

6/19/12 Lipids + Terpenes

Lab Quiz #2: DCC, Boc, Merrifield, phthalimidomalonate, Strecker

Lipid - Naturally-occurring fat-soluble molecule

Fatty acids - (very) long-chain carboxylic acids

Saturated



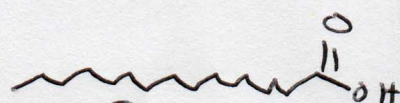
(12)

lauric



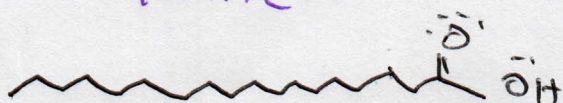
(14)

myristic



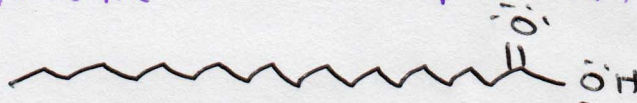
(16)

palmitic



(18)

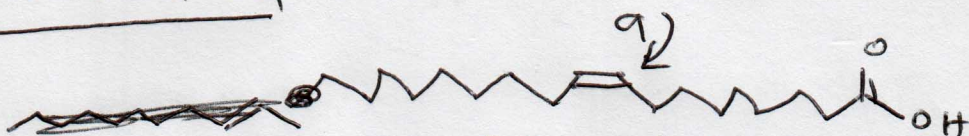
stearic



(20)

arachidic

Unsaturated



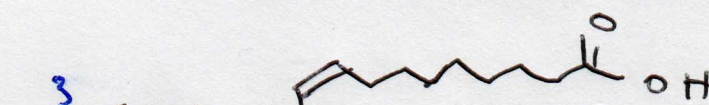
(18)

oleic acid



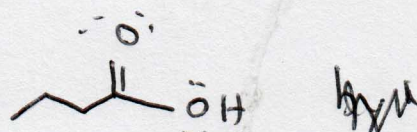
linoleic acid

( $\omega$ -6)



linolenic acid

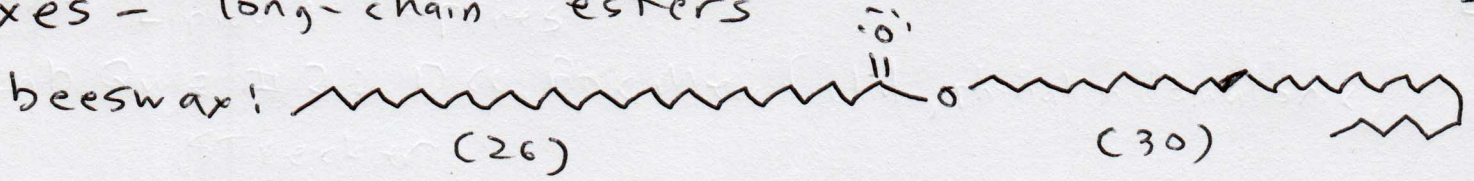
( $\omega$ -3)



butyric acid

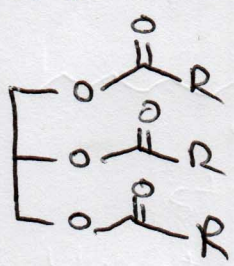
essential fatty acids

Waxes - long-chain esters

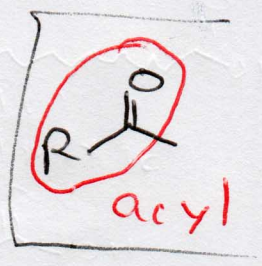


Although waxes are thoroughly non-polar, they have extensive dispersion forces due to the very large size of the molecules. The temporary dipoles created by dispersion forces are able to hold waxes together as solids @ RT.

Fats - Triglycerides / triacylglycerols

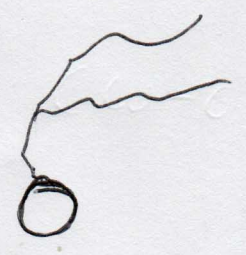
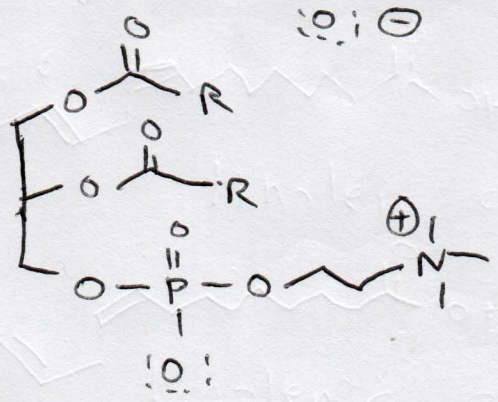
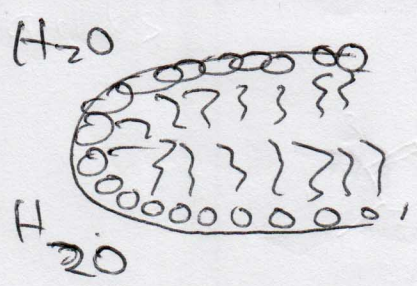
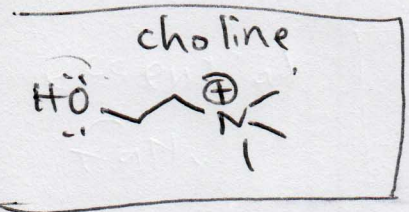
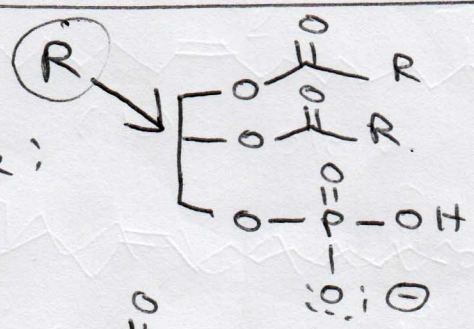


Fat - solid @ RT  
Oil - liquid @ RT



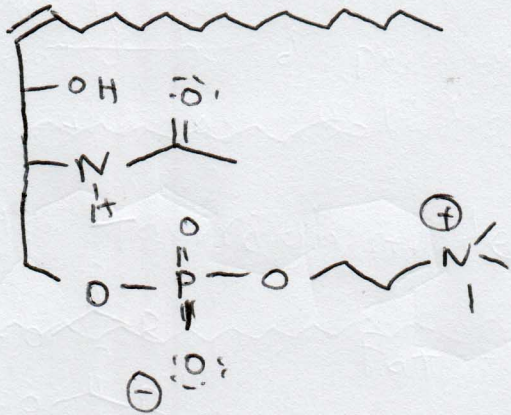
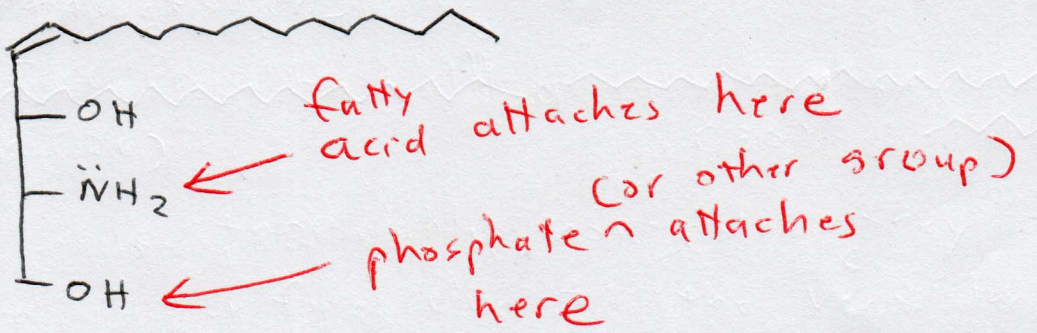
Phospholipids

General structure:



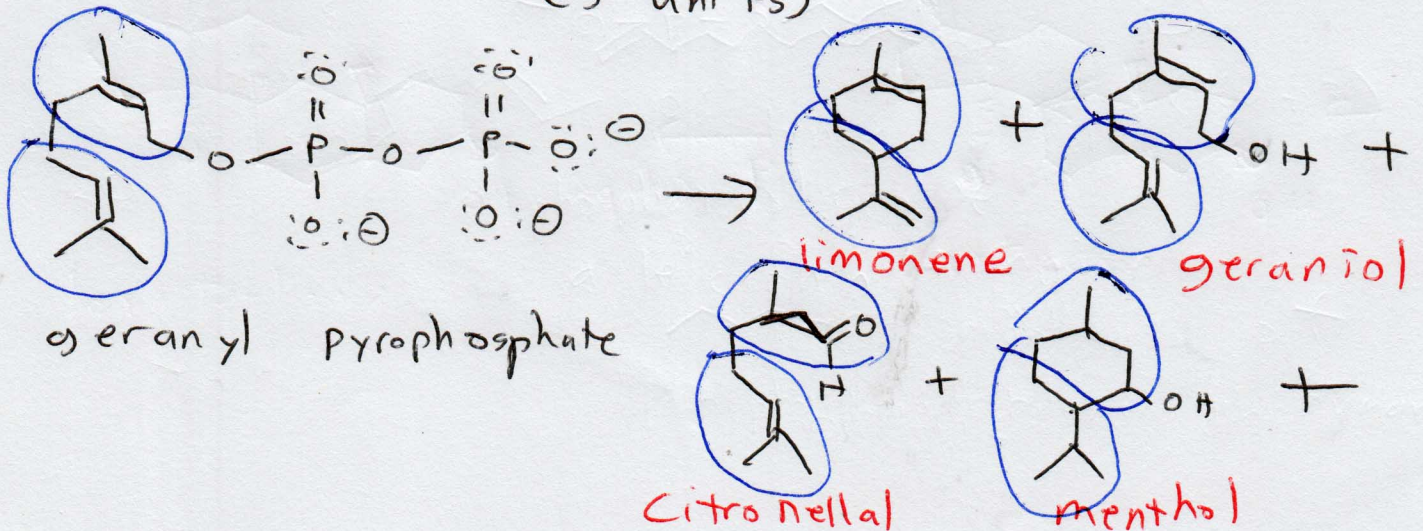
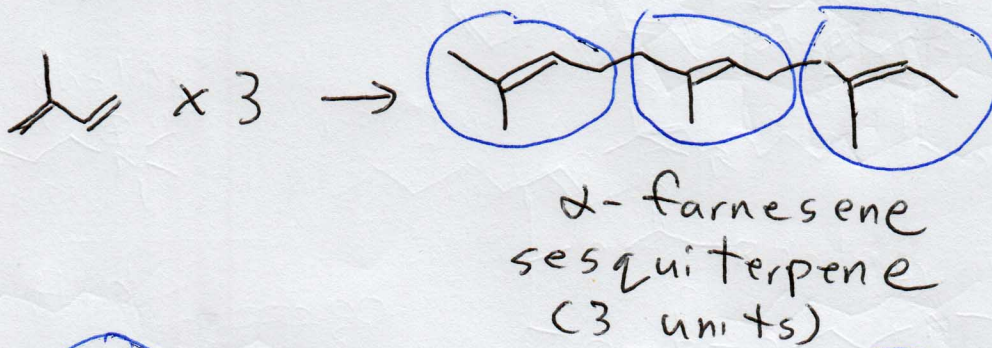
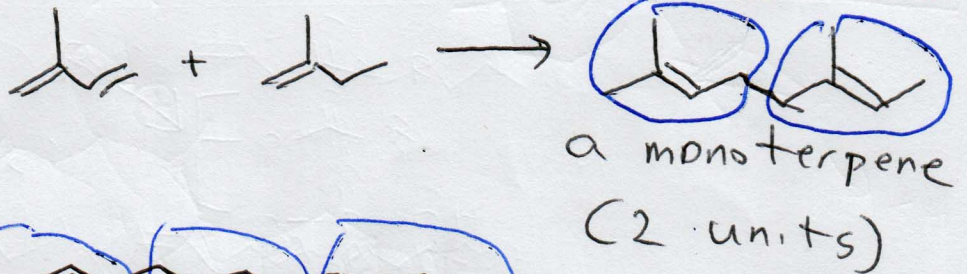
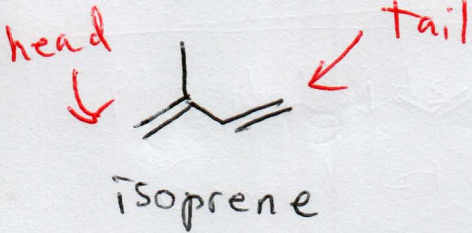
a phosphatidyl choline  
a lecithin → major components of phospholipid bilayers in humans.

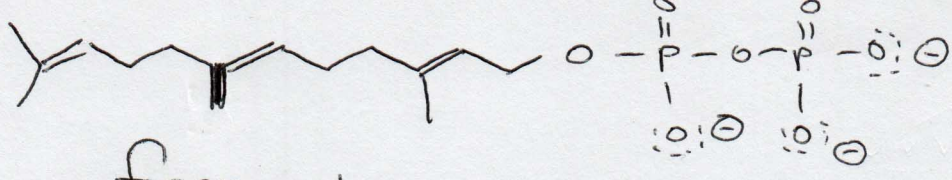
sphingosine



sphingomyelin

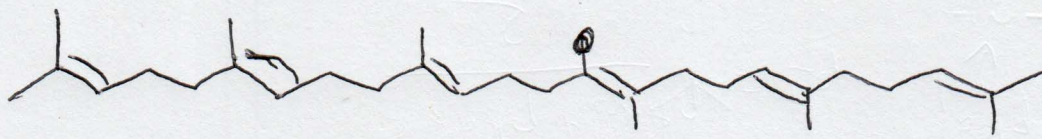
Terpenes



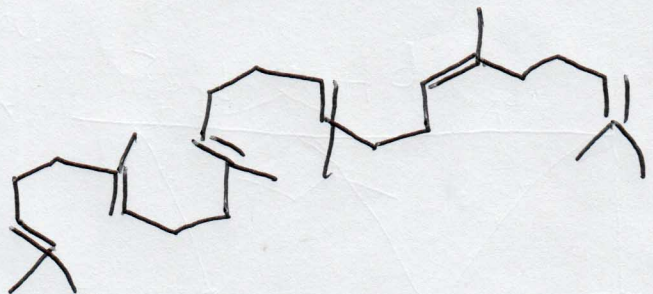
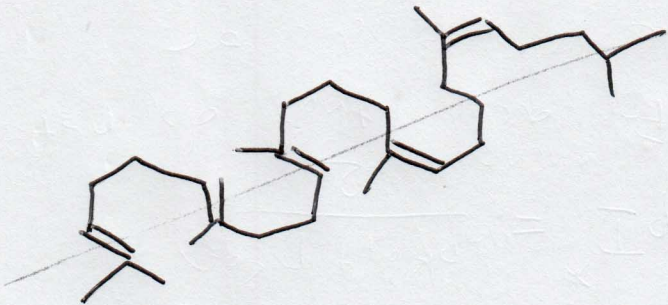


farnesyl pyrophosphate

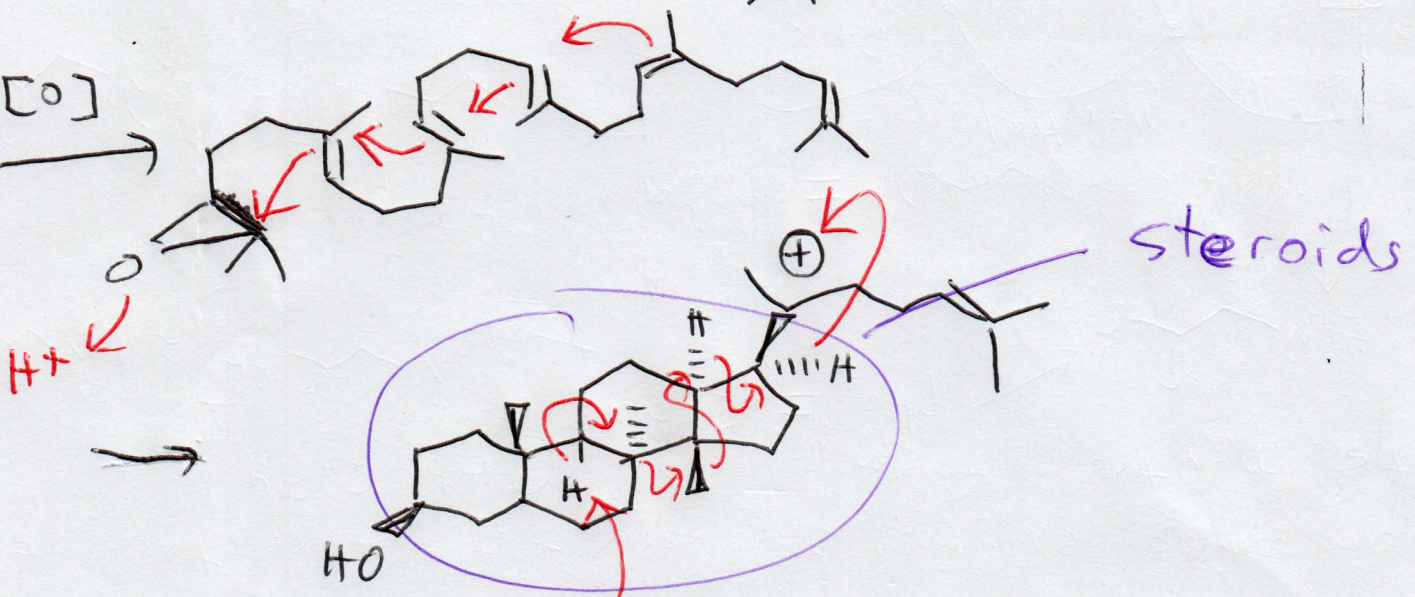
$\times 2$   
 (tail-tail)



squalene

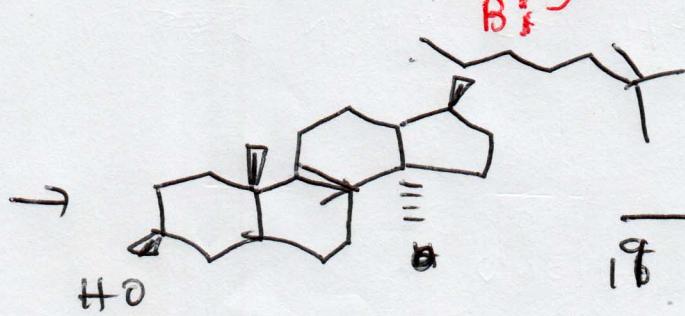


[O]  
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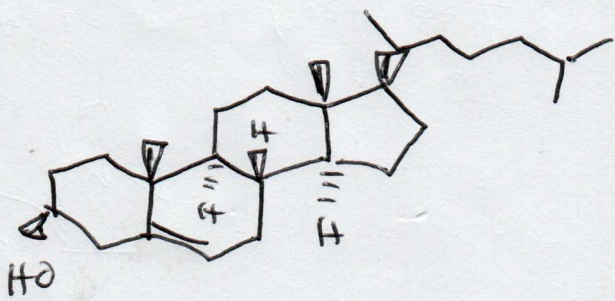
H<sup>+</sup> →

→



lanosterol

16 steps



cholesterol