

Липиды

Технические характеристики

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Lipids

Lipids form a broad category of biomolecules which constitute an essential part of living organisms in addition to carbohydrates and proteins. This brochure introduces lipids and related substances such as fatty acids and their derivatives. The biosynthesis of fatty acids involves the condensation of malonyl-CoA (or methylmalonyl CoA) with acyl CoA as a primer.¹⁾ Carboxylic acids with chains of 4 or more carbons are referred to as fatty acids while those with 10 or more carbons are called higher fatty acids.²⁾ Lipids are classified as the below.³⁾

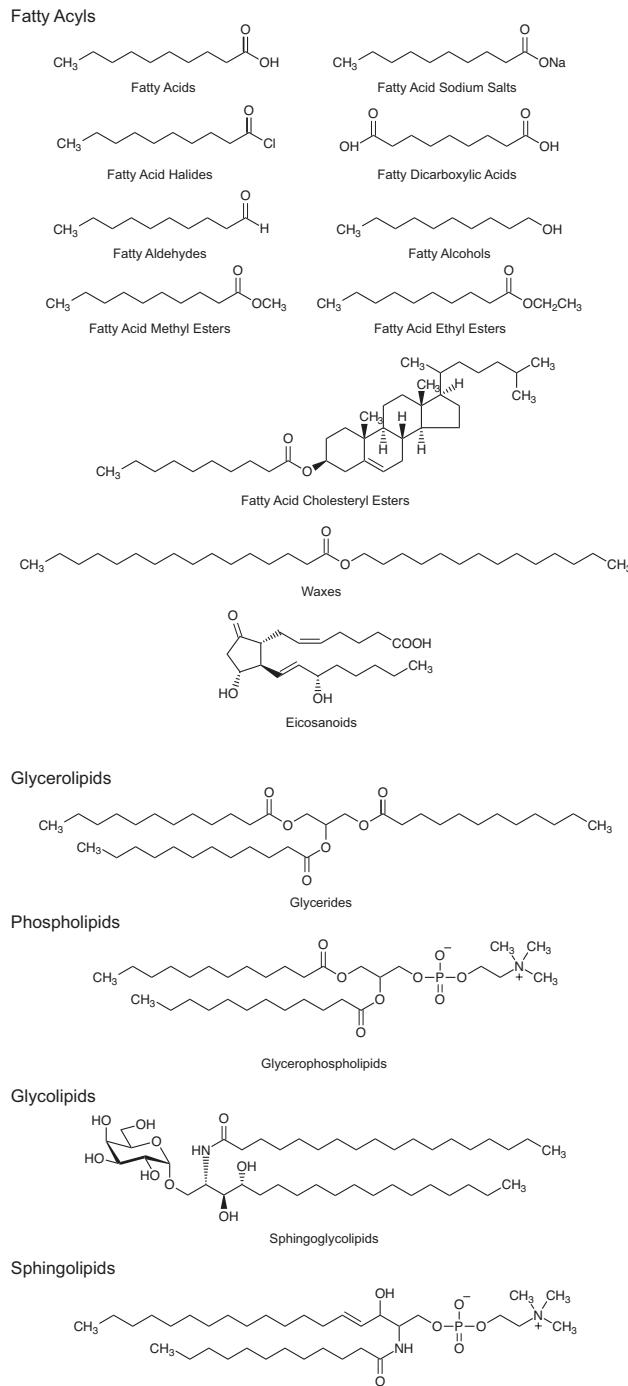
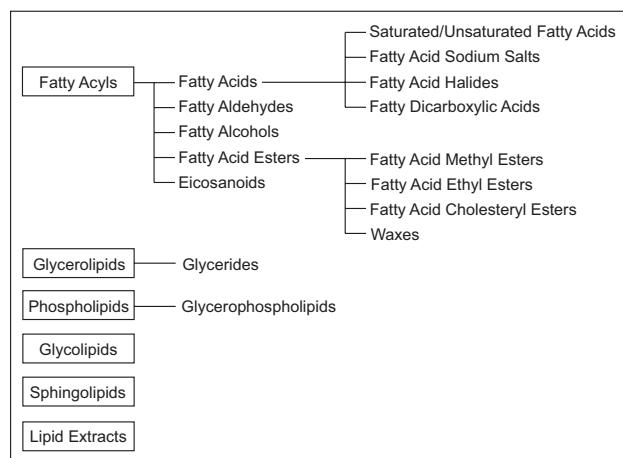


Figure 1. Classification of Lipids

● Functional Roles

Fatty acids exist in living organisms mainly as esters of glycerol and triacylglycerols which occur as a major form of energy storage in adipose tissue. Triacylglycerols are found in living organisms as mixtures of acyl groups with different number of carbons and are difficult in most cases to isolate as a single substance. Moreover, fatty acids also exist in living organisms in the form of cholesteryl esters which constitute an essential component of cell membranes where it is required to establish proper membrane permeability and fluidity.

Free fatty acids are known to suppress cell-growth at an order of 0.1mM and above, therefore considerable attention should be paid during their administration to cells.⁴⁾

● Storage Precautions

Unsaturated fatty acids like oleic acid are known to undergo aerial oxidation to produce peroxides. Opened bottles of unsaturated fatty acids and their derivatives should be stored in the refrigerator or frozen with inert gas such as nitrogen or argon. Moreover the tendency to oxidation increases as the degree of unsaturation in the fatty acids increases.

● Derivatives

Fatty acid methyl esters are the most widely used fatty acid derivatives in analytical chemistry due to their ease of handling in organic solvents as compared to the highly polar free fatty acids. Moreover their analysis by TLC, gas chromatography (GC) and liquid chromatography (LC) can be improvised by suppressing tailing.

Although fatty acid ethyl esters are rarely used for analysis as compared to the methyl esters, they offer an advantage since their method of preparation from fatty acids involves the use of the less toxic ethanol instead of methanol. For instance, eicosapentaenoic acid which is used as a hyperlipemia medicine is being supplied as ethyl ester. Ethyl esters of lower to middle-chain fatty acids can be also employed in the fragrance industry. Sodium salts of fatty acids can be obtained as saponification products of lipids and are widely used in daily life as an ingredient of soap owing to their amphiphilicity and surfactant properties.

● Analysis

GC is the most frequently used technique for the analysis of fatty acids. However, their direct analysis appears to be difficult owing to their low volatility in electron impact (EI) ionization mass spectrometry under normal condition. They can however be easily detected by GC-MS method upon derivatization to their methyl esters.

The several methylation methods include the treatment of the free fatty acids with boron trifluoride-ether complex in methanol or with trimethylsilyldiazomethane, etc.

The GC on-column method is a simple method that uses a methanolic solution of trimethylsulfonium hydroxide or 3-(trifluoromethyl)phenyltrimethylammonium hydroxide to analyze the fatty acid component of lipids such as glycerolipids.

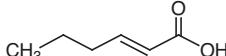
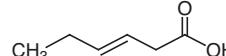
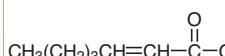
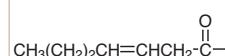
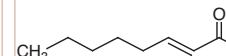
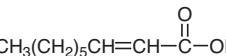
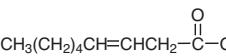
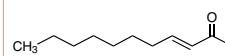
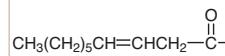
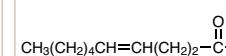
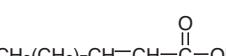
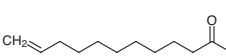
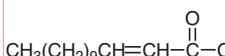
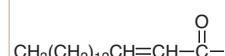
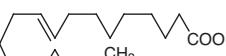
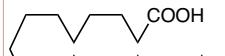
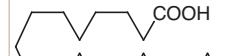
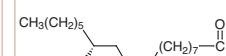
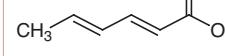
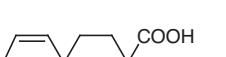
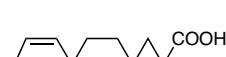
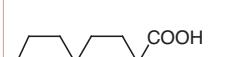
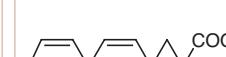
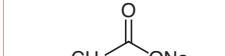
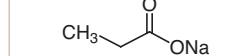
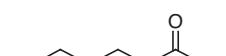
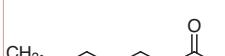
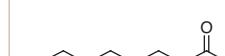
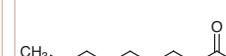
● Solubility

In general, the solubility of fatty acids in water decreases as the carbon number increases.

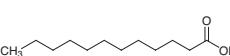
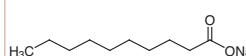
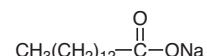
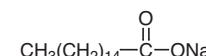
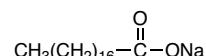
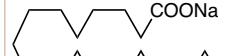
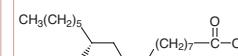
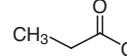
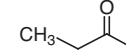
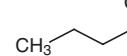
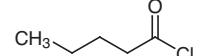
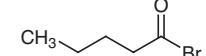
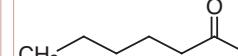
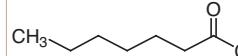
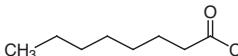
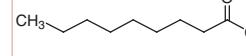
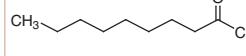
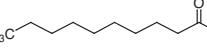
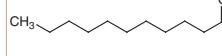
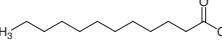
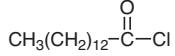
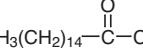
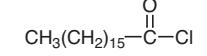
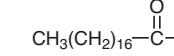
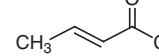
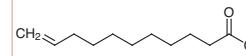
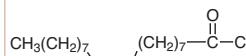
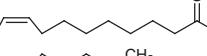
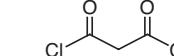
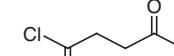
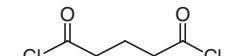
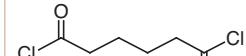
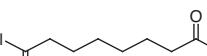
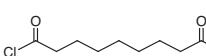
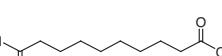
Fatty acid esters and glycerolipids are insoluble in water but soluble in ethanol, chloroform and diethyl ether. They can be added to the buffer solution as a dimethyl sulfoxide solution to examine their activity in living organisms. Please take caution that the solution becomes suspended as the concentration level of the dissolved substance increases. It is recommended to define the optimal concentration level and volume of addition in advance. Sodium salts of fatty acid are more water-soluble than the free fatty acids. Long-chain fatty acid salts tend to form micelles.

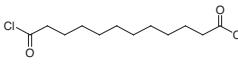
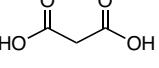
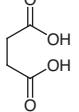
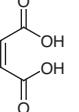
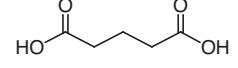
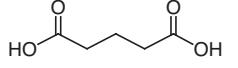
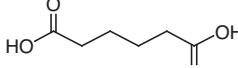
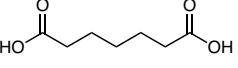
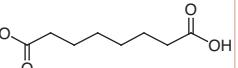
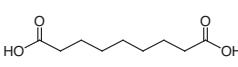
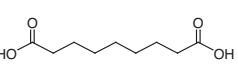
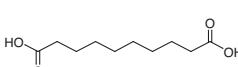
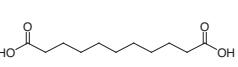
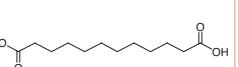
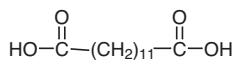
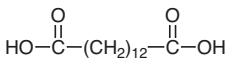
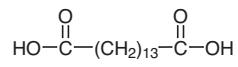
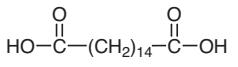
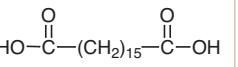
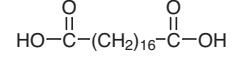
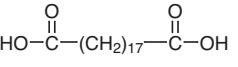
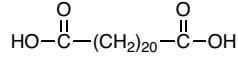
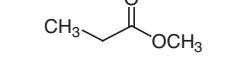
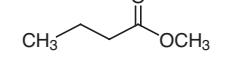
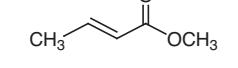
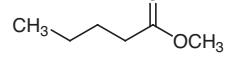
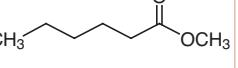
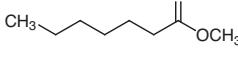
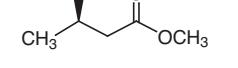
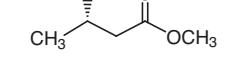
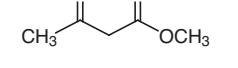
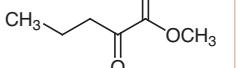
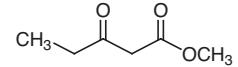
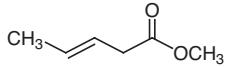
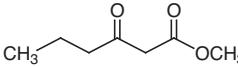
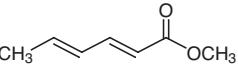
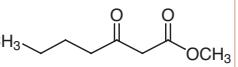
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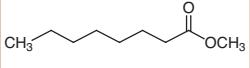
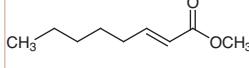
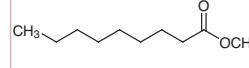
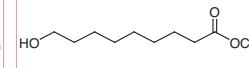
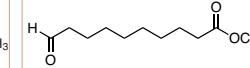
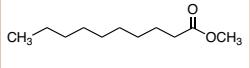
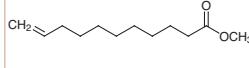
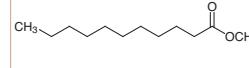
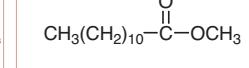
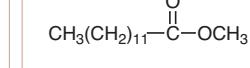
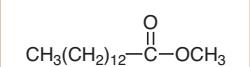
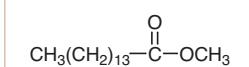
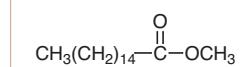
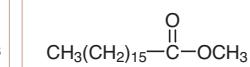
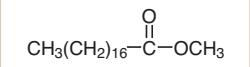
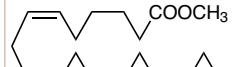
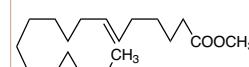
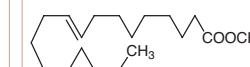
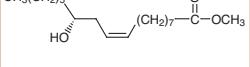
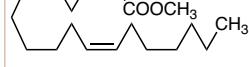
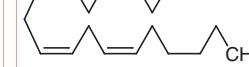
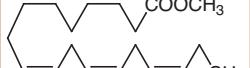
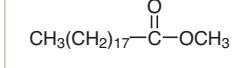
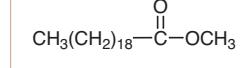
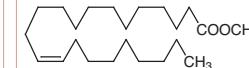
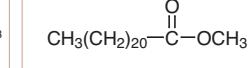
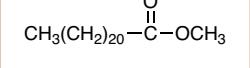
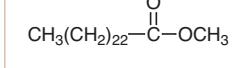
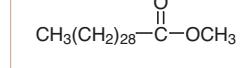
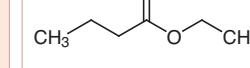
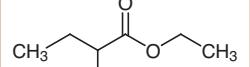
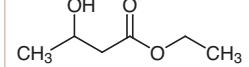
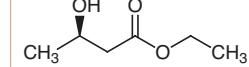
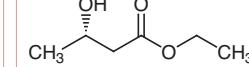
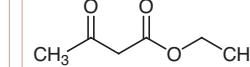
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O0010  Elaic Acid CAS RN: 112-79-8	O0009  Petroselinic Acid CAS RN: 593-39-5	O0011  Oleic Acid (>85.0%) CAS RN: 112-80-1	O0180  Oleic Acid (>99.0%) CAS RN: 112-80-1	R0027  Ricinoleic Acid CAS RN: 141-22-0
D0965  Erucic Acid CAS RN: 112-86-7	T1642  cis-15-Tetracosenoic Acid CAS RN: 506-37-6	S0053  Sorbic Acid CAS RN: 110-44-1	L0053  Linoleic Acid (>85.0%) CAS RN: 60-33-3	L0124  Linoleic Acid (>97.0%) CAS RN: 60-33-3
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D2226  DHA CAS RN: 6217-54-5	Fatty Acid Sodium Salts		S0559  Sodium Acetate CAS RN: 127-09-3	P0512  Sodium Propionate CAS RN: 137-40-6
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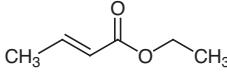
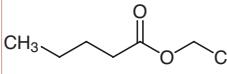
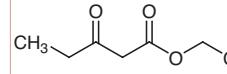
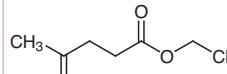
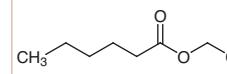
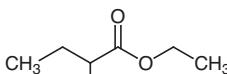
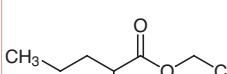
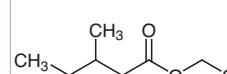
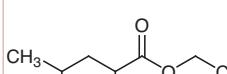
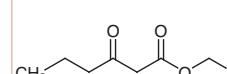
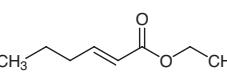
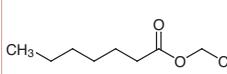
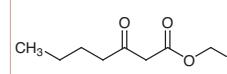
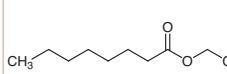
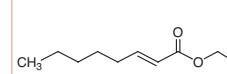
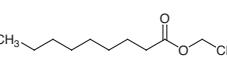
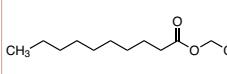
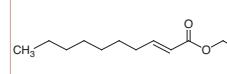
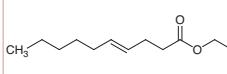
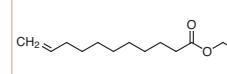
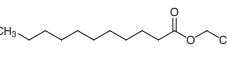
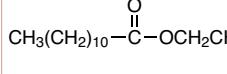
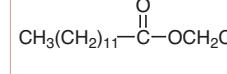
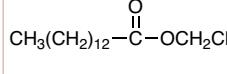
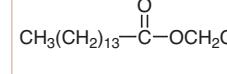
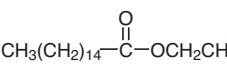
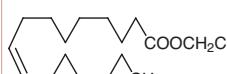
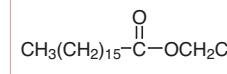
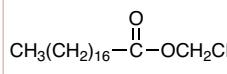
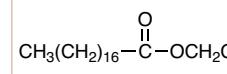
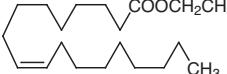
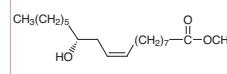
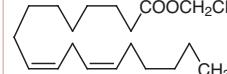
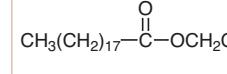
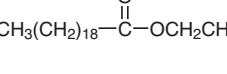
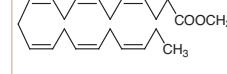
Lipids

L0016 25g 400g  Sodium Laurate CAS RN: 629-25-4	D0024 25g 100g 500g  Sodium Decanoate CAS RN: 1002-62-6	M0483 25g 100g 500g  Sodium Myristate CAS RN: 822-12-8	P0007 25g 500g  Sodium Palmitate CAS RN: 408-35-5	S0081 25g  Sodium Stearate CAS RN: 822-16-2
O0057 25g 100g 500g  Sodium Oleate CAS RN: 143-19-1	L0056 5g 25g  Sodium Linoleate CAS RN: 822-17-3	R0030 25g 500g  Sodium Ricinolate CAS RN: 5323-95-5	Fatty Acid Halides	
A0080 25g 500g  Acetyl Bromide CAS RN: 506-96-7	A0095 10g 25g  Acetyl Iodide CAS RN: 507-02-8	P0516 25g 500g  Propionyl Chloride CAS RN: 79-03-8	P0515 25g  Propionyl Bromide CAS RN: 598-22-1	B0770 25g 500g  Butyryl Chloride CAS RN: 141-75-3
V0010 25mL 100mL 500mL  Valeryl Chloride CAS RN: 638-29-9	V0038 10g  Valeryl Bromide CAS RN: 1889-26-5	H0117 25g 100g 500g  Hexanoyl Chloride CAS RN: 142-61-0	H0040 25g 100g 500g  Heptanoyl Chloride CAS RN: 2528-61-2	O0039 25mL 100mL 500mL  n-Octanoyl Chloride CAS RN: 111-64-8
N0372 25g 100g  Nonanoyl Chloride (>95.0%) CAS RN: 764-85-2	N0813 25g  Nonanoyl Chloride (>97.0%) CAS RN: 764-85-2	D0027 25mL 100mL 500mL  Decanoyl Chloride CAS RN: 112-13-0	U0026 10mL 25mL  Undecanoyl Chloride CAS RN: 17746-05-3	D0972 25mL 500mL  Lauroyl Chloride CAS RN: 112-16-3
T0086 25g 400g  Myristoyl Chloride CAS RN: 112-64-1	P0009 25mL 500mL  Palmitoyl Chloride CAS RN: 112-67-4	H0782 25mL  Heptadecanoyl Chloride CAS RN: 40480-10-2	S0404 25g 250g  Stearoyl Chloride CAS RN: 112-76-5	C0424 25g 100g 500g  Crotonoyl Chloride (cis- and trans-mixture) CAS RN: 10487-71-5
U0008 25mL 250mL  10-Undecenoyl Chloride CAS RN: 38460-95-6	O0053 25g 250g  Oleoyl Chloride CAS RN: 112-77-6	L0113 1g  Linoleoyl Chloride CAS RN: 7459-33-8	M0882 10g 25g  Malonyl Chloride CAS RN: 1663-67-8	S0110 25g 250g  Succinyl Chloride CAS RN: 543-20-4
G0202 25mL  Glutaryl Chloride CAS RN: 2873-74-7	A0169 25g 100g 500g  Adipoyl Chloride CAS RN: 111-50-2	S0420 25g  Suberoyl Chloride CAS RN: 10027-07-3	A0562 25mL  Azelaoyl Chloride CAS RN: 123-98-8	S0030 25mL 100mL 500mL  Sebacoyl Chloride CAS RN: 111-19-3

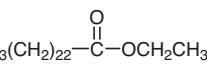
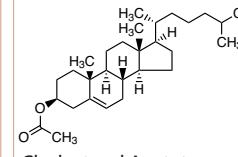
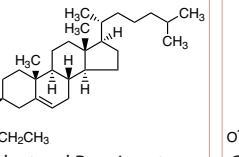
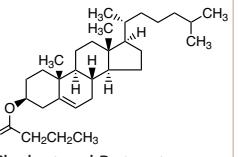
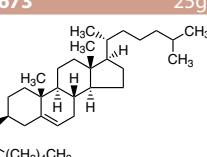
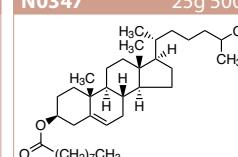
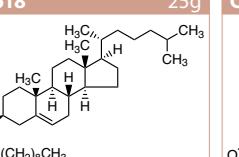
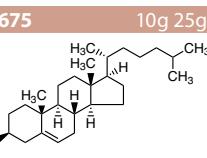
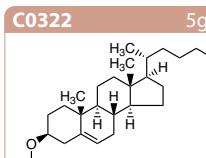
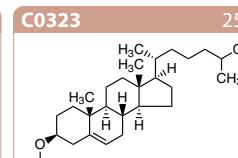
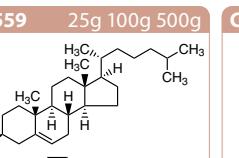
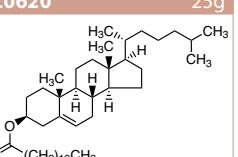
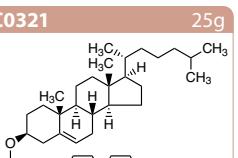
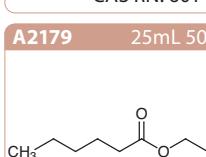
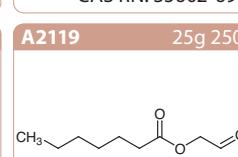
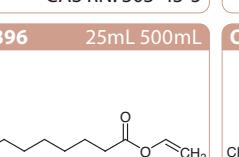
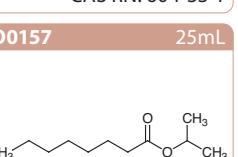
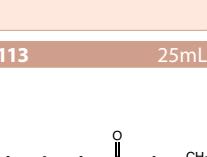
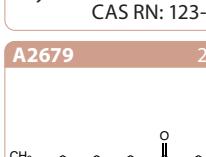
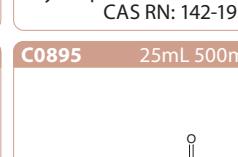
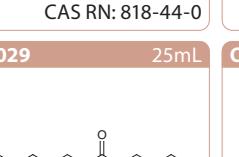
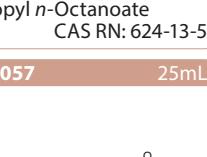
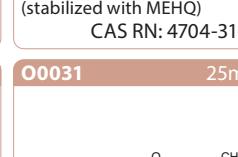
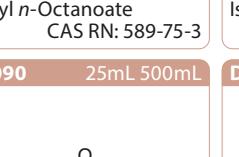
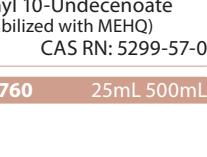
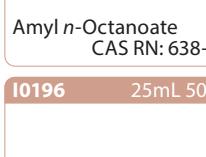
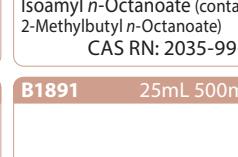
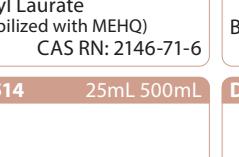
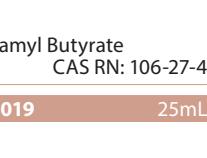
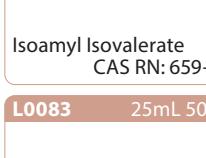
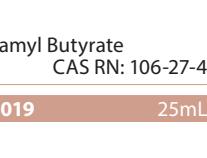
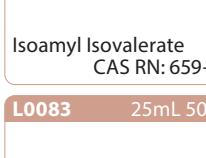
D2544  Dodecanediyoyl Dichloride CAS RN: 4834-98-4	Fatty Dicarboxylic Acids	M0028  Malonic Acid CAS RN: 141-82-2	S0100  Succinic Acid CAS RN: 110-15-6	M0006  Maleic Acid CAS RN: 110-16-7
G0069  Glutaric Acid CAS RN: 110-94-1	G0245  Glutaric Acid (ca. 50% in Water, ca. 4.3mol/L) CAS RN: 110-94-1	A0161  Adipic Acid CAS RN: 124-04-9	P0435  Pimelic Acid CAS RN: 111-16-0	O0023  Suberic Acid CAS RN: 505-48-6
A0561  Azelaic Acid (>80.0%) CAS RN: 123-99-9	A1318  Azelaic Acid (>98.0%) CAS RN: 123-99-9	S0022  Sebacic Acid CAS RN: 111-20-6	N0333  Undecanedioic Acid CAS RN: 1852-04-6	D0013  Dodecanedioic Acid CAS RN: 693-23-2
T0021  Tridecanedioic Acid CAS RN: 505-52-2	T0704  Tetradecanedioic Acid CAS RN: 821-38-5	P0909  Pentadecanedioic Acid CAS RN: 1460-18-0	H0293  Hexadecanedioic Acid CAS RN: 505-54-4	H0972  Heptadecanedioic Acid CAS RN: 2424-90-0
00222  Octadecanedioic Acid CAS RN: 871-70-5	N0663  Nonadecanedioic Acid CAS RN: 6250-70-0	D3137  Docosanedioic Acid CAS RN: 505-56-6	Fatty Acid Esters	
P0508  Methyl Propionate CAS RN: 554-12-1	B0763  Methyl Butyrate CAS RN: 623-42-7	C0419  Methyl Crotonate CAS RN: 623-43-8	V0005  Methyl Valerate CAS RN: 624-24-8	H0111  Methyl Hexanoate CAS RN: 106-70-7
H0032  Methyl Heptanoate CAS RN: 106-73-0	H0705  Methyl (R)-3-Hydroxybutyrate CAS RN: 3976-69-0	H0704  Methyl (S)-3-Hydroxybutyrate CAS RN: 53562-86-0	A0650  Methyl Acetoacetate CAS RN: 105-45-3	M1863  Methyl 2-Oxovalerate CAS RN: 6376-59-6
K0035  Methyl 3-Oxovalerate CAS RN: 30414-53-0	P1210  Methyl trans-3-Pentenoate CAS RN: 20515-19-9	K0037  Methyl 3-Oxohexanoate CAS RN: 30414-54-1	S0056  Methyl Sorbate CAS RN: 1515-80-6	O0246  Methyl 3-Oxoheptanoate CAS RN: 39815-78-6

Lipids

00033 25mL 500mL	M2014 5mL 25mL	N0290 25mL	H0835 1g 5g	M2263 1g 5g
 Methyl <i>n</i> -Octanoate CAS RN: 111-11-5	 Methyl <i>trans</i> -2-Octenoate CAS RN: 7367-81-9	 Methyl Nonanoate CAS RN: 1731-84-6	 Methyl 9-Hydroxyoctanoate CAS RN: 34957-73-8	 Methyl 9-Formylnonanoate CAS RN: 14811-73-5
D0023 25mL 500mL	U0036 25mL 100mL 500mL	U0050 25mL	L0015 25mL 500mL	T0960 5mL 25mL 100mL
 Methyl Decanoate CAS RN: 110-42-9	 Methyl 10-Undecenoate CAS RN: 111-81-9	 Methyl Undecanoate CAS RN: 1731-86-8	 Methyl Laurate CAS RN: 111-82-0	 Methyl Tridecanoate CAS RN: 1731-88-0
M0482 25mL 500mL	P0869 5mL 25mL	P0006 25g 250g	P1958 100mg 1g	H0566 5g 25g
 Methyl Myristate CAS RN: 124-10-7	 Methyl Pentadecanoate CAS RN: 7132-64-1	 Methyl Palmitate CAS RN: 112-39-0	 Methyl <i>cis</i> -9-Hexadecenoate CAS RN: 1120-25-8	 Methyl Heptadecanoate CAS RN: 1731-92-6
S0080 25g 500g	M2306 500mg	M2310 100mg 500mg	O0055 25mL 500mL	O0226 1mL 5mL
 Methyl Stearate CAS RN: 112-61-8	 Methyl <i>cis</i> -6-Octadecenoate CAS RN: 2777-58-4	 Methyl <i>trans</i> -6-Octadecenoate CAS RN: 14620-36-1	 Methyl Oleate CAS RN: 112-62-9	 Methyl <i>trans</i> -9-Octadecenoate CAS RN: 1937-62-8
R0029 25mL 500mL	M2308 100mg	M2309 100mg	L0078 25mL 500mL	M2307 100mg 500mg
 Methyl Ricinoleate CAS RN: 141-24-2	 Methyl <i>cis</i> -11-Octadecenoate CAS RN: 1937-63-9	 Methyl <i>trans</i> -11-Octadecenoate CAS RN: 6198-58-9	 Methyl Linoleate CAS RN: 112-63-0	 Methyl Linolelaidate CAS RN: 2566-97-4
L0051 25mL 100mL	N0460 5g 25g	A0900 5g 25g	D1017 25mL 500mL	B1748 10g
 Methyl Linolenate CAS RN: 301-00-8	 Methyl Nonadecanoate CAS RN: 1731-94-8	 Methyl Arachidate CAS RN: 1120-28-1	 Methyl <i>cis</i> -13-Docosenoate CAS RN: 1120-34-9	 Methyl Behenate (>96.0%) CAS RN: 929-77-1
B1241 25g	L0112 1g 5g	T0812 100mg 1g	Fatty Acid Ethyl Esters	
 Methyl Behenate (>90.0%) CAS RN: 929-77-1	 Methyl Lignocerate CAS RN: 2442-49-1	 Methyl Triacantanate CAS RN: 629-83-4	 Ethyl Butyrate CAS RN: 105-54-4	
H0229 5g 25g	H0230 25g 500g	H1029 1g 5g	H0975 5g 25g	A0649 25g 500g
 Ethyl 2-Hydroxybutyrate CAS RN: 52089-54-0	 Ethyl DL-3-Hydroxybutyrate CAS RN: 5405-41-4	 Ethyl (<i>R</i>)-(-)-3-Hydroxybutyrate CAS RN: 24915-95-5	 Ethyl (<i>S</i>)-(+)-3-Hydroxybutyrate CAS RN: 56816-01-4	 Ethyl Acetoacetate CAS RN: 141-97-9

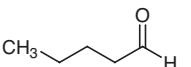
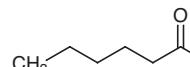
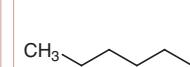
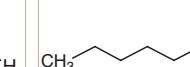
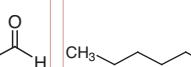
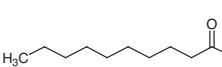
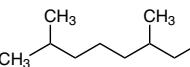
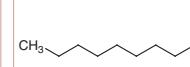
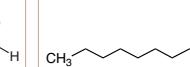
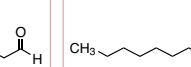
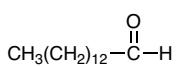
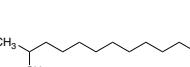
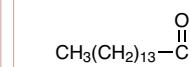
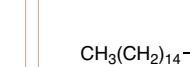
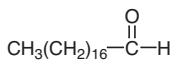
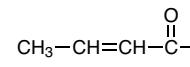
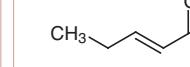
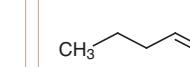
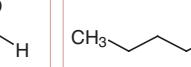
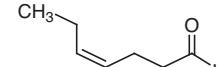
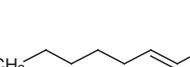
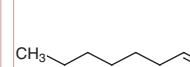
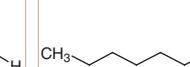
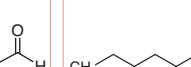
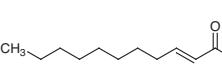
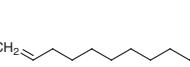
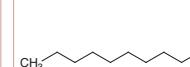
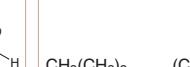
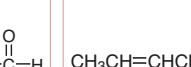
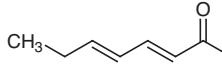
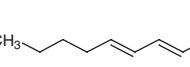
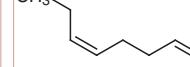
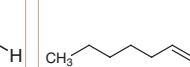
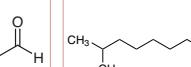
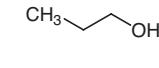
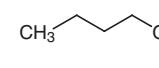
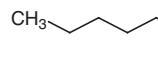
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E0345 25mL 500mL  Ethyl 2-Ethylbutyrate CAS RN: 2983-38-2	E0801 25mL 500mL  Ethyl 2-Methylvalerate CAS RN: 39255-32-8	E0803 5g 25g  Ethyl 3-Methylvalerate CAS RN: 5870-68-8	E0802 5g 25g  Ethyl DL-Leucate CAS RN: 10348-47-7	K0030 25mL 500mL  Ethyl 3-Oxohexanoate CAS RN: 3249-68-1
E0787 25g  Ethyl trans-2-Hexenoate CAS RN: 27829-72-7	H0031 25mL 500mL  Ethyl Heptanoate CAS RN: 106-30-9	O0216 10g 25g  Ethyl 3-Oxoheptanoate CAS RN: 7737-62-4	O0030 25mL 500mL  Ethyl n-Octanoate CAS RN: 106-32-1	O0286 25mL  Ethyl trans-2-Octenoate CAS RN: 7367-82-0
N0289 25mL  Ethyl Nonanoate CAS RN: 123-29-5	D0022 25mL 500mL  Ethyl Decanoate CAS RN: 110-38-3	D2767 25mL  Ethyl trans-2-Decenoate CAS RN: 7367-88-6	D1931 10mL  Ethyl trans-4-Decenoate CAS RN: 76649-16-6	E0771 25g 250g  Ethyl 10-Undecenoate CAS RN: 692-86-4
U0049 25mL 250mL  Ethyl Undecanoate CAS RN: 627-90-7	L0013 25mL 500mL  Ethyl Laurate CAS RN: 106-33-2	T0959 5mL 25mL  Ethyl Tridecanoate CAS RN: 28267-29-0	M0479 25mL 100mL 500mL  Ethyl Myristate CAS RN: 124-06-1	P0868 5mL 25mL  Ethyl Pentadecanoate CAS RN: 41114-00-5
P0003 25mL 500mL  Ethyl Palmitate CAS RN: 628-97-7	H0501 100mg  Ethyl cis-9-Hexadecenoate CAS RN: 56219-10-4	H0526 5g 25g  Ethyl Heptadecanoate CAS RN: 14010-23-2	S0079 25g 250g  Ethyl Stearate (>96.0%) CAS RN: 111-61-5	S0365 25g  Ethyl Stearate (>99.0%) CAS RN: 111-61-5
O0143 5mL 25mL  Ethyl Oleate (>95.0%) CAS RN: 111-62-6	OO054 25mL 500mL  Ethyl Oleate (>70.0%) CAS RN: 111-62-6	R0049 25mL  Ethyl Ricinoleate CAS RN: 55066-53-0	L0135 5mL 25mL  Ethyl Linoleate (>97.0%) CAS RN: 544-35-4	N0459 5g 25g  Ethyl Nonadecanoate CAS RN: 18281-04-4
A0899 5g 25g  Ethyl Arachidate CAS RN: 18281-05-5	E0442 200mg  EPA Ethyl Ester CAS RN: 86227-47-6	E0853 25g  EPA Ethyl Ester (stabilized with Tocopherols) CAS RN: 86227-47-6	D1014 5mL 25mL  Ethyl Erucate CAS RN: 37910-77-3	D2195 100mg  DHA Ethyl Ester CAS RN: 84494-72-4

Lipids

L0111  Ethyl Lignocerate CAS RN: 24634-95-5	5g	C0319  Cholesterol Acetate CAS RN: 604-35-3	25g	C0676  Cholesterol Propionate CAS RN: 633-31-8	10g 25g	C0668  Cholesterol Butyrate CAS RN: 521-13-1	25g
C0673  Cholesterol Hexanoate CAS RN: 1062-96-0	25g	C0334  Cholesterol n-Octanoate CAS RN: 1182-42-9	5g 25g	N0347  Cholesterol Pelargonate CAS RN: 1182-66-7	25g 500g	C0618  Cholesterol Decanoate CAS RN: 1183-04-6	25g
C0675  Cholesterol Myristate CAS RN: 1989-52-2	10g 25g	C0322  Cholesterol Palmitate CAS RN: 601-34-3	5g 25g	C0323  Cholesterol Stearate CAS RN: 35602-69-8	25g	C0559  Cholesterol Oleate CAS RN: 303-43-5	25g 100g 500g
C0620  Cholesterol Laurate CAS RN: 1908-11-8	25g	C0321  Cholesterol Linoleate CAS RN: 604-33-1	25g				
A2179  Allyl Hexanoate CAS RN: 123-68-2	25mL 500mL	A2119  Allyl Heptanoate CAS RN: 142-19-8	25g 250g	C0896  Vinyl n-Octanoate (stabilized with MEHQ) CAS RN: 818-44-0	25mL 500mL	O0157  Isopropyl n-Octanoate CAS RN: 5458-59-3	25mL
P2113  Propyl n-Octanoate CAS RN: 624-13-5	25mL	A2679  Allyl Nonanoate CAS RN: 7493-72-3	25mL	C0895  Vinyl Decanoate (stabilized with MEHQ) CAS RN: 4704-31-8	25mL 500mL	O0029  Butyl n-Octanoate CAS RN: 589-75-3	25mL
U0057  Vinyl 10-Undecenoate (stabilized with MEHQ) CAS RN: 5299-57-0	25mL	O0028  Amyl n-Octanoate CAS RN: 638-25-5	25mL 500mL	O0031  Isoamyl n-Octanoate (contains 2-Methylbutyl n-Octanoate) CAS RN: 2035-99-6	25mL	L0090  Vinyl Laurate (stabilized with MEHQ) CAS RN: 2146-71-6	25mL 500mL
B0760  Isoamyl Butyrate CAS RN: 106-27-4	25mL 500mL	I0196  Isoamyl Isovalerate CAS RN: 659-70-1	25mL 500mL	B1891  Hexyl Butyrate CAS RN: 2639-63-6	25mL 500mL	C1514  Hexyl Hexanoate CAS RN: 6378-65-0	25mL 500mL
D0019  Isoamyl Decanoate CAS RN: 2306-91-4	25mL	L0083  Butyl Laurate CAS RN: 106-18-3	25mL 500mL	L0084  Isobutyl Laurate CAS RN: 37811-72-6	25mL 500mL	L0012  Amyl Laurate CAS RN: 5350-03-8	25mL 500mL
D0018  Amyl Decanoate CAS RN: 5933-87-9	25mL	L0014  Isoamyl Laurate CAS RN: 6309-51-9	25mL				

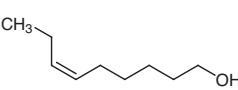
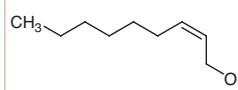
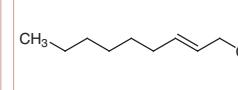
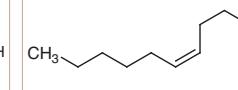
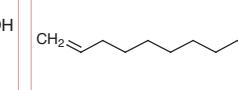
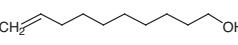
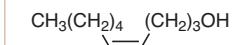
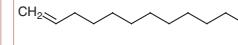
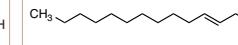
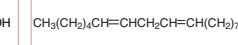
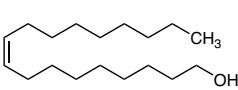
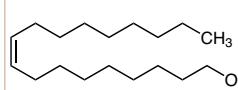
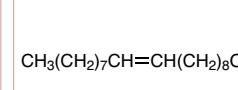
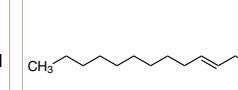
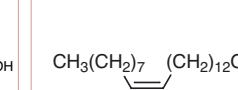
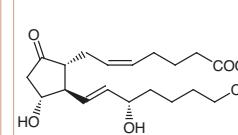
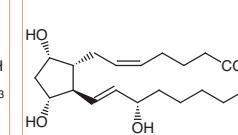
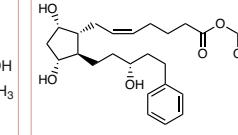
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Isopropyl Myristate CAS RN: 110-27-0			Lauroylcholine Chloride CAS RN: 25234-60-0			Vinyl Palmitate (stabilized with MEHQ) CAS RN: 693-38-9			2-Ethylhexyl Palmitate CAS RN: 29806-73-3			Butyl Hexanoate CAS RN: 626-82-4		
I0197	25mL 500mL		B4322	25mL		B3359	25mL 500mL		B6101	25mL 100mL		M0477	25mL 500mL	
Isobutyl Isovalerate CAS RN: 589-59-3			Butyl Valerate CAS RN: 591-68-4			Butyl 2-Methylvalerate CAS RN: 6297-41-2			Butyl 2-Methylbutyrate CAS RN: 15706-73-7			Butyl Myristate CAS RN: 110-36-1		
M0555	25mL		L0107	25mL		P0005	25mL 500mL		S0241	25g 100g		P0649	25mL	
Isobutyl Myristate CAS RN: 25263-97-2			Benzyl Laurate CAS RN: 140-25-0			Isopropyl Palmitate CAS RN: 142-91-6			Vinyl Stearate (stabilized with MEHQ) CAS RN: 111-63-7			Butyl Palmitate CAS RN: 111-06-8		
P0651	25mL		L0139	25mL 500mL		A0879	25mL 500mL		S0366	5g 25g		L0122	5g 25g	
Isobutyl Palmitate CAS RN: 110-34-9			Isopropyl Linoleate CAS RN: 22882-95-7			Methyl O-Acetylricinoleate CAS RN: 140-03-4			Glycidyl Stearate CAS RN: 7460-84-6			2-Naphthyl Laurate CAS RN: 6343-73-3		
R0045	25mL 500mL		S0077	25g 400g		M0780	10g		O0007	5g 25g		P0738	25g	
Butyl Ricinoleate CAS RN: 151-13-3			Butyl Stearate CAS RN: 123-95-5			2-Naphthyl Myristate CAS RN: 7262-80-8			Phenyl Stearate CAS RN: 637-55-8			Pentaerythritol Distearate (mixture) CAS RN: 13081-97-5		
P0739	25g 500g		A0021	25mL 500mL		A0033	25mL 500mL		A0034	25mL 500mL		A0041	25mL 500mL	
Pentaerythritol Tetraestearate (contains palmitate) CAS RN: 115-83-3			Amyl Acetate CAS RN: 628-63-7			Isoamyl Acetate CAS RN: 123-92-2			Isobutyl Acetate CAS RN: 110-19-0			Nonyl Acetate CAS RN: 143-13-5		
A0904	25mL 500mL		A0934	25mL 500mL		B6116	25g		D1080	25mL 500mL		B0751	25mL 500mL	
Heptyl Acetate CAS RN: 112-06-1			Oleyl Acetate CAS RN: 693-80-1			Benzyl Octanoate CAS RN: 10276-85-4			Waxes			Decyl Decanoate CAS RN: 1654-86-0		
I0662	25g 500g		S0078	25g		P1077	25g 500g		Fatty Aldehydes			Butyraldehyde CAS RN: 123-72-8		
3-Isoamyl-6-methyl-2-heptyl Myristate CAS RN: 88332-30-3			Dodecyl Stearate CAS RN: 5303-25-3			Hexadecyl Palmitate CAS RN: 540-10-3								

Lipids

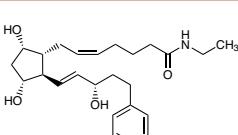
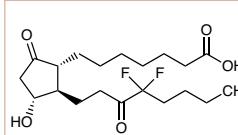
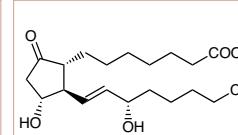
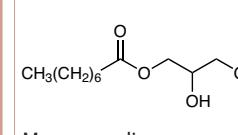
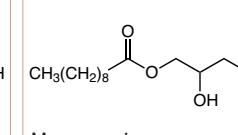
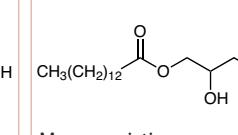
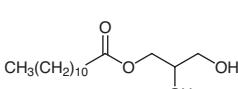
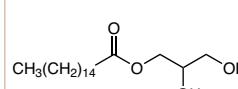
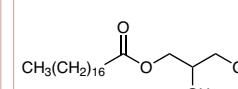
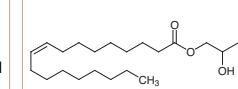
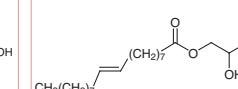
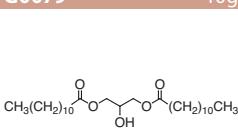
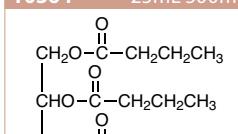
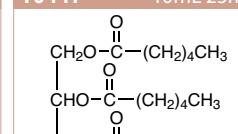
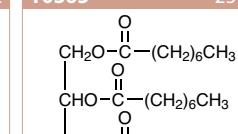
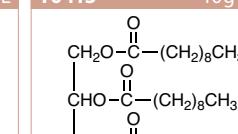
V0001 25mL 500mL  Valeraldehyde CAS RN: 110-62-3	H0133 25mL 100mL 500mL  Hexanal CAS RN: 66-25-1	H0025 25mL 500mL  Heptanal CAS RN: 111-71-7	O0044 25mL 500mL  n-Octanal CAS RN: 124-13-0	N0296 25mL 100mL 500mL  Nonanal CAS RN: 124-19-6
D0032 25mL 500mL  Decanal CAS RN: 112-31-2	D6104 200mg  (±)-Dihydrocitronellal CAS RN: 5988-91-0	U0009 25mL 250mL  Undecanal CAS RN: 112-44-7	D0979 25mL 500mL  Dodecanal (stabilized with DL- α -Tocopherol) CAS RN: 112-54-9	T0410 5mL  Tridecanal CAS RN: 10486-19-8
T2696 1g  Tetradecanal CAS RN: 124-25-4	M3275 1g  12-Methyltridecanal CAS RN: 75853-49-5	P1869 1g  Pentadecanal CAS RN: 2765-11-9	H1296 1g  Hexadecanal CAS RN: 629-80-1	H1295 1g  Heptadecanal CAS RN: 629-90-3
O0368 1g  Octadecanal CAS RN: 638-66-4	C0414 25mL 500mL  Crotonaldehyde (cis- and trans- mixture) CAS RN: 4170-30-3	P1790 5g 25g  trans-2-Pentenal CAS RN: 1576-87-0	H0345 25mL 100mL 500mL  trans-2-Hexenal CAS RN: 6728-26-3	H0579 5mL 25mL  trans-2-Heptenal CAS RN: 18829-55-5
H0520 5mL 25mL  cis-4-Heptenal CAS RN: 6728-31-0	O0176 10mL 25mL  trans-2-Octenal CAS RN: 2548-87-0	N0483 5mL 25mL  trans-2-Nonenal CAS RN: 18829-56-6	N0430 25mL  trans-2-Nonenal (contains trans-2-Nonenal Diethyl Acetal) (ca. 10% in Ethanol, ca. 0.57mol/L) CAS RN: 18829-56-6	D1642 5mL 25mL  trans-2-Decenal CAS RN: 3913-81-3
U0046 5mL 25mL  trans-2-Undecenal CAS RN: 53448-07-0	U0011 25mL  10-Undecenal CAS RN: 112-45-8	D2068 25mL  trans-2-Dodecenal CAS RN: 20407-84-5	H0679 1g 10g  cis-11-Hexadecenal CAS RN: 53939-28-9	H0581 25mL  2,4-Hexadienal CAS RN: 80466-34-8
H0681 5mL  trans,trans-2,4-Heptadienal CAS RN: 4313-03-5	N0521 5mL  trans,trans-2,4-Nonadienal CAS RN: 5910-87-2	N0836 1g 5g  trans,cis-2,6-Nonadienal CAS RN: 557-48-2	D1934 5mL 25mL  trans,trans-2,4-Decadienal CAS RN: 25152-84-5	M3275 1g  12-Methyltridecanal CAS RN: 75853-49-5
Fatty Alcohols	Saturated Fatty Alcohols	P0491 25mL 500mL  1-Propanol CAS RN: 71-23-8	B0704 25mL 500mL  1-Butanol CAS RN: 71-36-3	P0055 25mL 500mL  1-Pentanol CAS RN: 71-41-0

H0130	25mL 500mL	H0033	25mL 500mL	O0036	25mL 500mL	N0292	25mL 500mL	D0031	25mL 500mL	
1-Hexanol CAS RN: 111-27-3		1-Heptanol CAS RN: 111-70-6		1-Octanol CAS RN: 111-87-5		1-Nonanol CAS RN: 143-08-8		1-Decanol CAS RN: 112-30-1		
U0005	25mL 100mL 500mL	D0978	25g 400g	T0803	25g	T0414	25mL 500mL	T0084	25mL 500mL	
1-Undecanol CAS RN: 112-42-5		1-Dodecanol CAS RN: 112-53-8		1-Tridecanol CAS RN: 112-70-9		Tridecanol (mixture of isomers) CAS RN: 26248-42-0		1-Tetradecanol CAS RN: 112-72-1		
P0036	25g 100g 500g	H0071	25g 500g	H0018	5g 25g	O0006	25g 500g	N0284	5g 25g	
1-Pentadecanol CAS RN: 629-76-5		1-Hexadecanol CAS RN: 36653-82-4		1-Heptadecanol CAS RN: 1454-85-9		1-Octadecanol CAS RN: 112-92-5		1-Nonadecanol CAS RN: 1454-84-8		
E0004	25g 500g	H0011	10g	D0964	25g 500g	T0403	100mg	T0593	1g 5g	
1-Eicosanol CAS RN: 629-96-9		1-Heneicosanol CAS RN: 15594-90-8		1-Docosanol CAS RN: 661-19-8		1-Tricosanol CAS RN: 3133-01-5		1-Tetracosanol CAS RN: 506-51-4		
H0342	100mg 1g	00199	100mg 1g	T1049	100mg 1g	Unsaturated Fatty Alcohols			B0236	10mL 25mL 500mL
1-Hexacosanol CAS RN: 506-52-5		1-Octacosanol CAS RN: 557-61-9		1-Triacontanol CAS RN: 593-50-0		3-Buten-1-ol CAS RN: 627-27-0				
B0696	25mL	P1199	5mL 25mL	P1243	25mL 250mL	H0124	25mL 100mL	H0346	25g 250g	
Crotyl Alcohol (cis- and trans-mixture) CAS RN: 6117-91-5		cis-2-Penten-1-ol CAS RN: 1576-95-0		4-Penten-1-ol CAS RN: 821-09-0		cis-3-Hexen-1-ol CAS RN: 928-96-1		trans-2-Hexen-1-ol CAS RN: 928-95-0		
H0653	10mL 25mL 250mL	H0751	25mL	H0754	10mL	H0682	5mL	H0833	5mL 25mL	
5-Hexen-1-ol CAS RN: 821-41-0		cis-2-Hexen-1-ol CAS RN: 928-94-9		cis-4-Hexen-1-ol CAS RN: 928-91-6		trans-2-Hepten-1-ol CAS RN: 33467-76-4		cis-4-Hepten-1-ol CAS RN: 6191-71-5		
H0949	5g 25g	00247	10mL 100mL	O0248	25mL	O0250	5mL 25mL	O0280	5mL 25mL	
6-Hepten-1-ol CAS RN: 4117-10-6		trans-2-Octen-1-ol CAS RN: 18409-17-1		cis-3-Octen-1-ol CAS RN: 20125-84-2		cis-5-Octen-1-ol CAS RN: 64275-73-6		7-Octen-1-ol CAS RN: 13175-44-5		

Lipids

N0469 10mL	N0586 10mL	N0587 10mL	N0588 10mL 25mL	N0650 5g 25g
 cis-6-Nonen-1-ol CAS RN: 35854-86-5	 cis-2-Nonen-1-ol CAS RN: 41453-56-9	 trans-2-Nonen-1-ol CAS RN: 31502-14-4	 cis-3-Nonen-1-ol CAS RN: 10340-23-5	 8-Nonen-1-ol CAS RN: 13038-21-6
D1892 25mL 500mL	D2293 5mL	U0047 25mL 500mL	T1502 10mL	O0225 5mL 25mL
 9-Decen-1-ol CAS RN: 13019-22-2	 cis-4-Decen-1-ol CAS RN: 57074-37-0	 10-Undecen-1-ol CAS RN: 112-43-6	 trans-2-Tridecen-1-ol CAS RN: 68480-25-1	 Linoleyl Alcohol CAS RN: 506-43-4
O0058 25mL 500mL	O0572 1g 5g	O0228 1g 5g	D1936 5mL	D2174 1g 5g
 Oleyl Alcohol (>70.0%) CAS RN: 143-28-2	 Oleyl Alcohol (High Purity) >99.0% CAS RN: 143-28-2	 trans-9-Octadecenol CAS RN: 506-42-3	 trans-2-Dodecenol CAS RN: 69064-37-5	 cis-13-Docosenol CAS RN: 629-98-1
Eicosanoids		Prostaglandins		
P1884 1mg 10mg	P1885 1mg 10mg	L0262 10mg 50mg		
 Prostaglandin E ₂ CAS RN: 363-24-6	 Prostaglandin F _{2a} CAS RN: 551-11-1	 Latanoprost CAS RN: 130209-82-4		

Glycerolipids

B6165 5mg 25mg	L0355 50mg	P1917 10mg	M1071 1g 5g	M1072 1g 5g	M1073 1g 5g
 Bimatoprost CAS RN: 155206-00-1	 Lubiprostone CAS RN: 136790-76-6	 Prostaglandin E ₁ CAS RN: 745-65-3	 Monocaprylin CAS RN: 26402-26-6	 Monocaprin CAS RN: 26402-22-2	 Monomyristin CAS RN: 589-68-4
G0081 5g 25g	G0083 25g	G0085 25g 500g	G0082 25g 500g	M1075 1g	
 Monolaurin CAS RN: 142-18-7	 Monopalmitin CAS RN: 542-44-9	 Monostearin CAS RN: 123-94-4	 Monoolein CAS RN: 111-03-5	 Monoelaidin CAS RN: 2716-53-2	
G0079 10g	T0364 25mL 500mL	T0441 10mL 25mL	T0365 25mL	T0413 10g 25g	
 alpha,alpha'-Dilaurin CAS RN: 539-93-5	 Tributyrin CAS RN: 60-01-5	 Tricaproin CAS RN: 621-70-5	 Tricaprylin CAS RN: 538-23-8	 Tricaprin CAS RN: 621-71-6	

G0087	25g 100g 500g	G0088	25g	T3096	25g 100g	G0213	25g 250g	G0212	25g 250g
 Trilaurin CAS RN: 538-24-9		 Trimyristin CAS RN: 555-45-3		 Tripalmitin (>80.0%) CAS RN: 555-44-2		 Tripalmitin (>85.0%) CAS RN: 555-44-2		 Tristearin CAS RN: 555-43-1	

G0089	25g 100g	T1389	1g 5g	T1391	1g 5g	T1388	5g 25g	T1392	1g
 Triolein CAS RN: 122-32-7		 Triarachidin CAS RN: 620-64-4		 Tribehenin CAS RN: 18641-57-1		 Trilinolein CAS RN: 537-40-6		 Trielaidin CAS RN: 537-39-3	

Phospholipids

D3925	200mg 1g	D3926	200mg 1g	D4250	250mg 1g	D5319	250mg	D4249	250mg
 L-DPPC CAS RN: 63-89-8		 DSPC CAS RN: 816-94-4		 DOPC CAS RN: 4235-95-4		 DEPC CAS RN: 51779-95-4		 L-DMPE CAS RN: 998-07-2	

D4213	250mg	D4214	250mg	D4251	250mg	D6219	50mg	D3946	1g
 L-DPPE CAS RN: 923-61-5		 DSPE CAS RN: 1069-79-0		 DOPE CAS RN: 4004-05-1		 DOP-DEDA CAS RN: 2247753-10-0		 DMPG Sodium Salt CAS RN: 200880-40-6	

D5318	250mg	P2522	250mg	P2694	250mg	M3264	250mg	M3330	100mg
 DOPG Sodium Salt CAS RN: 67254-28-8		 POPG Sodium Salt CAS RN: 268550-95-4		 1-Palmitoyl-sn-glycero-3-phosphocholine CAS RN: 17364-16-8		 Methyl-PEG2000-DSPE CAS RN: 147867-65-0		 MPEG2000-DSPE Sodium Salt CAS RN: 247925-28-6	

A2638	お問合せください	P2079	お問合せください	P2080	お問合せください	D6011	10mg	P2807	100mg
 6-OAc PtdGlc(di-acyl Chain) CAS RN: 1065483-61-5		 2,3,4,6-Tetra-O-acetyl-PtdGlc(di-acyl Chain) CAS RN: 1037195-49-5		 2,3,4,6-Tetra-O-acetyl-PtdGlc(mono-acyl Chain)		 DSPE-PEG(2000)-Amine Ammonium Salt CAS RN: 474922-26-4		 Presome® ACD-1	

G0419	お問合せください	G0421	お問合せください	G0422	お問合せください
 Ganglioside GM ₃ [d18:1, (Carbon-13)C16:0]		 Ganglioside GM ₁ [d18:1, (Carbon-13)C16:0]		 Ganglioside GM ₃ (phyto-type) CAS RN: 1046791-63-2	

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