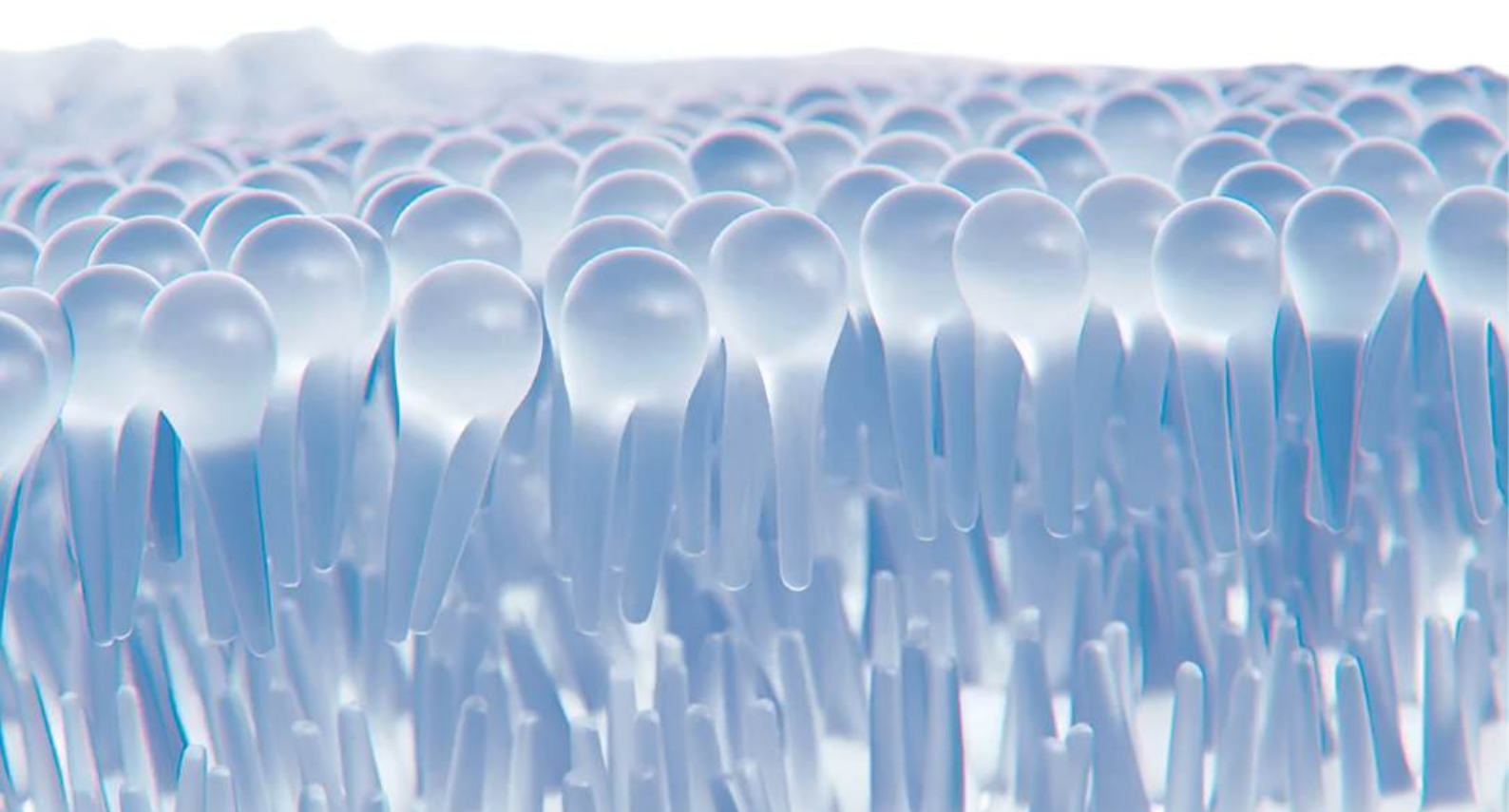


# PRODUCT CATALOUGE

**LARODAN RESEARCH GRADE LIPIDS**





Larodan's high-purity lipids are typically used as analytical reference standards and research reagents. In addition to our comprehensive catalog of products, we also provide custom synthesis of complex and novel lipids.

Our products are usually supplied in  $\mu\text{g}$  and  $\text{mg}$ , up to multi-gram scale. Standard purity is over 99%. All products include a certificate of analysis.

**Fatty Acids (FA) and FA Methyl Esters (FAME)**

Saturated-Unsaturated-Conjugated  
 Di-acids/Di-esters  
 Ethyl esters  
 Branched/Methylated  
 Cyclic

**Oxylipins**

OH-Oxo-Epoxy-Hydroperoxy-Ether  
 Aldehydes-Diols

**Prostaglandins**

**Glycerides (Acylglycerols)**

Mono-Di-Triglycerides  
 Single and Mixed fatty acids  
 1,2 and 1,3 positions  
 Galactosyl diglycerides

**MCPDs and Glycidyl Esters**

- 3-Chloropropanediols (3-MCPD)
- 2-Chloropropanediols (2-MCPD)
- Bromopropanediols
- Glycidyl Esters
- Stable Isotope Labeled Glycidyl Esters
- Stable Isotope Labeled MCPDs

**Phospholipids**

Synthetic and Natural  
 PC, PG, PE, PS, PA, PI  
 LPC, LPG, LPE, LPS, LPA, LPI  
 Egg, Soybean, Sunflower  
 Bovine, Porcine

**Sphingolipids**

Sphingosines-Ceramides  
 Phosphosphingolipids-Spingomyelins  
 Glycosphingolipids-Cerebrosides-  
 Sulfatides-Gangliosides

**Wax Esters**

**Fatty Alcohols**

**Saturated Hydrocarbons**

**Carnitines (L- and D-)**

**Isotopically labeled carnitines**

**Coenzyme A and CoA esters**

**Sterols**

**Polyprenols and Dolichols**

**Polyprenyl Phosphate**

**Glycines**

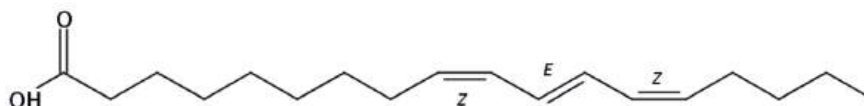
# OUR LIPIDS

► Customized    ► Stable isotope labeled    ► Kits    ► Mixtures

**9(Z),11(E),13(Z)-Octadecatrienoic acid (Punicic acid)**

Product #: 10-1875

CAS #: 544-72-9





# PHOSPHOLIPIDS

Phospholipids are essential constituents of all biological membranes exhibiting many functions. They act as dynamic components that are essential for the functionality and structure of the cells.

Larodan offers both natural and synthetic phospholipids with high purity in mg up to 100gram scale. All products come with a certificate of analysis and we guarantee a purity of above 98% for synthetic products and above 96% for natural products.

## SYNTHETIC

DMPC	DMPG	DMPE	DOPS
DPPC	DPPG	DPPE	DPPA
DSPC	DSPG	DSPE	DSPA
DOPC	DOPG	DOPE	DOPA
POPC	POPG		

## NATURAL

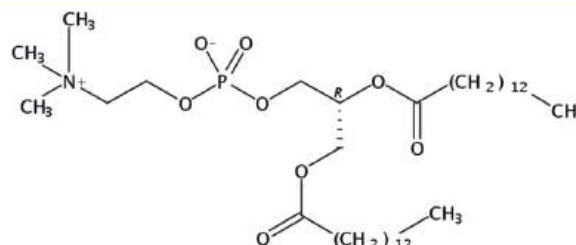
EGGS: PC, LPC, PG, PE, SM, PA  
 SOYBEAN: PC, LPC, PE, PA  
 SUNFLOWER: PC, LPC

 Customized
  Stable isotope labeled
  Kits
  Mixtures

### DMPC 14:0/14:0

Product #: 37-1400

CAS #: 18194-24-6





**MCPD: monochloropropanediols, either 3-MCPD or 2-MCPD** in the free form, also including their esterified (with fatty acids) form

**GE: glycidyl esters**, also including their free form, glycidol

Larodan makes broad range of isomerically pure MCPD and GE compounds. These are used as **reference standards** for identification, characterization and quantification of MCPD and GE. We have standards for both direct and indirect analytical methods using GC, GC-MS, HPLC and LC-MS. The products are available either in their naturally occurring forms, that can be used as external standards, or as stable isotope labelled compounds, that can be used as internal standards. Our standards are used in explorative process development projects as well as routine quality control of product in various stages of the manufacturing process. In addition, the compounds are used as **reagents for research** into their biological activity and health effects.

Standard purity of products is **over 99%**. Typical package size is between 25 mg and 250 mg (under 25 mg for stable isotope labeled compounds), with other sizes are available on request. Product is typically delivered neat (powder), but can also be delivered in a suitable solution of choice. All products are delivered with a certificate of analysis. Most compounds are in stock for immediate delivery, while others are made to order with short delivery times.

## PRODUCT CATEGORIES

3-MCPD  
 3-MCPD diester with same fatty acid  
 3-MCPD diester with mixed fatty acids  
 3-MCPD 2-monoester  
 3-MCPD 1-monoester

Glycidol  
 Glycidyl ester

MBPD (monobromopropanediol)

2-MCPD  
 2-MCPD diester with same fatty acid  
 2-MCPD diester with mixed fatty acids  
 2-MCPD monoester

Stable isotope labeled  
 Deuterium (Hydrogen-2, 2H)  
 Carbon-13 (13C)

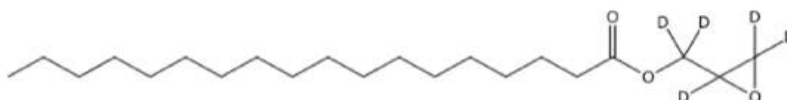
Neat (powder) or in solution

# OUR MCPD & GE

### Glycidyl Stearate-d5

Product #: 41-4118

CAS #: 1346598-19-3





# NANOPARTICLE RESEARCH

The biological significance of lipids, with their ability to form bilayers and compartments within cells, has long been appreciated. However the therapeutic potential of these same properties - to encapsulate, stabilize, and deliver biologics and other sensitive compounds - has only recently begun to be fully realized. As these applications continue to be developed and new ones explored, there is an ever-increasing need for companies with expertise in the development, synthesis, and scale-up of new lipids and lipid-like compounds.

Our vast catalog of compounds combined with decades of expertise in lipid synthesis and the ability to offer customized chemistry solutions makes Larodan an ideal research partner.

## ▶ Customized Chemistry Solutions

### Synthetic Membrane Phospholipids:

Uniform or mixed acyl chains

- Myristin
- Palmitin
- Stearin
- Olein
- Others

Phosphatidyl Cholines

Phosphatidyl Ethanolamines

Phosphatidyl Glycerols

### Ceramides & Other Sphingolipids

### Stable Isotope Labeled Compounds

### PEGylated Lipids:

DSPE-MPEG 2000

DSPE-MPEG 5000

DMG-PEG 2000

### Cationic/Ionizable Lipids:

SM-102

ALC-0135

ALC-0159

DODAP

DOTAP

DODMA

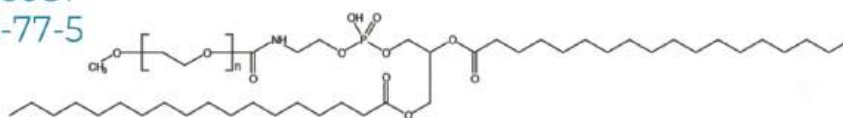
DOTMA

## Customized compounds by request

### DSPE-MPEG 2000

Product number: 38-6081

CAS number: 474922-77-5





# OUR GLYCERIDES

Glycerides, also referred to as acylglycerols or glycerolipids, are esters formed from glycerol and fatty acids. Glycerol has three hydroxyl functional groups that are esterified with one, two, or three fatty acids to form monoglycerides, diglycerides, and triglycerides. Vegetable oils and animal fats contain mostly triglycerides, that is broken down by natural enzymes into mono- and diglycerides and free fatty acids and glycerol.

Larodan offers synthetic glycerides in mg up to multi g scale. Standard purity is above 99%. All products come with a certificate of analysis.

## Monoglycerides

(MAG, MG)

1-position

2-position

## Diglycerides

(DAG, DG)

1,2-Single fatty acids

1,3-Single fatty acids

1,2-Mixed fatty acids

1,3-Mixed fatty acids

## Triglycerides

(TAG, TG)

Single fatty acids

Two mixed fatty acids

Three mixed fatty acids

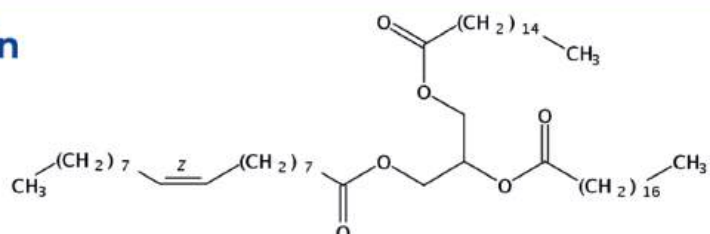
 Customized
  Stable isotope labeled
  Kits
  Mixtures

### 1-Palmitin-2-Stearin-3-Olein

Product #: 34-3002

CAS #: 2190-28-5

Lipid #:TG (16:0/18:0/18:1)





# OUR FATTY ACIDS

Larodan's lipids are of high purity, and typically used as analytical reference standards and research reagents. In addition to our comprehensive list of catalog products, we also provide custom synthesis of complex and novel lipids.

Our products are supplied in  $\mu\text{g}$  and  $\text{mg}$ , up to multi g scale. Standard purity is above 99%. All products come with a certificate of analysis.

## Fatty Acids | Methyl Esters (FAME) | Ethyl Esters

### Saturated

### Monounsaturated

### Polyunsaturated

### Conjugated

### Odd and even # C

### Branched (Iso, Ante-iso)

### Cyclic

### Di-acids / Di-esters

### Stable isotope labeled

### Oxidized

– with Hydroxy (OH)

– with Keto (Oxo)

– with Epoxy

– with Hydroperoxy

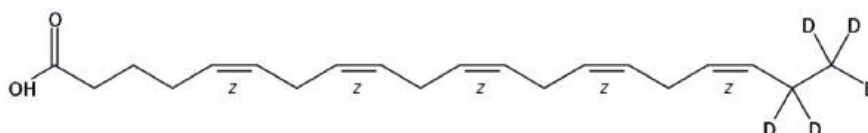
– with Ether

 Customized
  Stable isotope labeled
  Kits
  Mixtures

### 5(Z),8(Z),11(Z),14(Z),17(Z)-Eicosapentaenoic acid D5 (EPA-19,19,20,20,20-D5)

Product #: 71-2005

CAS #: 1197205-73-4





# FOOD OIL CHEMISTRY

One of the primary functions of lipids in biological systems is to store energy in the form of acylglycerols (commonly called glycerides), especially triglycerides. These consist of 1, 2, or 3 fatty acyl groups coupled to a glycerol backbone via ester linkages to yield mono-, di-, or tri-glycerides. The vast majority of dietary lipids occur in this form, and as the primary component of adipose tissue, they are also the manner in which excess energy can be stored for later use. Depending on the specific fatty acyl composition, these glycerides may occur as either solids at room temperature (fats) or liquids (oils).

In addition to glycerides, a number of other lipids are of particular importance in food oil chemistry including phospholipids (emulsifiers such as Lecithin), sterols, and MCPDs/GEs - trace contaminants which may be produced during the processing of food oils.

Since 1964, Larodan has been a world leader in small-scale, high purity lipid synthesis. We offer an expansive catalog of these compounds and are often able to facilitate additional requests via customized chemistry solutions. Whether you need reference standards for quality control, are formulating new products, looking to enhance taste/texture, or studying the physical or nutritional properties of lipids, Larodan is the ideal partner for anyone working with fats and food oils!

## ▶ Customized Chemistry Solutions

### Acylglycerols:

- Mono-, di-, and tri-glycerides
- Uniform or mixed acyl chains
- Stereospecific acyl positioning (1, 2, or 3 position)
- Stable Isotope Labeled (Deuterium/<sup>13</sup>C)

### Monochloropropanediols (MCPD) and Glycidyl Esters (GE):

- Free MCPD/Glycidol and their esters
- 2-MCPD
- 3-MCPD
- Monobromo/Monoiodopropanediols (MBPD/MIPD)
- Stable Isotope Labeled (Deuterium/<sup>13</sup>C)

### Cholesterol/Sterols

### Phospholipids:

- Natural or Synthetic
- Egg/Soy/Others
- Phosphatidylcholine (PC)
- Phosphatidylethanolamine (PE)
- Phosphatidylglycerol (PG)
- Phosphatidylserine (PS)
- Phosphatidic Acid (PA)
- Phosphatidylinositol (PI)

### Bulk Lipids (FFA, Methyl and Ethyl Esters)

- DHA
- EPA
- Oleic Acid
- Linoleic Acid
- Others by request

▶ STABLE ISOTOPE LABELED

▶ CUSTOMIZED CHEMISTRIES

▶ RESEARCH USE ONLY

### Ethyl 5(Z),8(Z),11(Z),14(Z),17(Z)-Eicosapentaenoate

Product number: 30-2005

CAS number: 86227-47-6

