CHAPTER TWENTY ONE

FATTY ACID STORAGE: TRIACYLGLYCEROL SYNTHESIS

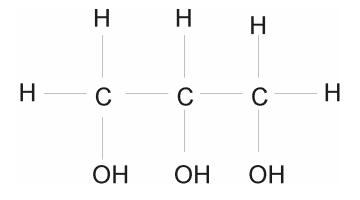
In what form are fatty acids stored in the body?

Mainly in the form of triacylglycerols.

What are the constituent pats of a triacylglycerol molecule ?

Triacylglycerols consist of three fatty acids joined to a molecule of glycerol.

Draw the structure of glycerol.



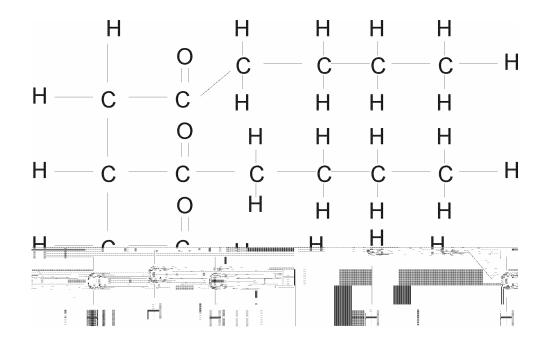
What kind of organic molecule is glycerol?

It is an alcohol (i.e. it has hydroxyl (-OH) groups).

What are the chemical bonds between the carboxyl groups of the fatty acids and the hydroxyl groups of glycerol in a triacylglycerol called?

They are *ester* bonds (remember an acid and an alcohol forms an ester).

Draw the structure of a triacylglycerol molecule.



Note the glycerol molecule at the left of the diagram (as you look at it), the ester bonds between the carbons of the glycerol and the carboxyl carbons of the three fatty acid molecules and finally the three alkyl chains.

How is glycerol synthesized ?

Glucose is converted into glycerol by first converting it into dihydroxyacetone phosphate (in the glycolysis pathway). The DHAP is then converted into glycerol instead of glyceraldehyde-3-phosphate.

What are two advantages of triacylglycerol over glycogen as energy storage molecules ?

As mentioned in the chapter on beta oxidation, triacylglycerol contains more energy per gram than glycogen. Secondly, triacylglycerol is hydrophobic and so it is stored without water while glycogen is hydrated. This means that triacylglycerol takes up less space than glycogen.

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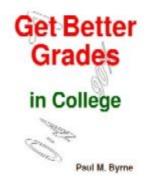
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