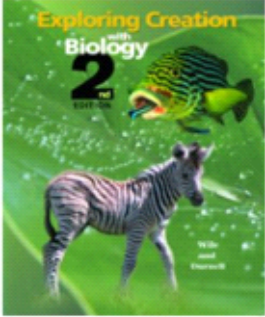



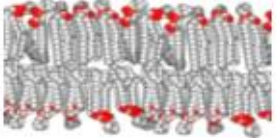




M05 L3 Lipids and Proteins


Thursday, March 05, 2009
11:29 AM

VoiceThread	http://voicethread.com/share/232656/
Cmap	Take the lipids and proteins links at http://cmapspublic2.ihmc.us/rid=1162255504437_1407680531_16462/00%20The%20Molecules%20of%20Cells.cmap

Slides	Notes
 <h2>Module 05: Chemistry of Life</h2> <p>Lecture 1: A Wee Bit of Chemistry Lecture 2: Diffusion and Osmosis; Carbohydrates  Lecture 3: Lipids and Proteins Lab Day Interactive Practice</p>	
<p>Carbohydrates Lipids Proteins Nucleic Acid Organic Molecules</p> <p>Lipids, also known as fats, are important biological molecules because most animals store excess food energy as fat...</p>   <p>and they make up the majority of cell membranes.</p>  	<p>Animals Specifically - store excess energy as fat. Plants will store extra energy as carbohydrates.</p> <p>Lipids will be very important in the next module</p>

Carbohydrates Lipids Proteins Nucleic Acid Organic Molecules

 Structure of Lipids

Lipids in the Body 

Divide topic into Structure and in the body.

Carbohydrates Lipids Proteins Nucleic Acid Organic Molecules

$$\begin{array}{c}
 \text{O} \\
 | \\
 \text{C} - \text{OH}
 \end{array}$$

acid group

When a molecule has a pattern like this within it, it is considered an Organic Acid

If you see this pattern, you have an organic acid.

This is called an acid group.

Carbohydrates

Lipids

Proteins

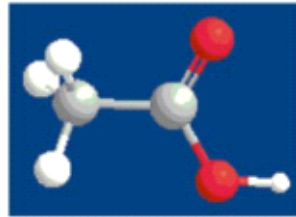
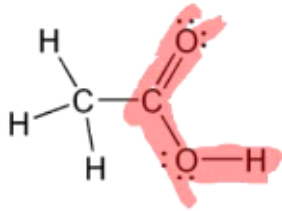
Nucleic Acid

Organic Molecules



Acetic Acid

Vinegar is 4 to 8% acetic acid



Example -
Acid group in red

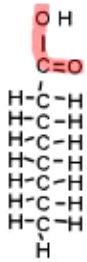
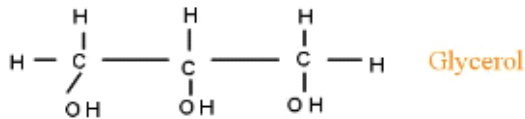
Carbohydrates

Lipids

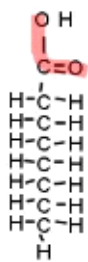
Proteins

Nucleic Acid

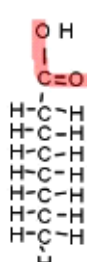
Organic Molecules



Fatty Acid



Fatty Acid



Fatty Acid

How they get their shape:

The three fatty acid tails connect to the glycerol.

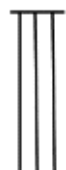


Dehydration reaction to join them.

Gets a hydrophobic/lipic structure

Carbohydrates Lipids Proteins Nucleic Acid Organic Molecules




Structure of Lipids

👉 Lipids in the Body




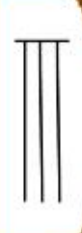







Carbohydrates Lipids Proteins Nucleic Acid Organic Molecules

Lipids (butter, oil, waxes) are insoluble in water

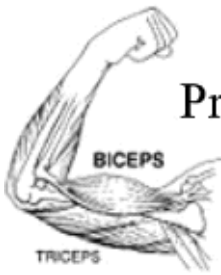

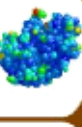


Spelling error! Insoluble
 Soap emulsifies it


Carbohydrates	Lipids	Proteins	Nucleic Acid	Organic Molecules
	<p>Fats</p> 	<p>Oils</p> 	<p>Waxes</p> 	
	<chem>CCCCCCCCCCCCCCCC(=O)O</chem> <small>saturated</small>	<chem>CCCCCCCC=CCCC(=O)O</chem> <small>unsaturated</small>	 	

Solid/liquid at room temp

As many hydrogens as it can hold is saturated fats.

Blood flow connection

Carbohydrates	Lipids	Proteins	Nucleic Acid	Organic Molecules
		<p>Proteins are involved in nearly every chemical reaction related to life.</p>  <p><i>structure</i> <i>signaling</i> <i>immune system</i> <i>cell adhesion</i> <i>cell cycle</i></p>		   

Carbohydrates	Lipids	Proteins	Nucleic Acid	Organic Molecules	Topics
<p>  Basic Building Blocks - Amino Acids </p> <p>What do they look like</p> <p>Abiogenesis</p> <p>Enzymes</p>					
<div> $\begin{array}{c} \text{COO}^- \\ \\ \text{H}_3\text{N}^+ - \text{C} - \text{H} \\ \\ \text{R} \end{array}$ </div> <p style="color: red;">General Structure of an Amino Acid</p> <p>There are about 20 different amino acids.</p> <p> hydrogen carbon nitrogen oxygen some also have phosphorous and sulfur </p>					<p>Legos</p> <p>Amino Acids</p> <p>8 amino acids are essential because your body cannot make them. You must get them from your diet.</p>

Carbohydrates

Lipids

Proteins

Nucleic Acid

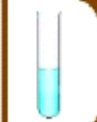
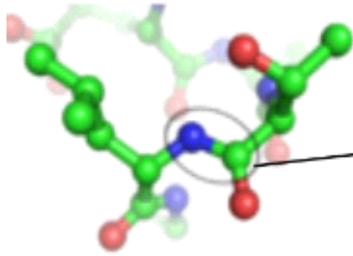
Organic Molecules

Amino acids are joined to make proteins using

the dehydration reaction

to form

peptide bonds



Carbohydrates

Lipids

Proteins

Nucleic Acid

Organic Molecules

Complex

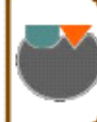
Basic Building Blocks - Amino Acids

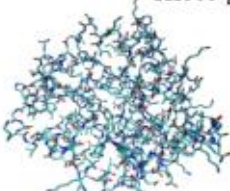
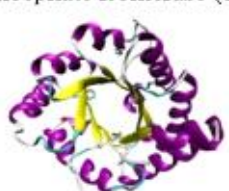
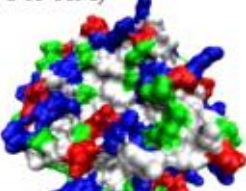

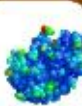


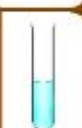

☞ What do they look like

Complex!

Abiogenesis

Enzymes




Carbohydrates	Lipids	Proteins	Nucleic Acid	Organic Molecules
Triose-phosphate isomerase (TPI or TIM)				
				
atom type	backbone conformation	surface, color coded to solvent-accessibility		
<hr/>				
				
Real molecules are dynamic	Immunoglobulin G (IgG)			

Properties:

How many
Order, position
Sequence
Even folding

Not static

Like machine parts

Carbohydrates	Lipids	Proteins	Nucleic Acid	Organic Molecules
Basic Building Blocks - Amino Acids				
What do they look like				
 Abiogenesis				
Enzymes				

Title slide for Abiogenesis

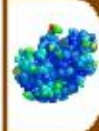
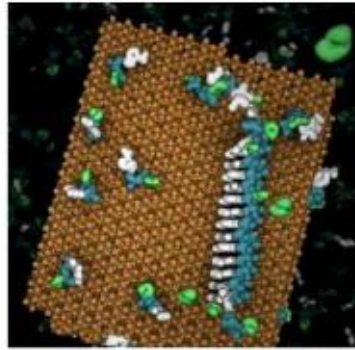
Carbohydrates

Lipids

Proteins

Nucleic Acid

Organic Molecules



Miller had to pull the amino acids out so they wouldn't be destroyed once they formed.

Clay matrix. Some amino acids will line up. Creationist chuckle about that one because clay is soil. God says he mad man for dirt. So science would be reflecting what the Bible says. :0)

Carbohydrates

Lipids

Proteins


Nucleic Acid

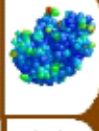
Organic Molecules

Basic Building Blocks - Amino Acids

What do they look like

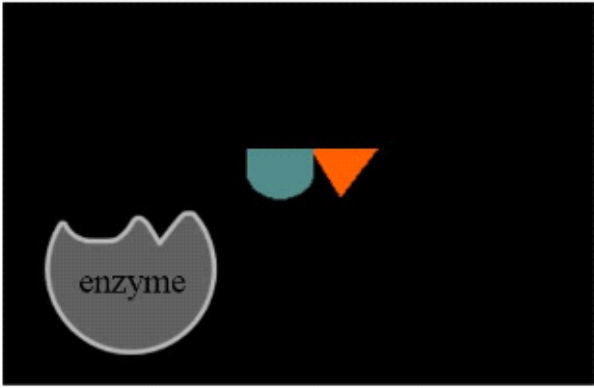
Abiogenesis

 Enzymes



Title slide

Carbohydrates Lipids Proteins Nucleic Acid Organic Molecules

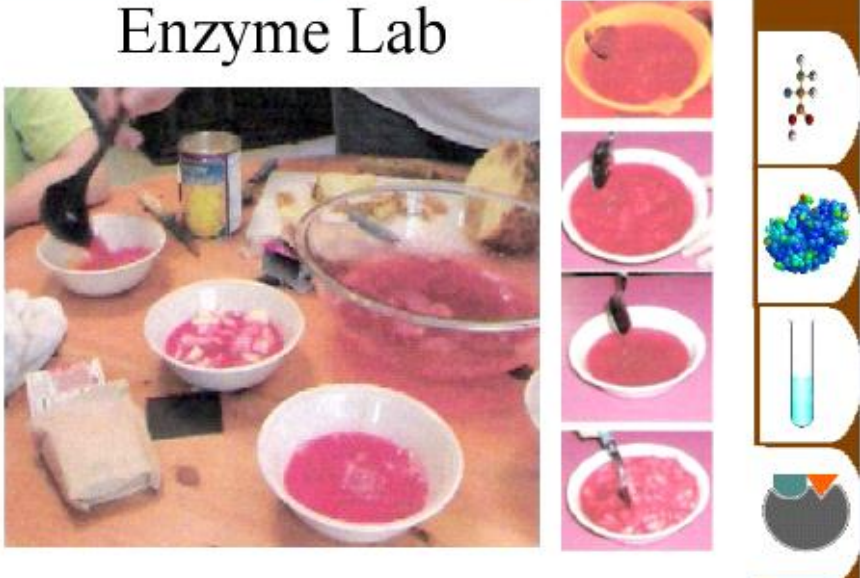


The diagram shows a grey, irregularly shaped object labeled "enzyme" with a jagged, open top. Above it are two smaller shapes: a teal semi-circle and an orange triangle. To the right of the enzyme is a vertical stack of four icons: a ball-and-stick molecular model, a space-filling molecular model, a test tube containing blue liquid, and a grey container with a teal semi-circle and orange triangle inside.

Enzymes assemble or disassemble proteins.

Carbohydrates Lipids Proteins Nucleic Acid Organic Molecules

Enzyme Lab



The "Enzyme Lab" section features a large photograph on the left showing a person's hands using a black spoon to mix a pink substance in a white bowl. On the table are several other white bowls containing pink liquid, a large glass bowl with pink liquid, a can of yellow liquid, and a piece of pineapple. To the right of the main photo is a vertical strip of four smaller photos showing a black spoon being used to stir a pink liquid in a white bowl. To the right of this strip is a vertical stack of four icons: a ball-and-stick molecular model, a space-filling molecular model, a test tube containing blue liquid, and a grey container with a teal semi-circle and orange triangle inside.

This lab explores the fragility of the bromelain enzyme. More on that on lab day.

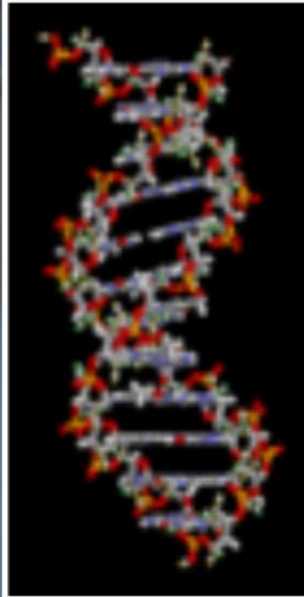
Carbohydrates

Lipids

Proteins

Nucleic
Acid

Organic
Molecules



Deoxyribonucleic Acid

DNA

The instructions for life itself.

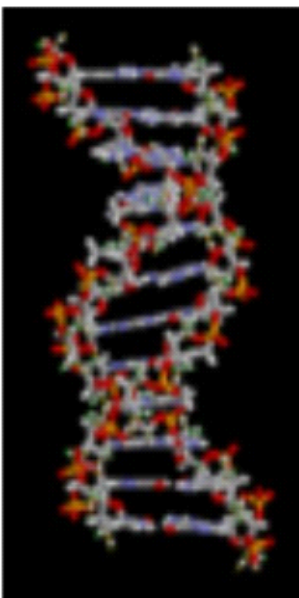
Carbohydrates

Lipids

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Nucleic
Acid

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Molecules



deoxyribose (simple sugar w/5 carbons)
phosphate group (phosphorous, hydrogen, and oxygen)
base (adenine, thymine, guanine, cytosine)

T = thymine
A = adenine
G = Guanine
C = Cytosine

pairing pattern

hydrogen bonding is used to attach the bases
to each other.

It is merely 15% as strong as a true chemical
bond between atoms.

8am: <http://www.virtualhomeschoolgroup.com/mod/quiz/view.php?id=818>

9am: <http://www.virtualhomeschoolgroup.com/mod/quiz/view.php?id=10889>

2:30: <http://www.virtualhomeschoolgroup.com/mod/quiz/view.php?id=13895>

2011/12: <http://www.virtualhomeschoolgroup.com/mod/quiz/view.php?id=18274>