



Hold the Fat Please!

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Ewww... Fat!!

- * Fat is essential for proper functioning of the body
 - Protects neurons in the brain
 - Used in cell wall building
 - Insulates the body
 - Linked to hormone regulation

Today - Extracting Fat

- * Fat is present in almost all foods
- * We are going to learn how to extract fat
- * First - need to establish some basic facts about fat

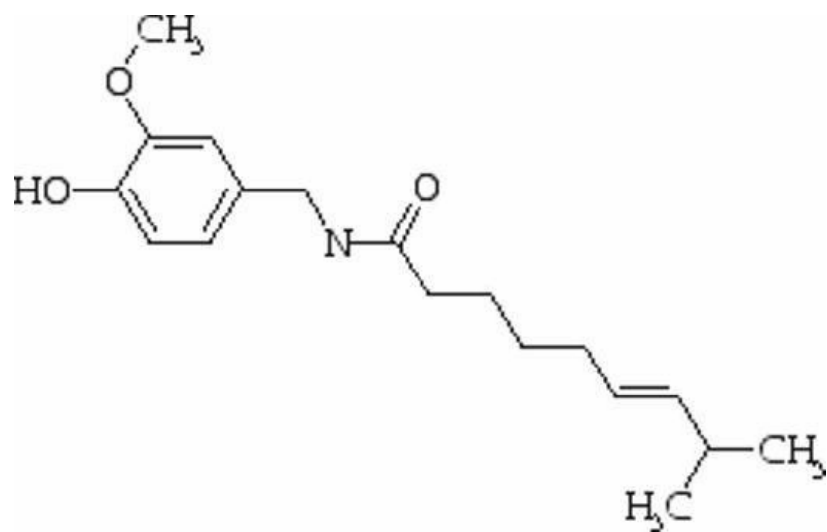
Lab Safety

- * WEAR YOUR GOGGLES AT ALL TIMES
- * No organic solvents down the drain
- * No glass in the trash



What Can I Do With This
Information?

Capsaicin



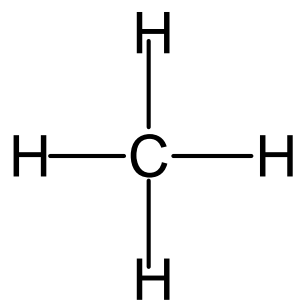
* Doesn't make a whole lot of sense, eh?

Organic Chemistry

- * Fats and Oils are considered to be “Organic Compounds”
 - Made of Carbon (C) and Hydrogen (H) and sometimes Nitrogen (N) and Oxygen (O)
 - Not related to how it is produced
- * What do all of these structures mean?

Methane

* Simplest organic molecule

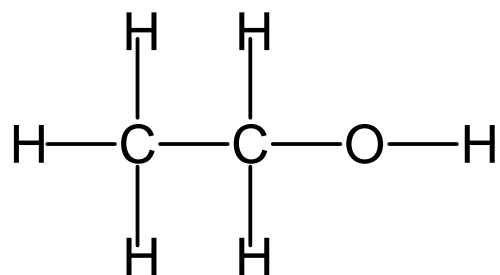


OR



Ethanol

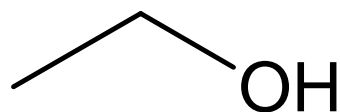
* Let's introduce another atom



OR



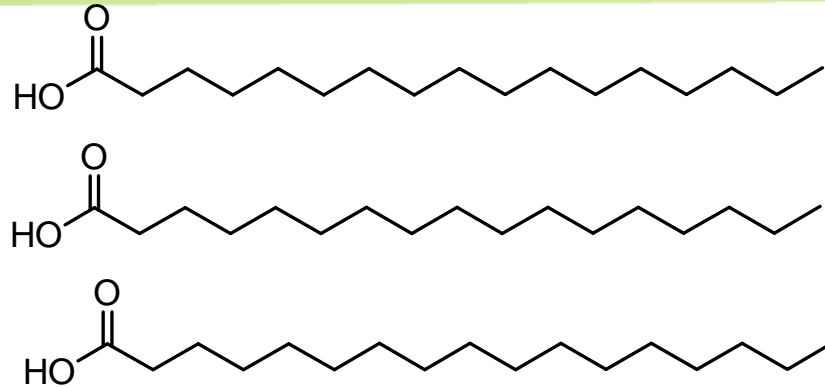
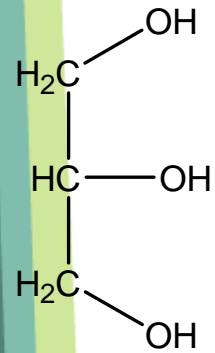
OR



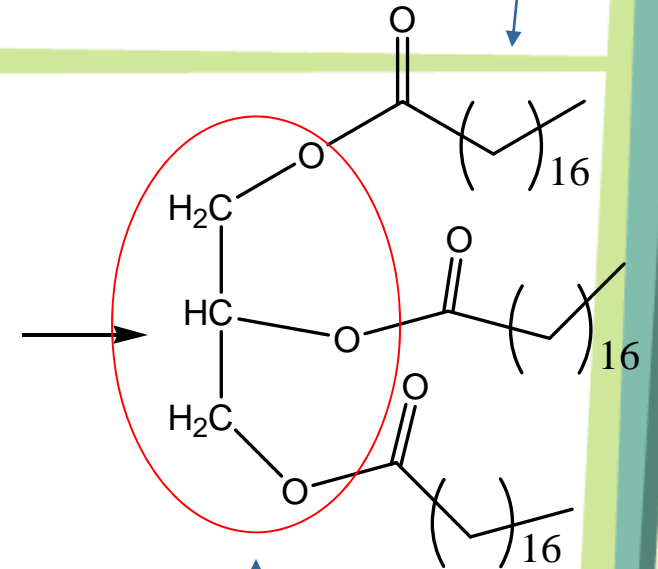


How Does This Relate to
Fat?!

Triglycerides



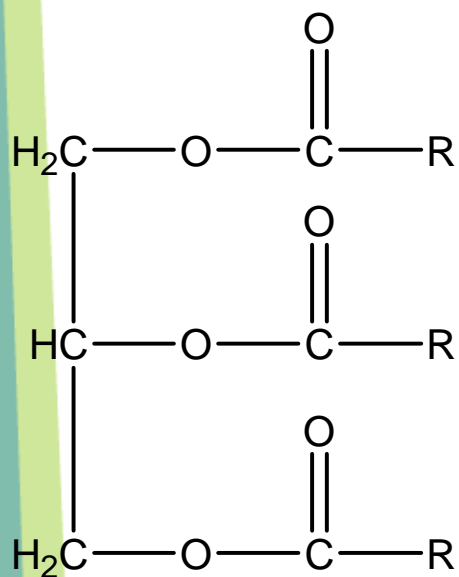
Acid functionality



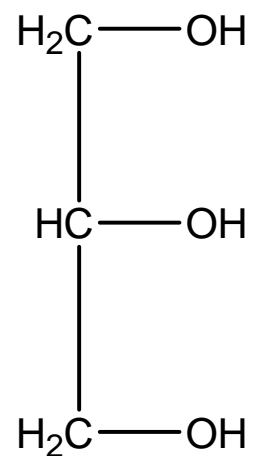
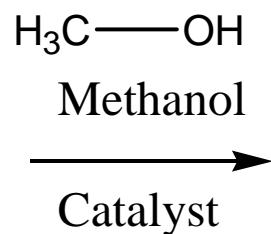
Fatty acid

glycerol

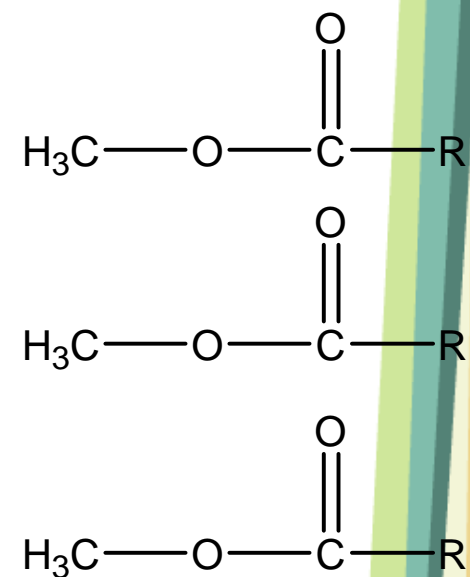
Biodiesel!



triglyceride

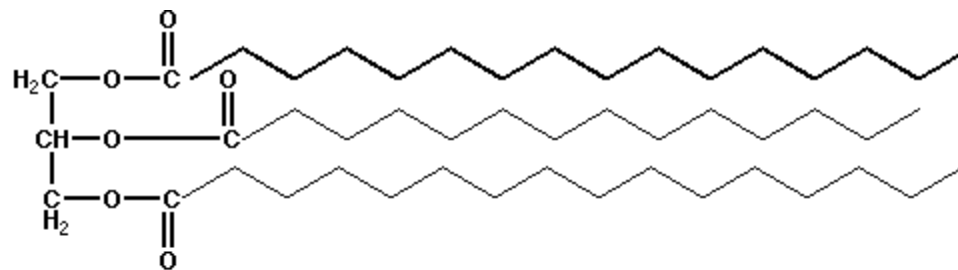


glycerol

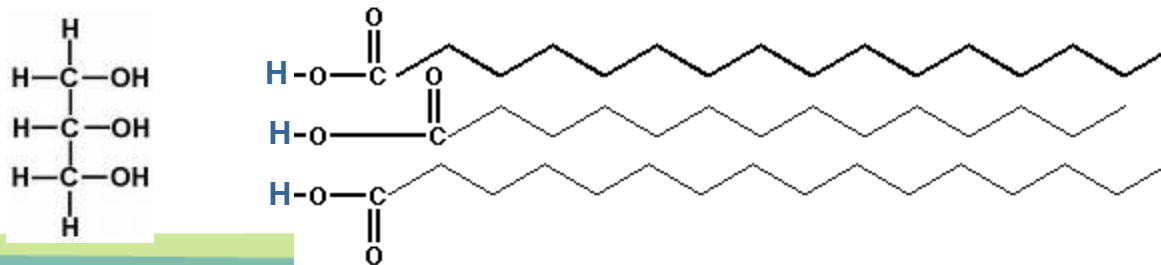


Methyl ester
BIODIESEL

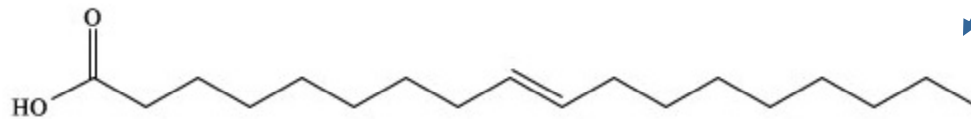
Fatty Acids and Triglycerides



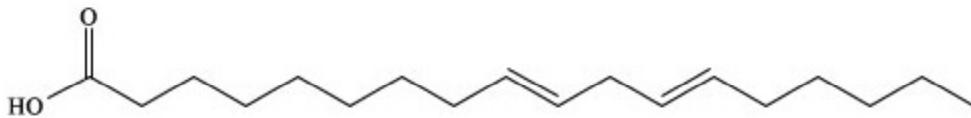
Hydrolysis



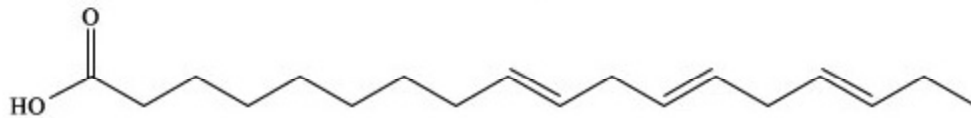
Cis versus Trans



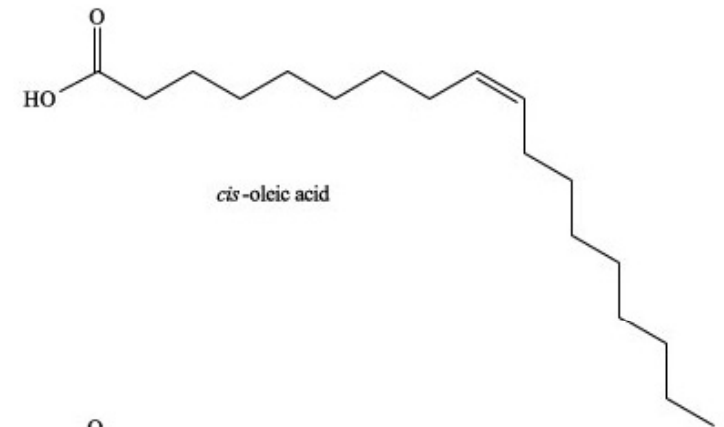
trans-oleic acid



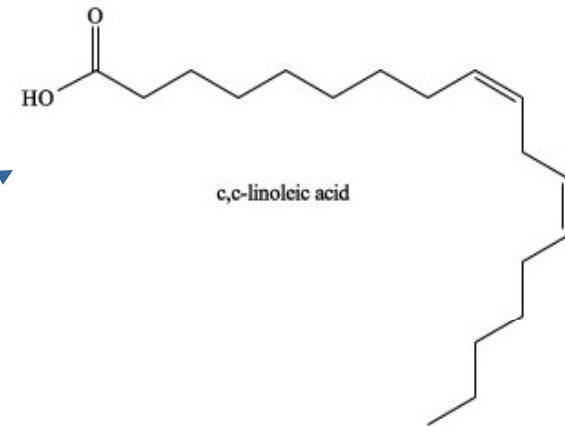
t,t-linoleic acid (linolelaidic acid)



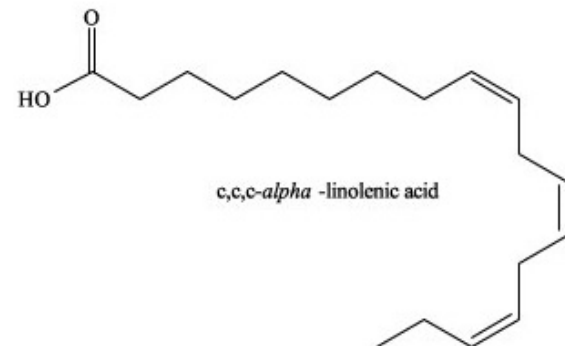
t,t,t- α -linolenic acid (linolenelaidic acid)



cis-oleic acid



c,c-linoleic acid



c,c,c- α -linolenic acid

Linolenic Acid is the only essential Fatty Acid