



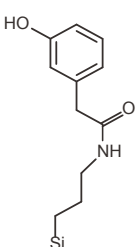
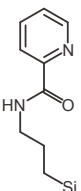
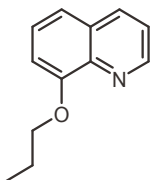
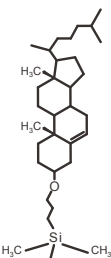
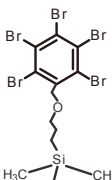
**COSMOSIL**

# COSMOSIL SFC Columns

Supercritical Fluid Chromatography (SFC) has become more attractive because it offers some advantages over HPLC, such as high speed, unique selectivity and environmentally friendly separations. Many conventional normal-phase stationary phases, such as diol, amino and cyano, have been used for SFC applications. However, these phases present limitations for separations. COSMOSIL SFC Columns have been developed to enhance the capability of SFC separations.

## COSMOSIL SFC Columns

Nacalai Tesque has developed columns specially designed for SFC in collaboration with Nacalai USA and Pfizer, Inc. Global R&D: COSMOSIL HP, PY (equivalent to 2-ethylpyridine) and Quinoline. In addition to these, our HPLC columns Cholester and PBr have been tested for use with SFC.

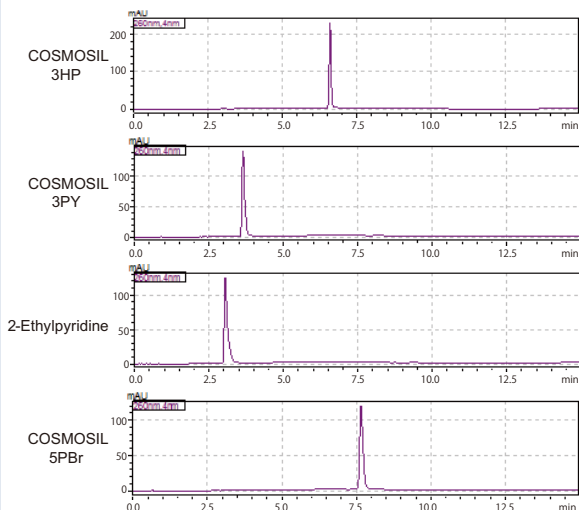
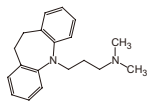
Packing Material	HP	PY	Quinoline		Cholester		PBr
Particle Sizes	3, 5 $\mu\text{m}$		2.5 $\mu\text{m}$	5 $\mu\text{m}$	2.5 $\mu\text{m}$	5 $\mu\text{m}$	5 $\mu\text{m}$
Pore Sizes	120 $\text{\AA}$		130 $\text{\AA}$	120 $\text{\AA}$	130 $\text{\AA}$	120 $\text{\AA}$	120 $\text{\AA}$
Surface Area	300 $\text{m}^2/\text{g}$		330 $\text{m}^2/\text{g}$	300 $\text{m}^2/\text{g}$	330 $\text{m}^2/\text{g}$	300 $\text{m}^2/\text{g}$	300 $\text{m}^2/\text{g}$
Structure							
Stationary Phase	3-Hydroxyphenyl group	Pyridinyl group	Quinoline group		Cholesteryl group		Pentabromobenzyl group

## Pharmaceutical Analysis

Each phase has different retention properties.

### Imipramine

Column: COSMOSIL \*\*  
 Column size: 2.1mm I.D.-150mm  
 Mobile phase: A: CO<sub>2</sub>  
 B: 0.1% CH<sub>3</sub>COONH<sub>4</sub> -Methanol  
 B conc. 0→60% (0→14min), 60% (14-17min)  
 Flow rate: 0.8 ml/min  
 BPR: 10 MPa  
 Temperature: 40 °C  
 Detection: UV260nm  
 Sample: Imipramine (1mmol/l)  
 Inj.Vol.: 2.0  $\mu\text{l}$

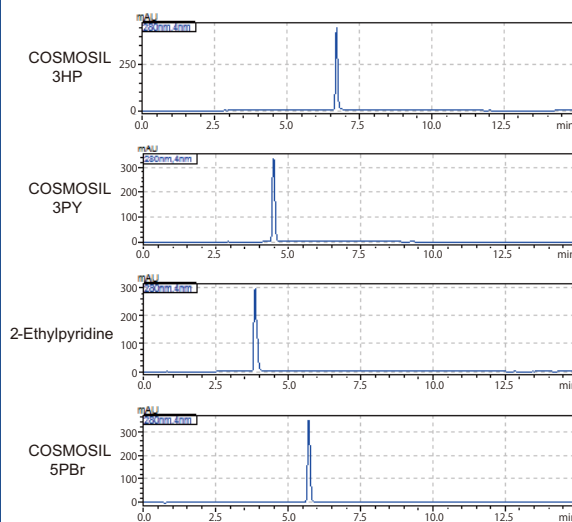
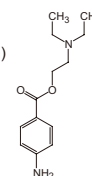


Data courtesy of Kyushu University Medical Institute of Bioregulation Research Center for Transomics Medicine Division of Metabolomics SFC-214

NACALAI TESQUE, INC

### Procaine

Column: COSMOSIL \*\*  
 Column size: 2.1mm I.D.-150mm  
 Mobile phase: A: CO<sub>2</sub>  
 B: 0.1% CH<sub>3</sub>COONH<sub>4</sub> - Methanol  
 B conc. 0→60% (0→14min), 60% (14-17min)  
 Flow rate: 0.8 ml/min  
 BPR: 10 MPa  
 Temperature: 40 °C  
 Detection: UV280nm  
 Sample: Procaine (1mmol/l)  
 Inj.Vol.: 2.0  $\mu\text{l}$

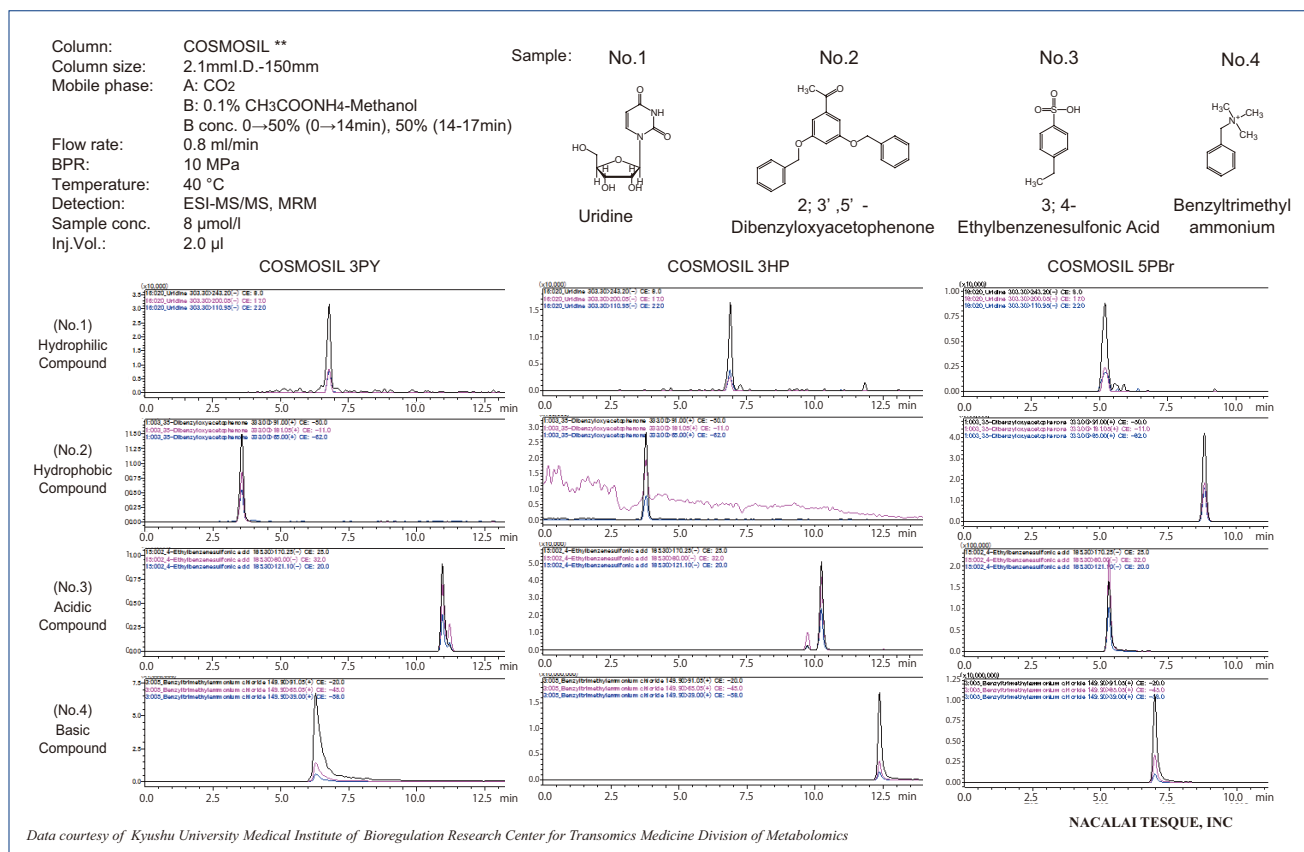


Data courtesy of Kyushu University Medical Institute of Bioregulation Research Center for Transomics Medicine Division of Metabolomics SFC-210

NACALAI TESQUE, INC

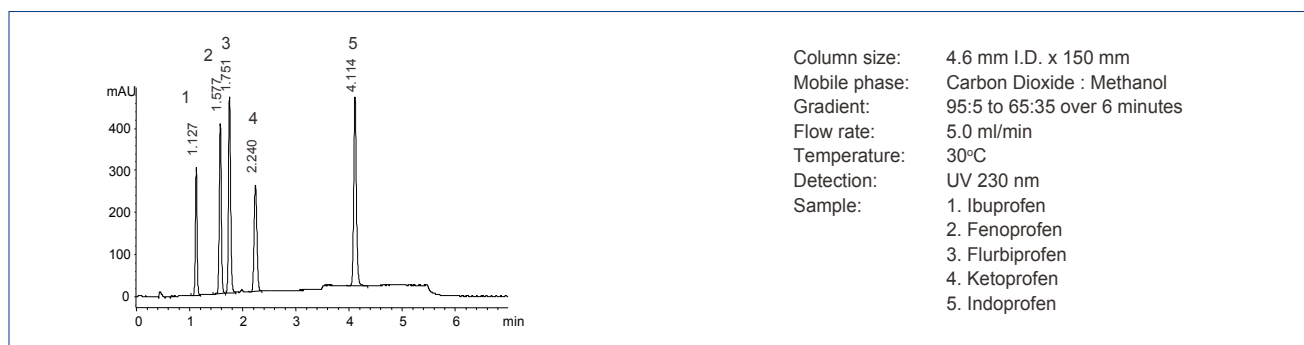
## Comparison of Retention Behavior

The following three stationary phases were evaluated for their retention of hydrophilic, hydrophobic, acidic and basic compounds. COSMOSIL HP and PY elute hydrophobic compounds first and retain hydrophilic compounds longer, whereas PBr elutes in the reverse order, exhibiting high retention for hydrophobic compounds. HP had the longest retention for basic compounds.

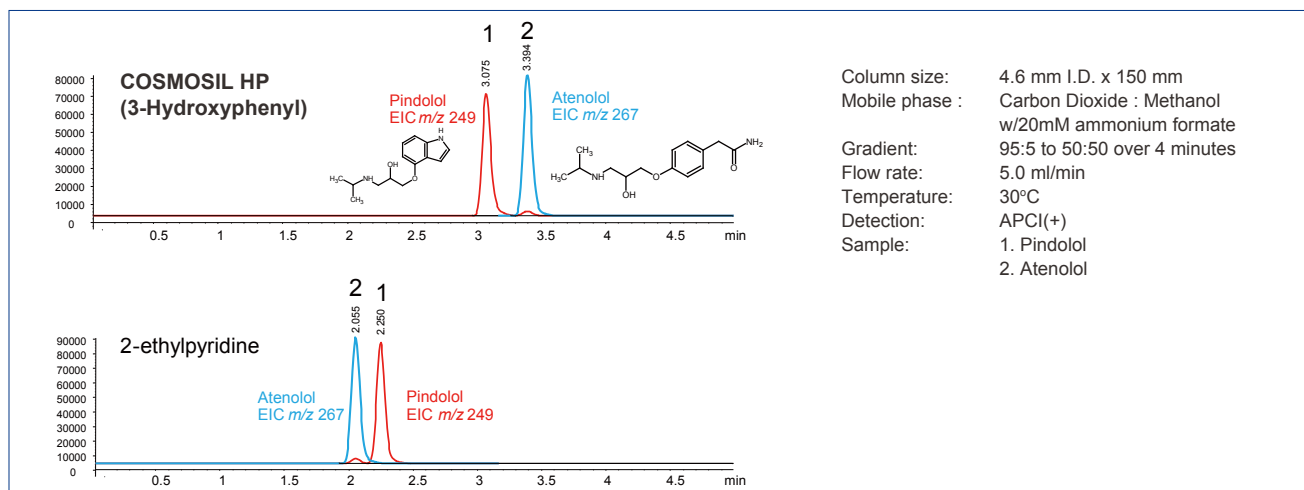


## COSMOSIL HP(3-Hydroxyphenyl)

### Application Data: Non-steroidal anti-inflammatory drugs

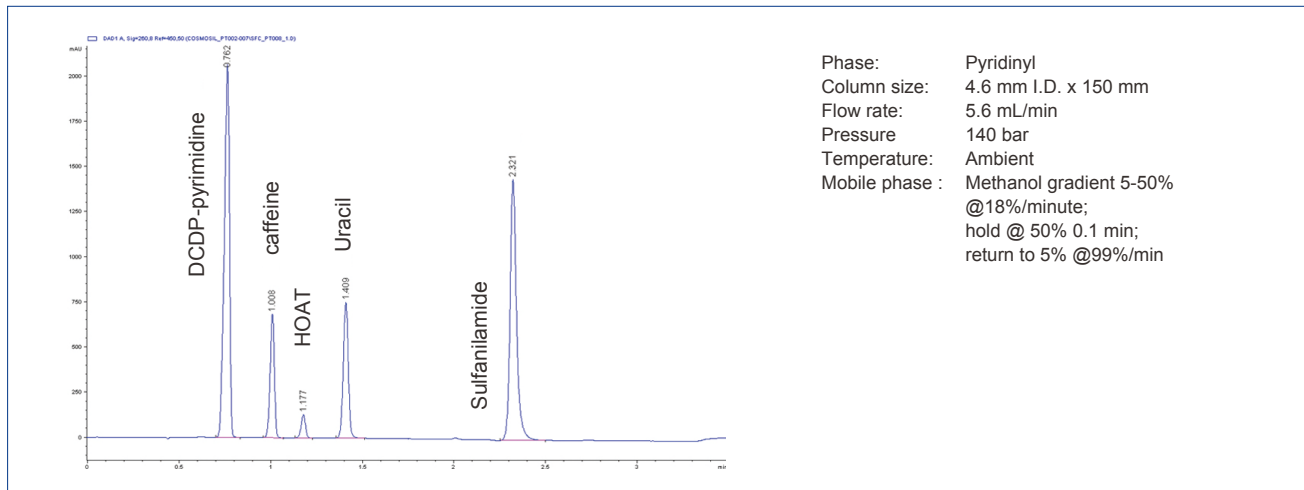


### Application Data: Beta Blockers (Peak elution order reversal under identical conditions)



## COSMOSIL PY (Pyridinyl)

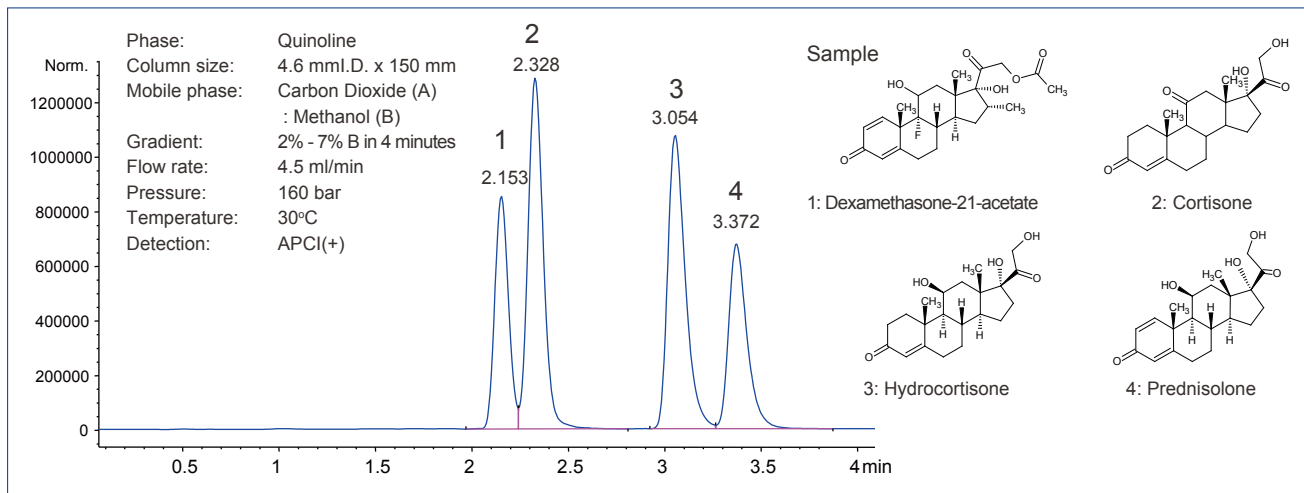
### Application Data: Hydrophilic organics



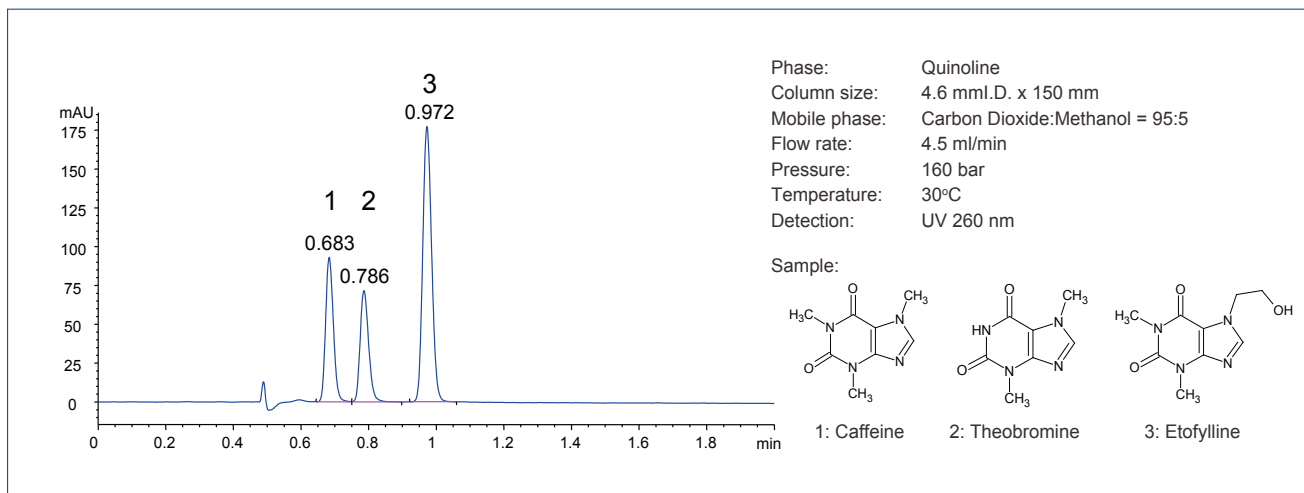
## COSMOSIL Quinoline

The structural similarities between polar lipids, such as cholesterol and related analogs, have posed chromatographic and spectrometric challenges to analysts interested in quantifying these potential biomarkers. COSMOSIL Quinoline has been developed to improve the separation of these structural isomers utilizing the  $\pi$ - $\pi$  interactions and structural rigidity of the naphthylethyl phase and the hydrogen bonding of the pyridine phase.

### Application Data: Steroids



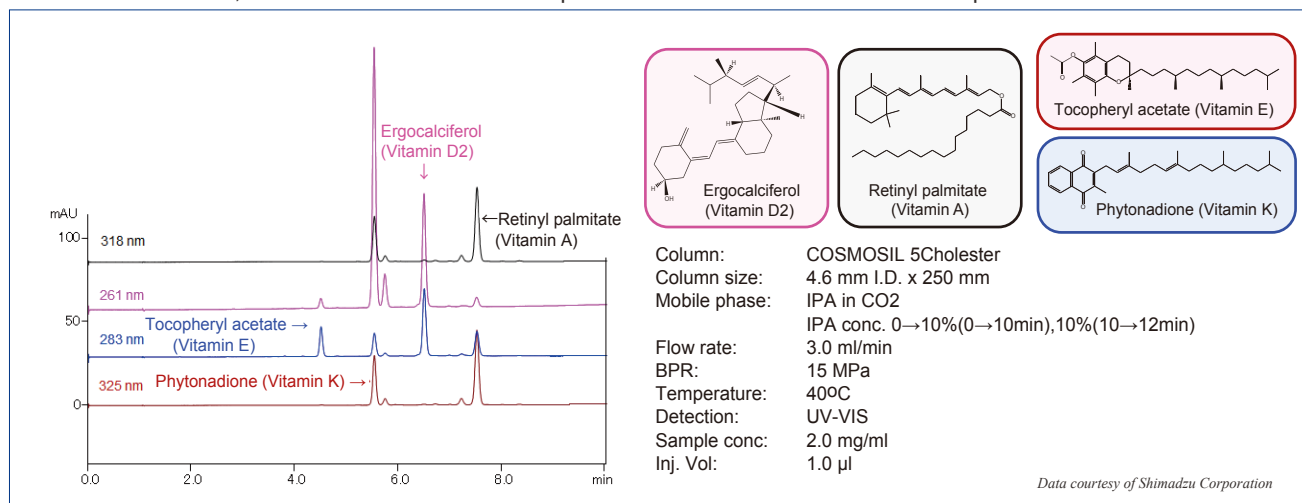
### Application Data: Caffeine analogs



# COSMOSIL Cholester

## Fat-Soluble Vitamin Analysis

When used with SFC, COSMOSIL Cholester can separate fat-soluble vitamins and their impurities.



COSMOSIL Cholester exhibits strong retention for fat-soluble vitamins and is suitable for on-line SFE-SFC using Shimadzu's Nexera UC. The on-line extraction from food also produced triglyceride impurities, which were successfully separated from the vitamins.

## Ordering Information

### COSMOSIL HP (3-Hydroxyphenyl)

Product Name	Column Size (mm I.D. x mm)	Product No.
Packed Column (5 µm)	2.0 x 150	13787-91
	4.6 x 250	13788-81
	10.0 x 250	13789-71
	20.0 x 250	13790-31
Guard Column (5 µm)	10.0 x 20	13791-21
Packed Column (3 µm)	2.0 x 150	13792-11
	4.6 x 250	13793-01

### COSMOSIL PY (Pyridinyl)

Product Name	Column Size (mm I.D. x mm)	Product No.
Packed Column (5 µm)	2.0 x 150	13818-81
	4.6 x 250	13827-61
	10.0 x 250	13828-51
	20.0 x 250	13829-41
Guard Column (5 µm)	10.0 x 20	13830-01
Packed Column (3 µm)	2.0 x 150	13831-91
	4.6 x 250	13832-81

### COSMOSIL Quinoline

Product Name	Column Size (mm I.D. x mm)	Product No.
Packed Column (5 µm)	2.0 x 150	Inquire
	4.6 x 100	Inquire
	4.6 x 150	Inquire
	10.0 x 150	Inquire
	20.0 x 150	Inquire
Packed Column (2.5 µm)	3.0 x 50	Inquire
	3.0 x 100	Inquire
	3.0 x 150	Inquire

### COSMOSIL Cholester

Product Name	Column Size (mm I.D. x mm)	Product No.
Packed Column (5 µm)	4.6 x 150	05976-61
	4.6 x 250	05977-51
	10.0 x 250	05979-31
	20.0 x 250	05982-71

### COSMOSIL PBr

Product Name	Column Size (mm I.D. x mm)	Product No.
Packed Column (5 µm)	4.6 x 150	12394-61
	4.6 x 250	12395-51
	10.0 x 250	12397-31
	20.0 x 250	12398-21

Other sizes may be available. Please inquire.

For research use only, not intended for diagnostic or drug use.