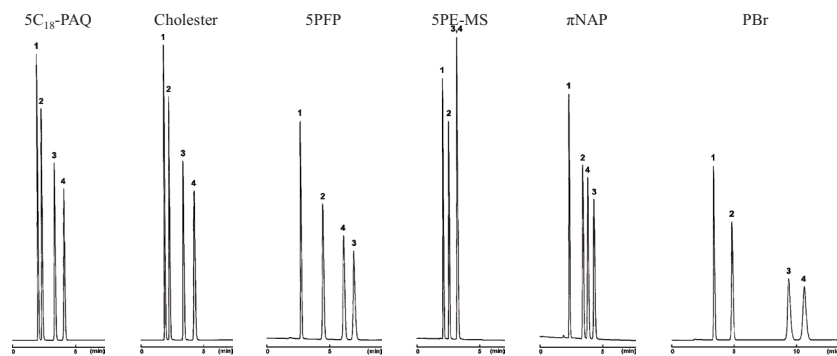
AP-1427

## Comparison of retention (Catecholamine)

### COSMOSIL Application Data

Column: COSMOSIL \*\*  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: 20mmol/l Phosphate buffer(pH2.5)  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample: 1;  $L$ -Noradrenaline (0.5mg/ml)  
 2;  $L$ -Adrenaline (0.5mg/ml)  
 3; Dopamine (0.5mg/ml)  
 4;  $L$ -DOPA (0.5mg/ml)  
 Inj.Vol.: 1.0 $\mu$ l



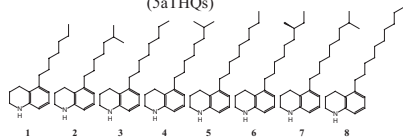
AP-1323

## Membrane-interacting lipophilic metabolites

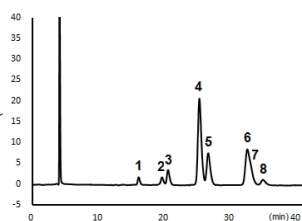
### COSMOSIL Application Data

Column: COSMOSIL \*\*  
 Column size: 4.6mmI.D.-250mm  
 Mobile phase: Methanol/  $\text{H}_2\text{O}$  = \*/\*  
 Flow rate: 0.8 ml/min  
 Temperature: 25°C  
 Detection: UV254nm

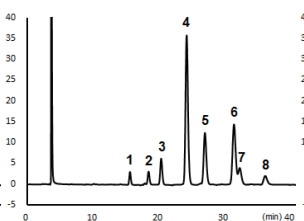
Sample: 5-alkyl-1,2,3,4-tetrahydroquinolines  
 (5aTHQs)



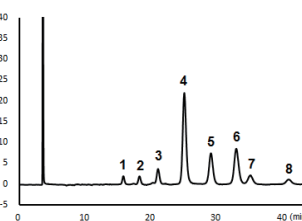
5 $C_8$ -MS  
 (Methanol/  $\text{H}_2\text{O}$  = 82.5/17.5)



5 $C_{18}$ -AR-II  
 (Methanol/  $\text{H}_2\text{O}$  = 89/11)



Cholester  
 (Methanol/  $\text{H}_2\text{O}$  = 90/10)



Data courtesy of Shinichi Nishimura, Ph. D. and Hideaki Kakeya, Ph. D. Department of System Chemotherapy and Molecular Sciences,  
 Division of Bioinformatics and Chemical Genomics, Graduate School of Pharmaceutical Sciences, Kyoto University

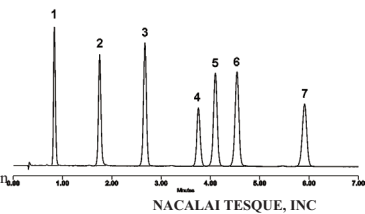
NACALAI TESQUE, INC

AP-1482

## Camptothecins

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mm I.D.-50mm  
 Mobile phase: A; 0.05% TFA-H<sub>2</sub>O  
 B; 0.05% TFA-Acetonitrile  
 B conc. 20→30% 7min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV370nm  
 Sample:  
 1; Topotecan  
 2; 9-Aminocamptothecin  
 3; 10-Hydroxycamptothecin  
 4; Irinotecan  
 5; Camptothecin  
 6; 7-Ethyl 10-Hydroxycamptothecin  
 7; 9-Nitro-20(S)-Camptothecin  
 Inj. Vol.: 0.5µl  
 Data courtesy of a LKT Laboratories, Inc

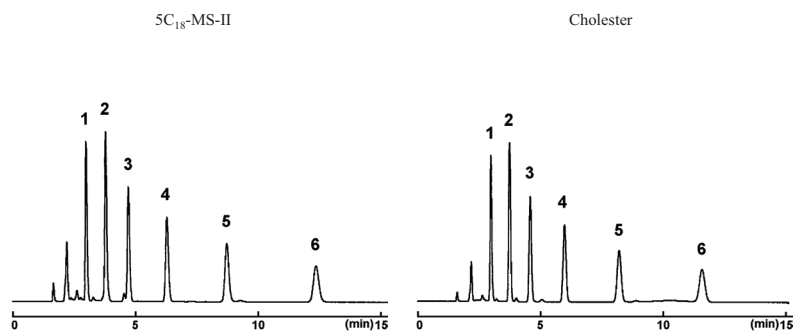


AP-1295

## Basic Characteristics

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Methanol/H<sub>2</sub>O = 80/20  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm  
 Sample:  
 1; Benzene (1.67µg)  
 2; Toluene (1.67µg)  
 3; Ethylbenzene (1.67µg)  
 4; n-Propylbenzene (1.67µg)  
 5; n-Butylbenzene (1.67µg)  
 6; Amylbenzene (1.67µg)



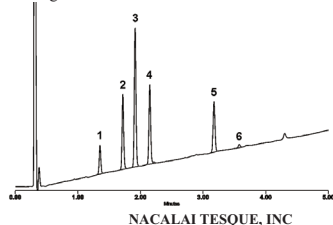
NACALAI TESQUE, INC

AP-1018

## Celery

### COSMOSIL Application Data

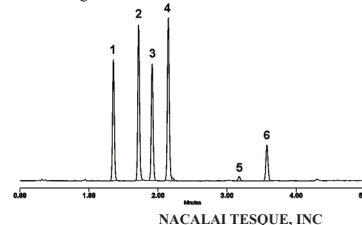
Column: 2.5Cholester  
 Column size: 2.0mm I.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 25→85% 5min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV230nm  
 Sample:  
 1; Coumarin  
 2; Luteolin  
 3; Psoralen  
 4; Apigenin  
 5; Sedanolide  
 6; trans-Anethole  
 Inj. Vol.: 0.5µl  
 Data courtesy of a LKT Laboratories, Inc



AP-1296

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mm I.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 25→85% 5min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV260nm  
 Sample:  
 1; Coumarin  
 2; Luteolin  
 3; Psoralen  
 4; Apigenin  
 5; Sedanolide  
 6; trans-Anethole  
 Inj. Vol.: 0.5µl  
 Data courtesy of a LKT Laboratories, Inc



AP-1297

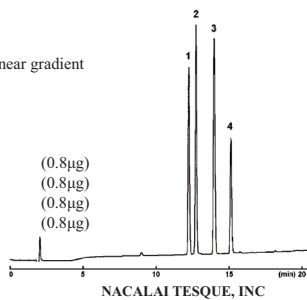


## Peptides

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: A: 0.05%TFA-H<sub>2</sub>O  
 B: 0.05%TFA-Acetonitrile  
 B conc. 10→40% 20min Linear gradient  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220nm

Sample: 1; Oxytocin (0.8µg)  
 2; Angiotensin II(Human) (0.8µg)  
 3; Angiotensin I(Human) (0.8µg)  
 4; Substance P (0.8µg)



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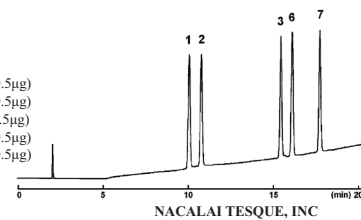
AP-0238

## Angiotensins

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: A: 0.05%TFA-10%Acetonitrile  
 B: 0.05%TFA-30%Acetonitrile  
 B conc. 0→100% 20min Linear gradient  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220nm

Sample: 1; Angiotensin II, [Sar<sup>1</sup>,Thr<sup>8</sup>] (0.5µg)  
 2; Angiotensin II, [Sar<sup>1</sup>,Ala<sup>8</sup>] (0.5µg)  
 3; Angiotensin II, Des-Asp<sup>1</sup>-[Ile<sup>6</sup>] (0.5µg)  
 6; Angiotensin II, [Val<sup>5</sup>] (0.5µg)  
 7; Angiotensin II (Human) (0.5µg)



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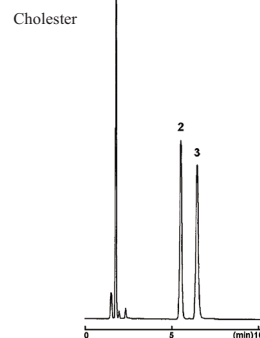
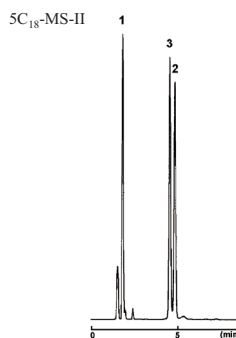
AP-0242

## Flavanones

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Acetonitrile/ 20mmol/l Phosphate  
 buffer(pH2.5) = 40/60  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample: 1; Naringin (0.4µg)  
 2; Naringenin (0.2µg)  
 3; Apigenin (0.2µg)



NACALAI TESQUE, INC

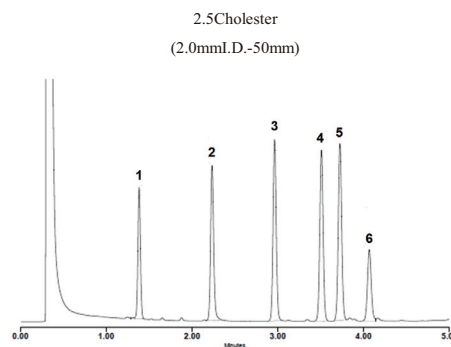
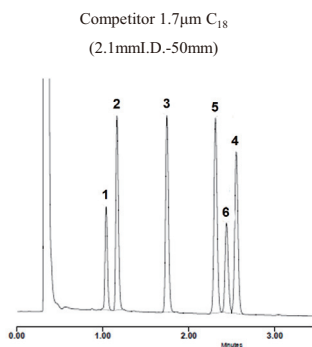
AP-1033

## Berry Flavonoids

### COSMOSIL Application Data

Column: Competitor 1.7µm C<sub>18</sub>  
 Column size: (2.1mm I.D.-50mm)  
 Mobile phase: A: 10mmol/l Phosphate buffer(pH2.6)  
 B: Acetonitrile  
 B conc. 20→50% 5min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV210nm

Sample: 1; Hesperidin [Vitamin P]  
 2; Myricetin  
 3; Luteolin  
 4; Hesperetin  
 5; Apigenin  
 6; Kaempferol  
 Inj. Vol.: 0.5µl



NACALAI TESQUE, INC

AP-1292

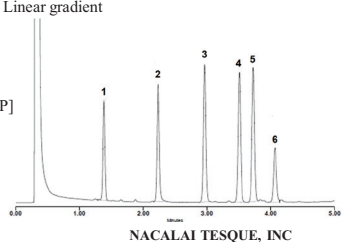
Data courtesy of a LKT Laboratories, Inc

## Berry Flavonoids

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 10mmol/l Phosphate buffer(pH2.6)  
 B; Acetonitrile  
 B conc. 20→50% 5min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV210nm

Sample: 1; Hesperidin [Vitamin P]  
 2; Myricetin  
 3; Luteolin  
 4; Hesperetin  
 5; Apigenin  
 6; Kaempferol  
 Inj.Vol.: 0.5µl



Data courtesy of a LKT Laboratories, Inc

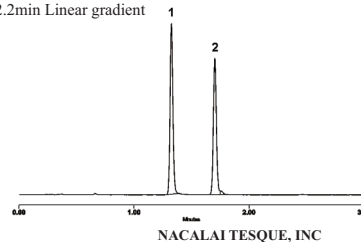
AP-1292P

## Chamomile

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 30→60% 2.2min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV340nm

Sample: 1; Luteolin  
 2; Apigenin  
 Inj.Vol.: 0.5µl



Data courtesy of a LKT Laboratories, Inc

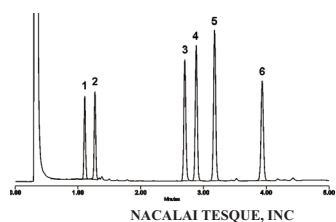
AP-1298

## Citrus Flavonoids

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 10mmol/l Phosphate buffer(pH2.6)  
 B; Acetonitrile  
 B conc. 20→50% 5min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV210nm

Sample: 1; Rutin  
 2; Naringin  
 3; Quercetin  
 4; Naringenin  
 5; Apigenin  
 6; Nobiletin  
 Inj.Vol.: 0.5µl



Data courtesy of a LKT Laboratories, Inc

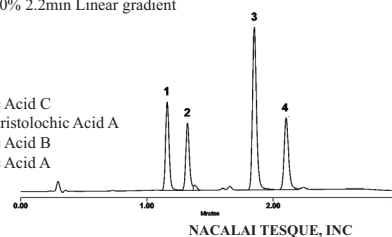
AP-1299

## Aristolochic Acids

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 40→70% 2.2min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV250nm

Sample: 1; Aristolochic Acid C  
 2; 7-Hydroxyaristolochic Acid A  
 3; Aristolochic Acid B  
 4; Aristolochic Acid A  
 Inj.Vol.: 0.5µl



Data courtesy of a LKT Laboratories, Inc

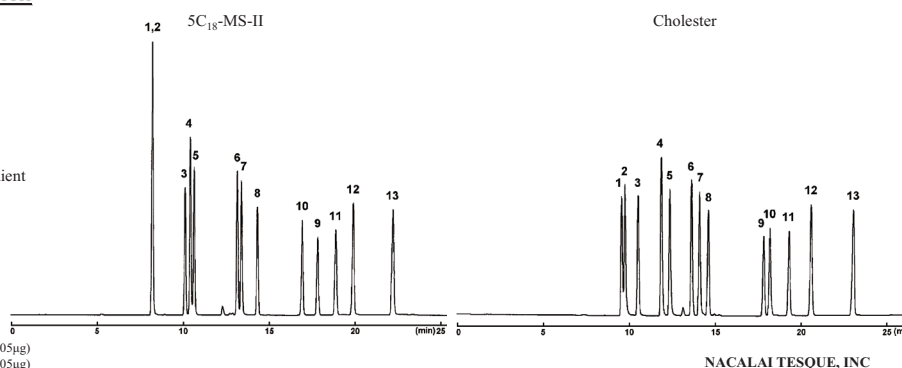
AP-1291

## Flavones

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: A: Acetonitrile/20mmol/l Phosphate  
 buffer(pH2.5) = 20/80  
 B: Acetonitrile/20mmol/l Phosphate  
 buffer(pH2.5) = 70/30  
 B conc. 0→100% 20min Linear gradient  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample:  
 1; Fisetin (0.25µg)  
 2; Myricetin (0.20µg)  
 3; 7,8-Dihydroxyflavone (0.05µg)  
 4; Luteolin (0.20µg)  
 5; Quercetin (0.20µg)  
 6; 7-Hydroxyflavone (0.10µg)  
 7; Baicalein (0.05µg)  
 8; 6-Hydroxyflavone (0.05µg)  
 9; Flavone (0.05µg)  
 10; Chrysin (0.05µg)  
 11; 6-Methoxyflavone (0.05µg)  
 12; 3-Hydroxyflavone (0.25µg)  
 13; 5-Hydroxyflavone (0.05µg)



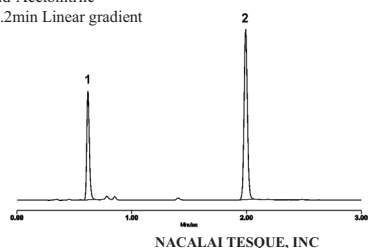
NACALAI TESQUE, INC

AP-1032

## Skullcap

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 35→65% 2.2min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV275nm  
 Sample: 1; Baicalin  
 2; Wogonin  
 Inj.Vol.: 0.5µl



Data courtesy of a LKT Laboratories, Inc

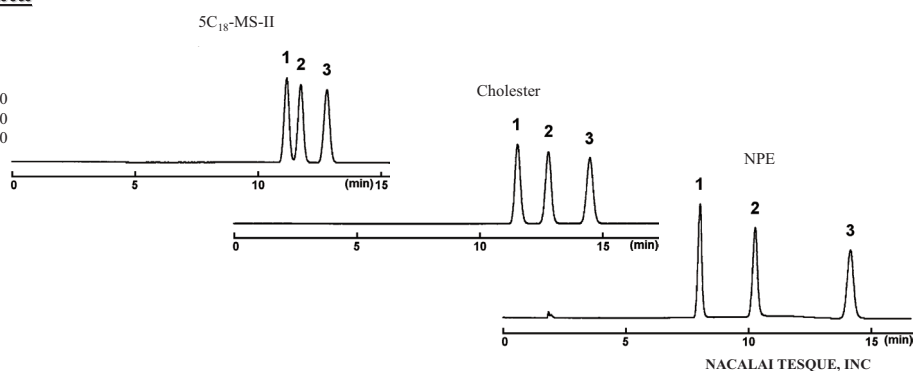
AP-1305

## Fluorinated Benzenes

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: 5C<sub>18</sub>-MS-II Methanol/ H<sub>2</sub>O = 50/50  
 Cholester Methanol/ H<sub>2</sub>O = 50/50  
 NPE Methanol/ H<sub>2</sub>O = 40/60  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: 1; Benzene (3.0µg)  
 2; Fluorobenzene (1.0µg)  
 3; *o*-Difluorobenzene (1.0µg)



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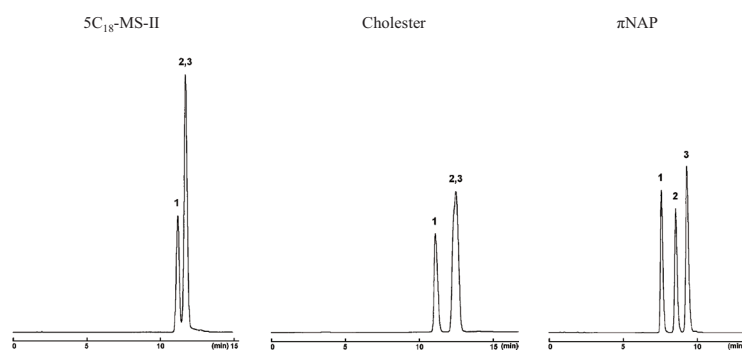
AP-1047

## Fluorine Compounds

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

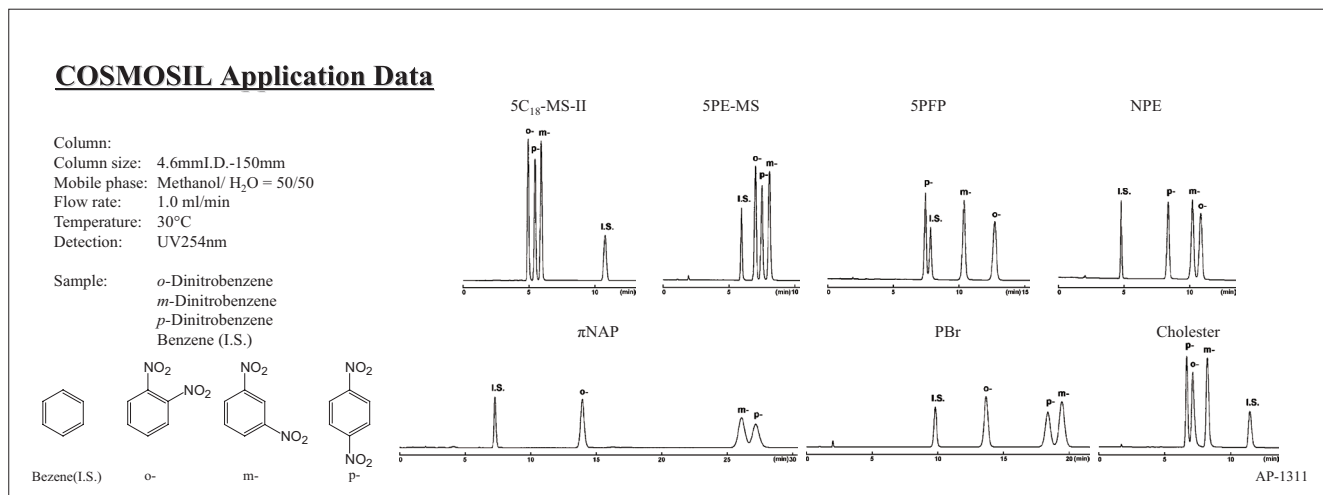
Sample: 1; Benzene (6.0µg)  
 2; Fluorobenzene (2.0µg)  
 3; *p*-Difluorobenzene (2.0µg)



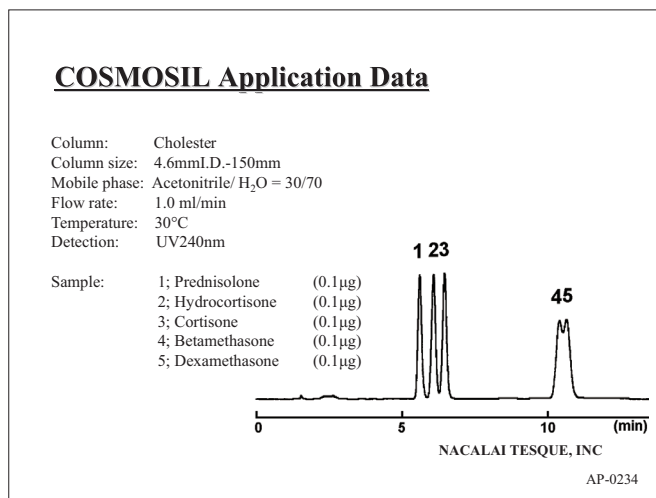
NACALAI TESQUE, INC

AP-1053

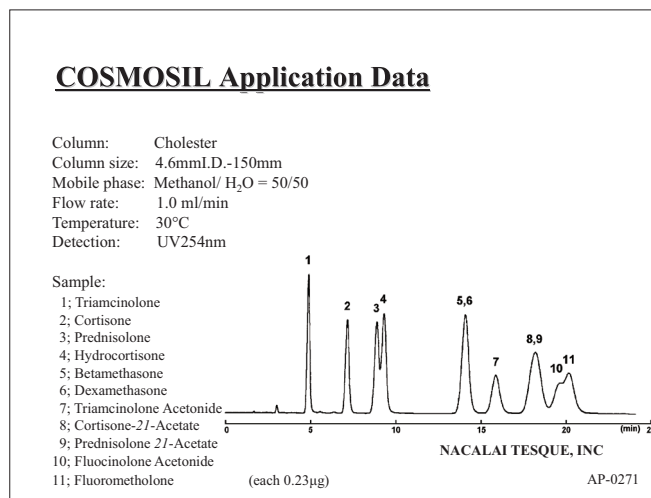
Comparison of separation properties for COSMOSIL specialty phases



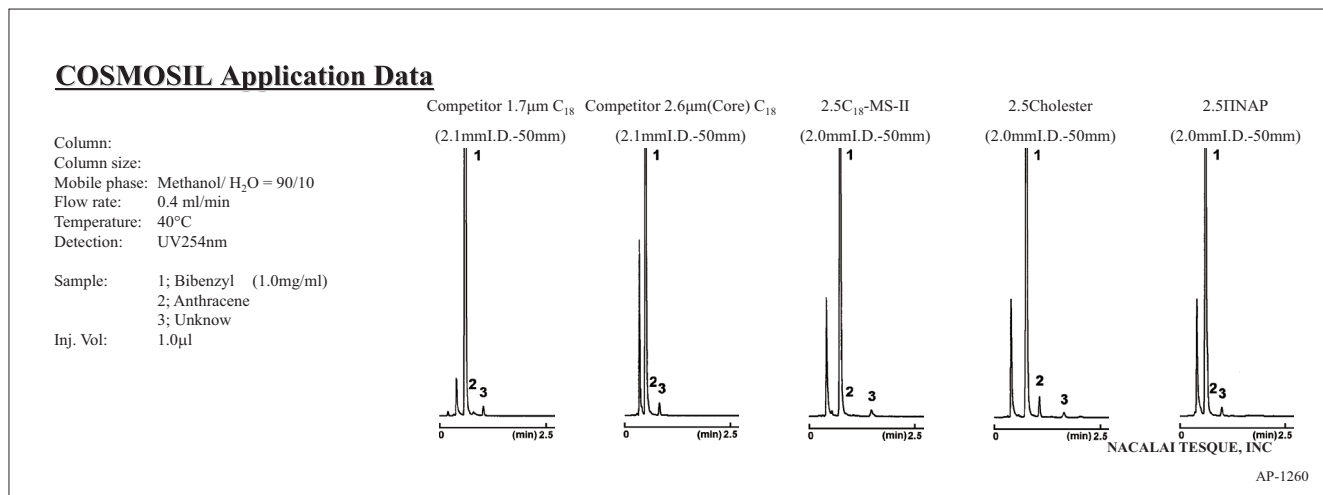
Adrenal Cortical Hormones



Adrenal Cortical Hormones



Bibenzyl

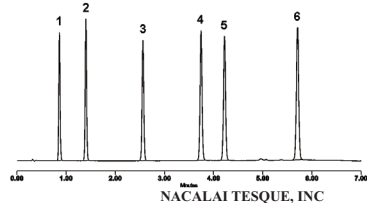


## Red Clover Flavonoids

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 20→55% 6min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV255nm

Sample: 1; Daidzin  
 2; Genistin  
 3; Daidzein  
 4; Genistein  
 5; Formononetin  
 6; Biochanin A  
 Inj.Vol.: 0.5µl



Data courtesy of a LKT Laboratories, Inc

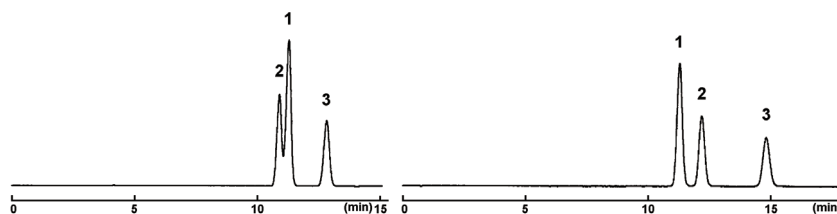
AP-1304

## Halogenated Benzenes

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 60/40  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: 1; Toluene (3.3µg)  
 2; Chlorobenzene (3.3µg)  
 3; Bromobenzene (3.3µg)



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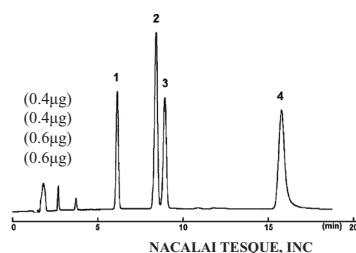
AP-1046

## Toad Venom (Crude Drugs)

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Acetonitrile / 0.1% Phosphoric Acid = 45/55  
 Flow rate: 1.0 ml/min  
 Temperature: 40°C  
 Detection: UV300nm

Sample: 1; Bufalin (0.4µg)  
 2; Cinobufagin (0.4µg)  
 3; Resibufogenin (0.6µg)  
 4; Indometacin[Indomethacin] (0.6µg)



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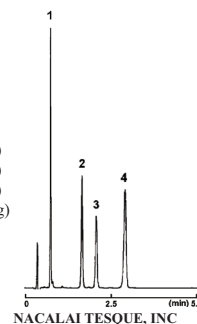
AP-0204

## Prednisolone Acetate

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 3.0mmI.D.-75mm  
 Mobile phase: Acetonitrile/ H<sub>2</sub>O = 40/60  
 Flow rate: 1.0 ml/min  
 Temperature: 40°C  
 Detection: UV254nm

Sample: 1; Prednisolone (0.1µg)  
 2; Prednisolone 21-Acetate (0.1µg)  
 3; Cortisone-21-Acetate (0.1µg)  
 4; Butyl p-Hydroxybenzoate (0.05µg)



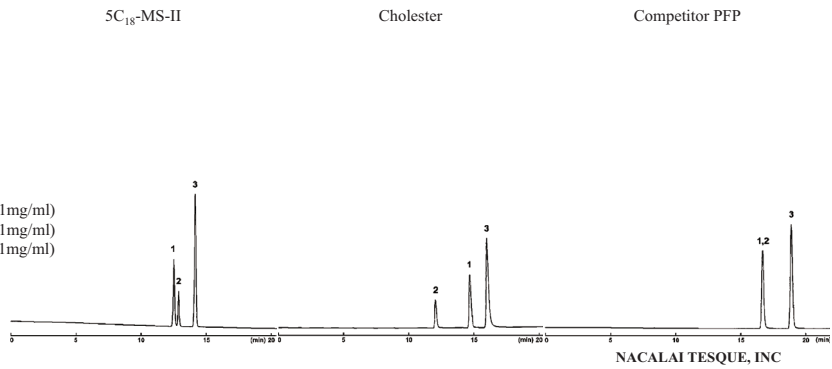
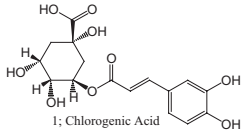
NACALAI TESQUE, INC

AP-1144

## Coffee (Standard)

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: A: 20mmol/l Phosphate buffer(pH2.5)  
 B: Methanol  
 B conc. 10→50% 20min Linear gradient  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV290nm  
 Sample: 1; Chlorogenic Acid (0.1mg/ml)  
 2; Caffeine (0.1mg/ml)  
 3; Caffeic Acid [3,4-Dihydroxycinnamic Acid] (0.1mg/ml)  
 Inj. Vol: 1.0µl



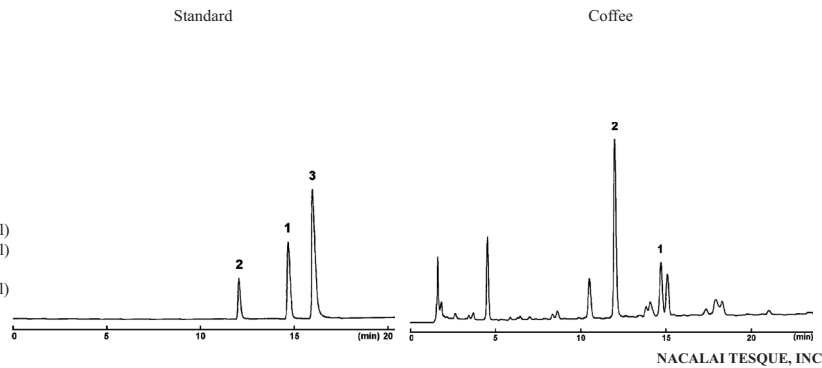
NACALAI TESQUE, INC

AP-1266

## Coffee

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: A: 20mmol/l Phosphate buffer(pH2.5)  
 B: Methanol  
 B conc. 10→50% 20min Linear gradient  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV290nm  
 Sample: 1; Chlorogenic Acid (0.1mg/ml)  
 2; Caffeine (0.1mg/ml)  
 3; Caffeic Acid [3,4-Dihydroxycinnamic Acid] (0.1mg/ml)  
 Inj. Vol: 1.0µl



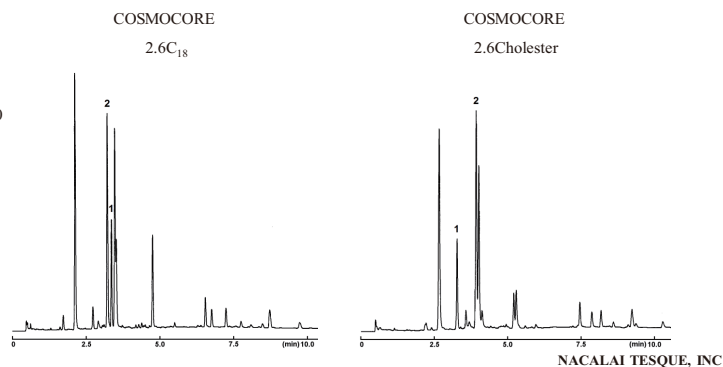
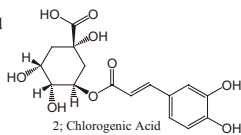
NACALAI TESQUE, INC

AP-1267

## Coffee

### COSMOCORE Application Data

Column: COSMOCORE  
 Column size: 2.1mm I.D.-100mm  
 Mobile phase: A: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 5/95  
 B: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 50/50  
 B conc. 0→60% 10min Linear gradient  
 Mixer: 0.18ml  
 Flow rate: 0.4 ml/min  
 Temperature: 40°C  
 Detection: UV290nm  
 Sample: Coffee  
 1; Caffeine  
 2; Chlorogenic Acid  
 Inj. Vol: 0.5µl



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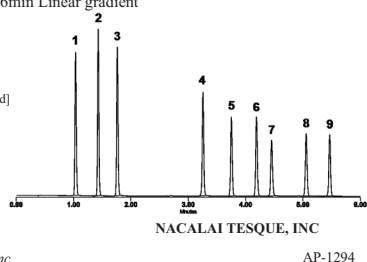
AP-1409

## Caffeic Acid Esters

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 15→100% 6min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV325nm

Sample:  
 1: Caffeic Acid [3,4-Dihydroxycinnamic Acid]  
 2: Ferulic Acid  
 3: Methyl Caffate  
 4: Phenethyl Caffate  
 5: Phenylethyl 3-Methylcaffate  
 6: Phenylethyl 3,4-Dimethylcaffate  
 7: *n*-Octyl Caffate  
 8: *n*-Octyl 3-Methylcaffate  
 9: *n*-Octyl 3,4-Dimethylcaffate  
 Inj. Vol.: 0.5µl  
 Data courtesy of a KLT Laboratories, Inc



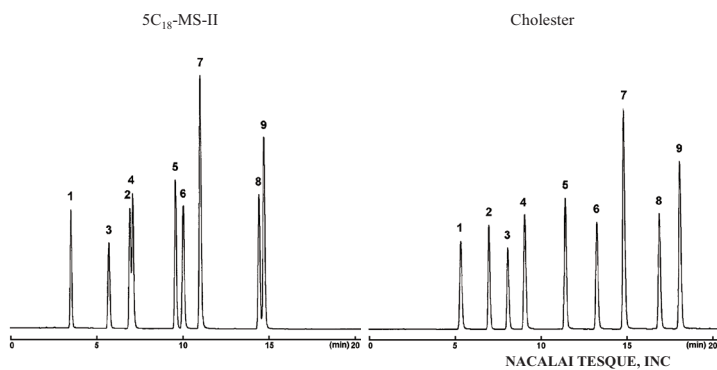
## Catechins

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: A: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 10/90  
 B: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 30/70  
 B conc. 0→100% 20min Linear gradient  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample:  
 1; (-) - Galloocatechin [(-) - GC] (0.80mg/ml)  
 2; Caffeine (0.08mg/ml)  
 3; (-) - Epigalloocatechin [(-) - EGC] (0.80mg/ml)  
 4; (-) - Catechin [(-) - C] (0.40mg/ml)  
 5; (-) - Epicatechin [(-) - EC] (0.40mg/ml)  
 6; (-) - Epigalloocatechin Gallate [(-) - EGCg] (0.20mg/ml)  
 7; (-) - Galloocatechin Gallate [(-) - GCg] (0.40mg/ml)  
 8; (-) - Epicatechin Gallate [(-) - ECg] (0.20mg/ml)  
 9; (-) - Catechin Gallate [(-) - Cg] (0.20mg/ml)

Injection Vol. 1.0µl

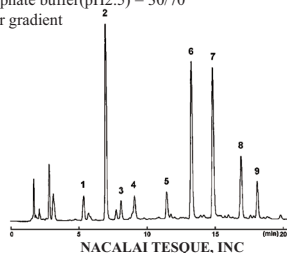


## Catechins (Green Tea)

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: A: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 10/90  
 B: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 30/70  
 B conc. 0→100% 20min Linear gradient  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample:  
 1; (-) - Galloocatechin [(-) - GC]  
 2; Caffeine  
 3; (-) - Epigalloocatechin [(-) - EGC]  
 4; (-) - Catechin [(-) - C]  
 5; (-) - Epicatechin [(-) - EC]  
 6; (-) - Epigalloocatechin Gallate [(-) - EGCg]  
 7; (-) - Galloocatechin Gallate [(-) - GCg]  
 8; (-) - Epicatechin Gallate [(-) - ECg]  
 9; (-) - Catechin Gallate [(-) - Cg]  
 Injection Vol. 1.0µl

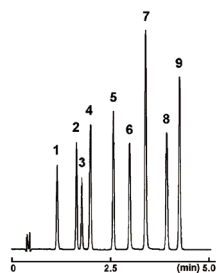


## Catechins

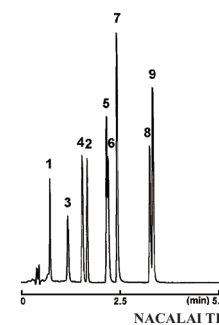
### COSMOSIL Application Data

Column size: 3.0mmI.D.-75mm  
 Mobile phase: A: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 10/90  
 B: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 30/70  
 B conc. 0→100% 5min Linear gradient  
 Mixer 0.5ml  
 Flow rate: 1.0 ml/min  
 Temperature: 40°C  
 Detection: UV280nm  
 Sample:  
 1; (-) - Gallo catechin [(-) - GC] (0.40mg/ml)  
 2; Caffeine (0.04mg/ml)  
 3; (-) - Epigallocatechin [(-) - EGC] (0.40mg/ml)  
 4; (-) - Catechin [(-) - C] (0.20mg/ml)  
 5; (-) - Epicatechin [(-) - EC] (0.20mg/ml)  
 6; (-) - Epigallocatechin Gallate [(-) - EGCg] (0.10mg/ml)  
 7; (-) - Gallo catechin Gallate [(-) - GCg] (0.20mg/ml)  
 8; (-) - Epicatechin Gallate [(-) - ECg] (0.10mg/ml)  
 9; (-) - Catechin Gallate [(-) - Cg] (0.10mg/ml)  
 Injection Vol. 1.0µl

COSMOSIL 2.5Cholester



Competitor 2µmC<sub>18</sub>



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AP-1138

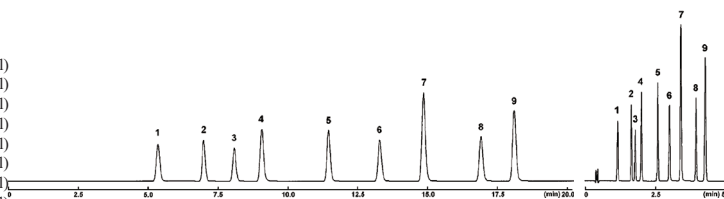
## Catechins

### COSMOSIL Application Data

Column: COSMOSIL Cholester  
 Mobile phase: A: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 10/90  
 B: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 30/70  
 B conc. 0→100% Linear gradient(5µm: 20min, 2.5µm: 5min)  
 Mixer 5µm: 2.6ml, 2.5µm: 0.5ml  
 Flow rate: 1.0 ml/min  
 Temperature: 40°C  
 Detection: UV280nm  
 Sample:  
 1; (-) - Gallo catechin [(-) - GC] (0.40mg/ml)  
 2; Caffeine (0.04mg/ml)  
 3; (-) - Epigallocatechin [(-) - EGC] (0.40mg/ml)  
 4; (-) - Catechin [(-) - C] (0.20mg/ml)  
 5; (-) - Epicatechin [(-) - EC] (0.20mg/ml)  
 6; (-) - Epigallocatechin Gallate [(-) - EGCg] (0.10mg/ml)  
 7; (-) - Gallo catechin Gallate [(-) - GCg] (0.20mg/ml)  
 8; (-) - Epicatechin Gallate [(-) - ECg] (0.10mg/ml)  
 9; (-) - Catechin Gallate [(-) - Cg] (0.10mg/ml)  
 Injection Vol. 1.0µl

Cholester (5µm)  
(4.6mmI.D.-150mm)

2.5Cholester (2.5µm)  
(3.0mmI.D.-75mm)



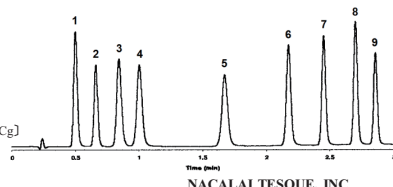
NACALAI TESQUE, INC

AP-1140

## Catechins

### COSMOCORE Application Data

Column: COSMOCORE 2.6Cholester  
 Column size: 2.1mmI.D.-50mm  
 Mobile phase: A: Acetonitrile/ 0.1% H<sub>3</sub>PO<sub>4</sub> = 10/90  
 B: Acetonitrile/ 0.1% H<sub>3</sub>PO<sub>4</sub> = 40/60  
 B conc. 0→100% 3min Linear gradient  
 Flow rate: 0.6 ml/min  
 Temperature: 30°C  
 Detection: UV280nm  
 Sample:  
 1; (-)-Gallo catechin[(-)-GC]  
 2; Caffeine  
 3; (-)-Epigallocatechin[(-)-EGC]  
 4; (-)-Catechin[(-)-C]  
 5; (-)-Epicatechin[(-)-EC]  
 6; (-)-Epigallocatechin Gallate[(-)-EGCg]  
 7; (-)-Gallo catechin Gallate[(-)-GCg]  
 8; (-)-Epicatechin Gallate[(-)-ECg]  
 9; (-)-Catechin Gallate[(-)-Cg]



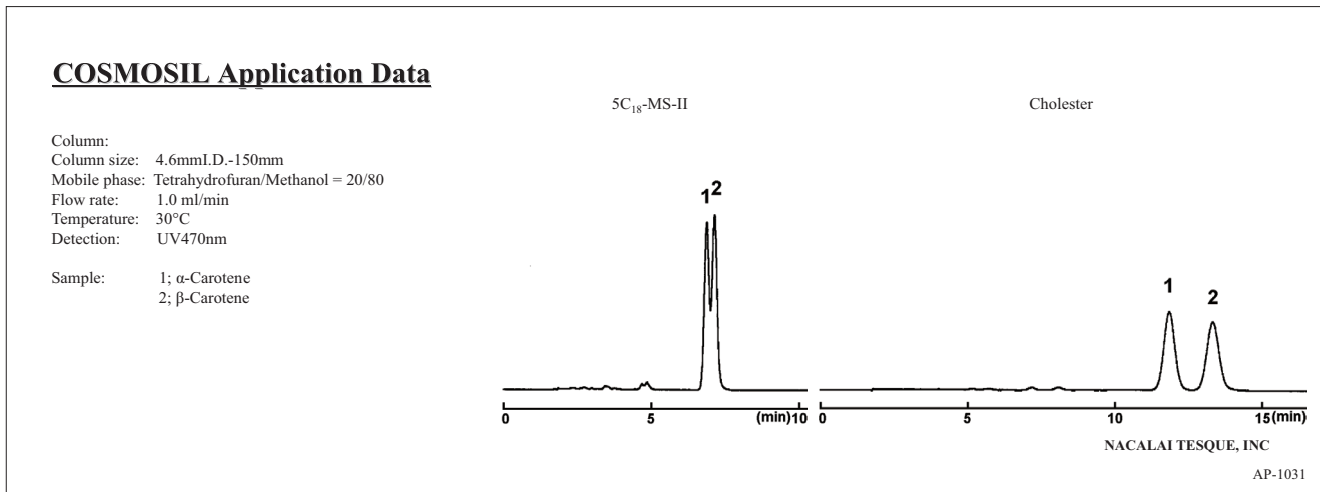
NACALAI TESQUE, INC

Data courtesy of a customer

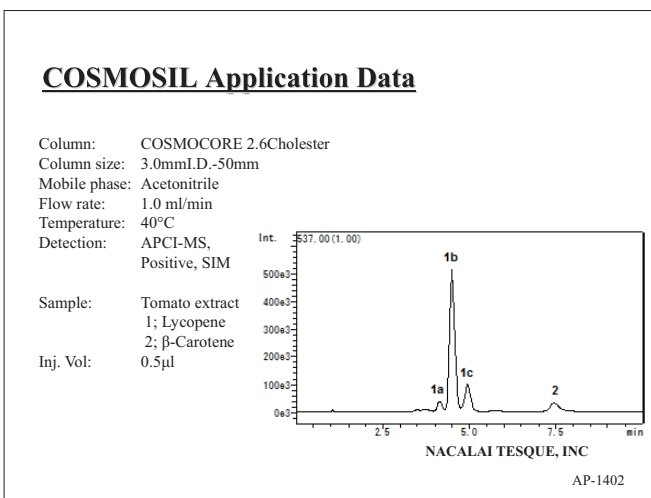
AP-1403



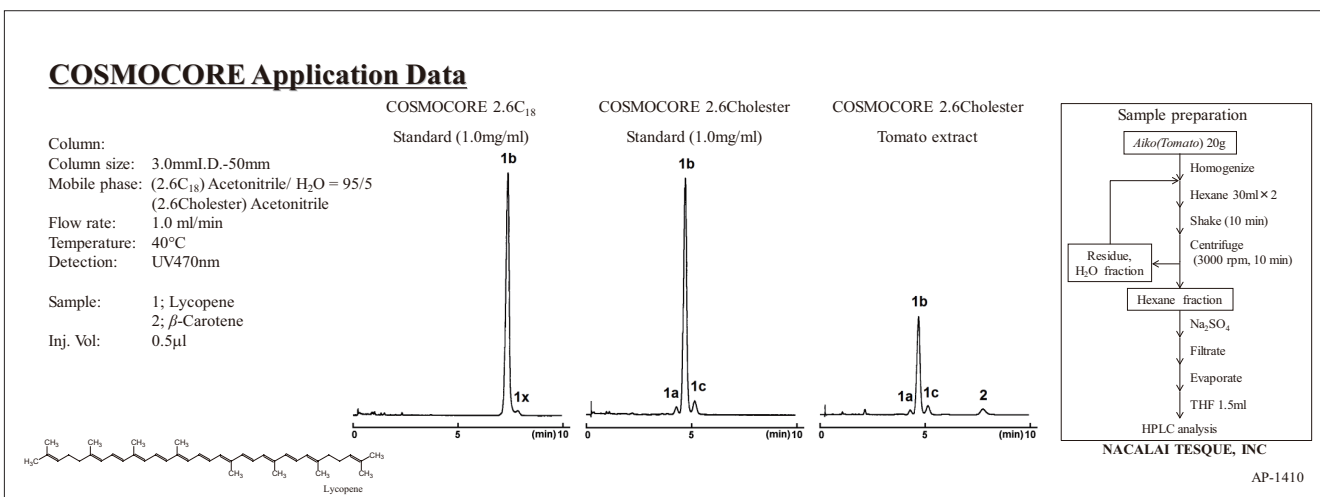
**Carotenes**



**Tomato extract**



**Tomato extract**

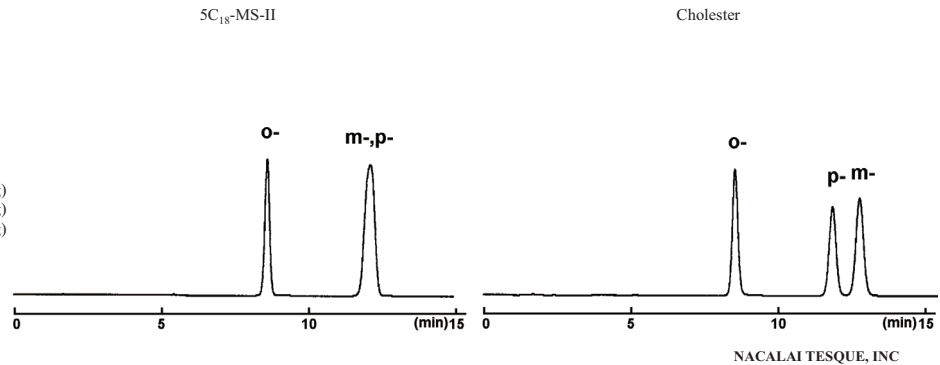


## Chloroacetophenone

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: *o*-Chloroacetophenone (0.30µg)  
*m*-Chloroacetophenone (0.15µg)  
*p*-Chloroacetophenone (0.05µg)



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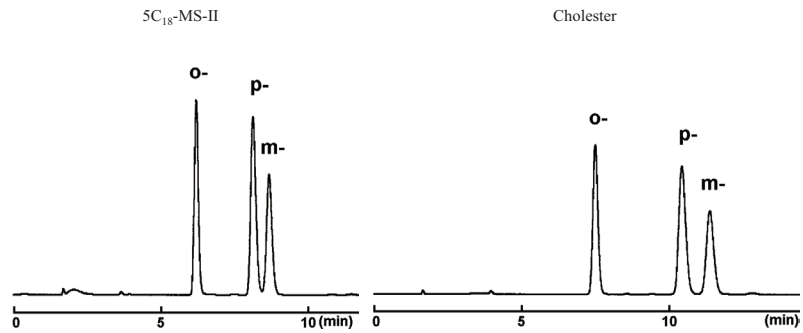
AP-1044

## Chlorophenols

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: *o*-Chlorophenol (2.0µg)  
*m*-Chlorophenol (2.0µg)  
*p*-Chlorophenol (4.0µg)



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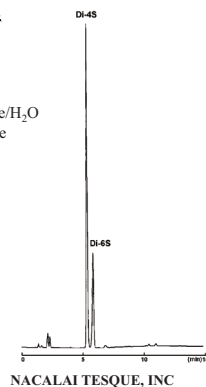
AP-1043

## Enzyme digests of Chondroitin Sulfate A

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: A; 1mmol/l Tetrabutylammonium bisulfate/H<sub>2</sub>O  
 B; 1mmol/l Tetrabutylammonium bisulfate  
 -Acetonitrile/H<sub>2</sub>O=67/33  
 B conc. 20%→65%(7min)→65%(12min)  
 Flow rate: 1.0 ml/min  
 Temperature: 40°C  
 Detection: UV240nm

Sample: Chondroitin Sulfate A  
 Chondroitinase AC-II digested



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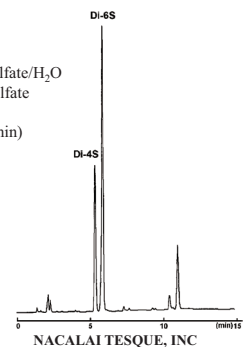
AP-1082

## Enzyme digests of Chondroitin Sulfate A

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: A; 1mmol/l Tetrabutylammonium bisulfate/H<sub>2</sub>O  
 B; 1mmol/l Tetrabutylammonium bisulfate  
 -Acetonitrile/H<sub>2</sub>O=67/33  
 B conc. 20%→65%(7min)→65%(12min)  
 Flow rate: 1.0 ml/min  
 Temperature: 40°C  
 Detection: UV240nm

Sample: Chondroitin Sulfate C  
 Chondroitinase AC-II digested



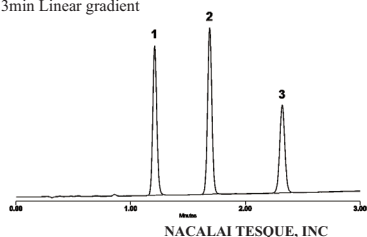
NACALAI TESQUE, INC

AP-1083

## Buckthorn

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 70→90% 3min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV250nm  
 Sample: 1; Chrysophanol  
 2; Emodin  
 3; Physcion  
 Inj. Vol: 0.5µl



Data courtesy of a LKT Laboratories, Inc

AP-1293

## Adrenal Cortical Hormones

### COSMOSIL Application Data

Column: Competitor 1.7µm C<sub>18</sub> (2.1mmI.D.-50mm)    Competitor 2.6µm(Core) C<sub>18</sub> (2.1mmI.D.-50mm)    2.5C<sub>18</sub>-MS-II (2.0mmI.D.-50mm)    2.5Cholester (2.0mmI.D.-50mm)    2.5IINAP (2.0mmI.D.-50mm)

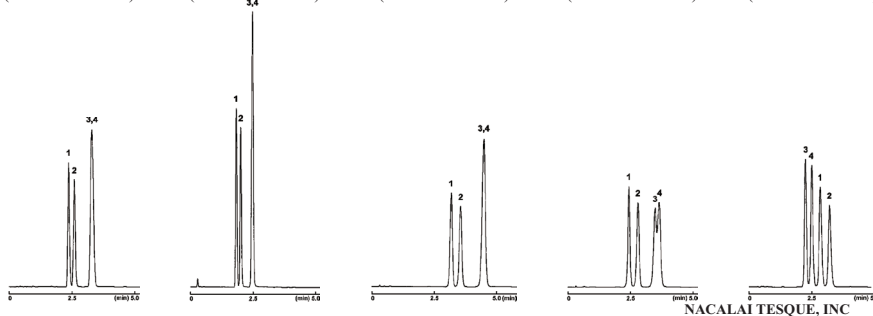
Column size: (2.1mmI.D.-50mm)    (2.1mmI.D.-50mm)    (2.0mmI.D.-50mm)    (2.0mmI.D.-50mm)    (2.0mmI.D.-50mm)

Mobile phase: C<sub>18</sub>, Choleste; Methanol/ H<sub>2</sub>O = 40/60  
 IINAP; Methanol/ H<sub>2</sub>O = 55/45

Flow rate: 0.4 ml/min  
 Temperature: 40°C  
 Detection: UV254nm

Sample: 1; Prednisone (0.375mg/ml)  
 2; Cortisone (0.375mg/ml)  
 3; Prednisolone (0.375mg/ml)  
 4; Hydrocortisone (0.375mg/ml)

Inj. Vol: 0.5µl

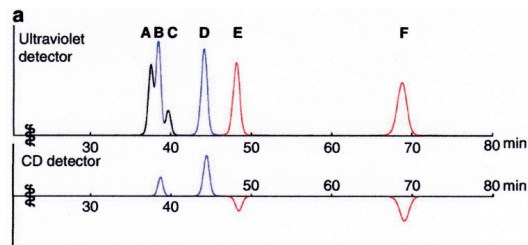
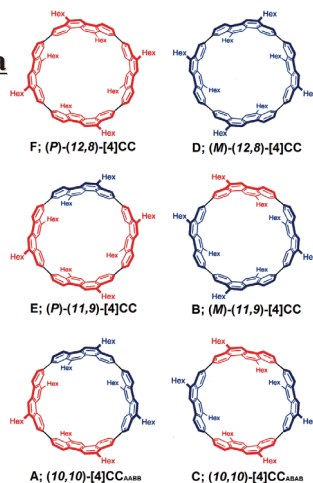


AP-1259

## CNT

### COSMOCORE Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-250mm × 3  
 Mobile phase: Dichloromethane/Methanol = 60/40  
 Flow rate: 1.0 ml/min  
 Temperature: 40°C  
 Detection: UV300nm, CD420nm  
 Sample: [4]cyclo-2,8-chrysenylene ([4]CC)



NACALAI TESQUE, INC

AP-1483

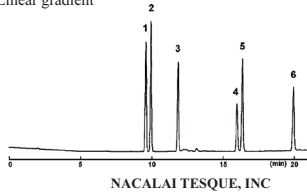
Data courtesy of S.Hitosugi, W. Nakanishi, T. Yamasaki, H. Isobe,  
 Department of Chemistry, Tohoku University

## Isoflavones

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: A: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 10/90  
 B: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 50/50  
 B conc. 0→100% 20min Linear gradient  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV260nm

Sample: 1; Daidzin (0.05µg)  
 2; Glycitin (0.05µg)  
 3; Genistin (0.05µg)  
 4; Daidzein (0.05µg)  
 5; Glycitein (0.075µg)  
 6; Genistein (0.025µg)



NACALAI TESQUE, INC

AP-0278

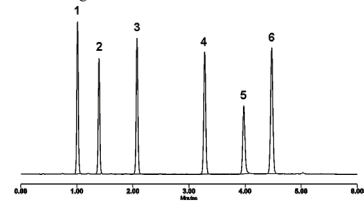
## Kudzu Flavonoids

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 15→45% 5min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV255nm

Sample: 1; Puerarin  
 2; Daidzin  
 3; Genistin  
 4; Daidzein  
 5; Quercetin  
 6; Genistein

Inj.Vol.: 0.5µl



NACALAI TESQUE, INC

AP-1302

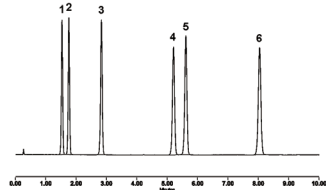
Data courtesy of a LKT Laboratories, Inc

## Soy Flavonoids

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 15→35% 10min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV255nm

Sample: 1; Daidzin  
 2; Glycitin  
 3; Genistin  
 4; Daidzein  
 5; Glycitein  
 6; Genistein  
 Inj.Vol.: 0.5µl



NACALAI TESQUE, INC

AP-1306

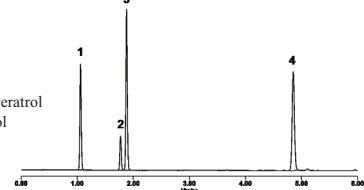
Data courtesy of a LKT Laboratories, Inc

## Grape Skin

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 20→80% 5.8min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample: 1; Polydatin  
 2; α,β-Dihydroresveratrol  
 3; *trans*-Resveratrol  
 4; Emodin  
 Inj.Vol.: 0.5µl



NACALAI TESQUE, INC

AP-1301

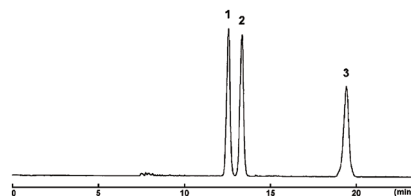
Data courtesy of a LKT Laboratories, Inc

## Fatty Acids

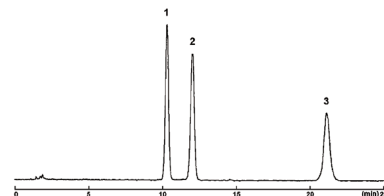
### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: 0.05%TFA-90%Methanol  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: ELSD

Sample: 1; Oleic Acid (3.0µg)  
 2; Elaidic Acid (3.0µg)  
 3; Stearic Acid  
 [Octadecanoic Acid] (3.0µg)



Cholester



NACALAI TESQUE, INC

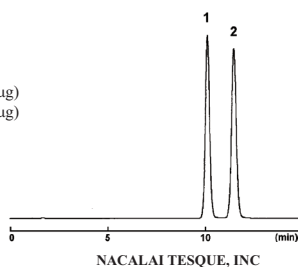
AP-1038

## Estradiols

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Acetonitrile/ H<sub>2</sub>O = 40/60  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample: 1; 17β-Estradiol (2.0µg)  
 2; 17α-Estradiol (2.0µg)



NACALAI TESQUE, INC

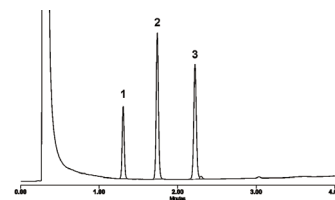
AP-0244

## Evodia

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; H<sub>2</sub>O  
 B; Acetonitrile  
 B conc. 40→85% 3.5min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV205nm

Sample: 1; Limonin  
 2; Evodiamine  
 3; Rutaecarpine  
 Inj.Vol.: 0.5µl



NACALAI TESQUE, INC

Data courtesy of a LKT Laboratories, Inc

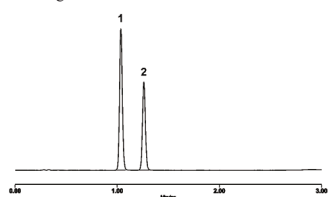
AP-1300

## Magnolia

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
 B; 0.1% Formic Acid-Acetonitrile  
 B conc. 60→80% 2.2min Linear gradient  
 Flow rate: 0.4 ml/min  
 Temperature: 30°C  
 Detection: UV293nm

Sample: 1; Honokiol  
 2; Magnolol  
 Inj.Vol.: 0.5µl



NACALAI TESQUE, INC

Data courtesy of a LKT Laboratories, Inc

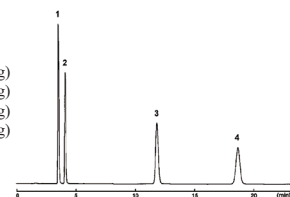
AP-1303

## Hydroxyflavones

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Acetonitrile / 20mmol/l Phosphate  
 buffer(pH2.5) = 50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample: 1; 7-Hydroxyflavone (0.2µg)  
 2; 6-Hydroxyflavone (0.1µg)  
 3; 3-Hydroxyflavone (0.5µg)  
 4; 5-Hydroxyflavone (0.1µg)



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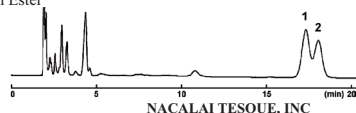
AP-0246

## Fatty Acid Derivatives

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: 1; Linolenic Acid  
 p-Bromophenacyl Ester  
 2; γ-Linolenic Acid  
 p-Bromophenacyl Ester



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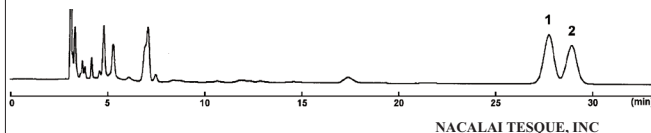
AP-0210

## Fatty Acid Derivatives

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-250mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: 1; Linolenic Acid p-Bromophenacyl Ester  
 2; γ-Linolenic Acid p-Bromophenacyl Ester



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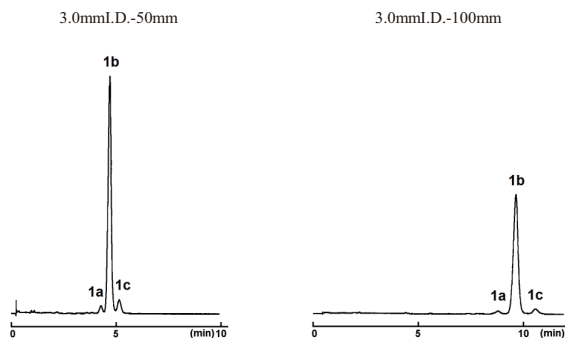
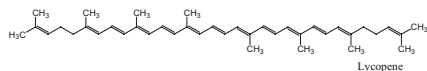
AP-0211

## Lycopene

### COSMOCORE Application Data

Column: COSMOCORE 2.6Cholester  
 Column size: 3.0mmI.D.-\*\*mm  
 Mobile phase: Acetonitrile  
 Flow rate: 1.0 ml/min  
 Temperature: 40°C  
 Detection: UV470nm

Sample: Lycopene (1.0mg/ml)  
 Inj. Vol: 0.5µl



NACALAI TESQUE, INC

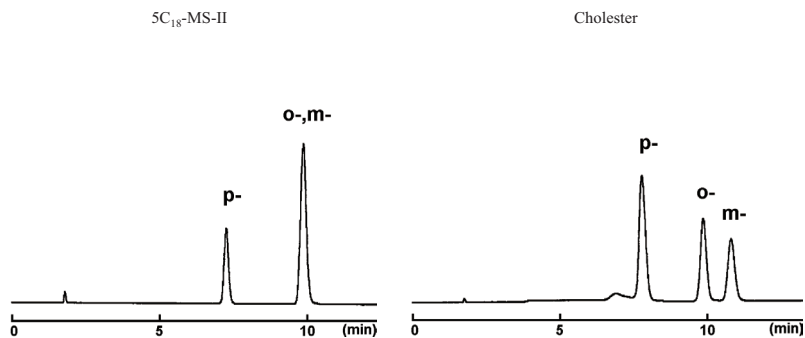
AP-1411

## Methoxyphenols

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Methanol/ H<sub>2</sub>O = 30/70  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: *o*-Methoxyphenol [Guaiacol] (3.3µg)  
*m*-Methoxyphenol (3.3µg)  
*p*-Methoxyphenol (3.3µg)



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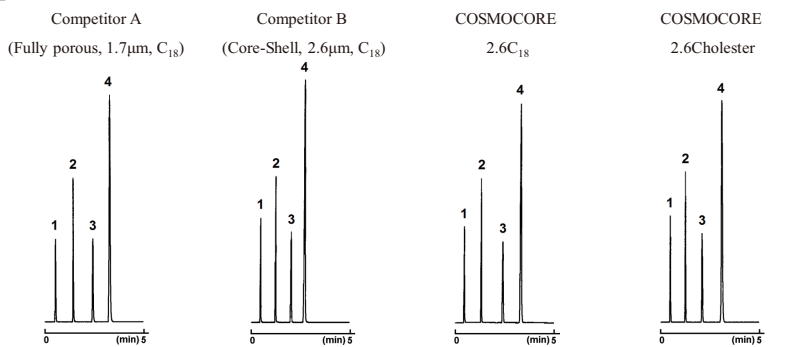
AP-1041

## Basic Characteristics

### COSMOCORE Application Data

Column: 2.1mmI.D.-100mm  
 Column size: 2.1mmI.D.-100mm  
 Mobile phase: Acetonitrile/ H<sub>2</sub>O = 50/50  
 Flow rate: 0.4 ml/min  
 Temperature: 40°C  
 Detection: UV254nm

Sample: 1; Uracil  
 2; Methyl Benzoate  
 3; Toluene  
 4; Naphthalene  
 Inj. Vol: 0.25µl



NACALAI TESQUE, INC

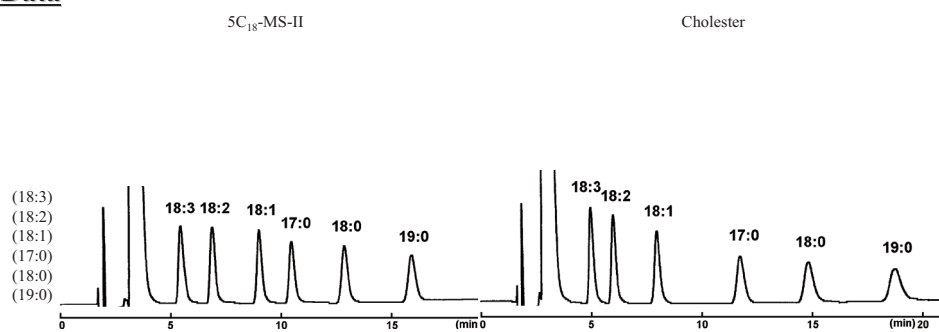
AP-1404

## Methylated Fatty Acids

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Methanol/H<sub>2</sub>O = 95/5  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: RI

Sample: Methyl Linolenate (18:3)  
 Methyl Linoleate (18:2)  
 Methyl Oleate (18:1)  
 Methyl Margarate (17:0)  
 Methyl Stearate (18:0)  
 Methyl Nonadecanoate (19:0)  
 (each 10µg)



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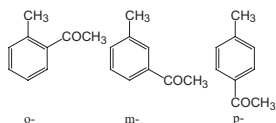
AP-1040

## Methylacetophenone

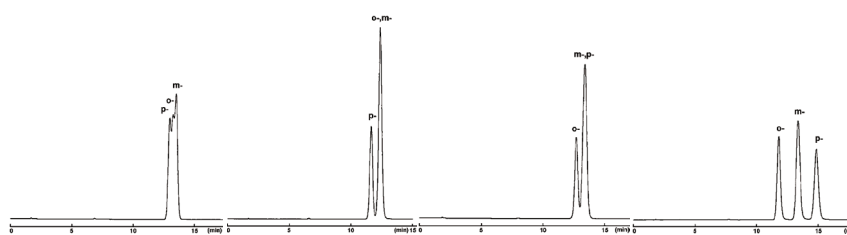
### COSMOSIL Application Data

Column: COSMOSIL 5C<sub>18</sub>-MS-II  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Methanol / H<sub>2</sub>O = 45/55  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: *o*-Methylacetophenone (0.15mg/ml)  
*m*-Methylacetophenone (0.125mg/ml)  
*p*-Methylacetophenone (0.075mg/ml)  
 Inj. Vol: 1.0µl



COSMOSIL 5C<sub>18</sub>-MS-II (Methanol / H<sub>2</sub>O = 45/55)    COSMOSIL Choleser (Methanol / H<sub>2</sub>O = 45/55)    COSMOSIL πNAP (Methanol / H<sub>2</sub>O = 50/50)    COSMOSIL 5PYE (Methanol / H<sub>2</sub>O = 55/45)



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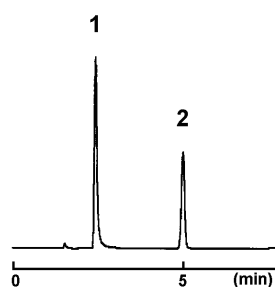
AP-1205

## Pyridine and Phenol

### COSMOSIL Application Data

Column: Choleser  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Acetonitrile/H<sub>2</sub>O = 30/70  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: 1; Pyridine (0.1µg)  
 2; Phenol (0.1µg)



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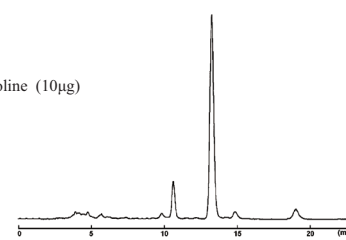
AP-0240

## Phosphatides

### COSMOSIL Application Data

Column: Choleser  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Methanol  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: ELSD

Sample: *L*-α-Phosphatidyl Choline (10µg)



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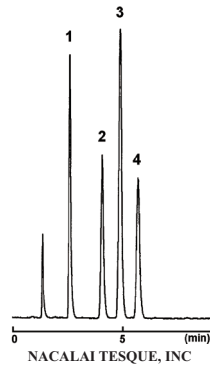
AP-0215

## Prostaglandins

### COSMOSIL Application Data

Column: Cholester  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: 0.05%TFA-40%Acetonitrile  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: ELSD

Sample: 1; Prostaglandin I<sub>2</sub> (2.0µg)  
 2; Prostaglandin F<sub>2α</sub> (2.0µg)  
 3; Prostaglandin E<sub>2</sub> (2.0µg)  
 4; Prostaglandin D<sub>2</sub> (2.0µg)



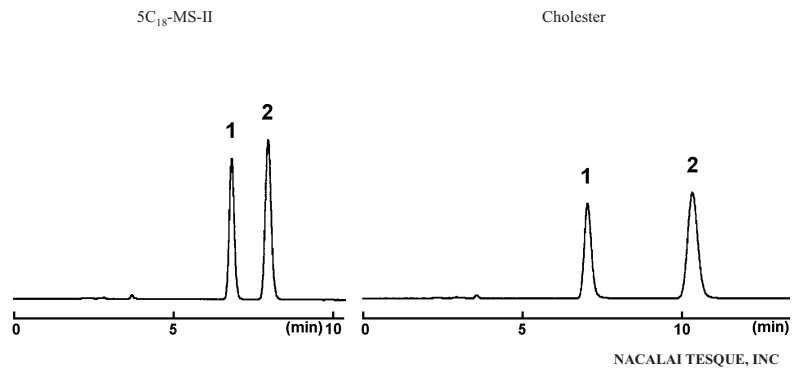
AP-0248

## Vitamin A Acid

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Methanol / 20mmol/l Phosphate  
 buffer(pH2.5) = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV350nm

Sample: 1; 13-*cis*-Retinoic Acid (0.04µg)  
 2; Vitamin A Acid, *all-trans*  
 [*all-trans* - Retinoic Acid] (0.04µg)



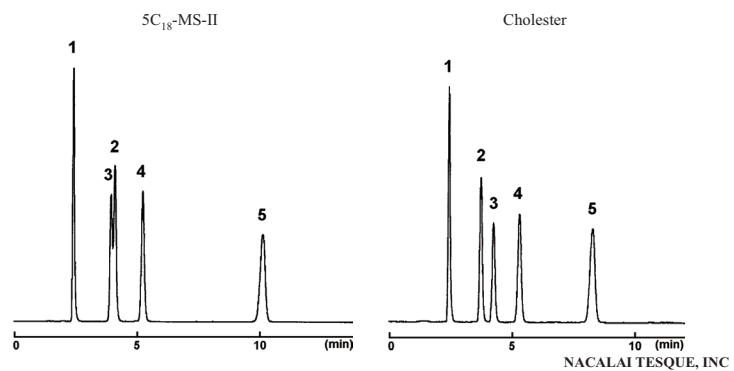
AP-1036

## Saikosaponins

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Acetonitrile/ H<sub>2</sub>O = 45/55  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: ELSD, Gain=6

Sample: 1; Saikosaponin c (1.5µg)  
 2; Saikosaponin a (1.5µg)  
 3; Saikosaponin b<sub>2</sub> (1.5µg)  
 4; Saikosaponin b<sub>1</sub> (1.5µg)  
 5; Saikosaponin d (1.5µg)

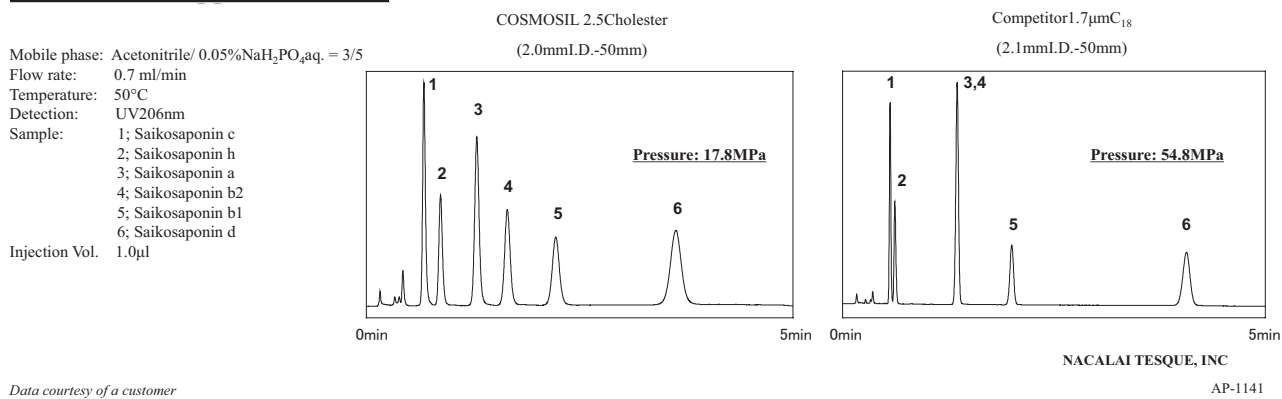


AP-1021



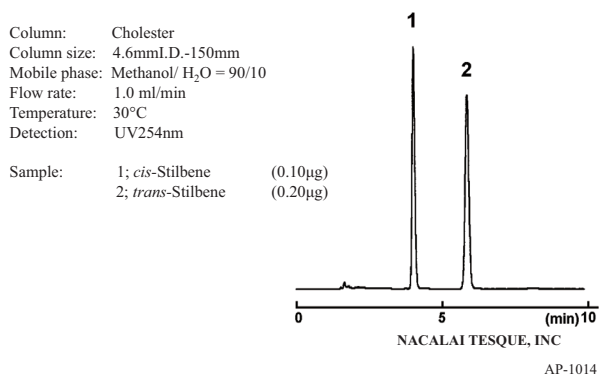
## Saikosaponins

### COSMOSIL Application Data



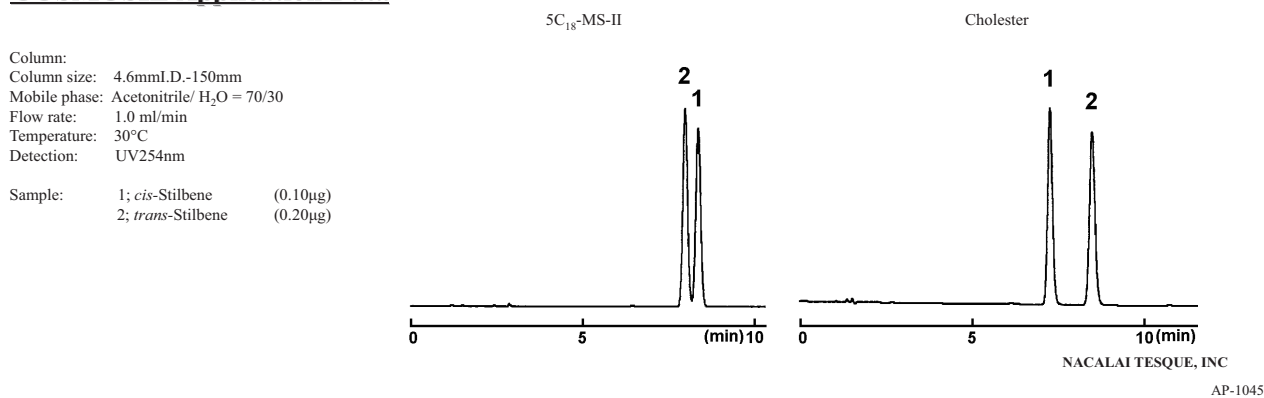
## Stilbenes

### COSMOSIL Application Data



## Stilbenes

### COSMOSIL Application Data

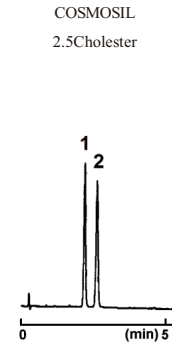
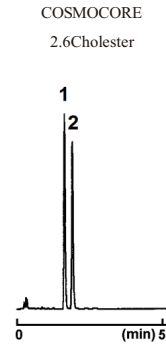
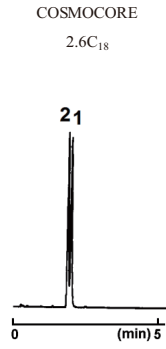
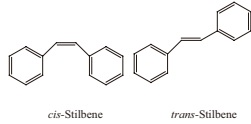


## Stilbenes

### COSMOCORE Application Data

Column: (COSMOCORE) 2.1mmI.D.-50mm  
(COSMOSIL) 2.0mmI.D.-50mm  
Mobile phase: Acetonitrile/ H<sub>2</sub>O = 60/40  
Flow rate: 0.4 ml/min  
Temperature: 40°C  
Detection: UV254nm

Sample: 1; *cis*-Stilbene (0.1mg/ml)  
2; *trans*-Stilbene (0.2mg/ml)  
Inj. Vol: 0.5µl



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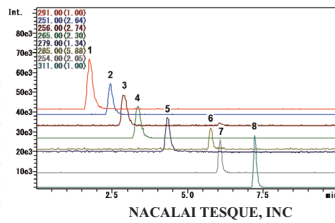
AP-1412

## Sulfa Drugs

### COSMOSIL Application Data

Column: 2.5Cholester  
Column size: 2.0mmI.D.-50mm  
Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
B; 0.1% Formic Acid-Acetonitrile  
B conc. 10→50% 5min Linear gradient  
Flow rate: 0.2 ml/min  
Temperature: 40°C  
Detection: ESI-MS, Positive, SIM

Sample:  
1; Trimethoprim (10mg/L)  
2; Sulfadiazine (10mg/L)  
3; Sulfathiazole (10mg/L)  
4; Sulfamerazine (10mg/L)  
5; Sulfamethazine (10mg/L)  
6; Sulfachloropyridazine (10mg/L)  
7; Sulfamethoxazole (10mg/L)  
8; Sulfadimethoxine (10mg/L)  
Inj. Vol.: 5.0µl



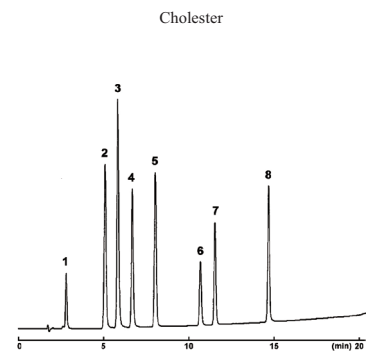
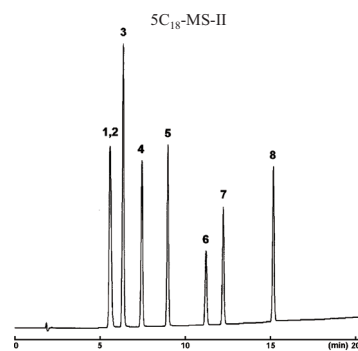
AP-1285

## Sulfa Drugs

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
Column size: 4.6mmI.D.-150mm  
Mobile phase: A; 0.1% Formic Acid-H<sub>2</sub>O  
B; 0.1% Formic Acid-Acetonitrile  
B conc. 10→50% 20min Linear gradient  
Flow rate: 1.0 ml/min  
Temperature: 40°C  
Detection: UV254nm

Sample: 1; Trimethoprim (0.1mg/ml)  
2; Sulfadiazine (0.1mg/ml)  
3; Sulfathiazole (0.1mg/ml)  
4; Sulfamerazine (0.1mg/ml)  
5; Sulfamethazine (0.1mg/ml)  
6; Sulfachloropyridazine (0.1mg/ml)  
7; Sulfamethoxazole (0.1mg/ml)  
8; Sulfadimethoxine (0.1mg/ml)  
Inj. Vol.: 1.0µl



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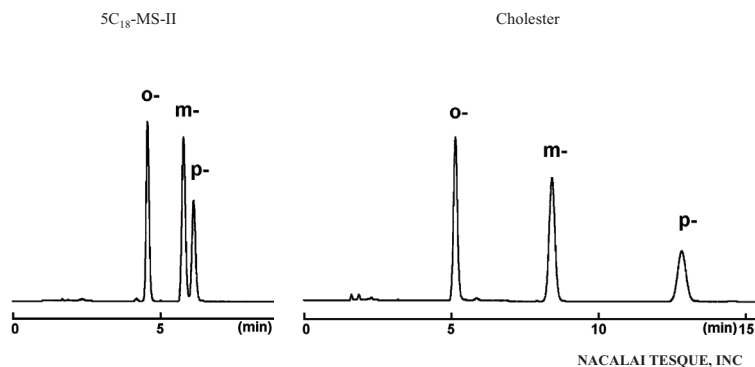
AP-1287

## Terphenyls

### COSMOSIL Application Data

Column: 4.6mm I.D.-150mm  
 Mobile phase: Methanol/H<sub>2</sub>O = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: *o*-Terphenyl (0.15µg)  
*m*-Terphenyl (0.05µg)  
*p*-Terphenyl (0.075µg)



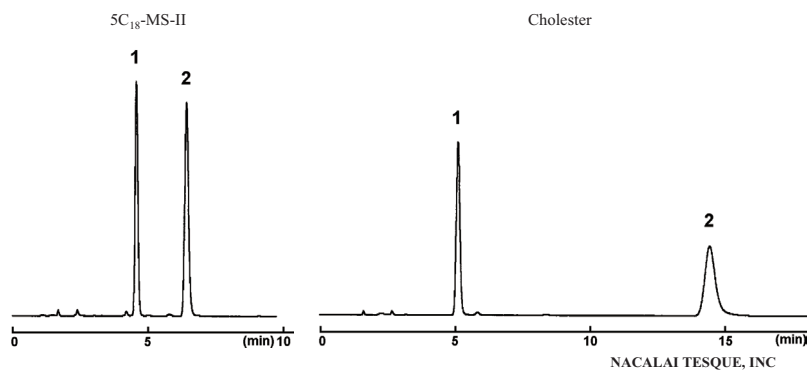
AP-1042

## Basic Characteristics

### COSMOSIL Application Data

Column: 4.6mm I.D.-150mm  
 Mobile phase: Methanol/H<sub>2</sub>O = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

Sample: 1; *o*-Terphenyl (0.1µg)  
 2; Triphenylene (0.01µg)



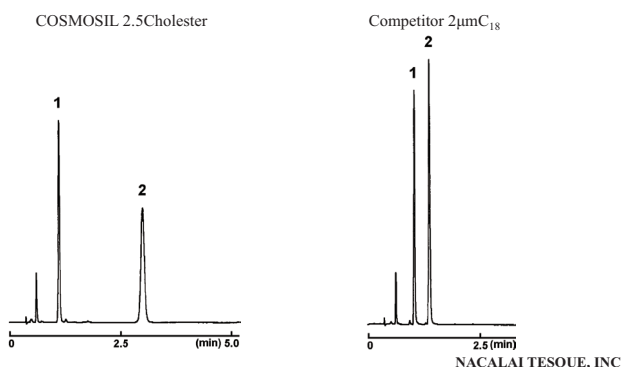
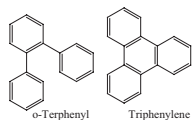
AP-1019

## Stereoselectivity

### COSMOSIL Application Data

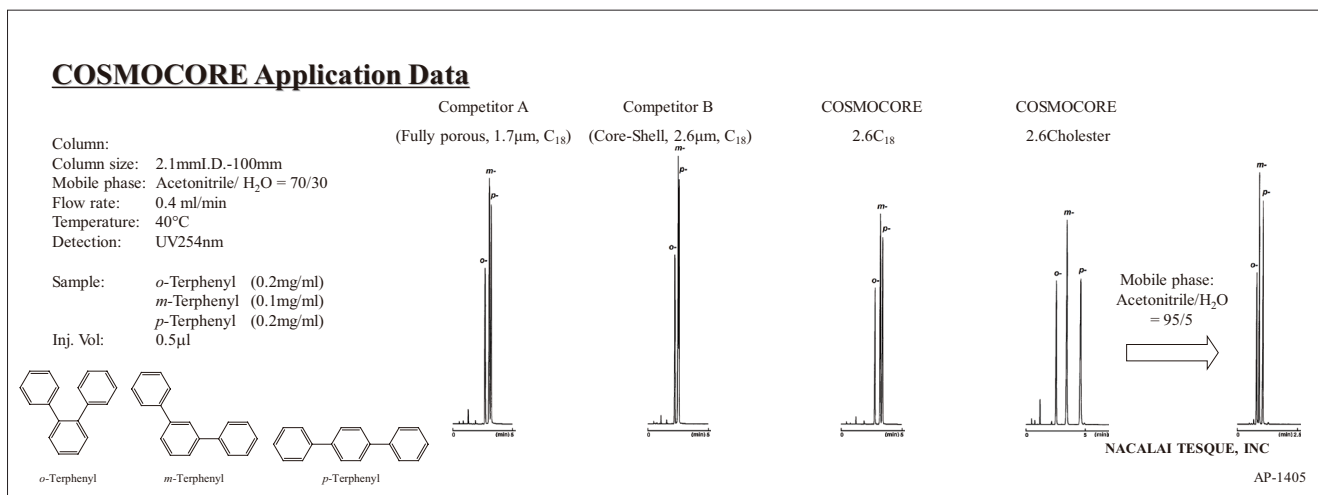
Column: 3.0mm I.D.-75mm  
 Mobile phase: Methanol/H<sub>2</sub>O = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 40°C  
 Detection: UV254nm

Sample: 1; *o*-Terphenyl (0.05µg)  
 2; Triphenylene (0.005µg)

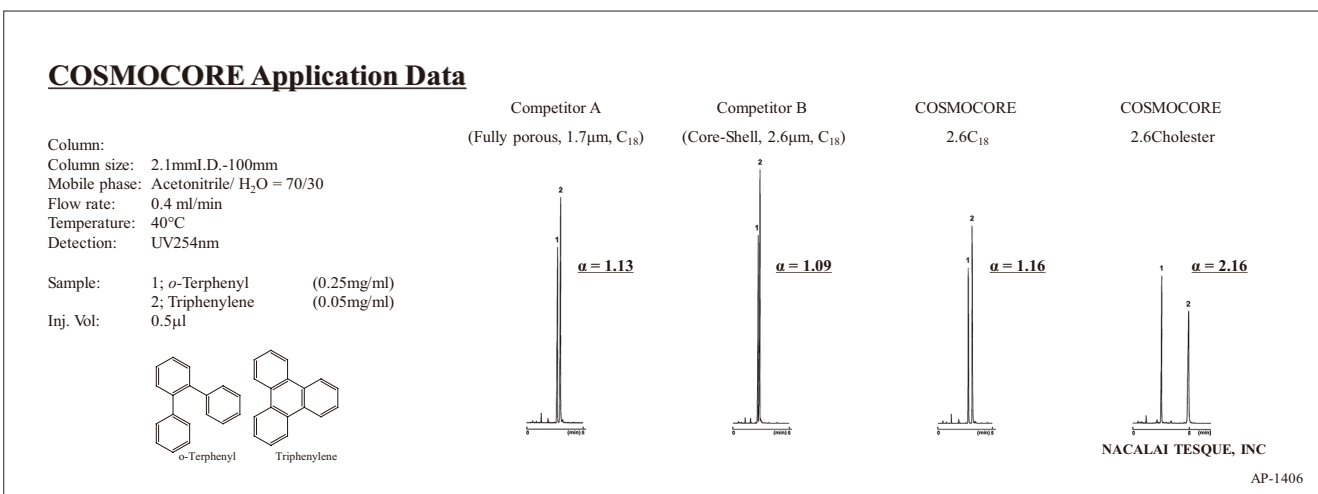


AP-1142

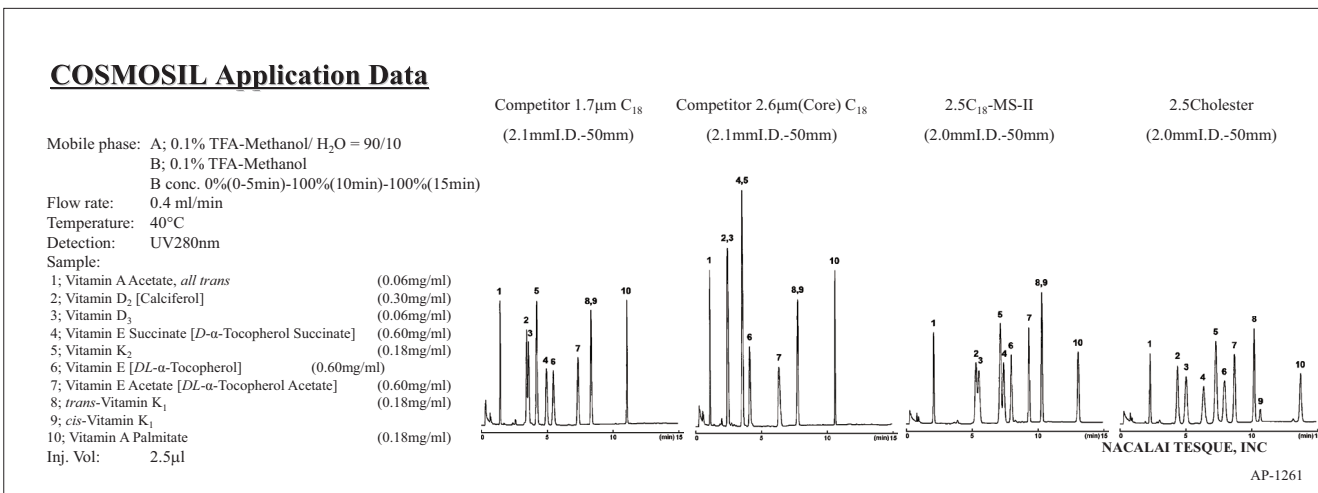
## Molecular shape selectivity



## Molecular shape selectivity



## Fat-Soluble Vitamins

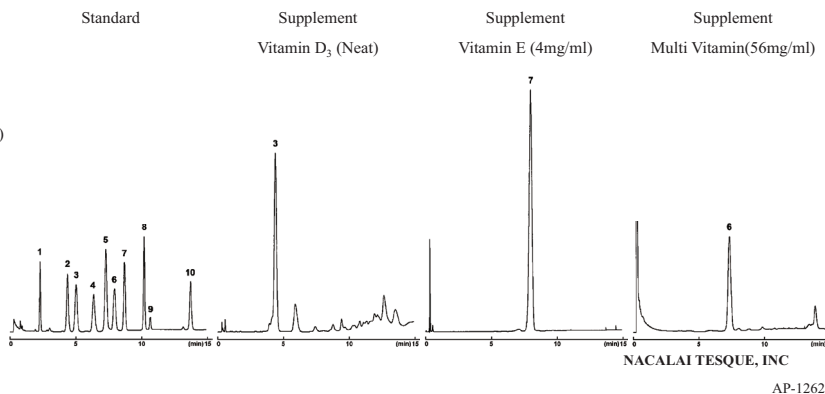


## Fat-Soluble Vitamins

### COSMOSIL Application Data

Column: 2.5Cholester  
 Column size: 2.0mmI.D.-50mm  
 Mobile phase: A; 0.1% TFA-Methanol/ H<sub>2</sub>O = 90/10  
 B; 0.1% TFA-Methanol  
 B conc. 0%(0-5min)-100%(10min)-100%(15min)  
 Flow rate: 0.4 ml/min  
 Temperature: 40°C  
 Detection: UV280nm

Sample: (Standard)  
 1; Vitamin A Acetate, all trans (0.06mg/ml)  
 2; Vitamin D<sub>2</sub> [Calciferol] (0.30mg/ml)  
 3; Vitamin D<sub>3</sub> (0.06mg/ml)  
 4; Vitamin E Succinate [D-α-Tocopherol Succinate] (0.60mg/ml)  
 5; Vitamin K<sub>2</sub> (0.18mg/ml)  
 6; Vitamin E [DL-α-Tocopherol] (0.60mg/ml)  
 7; Vitamin E Acetate [DL-α-Tocopherol Acetate] (0.60mg/ml)  
 8; trans-Vitamin K<sub>1</sub> (0.18mg/ml)  
 9; cis-Vitamin K<sub>1</sub>  
 10; Vitamin A Palmitate (0.18mg/ml)  
 Inj. Vol: 2.5µl

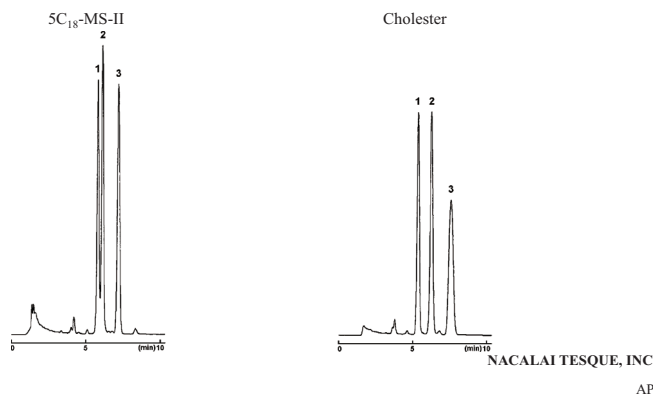


## Vitamin D, Vitamin E

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: Methanol  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample: 1; Vitamin D<sub>2</sub> [Calciferol] (1.25mg/ml)  
 2; Vitamin D<sub>3</sub> (0.25mg/ml)  
 3; Vitamin E [DL-α-Tocopherol] (2.50mg/ml)  
 Inj. Vol: 1.5µl

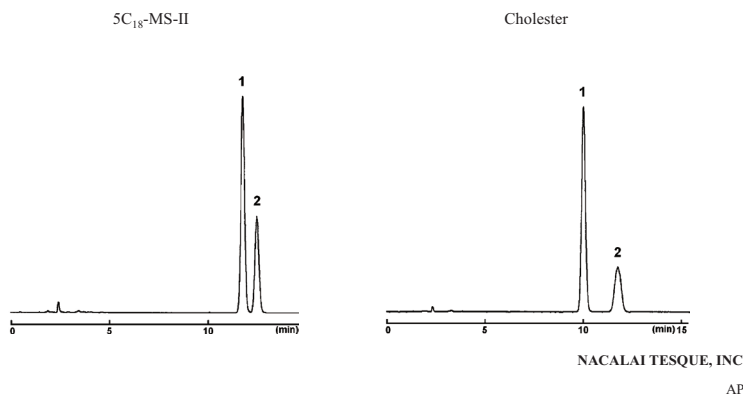


## Fatty Acids

### COSMOSIL Application Data

Column: 5C<sub>18</sub>-MS-II  
 Column size: 4.6mmI.D.-150mm  
 Mobile phase: 0.05%TFA-90%Methanol  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: ELSD

Sample: 1; cis-Vaccenic Acid (3.0µg)  
 2; trans-Vaccenic Acid (3.0µg)

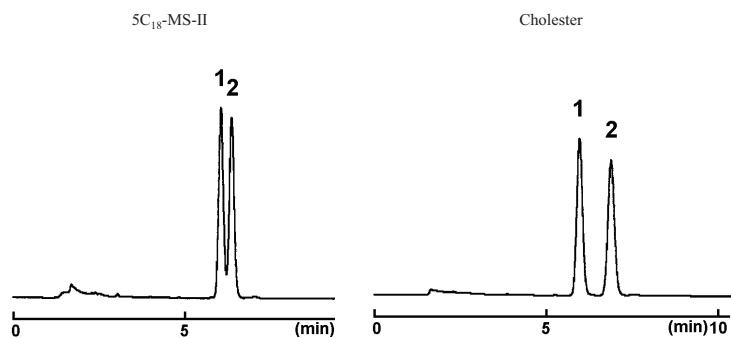


## Vitamin D

### COSMOSIL Application Data

Column:  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Methanol  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV265nm

Sample: 1; Vitamin D<sub>2</sub> [Calciferol] (0.3µg)  
 2; Vitamin D<sub>3</sub> (0.1µg)



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AP-1035

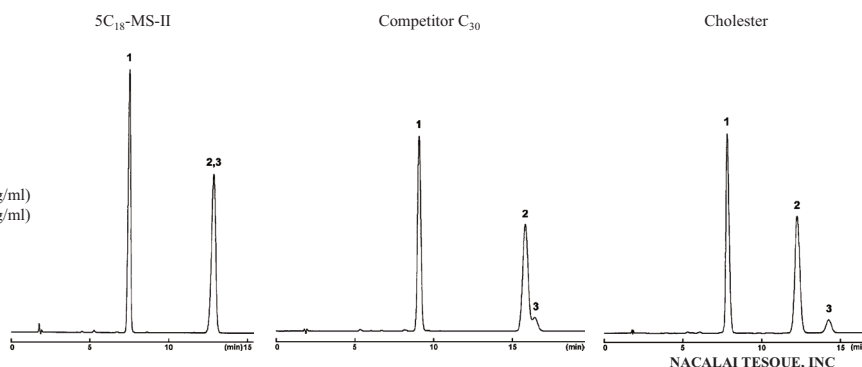
## Vitamin K

### COSMOSIL Application Data

Column:  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Methanol  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV280nm

Sample: 1; Vitamin K<sub>2</sub> [Menatetrenone] (0.25mg/ml)  
 2; *trans*-Vitamin K<sub>1</sub> (0.25mg/ml)  
 3; *cis*-Vitamin K<sub>1</sub>

Inj. Vol: 4.0µl



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AP-1289

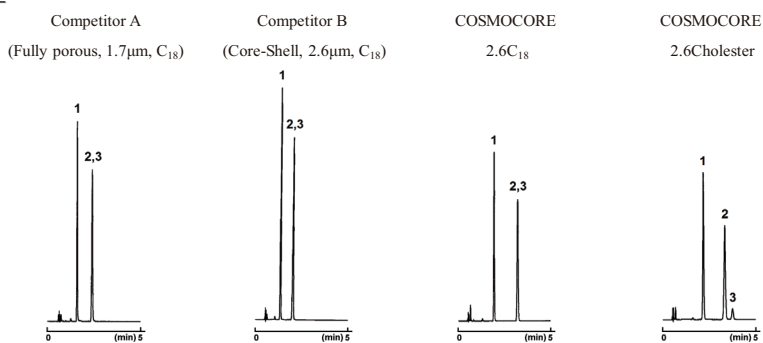
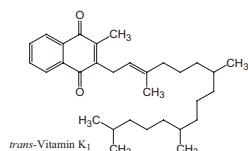
## Vitamin K

### COSMOCORE Application Data

Column:  
 Column size: 2.1mm I.D.-100mm  
 Mobile phase: Methanol  
 Flow rate: 0.4 ml/min  
 Temperature: 40°C  
 Detection: UV280nm

Sample: 1; Vitamin K<sub>2</sub> [Menatetrenone] (0.50mg/ml)  
 2; *trans*-Vitamin K<sub>1</sub> (0.50mg/ml)  
 3; *cis*-Vitamin K<sub>1</sub>

Inj. Vol: 0.5µl

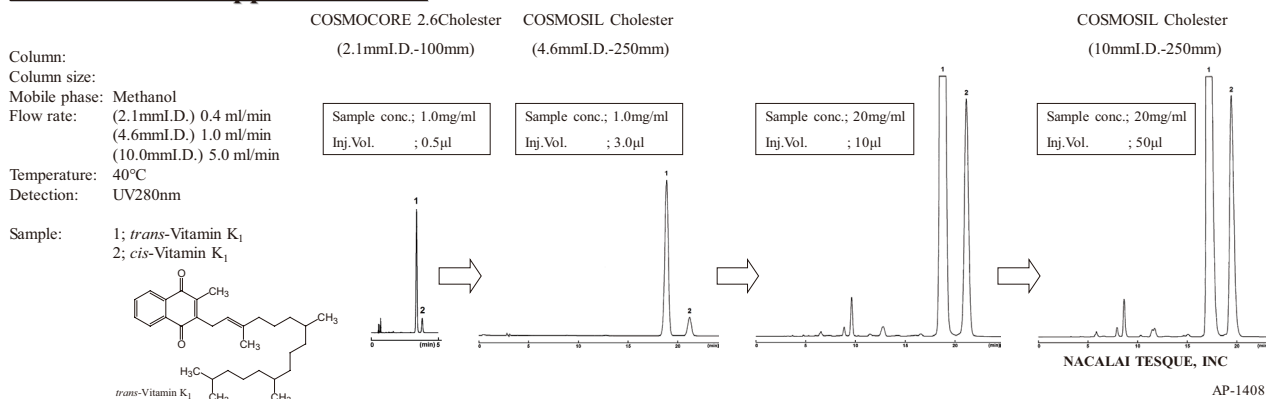


NACALAI TESQUE, INC

AP-1407

# Scale up

## COSMOCORE Application Data



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\*ID

AP-\*\*\*\*: Nacalai application data

No. \*: Reference list number

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AP-1083	Chondroitin Sulfate C Chodrotinase AC-II digested	26
AP-1032	Chrysin	18
AP-1293	Chrysophanol	27
AP-0204	Cinobufagin	21
No.24	Cinobufagin	9
No.35	Cinobufagin	11
No.45	Clinopodic Acid E	12
AP-0234	Cortisone	20
AP-0271	Cortisone	20
AP-1259	Cortisone	27
AP-0271	Cortisone-21-Acetate	20
AP-1144	Cortisone-21-Acetate	21
No.26	trans-p-Coumaric Acid	10
AP-1296	Coumarin	16
AP-1297	Coumarin	16
No.26	3-O-cis-p-Coumaroyl-d-quinic Acid	10
No.26	3-O-trans-p-Coumaroyl-d-quinic Acid	10
No.51	CsyB	12
AP-1483	[4]Cyclo-2,8-chrysenylene ([4]CC)	27
No.30	Cynatratoside A	10
No.78	DA16	14
AP-0278	Daidzein	28
AP-1302	Daidzein	28
AP-1304	Daidzein	21
AP-1306	Daidzein	28
AP-0278	Daidzin	28
AP-1302	Daidzin	28
AP-1304	Daidzin	21
AP-1306	Daidzin	28
AP-0234	Dexamethasone	20
AP-0271	Dexamethasone	20
No.77	Diborylate Chrysenes (2,8/2,9/3,9 positions)	14
No.58	2,2'-Didebromonagelamide B	13
AP-1047	1,2-Difluorobenzene	19
AP-1053	1,4-Difluorobenzene	19
AP-1301	alpha,β-Dihydroresveratrol	28
No.45	(2R)-3-(3,4-Dihydroxy phenyl)-2-hydroxypropionic Acid	12
No.69	(R,S)-5,7-Dihydroxy-3-(1-hydroxyethyl) phthalides	13
No.69	(S,R)-5,7-Dihydroxy-3-(1-hydroxyethyl) phthalides	13

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No.44	(7α,7'β,8α,8'α)-3,4-Dihydroxy-3',4'-methylenedioxy-7,9':7',9'-diepoxylignane(EC-1-1)	12
AP-1032	7,8-Dihydroxyflavone	18
No.69	cis-4,6-Dihydroxymellein [No.8]	13
No.31	2-(3,4-Dihydroxyphenyl)ethyl 3-O-β-D-allopyranosyl-6-O-caffeoyl-β-D-glucopyranoside	10
AP-1311	1,2-Dinitrobenzene	20
AP-1311	1,3-Dinitrobenzene	20
AP-1311	1,4-Dinitrobenzene	20
No.36	3,9-Dinitrofluoranthene (DNF)	11
No.36	1,3-Dinitropyrene (1,3-DNP)	11
No.36	1,6-Dinitropyrene (1,6-DNP)	11
No.36	1,8-Dinitropyrene (1,8-DNP)	11
AP-1323	L-DOPA	15
No.11	L-DOPA	9
AP-1323	Dopamine	15
AP-1038	Elaidic Acid	28
AP-1293	Emodin	27
AP-1301	Emodin	28
No.41	Epicatechin	11
No.42	Epicatechin	12
AP-1072	(-)-Epicatechin [(-)-EC]	23
AP-1077	(-)-Epicatechin [(-)-EC]	23
AP-1138	(-)-Epicatechin [(-)-EC]	24
AP-1140	(-)-Epicatechin [(-)-EC]	24
AP-1403	(-)-Epicatechin [(-)-EC]	24
No.41	Epicatechin Gallate	11
No.42	Epicatechin Gallate	12
AP-1072	(-)-Epicatechin Gallate [(-)-ECg]	23
AP-1077	(-)-Epicatechin Gallate [(-)-ECg]	23
AP-1138	(-)-Epicatechin Gallate [(-)-ECg]	24
AP-1140	(-)-Epicatechin Gallate [(-)-ECg]	24
AP-1403	(-)-Epicatechin Gallate [(-)-ECg]	24
No.41	Epigallocatechin	11
No.42	Epigallocatechin	12
AP-1072	(-)-Epigallocatechin [(-)-EGC]	23
AP-1077	(-)-Epigallocatechin [(-)-EGC]	23
AP-1138	(-)-Epigallocatechin [(-)-EGC]	24
AP-1140	(-)-Epigallocatechin [(-)-EGC]	24
AP-1403	(-)-Epigallocatechin [(-)-EGC]	24
No.41	Epigallocatechin Gallate	11
No.42	Epigallocatechin Gallate	12
AP-1072	(-)-Epigallocatechin Gallate [(-)-EGCg]	23
AP-1077	(-)-Epigallocatechin Gallate [(-)-EGCg]	23
AP-1138	(-)-Epigallocatechin Gallate [(-)-EGCg]	24
AP-1140	(-)-Epigallocatechin Gallate [(-)-EGCg]	24
AP-1403	(-)-Epigallocatechin Gallate [(-)-EGCg]	24
No.59	Epimagnolin	13
AP-0244	17α-Estradiol	29
AP-0244	17β-Estradiol	29
No.82	α-Estradiol	14
No.82	β-Estradiol	14
No.82	Estriol	14
No.82	Estrone	14
AP-1295	7-Ethyl 10-Hydroxycamptothecin	16
No.72	cis-[ <sup>2</sup> H, <sup>13</sup> C]-Ethyl 4-(4-{5-[(6-trifluoromethyl)pyridin-3-yl]amino}pyridin-2-yl) phenyl) cyclohexyl)acetate	14
No.72	trans-[ <sup>2</sup> H, <sup>13</sup> C]-Ethyl 4-(4-{5-[(6-trifluoromethyl)pyridin-3-yl]amino}pyridin-2-yl) phenyl) cyclohexyl)acetate	14
AP-1018	Ethylbenzene	16

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No.74	O-Ethylxime-derivative of 1,5-Anhydro-D-fructose (AF-OH)	14
AP-1300	Evodiamine	29
No.32	Evodionol Methyl Ether	10
No.62	Fargesin	13
AP-1294	Ferulic Acid	23
No.49	2,3-FIQ	12
AP-1032	Fisetin	18
AP-1032	Flavone	18
No.33	Flavonol Acylglycosides	10
No.26	Florahydroside I	10
No.26	Florahydroside II	10
No.14	[ <sup>18</sup> F]Florbetapir ([ <sup>18</sup> F]AV-45)	9
AP-0271	Fluocinolone Acetonide	20
No.39	Fluorescence-labeled of Free Fatty Acids (C16:0/C18:0/C18:1/ C18:2)	11
AP-1047	Fluorobenzene	19
AP-1053	Fluorobenzene	19
AP-0271	Fluorometholone	20
No.5	Foetidin	8
AP-1304	Formononetin	21
No.5	Free Ferulic Acid	8
No.66	Galgravin	13
	Gallocatechin	11
No.42	Gallocatechin	12
AP-1072	(-)-Gallocatechin [(-)-GC]	23
AP-1077	(-)-Gallocatechin [(-)-GC]	23
AP-1138	(-)-Gallocatechin [(-)-GC]	24
AP-1140	(-)-Gallocatechin [(-)-GC]	24
AP-1403	(-)-Gallocatechin [(-)-GC]	24
No.41	Gallocatechin Gallate	11
No.42	Gallocatechin Gallate	12
AP-1072	(-)-Gallocatechin Gallate [(-)-GCg]	23
AP-1077	(-)-Gallocatechin Gallate [(-)-GCg]	23
AP-1138	(-)-Gallocatechin Gallate [(-)-GCg]	24
AP-1140	(-)-Gallocatechin Gallate [(-)-GCg]	24
AP-1403	(-)-Gallocatechin Gallate [(-)-GCg]	24
AP-0278	Genistein	28
AP-1302	Genistein	28
AP-1304	Genistein	21
AP-1306	Genistein	28
AP-0278	Genistin	28
AP-1302	Genistin	28
13	Genistin	20
AP-1306	Genistin	28
No.30	Glucogenin C	10
No.30	Glucogenin C Mono-D-thevetoside	10
AP-0278	Glycitein	28
AP-1306	Glycitein	28
AP-0278	Glycitin	28
AP-1306	Glycitin	28
No.22	Grevillosides L	9
AP-1292	Hesperetin	17
AP-1292P	Hesperetin	18
No.37	Hippuric Acid	11
No.30	Hirundoside A	10
AP-1303	Honokiol	29
No.26	(+)-Hydrangenol 4'-O-β-d-glucopyranoside	10
No.26	Hydrangenol 8-O-β-d-glucopyranoside	10
No.26	Hydrangenol 8-O-β-d-glucopyranoside	10
AP-0234	Hydrocortisone	20
AP-0271	Hydrocortisone	20
AP-1259	Hydrocortisone	27

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No.69	5-Hydroxy-7-methoxy-3-(1-hydroxyethyl) phthalide [No.3]	13
No.61	3'-Hydroxyalternariol-5-O-methyl Ether	13
AP-1291	7-Hydroxyaristolochic Acid A	18
AP-1295	10-Hydroxycamptothecin	16
No.52	13-Hydroxydihydromelleolide	12
AP-0246	3-Hydroxyflavone	29
AP-1032	3-Hydroxyflavone	18
AP-0246	5-Hydroxyflavone	29
AP-1032	5-Hydroxyflavone	18
AP-0246	6-Hydroxyflavone	29
AP-1032	6-Hydroxyflavone	18
AP-0246	7-Hydroxyflavone	29
AP-1032	7-Hydroxyflavone	18
No.52	13-Hydroxymelleolide K	12
No.6	6β-Hydroxytestosterone	8
No.26	4-Hydroxythunberginol G 3'-O-β-d-glucopyranoside	10
No.3	IAPP-Alexa532	8
AP-0204	Indometacin [Indomethacin]	21
AP-1295	Irinotecan	16
No.32	Isoevodionol	10
AP-1292	Kaempferol	17
AP-1292P	Kaempferol	18
No.59	Kobusin	13
No.54	Kurahamide	13
No.57	Kurahyne	13
No.78	LA16	14
AP-1300	Limonin	29
AP-0210	Linolenic Acid p-Bromophenacyl Ester	29
AP-0211	Linolenic Acid p-Bromophenacyl Ester	29
AP-0210	γ-Linolenic Acid p-Bromophenacyl Ester	29
AP-0211	γ-Linolenic Acid p-Bromophenacyl Ester	29
No.4	Lipstatin	8
AP-1032	Luteolin	18
AP-1292	Luteolin	17
AP-1292P	Luteolin	18
AP-1296	Luteolin	16
AP-1297	Luteolin	16
AP-1298	Luteolin	18
AP-1402	Lycopene	25
AP-1410	Lycopene	25
AP-1411	Lycopene	30
No.40	E-Lycopene	11
No.65	E-Lycopene	13
No.40	Z-Lycopene	11
No.65	Z-Lycopene	13
AP-1303	Magnolol	29
No.64	Makomotindoline	13
No.32	Melicobisquinolinone B	10
No.32	Melicodenine B	10
No.32	Melicodenine D	10
No.32	Melicodenine F	10
No.32	Melicodin A	10
No.32	Melicodin B	10
No.32	Melicodin C	10
No.52	Melleolide	12
No.52	Melleolide D	12
AP-1032	6-Methoxyflavone	18
AP-1041	2-Methoxyphenol [Guaiacol]	30
AP-1041	3-Methoxyphenol	30
AP-1041	4-Methoxyphenol [Hydroquinone Monomethyl Ether]	30

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No.7	cis- Methyl 4-{5-[4-(4-Cyclohexyl-4-methoxypiperidin-1-yl)phenyl]-1,3,4-thiadiazol-2-yl}cyclohexane-1-carboxylate	8
No.7	trans- Methyl 4-{5-[4-(4-Cyclohexyl-4-methoxypiperidin-1-yl)phenyl]-1,3,4-thiadiazol-2-yl}cyclohexane-1-carboxylate	8
AP-1404	Methyl Benzoate	30
AP-1294	Methyl Caffeate	23
AP-1040	Methyl Linoleate	31
AP-1040	Methyl Linolenate	31
AP-1040	Methyl Margarate	31
AP-1040	Methyl nonadecanoate	31
AP-1040	Methyl Oleate	31
AP-1040	Methyl Stearate	31
No.19	[N-Methyl- <sup>11</sup> C] Vorozole	9
No.73	E-4-Methyl-2-dimethylphenylsilylmethylpropenal	13
No.73	Z-4-Methyl-2-dimethylphenylsilylmethylpropenal	13
AP-1205	o-Methylacetophenone	31
AP-1205	m-Methylacetophenone	31
AP-1205	p-Methylacetophenone	31
No.44	(7 $\alpha$ ,7' $\beta$ ,8 $\alpha$ ,8' $\alpha$ )-3,4-Methylenedioxy-3',4'-dihydroxy-7,9 :7',9'-diepoxyignane (EC-1-2)	12
No.76	(5Z,7E)-(1R,3R)-2,2-(Methyleneoxy) methano-9,10-seco-5,7,10(19)-cholestatriene 1,3,25-Triol	14
No.76	(5Z,7E)-(1R,3S)-2,2-(Methyleneoxy) methano-9,10-seco-5,7,10(19)-cholestatriene 1,3,25-Triol	14
No.76	(5Z,7E)-(1S,3R)-2,2-(Methyleneoxy) methano-9,10-seco-5,7,10(19)-cholestatriene 1,3,25-Triol	14
No.76	(5Z,7E)-(1S,3S)-2,2-(Methyleneoxy) methano-9,10-seco-5,7,10(19)-cholestatriene 1,3,25-Triol	14
No.52	5'-O-Methylmelledonal	12
No.48	Microcystin-LR	12
No.26	$\alpha$ -Morroniside	10
No.16	p-[ <sup>18</sup> F]MPPF	9
No.16	p-MPPNO2	9
No.2	Mycosporine-like Amino Acids	8
AP-1032	Myricetin	18
AP-1292	Myricetin	17
AP-1292P	Myricetin	18
AP-1404	Naphthalene	30
AP-1033	Naringenin	17
AP-1299	Naringenin	18
AP-1033	Naringin	17
AP-1299	Naringin	18
No.26	Neochlorogenic Acid	10
AP-1295	9-Nitro-20(S)-camptothecin	16
AP-1299	Nobiletin	18
No.10	Nobiletin	9
No.46	Nobiletin	12
No.53	Nocapyrone L	13
No.53	Nocapyrone R	13
AP-1323	L-Noradrenaline	15
No.19	Norvorozole	9
AP-1294	n-Octyl 3,4-Dimethylcaffeate	23
AP-1294	n-Octyl 3-Methylcaffeate	23
AP-1294	n-Octyl Caffeate	23
AP-1038	Oleic Acid	28
No.38	Oleic Acid Esters of Phytosterols	11
AP-0238	Oxytocin	17
No.45	(S)-PGME	12
AP-1294	Phenethyl Caffeate	23

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AP-1294	Phenylethyl 3,4-Dimethylcaffeate	23
AP-1294	Phenylethyl 3-Methylcaffeate	23
AP-0215	L- $\alpha$ -Phosphatidyl Choline	31
No.26	(3R)-Phyllodulcin 8-O- $\beta$ -d-glucopyranoside	10
No.26	(3S)-Phyllodulcin 8-O- $\beta$ -d-glucopyranoside	10
AP-1293	Physcion	27
AP-1301	Polydatin	28
AP-0234	Prednisolone	20
AP-0271	Prednisolone	20
AP-1144	Prednisolone	21
AP-1259	Prednisolone	27
AP-0271	Prednisolone 21-Acetate	20
AP-1144	Prednisolone 21-Acetate	21
AP-1259	Prednisone	27
No.82	Progesterone	14
AP-1018	n-Propylbenzene	16
AP-0248	Prostaglandin D <sub>2</sub>	32
AP-0248	Prostaglandin E <sub>2</sub>	32
AP-0248	Prostaglandin F <sub>2</sub> $\alpha$	32
AP-0248	Prostaglandin I <sub>2</sub>	32
AP-1296	Psoralen	16
AP-1297	Psoralen	16
AP-1302	Puerarin	28
No.49	1,6-PyQ	12
No.49	1,8-PyQ	12
AP-0240	Pyridine	31
No.1	Pyridoxal	8
No.1	Pyridoxamine	8
No.1	Pyridoxine	8
No.71	Pyripyropene A	13
No.71	Pyripyropene B	13
No.71	Pyripyropene D	13
AP-1032	Quercetin	18
AP-1299	Quercetin	18
AP-1302	Quercetin	28
No.21	Rakicidin A	9
No.21	Rakicidin B	9
No.21	Rakicidin E	9
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No.24	Resibufogenin	9
No.35	Resibufogenin	11
AP-1301	trans-Resveratrol	28
AP-1036	13-cis-Retinoic Acid	32
No.70	E-Rosmarinic Acid	13
No.70	Z-Rosmarinic Acid	13
AP-1300	Rutaecarpine	29
AP-1299	Rutin	18
AP-1021	Saikosaponin a	32
AP-1141	Saikosaponin a	33
AP-1021	Saikosaponin b <sub>1</sub>	32
AP-1141	Saikosaponin b <sub>1</sub>	33
AP-1021	Saikosaponin b <sub>2</sub>	32
AP-1141	Saikosaponin b <sub>2</sub>	33
AP-1021	Saikosaponin c	32
AP-1141	Saikosaponin c	33
AP-1021	Saikosaponin d	32
AP-1141	Saikosaponin d	33
AP-1141	Saikosaponin h	33
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AP-1296	Sedanolide	16
AP-1297	Sedanolide	16
No.30	Stauntosaponin A	10
No.30	Stauntosaponin B	10
AP-1038	Stearic Acid [Octadecanoic Acid]	28
AP-1014	cis-Stilbene	33
AP-1045	cis-Stilbene	33
AP-1412	cis-Stilbene	34
AP-1014	trans-Stilbene	33
AP-1045	trans-Stilbene	33
AP-1412	trans-Stilbene	34
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AP-1285	Sulfadiazine	34
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AP-1287	Sulfadimethoxine	34
AP-1285	Sulfamerazine	34
AP-1287	Sulfamerazine	34
AP-1285	Sulfamethazine	34
AP-1287	Sulfamethazine	34
AP-1285	Sulfamethoxazole	34
AP-1287	Sulfamethoxazole	34
AP-1285	Sulfathiazole	34
AP-1287	Sulfathiazole	34
No.46	Tangeretin	12
No.26	Taxiphyllin	10
No.17	Telmisartan	9
No.15	[ <sup>11</sup> C]Telmisartan	9
No.17	[ <sup>11</sup> C]Telmisartan	9
No.18	[ <sup>11</sup> C]Telmisartan	9
No.61	Tenuazonic Acid	13
AP-1042	m-Terphenyl	35
AP-1405	m-Terphenyl	36
AP-1019	o-Terphenyl	35
AP-1042	o-Terphenyl	35
AP-1142	o-Terphenyl	35
AP-1405	o-Terphenyl	36
AP-1406	o-Terphenyl	36
AP-1042	p-Terphenyl	35
AP-1405	p-Terphenyl	36
No.82	Testosterone	14
No.75	Tetraalkylpentacene derivative	14
No.21	TetrahydroRakicidin A	9
No.41	Theaflavin	11
No.42	Theaflavin	12
No.41	Theaflavin-3,3'-digallate	11
No.42	Theaflavin-3,3'-digallate	12
No.41	Theaflavin-3'-gallate	11
No.42	Theaflavin-3'-gallate	12
No.41	Theaflavin-3-gallate	11
No.42	Theaflavin-3-gallate	12
No.43	Theasaponin E5	12
No.26	Thunberginol C 8-O-β-d-glucopyranoside	10
No.26	Thunberginol D 3'-O-β-d-glucopyranoside	10
No.26	Thunberginol G 3'-O-β-d-glucopyranoside	10
No.26	Thunberginol G 8-O-β-d-glucopyranoside	10
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AP-1018	Toluene	16
AP-1046	Toluene	21
AP-1404	Toluene	30
AP-1295	Topotecan	16
AP-0271	Triamcinolone	20
AP-0271	Triamcinolone Acetonide	20
No.81	1,2,4-Triazole Derivatives	14
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AP-1287	Trimethoprim	34
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AP-1142	Triphenylene	35
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No.26	Umbelliferone Glucoside	10
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AP-1262	Vitamin A Palmitate	37
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AP-1204	Vitamin D <sub>2</sub> [Calciferol]	37
AP-1261	Vitamin D <sub>2</sub> [Calciferol]	36
AP-1262	Vitamin D <sub>2</sub> [Calciferol]	37
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AP-1204	Vitamin D <sub>3</sub>	37
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AP-1262	cis-Vitamin K <sub>1</sub>	37
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AP-1408	cis-Vitamin K <sub>1</sub>	39
AP-1261	trans-Vitamin K <sub>1</sub>	36
AP-1262	trans-Vitamin K <sub>1</sub>	37
AP-1289	trans-Vitamin K <sub>1</sub>	38
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AP-1408	trans-Vitamin K <sub>1</sub>	39
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AP-1289	Vitamin K <sub>2</sub> [Menatetrenone]	38
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