

MCPD

ESTERS AND GLYCIDYL ESTERS IN FOOD

Product of the
Month

REGULATORY GUIDELINES

- FSANZ
- USFDA
- HEALTH CANADA
- EFSA
- FSAI
- WHO

METHODS OF ANALYSIS

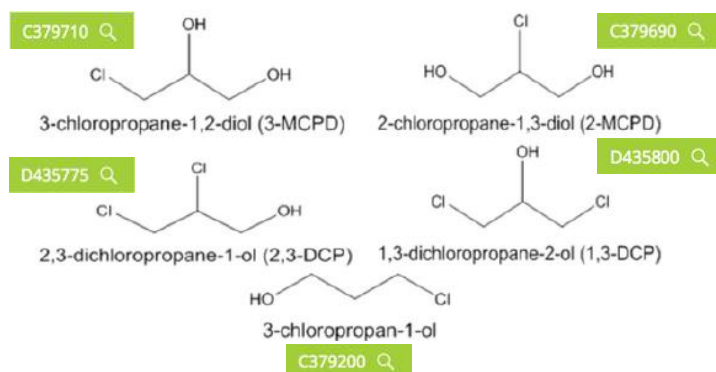
- Indirect Enzymatic Method
- QuEChERS Extraction
- Using GC-MS
- Tandem Mass Spectrometry
- Solid-Phase Extraction and GC-MS Analysis
- Proteomic analysis
- LC-MS/MS

3-MCPD

3-MCPD (3-monochloropropane-1,2-diol or 3-chloropropane-1,2-diol) is an organic chemical compound which is carcinogenic and highly suspected to be genotoxic in humans. It has male antifertility effects and is a chemical byproduct which may be formed in foods. It is primarily created in foods by protein hydrolysis by adding hydrochloric acid at high temperature to increase the breakdown of proteins into amino acids. Under these conditions, chloride can react with the glycerol backbone of lipids to produce 3-MCPD. It is also detected in foods, which have been in contact with materials containing epichlorohydrin-based wet-strength resins generally used in the production of tea bags and sausage casings.

CHLOROPROPANOLS

Source: DOI: 10.1111/1541-4337.12120



INTERNATIONAL CONCENTRATION LIMITS

Country/Region	3-MCPD (mg/kg)	Scope
Australia/New Zealand	0.2	Soya/oyster sauces
Canada	1	Soya/oyster sauces
the People's Republic of China	1	Acid-HVP
European Union	0.02	HVP and soya sauces (40% solids)
Republic of Korea	0.3	Soya sauce containing acid-HVP
Malaysia	1	HVP
	0.02	Liquid foods with acid-HVP
	1	Acid-HVP, industrial product
Switzerland	0.2	Savoury sauces
Thailand	1	Hydrolysed soya bean protein
USA	1	Acid-HVP

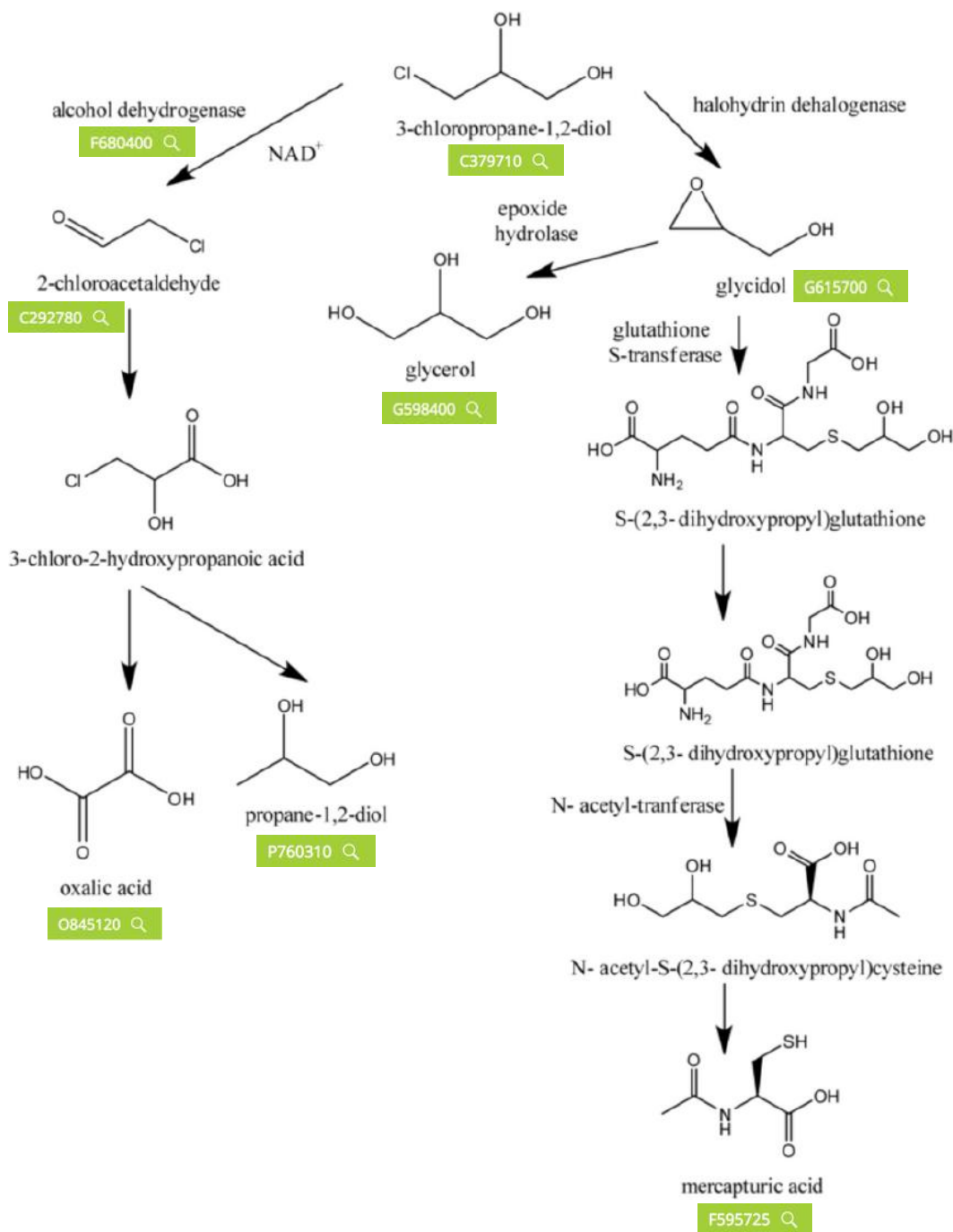
Source: IARC MONOGRAPHS 101



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HYPOTHESIZED METABOLIC PATHWAY FOR 3-MCPD

Source: IARC MONOGRAPHS 101



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SELECTION OF RELATED COMPOUNDS FROM TRC

Catalogue No: [G615700](#) 

Chemical Name: Glycidol

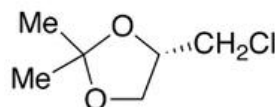
CAS number: 556-52-5



Catalogue No: [C369395](#) 

Chemical Name: (S)-4-Chloromethyl-2,2-dimethyl-1,3-dioxolane

CAS number: 60456-22-6

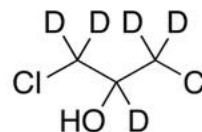


Catalogue No: [D435802](#) 

Labeled

Chemical Name: 1,3-Dichloro-2-propanol-d5

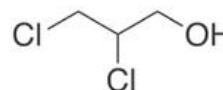
CAS number: 1173020-20-6



Catalogue No: [D435775](#) 

Chemical Name: 2,3-Dichloro-1-propanol

CAS number: 616-23-9

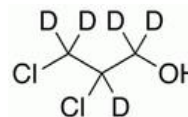


Catalogue No: [D435777](#) 

Labeled

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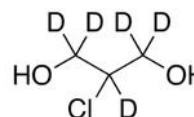


Catalogue No: [C379692](#) 

Labeled

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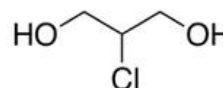
CAS number: 1216764-05-4



Catalogue No: [C379690](#) 

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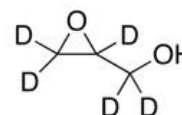
CAS number: 497-04-1



Catalogue No: [G615702](#) 

Chemical Name: Glycidol-d5

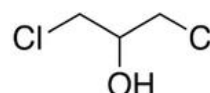
CAS number: 1246819-20-4



Catalogue No: [D435800](#) 

Chemical Name: 1,3-Dichloro-2-propanol

CAS number: 96-23-1



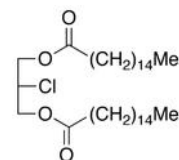
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SELECTION OF RELATED COMPOUNDS FROM TRC

Catalogue No: **D486840** 

Chemical Name: 1,3-Dipalmitoyl-2-chloropropanediol

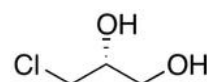
CAS number: 169471-41-4



Catalogue No: **C380465** 

Chemical Name: (R)-(-)-3-Chloro-1,2-propanediol

CAS number: 57090-45-6

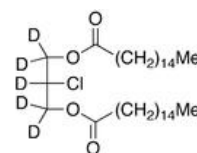


Catalogue No: **D486842** 

Labeled

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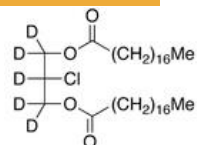


Catalogue No: **D493512** 

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Chemical Name: 1,3-Distearoyl-2-chloropropanediol-d5

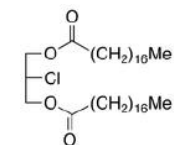
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Catalogue No: **D493510** 

Chemical Name: rac-1,3-Distearoyl-2-chloropropanediol

CAS number: 26787-56-4

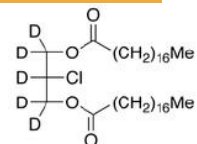


Catalogue No: **D493502** 

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Chemical Name: rac-1,2-Distearoyl-3-chloropropanediol-d5

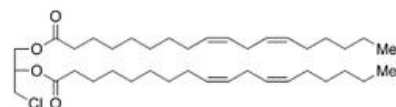
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Catalogue No: **D460595** 

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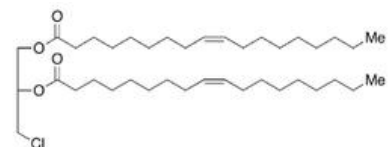
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Catalogue No: **D482200** 

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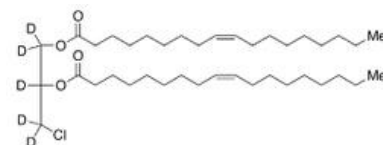


Catalogue No: **D482202** 

Labeled

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CAS number: 1246833-00-0



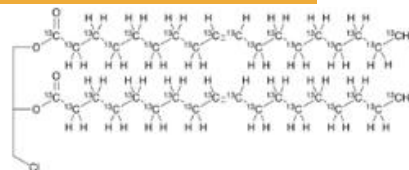
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SELECTION OF RELATED COMPOUNDS FROM TRC

Catalogue No: [D488223](#) 

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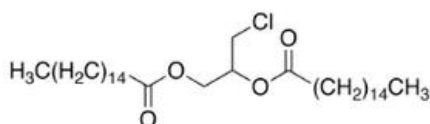
Chemical Name: rac 1,2-Dioleoyl-3-chloropropanediol-13C36



Catalogue No: [B515200](#) 

Chemical Name: rac 1,2-Bis-palmitoyl-3-chloropropanediol

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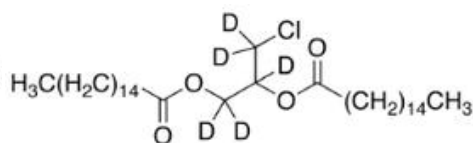


Catalogue No: [B515202](#) 

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CAS number: 1185057-55-9

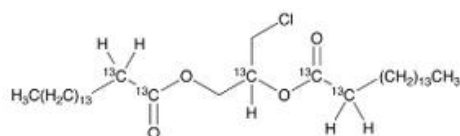


Catalogue No: [B515203](#) 

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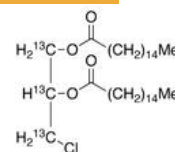
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Catalogue No: [B515204](#) 

Labeled

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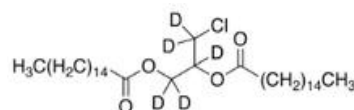


Catalogue No: [B515202](#) 

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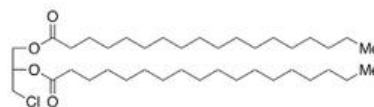
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Catalogue No: [D493500](#) 

Chemical Name: rac-1,2-Distearoyl-3-chloropropanediol

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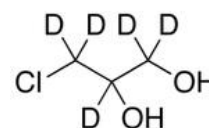


Catalogue No: [C379712](#) 

Labeled

Chemical Name: 3-Chloro-1,2-propanediol-d5

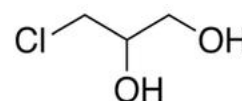
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Catalogue No: [C379710](#) 

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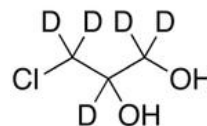
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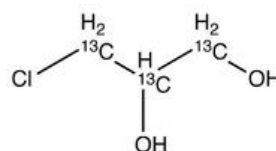
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SELECTION OF RELATED COMPOUNDS FROM TRC

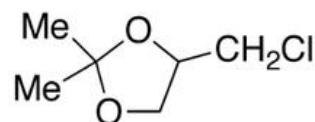
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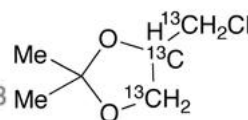
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 Chemical Name: 3-Chloro-1,2-propanediol-13C3
 CAS number: 1391053-60-3



Catalogue No: **C369405** 
 Chemical Name: 4-Chloromethyl-2,2-dimethyl-1,3-dioxolane
 CAS number: 4362-40-7

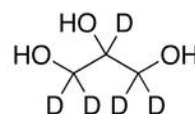



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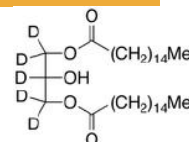


Catalogue No: **G598402** 
 Chemical Name: Glycerol-d5
 CAS number: 62502-71-0

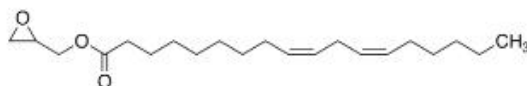
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Catalogue No: **G598412**  **Labeled**
 Chemical Name: Glycerol-d5 1,3-Dipalmitate
 CAS number: 65615-82-9



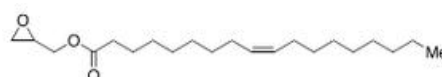
Catalogue No: **G615720** 
 Chemical Name: Glycidyl Linoleate
 CAS number: 24305-63-3



Catalogue No: **G615722**  **Labeled**
 Chemical Name: Glycidyl Linoleate-d5
 CAS number: 1246834-15-0



Catalogue No: **G615930** 
 Chemical Name: Glycidyl Oleate
 CAS number: 5431-33-4



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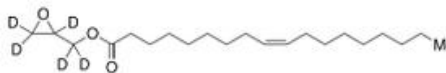
SELECTION OF RELATED COMPOUNDS FROM TRC

Catalogue No: **G615932** 

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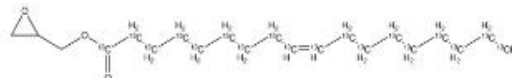


Catalogue No: **G615933** 

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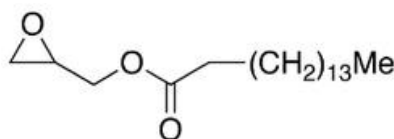
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Catalogue No: **G615950** 

Chemical Name: Glycidyl Palmitate

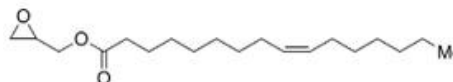
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Catalogue No: **G615680** 

Chemical Name: Glycidyl Palmitoleate

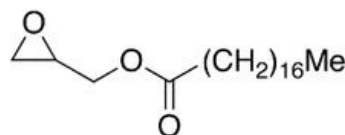
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Catalogue No: **G615985** 

Chemical Name: Glycidyl Stearate

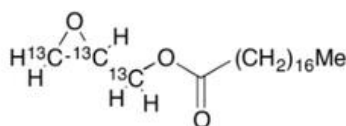
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Catalogue No: **G615986** 

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Chemical Name: Glycidyl Stearate-13C3

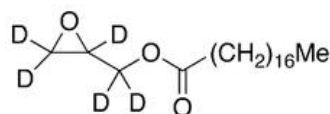


Catalogue No: **G615988** 

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CAS number: 1346598-19-3



Catalogue No: **C379200** 

Chemical Name: 3-Chloro-1-propanol

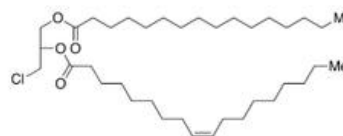
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Catalogue No: **P160500** 

Chemical Name: rac 1-Palmitoyl-2-oleoyl-3-chloropropanediol

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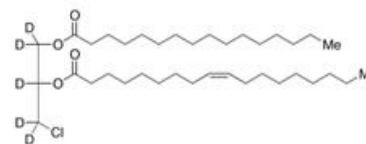
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SELECTION OF RELATED COMPOUNDS FROM TRC

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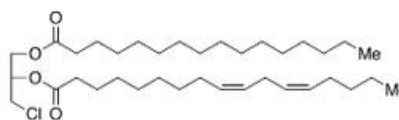
Chemical Name: rac 1-Palmitoyl-2-oleoyl-3-chloropropanediol-d5



Catalogue No: **P158950** 

Chemical Name: rac-1-Palmitoyl-2-linoleoyl-3-chloropropanediol

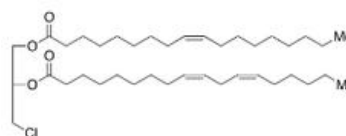
CAS number: 1246833-87-3



Catalogue No: **O530500** 

Chemical Name: rac 1-Oleoyl-2-linoleoyl-3-chloropropanediol

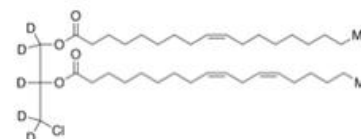
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Catalogue No: **O530502** 

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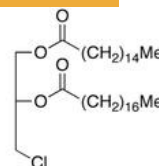
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Catalogue No: **P163500** 

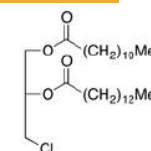
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CAS number: 1185060-41-6



Catalogue No: **L178700** 

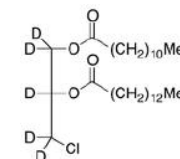
Chemical Name: 1-Lauroyl-2-myristoyl-3-chloropropanediol



Catalogue No: **L178702** 

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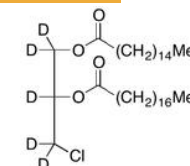
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Catalogue No: **P163502** 

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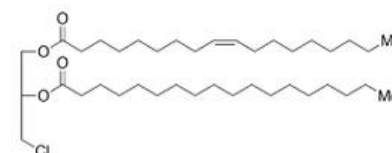
Chemical Name: rac 1-Palmitoyl-2-stearoyl-3-chloropropanediol-d5



Catalogue No: **O532900** 

Chemical Name: rac 1-Oleoyl-2-stearoyl-3-chloropropanediol

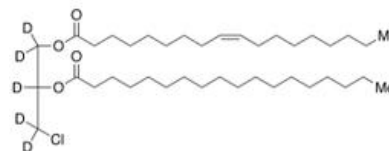
CAS number: 1336935-05-7



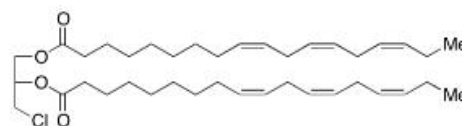
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SELECTION OF RELATED COMPOUNDS FROM TRC

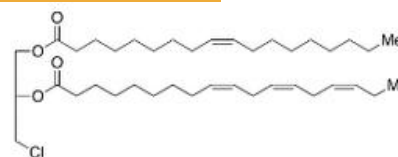
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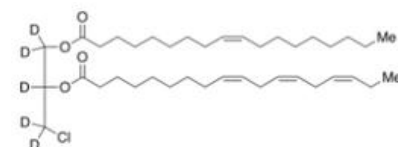
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 Chemical Name: rac-1,2-Dilinolenoyl-3-chloropropanediol
 CAS number: 74875-97-1



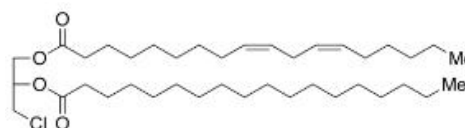
Catalogue No: **O530400** 
 Chemical Name: rac 1-Oleoyl-2-linolenoyl-3-chloropropanediol



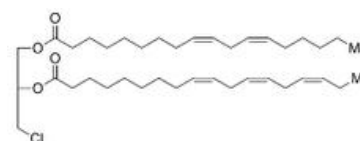
Catalogue No: **O530402**  **Labeled**
 Chemical Name: rac 1-Oleoyl-2-linolenoyl-3-chloropropanediol-d5



Catalogue No: **L468400** 
 Chemical Name: rac-1-Linoleoyl-2-stearoyl-3-chloropropanediol
 CAS number: 1246833-46-4



Catalogue No: **L468080** 
 Chemical Name: rac 1-Linoleoyl-2-linolenoyl-3-chloropropanediol
 CAS number: 1612870-93-5



Catalogue No: **P158850**  **Labeled**
 Chemical Name: rac-1-Palmitoyl-2-linolenoyl-3-chloropropanediol
 CAS number: 1246833-14-6

