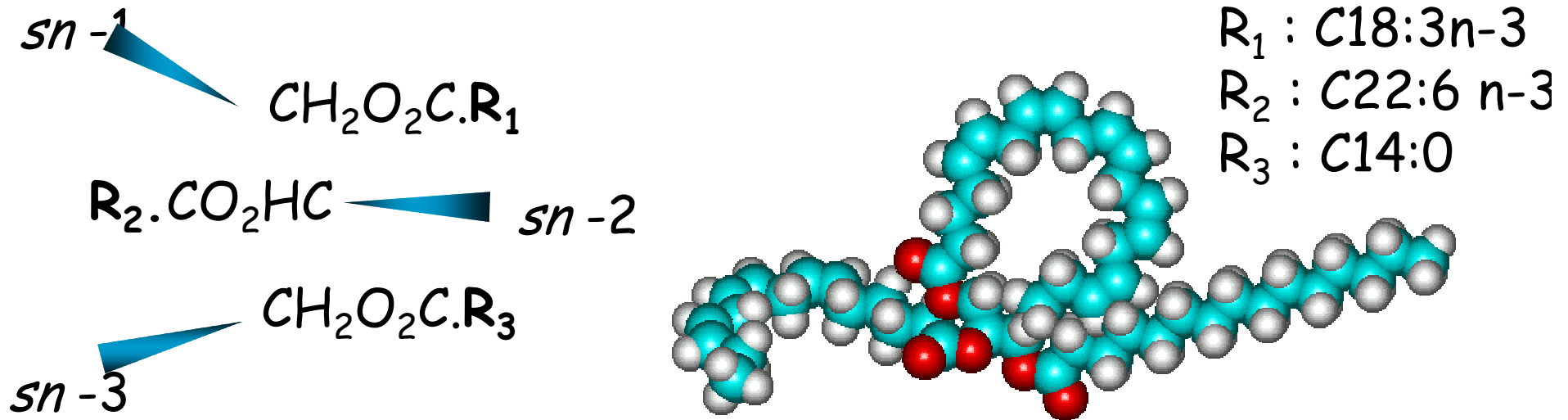


Fatty acids are provided currently throughout our food mainly by:

- TAG : 98% (50-100 g per day)
- Phospholipids mainly lecithins (2- 10 g per day)
- DAG always present in a minor component in vegetable oil and fats (1- 5 g per day)
- Cholesterol ester (0.15 – 0.4 g per day)
- Fat soluble vitamin esters
(retinyl palmitate 1mg, tocopherol acetate 15 mg per day)

(Fave et al., 2004)

The bioavailability depends highly on the TAG structure



- Intestinal absorption of FAs is dependent on their arrangement in the TAG molecules.
- FA is better absorbed when it is present as 2-MAG.
- They are conserved at this position (75%) in TAG newly synthesized by the enterocyte and present in lymph (Fave et al., 2004).

Absorption and metabolism

- Absorption and transport in chylomicrons of EPA and DHA can be highly enhanced when those fatty acids are esterified in sn2 position on a molecule containing medium chain at position sn1 sn3.
 - under normal condition
 - in biliary and pancreatic insufficiency
 - in small bowel injury
- **And not as free fatty acids**

(Christensen, 1995, Tso et al., 1999)

Absorption and metabolism

- It appears easier to purify DHA as an ethyl ester than in the acylglycerol form.
- Unfortunately, **DHA ethyl ester is not as easily incorporated into plasma TAGs as DHA in the acylglycerol form**

(Tanaka et al., 1993)

What is the benefit of using phospholipids as fatty acid carriers instead of TAGs ?

- Phospholipid can represent a lipid class of great interest in fatty acid targeting to specific tissues
- Bioavailability of the fatty acids is believed to be higher from PL compared to TAG.
- This may be due to the amphiphilic properties of phospholipids reflected in:
 - better water dispersibility
 - greater susceptibility to phospholipases compared to the glycerolysis of TAG