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# Organic Molecule Concept Map Review Answers

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Molecule  
Concept Map Review  
Answers

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## MASTERING BIOCHEMISTRY: YOUR GUIDE TO ORGANIC MOLECULE CONCEPT MAP REVIEW ANSWERS

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For students navigating the intricate world of biochemistry, the study of organic molecules often feels like learning a new language. Between the complex structures of carbohydrates, the diverse functions of lipids, the intricate

sequences of proteins, and the genetic blueprint of nucleic acids, it is easy to become overwhelmed. This is where a **concept map** becomes an invaluable tool. It transforms a dense chapter of a textbook into a visual, interconnected diagram. However, the true test of mastery comes when you try to verify your work. Finding reliable **Organic Molecule Concept Map Review Answers** is the final, critical step in solidifying your

understanding. This article serves as your comprehensive guide to not only finding those answers but also understanding the logic behind them, ensuring you build a robust foundation in organic chemistry and biology.

Whether you are preparing for a final exam, reviewing for the MCAT, or simply trying to connect the dots in your high school biology class, this guide will walk you through the essential components of any organic molecule concept map. We will explore the four major macromolecules, their monomers, polymers, functions, and the chemical bonds that hold them together. By the end, you will be able to critically evaluate your own map

and discuss the "why" behind every connection.

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## **WHY USE A CONCEPT MAP FOR ORGANIC MOLECULES?**

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Before diving into specific answers, it is important to understand the pedagogical power of a concept map. A concept map is more than just a study guide; it is a tool for active recall and critical thinking. When you create a map for organic molecules, you are forced to ask specific questions:

- What is the primary function of this molecule?
- What is the basic building block (monomer)?
- How are these building blocks

linked together?

- Where is this molecule found in a cell or in the diet?

### Looking for **Organic Molecule Concept Map Review**

**Answers** is not about plagiarism; it is about verification. A good set of answers explains the hierarchy of information. For instance, a basic map might list "Starch" under "Carbohydrates."

A perfect review answer, however, will clarify that starch is a **polysaccharide** (polymer) made of **glucose** (monomer) linked by **glycosidic bonds**, and that it serves as **energy storage in plants**. This level of detail is what separates a superficial understanding from a deep, lasting one.

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## CORE COMPONENTS OF AN ORGANIC MOLECULE CONCEPT MAP

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Every comprehensive concept map on this topic must accurately represent the four major classes of organic compounds. Let us break down the critical "review answers" you should expect for each category.

# 1. Carbohydrates: The Energy

# Specialist

## S

Carbohydrates are often the first branch on any organic molecule map. The central concept here is the ratio of Carbon, Hydrogen, and Oxygen, typically 1:2:1.

### Key Review Points:

- **Monomer:**  
Monosaccharides (e.g., glucose, fructose, galactose).
- **Bond Type:**  
Glycosidic linkage.
- **Disaccharides:**  
Sucrose (glucose + fructose),  
Lactose (glucose + galactose),  
Maltose (glucose + glucose).
- **Polysaccharide**

### s (Polymers):

- **Starch:**  
Energy storage in plants (amylose and amylopectin).
- **Glycogen:**  
Energy storage in animals (highly branched).
- **Cellulose:**  
Structural component of plant cell walls (beta-glycosidic bonds make it indigestible to humans).
- **Chitin:**  
Structural component in arthropod

exoskeletons and fungi.

- **Primary Functions:**  
Quick energy (ATP production), short-term energy storage, structural support.

When reviewing your concept map answers, ensure that the connection between **Cellulose** and **Structural Support** is clearly defined, and that **Glycogen** is correctly linked to **Animal Energy Storage**, not plant storage.

## 2. Lipids: The

# Diverse Hydrophobic Group

Lipids are tricky because they are not polymers in the traditional sense. They are not made of repeating monomers, but rather assembled from smaller molecular components. A common error in student concept maps is trying to force lipids into the monomer-polymer framework.

### Key Review Points:

- **Building Blocks:** Glycerol and Fatty Acids (for triglycerides and phospholipids).
- **Bond Type:** Ester linkage (between

glycerol and fatty acid).

- **Major Types:**

- **Triglycerides**

**(Fats/Oils)**: One

glycerol + three fatty acids.

Saturated

(solid at

room

temp) vs.

Unsaturated

(liquid at

room

temp).

- **Phospholipids:**

Glycerol +

two fatty

acids + a

phosphate

group. The

foundation

of the cell

membrane

(bilayer).

- **Steroids:**

Four fused

carbon

rings (e.g., cholesterol

,

testosterone,

estrogen).

- **Waxes:**

Long-chain

fatty acids

bonded to

long-chain

alcohols

(waterproofing).

- **Defining**

- **Characteristic:**

Hydrophobic

(nonpolar),

insoluble in

water.

- **Primary**

- **Functions:**

Long-term

energy storage,

insulation

(thermal and

electrical), cell

membrane

structure

(phospholipids),

hormone

production

(steroids).

A high-quality set of **Organic Molecule Concept Map Review Answers** will clearly differentiate between the "hydrophilic head" and "hydrophobic tails" of a phospholipid, as this is a crucial concept for understanding cellular biology.

### 3.

# Proteins: The Molecular Machines

Proteins are the most diverse and functionally complex of the organic molecules. Your concept map needs to reflect the hierarchy of protein

structure.

## Key Review Points:

- **Monomer:**  
Amino acids (20 standard types, differing only by the R-group).
- **Bond Type:**  
Peptide bond (a type of covalent bond formed via dehydration synthesis between the carboxyl and amino groups).
- **Polymer:**  
Polypeptide chain (a chain of multiple amino acids).
- **Levels of Structure:**
  - **Primary:**  
The linear sequence of amino acids.
  - **Secondary:** Folding into alpha-

helices or  
beta-  
pleated  
sheets  
(held by  
hydrogen  
bonds).

- **Tertiary:**  
Overall 3D  
shape of a  
single  
polypeptid  
e  
(influenced  
by disulfide  
bridges,  
hydrophobi  
c  
interaction  
s, ionic  
bonds).

- **Quaternar  
y:**  
Assembly  
of multiple  
polypeptid  
e subunits  
(e.g.,  
Hemoglobi  
n has four  
subunits).

### **Functions:**

Enzymatic  
catalysts  
(enzymes),  
transport  
(hemoglobin),  
defense  
(antibodies),  
structure  
(collagen),  
movement  
(actin/myosin),  
signaling  
(hormones/insuli  
n).

The most common  
mistake in review  
answers is confusing  
"Polypeptide" with  
"Protein." While all  
proteins are  
polypeptides, not all  
polypeptides are  
functional proteins  
(they may lack proper  
tertiary folding). Your  
review answers should  
reflect that function is  
dependent on **shape**.

### • **Primary**

# 4. Nucleic Acids: The Informati on

## Keepers

This is the final major branch. Nucleic acids are the only organic molecules that store and transmit hereditary information.

### Key Review Points:

- **Monomer:** Nucleotide (composed of a phosphate group, a pentose sugar, and a nitrogenous base).
- **Bond Type:** Phosphodiester

bond (linking the 3' carbon of one sugar to the 5' carbon of the next).

- **Polymers:** DNA (Deoxyribonucleic Acid) and RNA (Ribonucleic Acid).
- **Sugars:** Deoxyribose (DNA) vs. Ribose (RNA).
- **Bases:** Purines (Adenine, Guanine) and Pyrimidines (Cytosine, Thymine in DNA; Uracil in RNA).
- **Base Pairing Rules:** A-T (or A-U in RNA) and C-G.
- **Primary Functions:** Storage of genetic information (DNA), protein synthesis via

transcription and translation (mRNA, tRNA, rRNA), energy carriers (ATP is a modified nucleotide).

Your **Organic Molecule Concept Map Review Answers** should emphasize the relationship between DNA, RNA, and Protein Synthesis. The "Central Dogma of Biology" (DNA → RNA → Protein) is a perfect "bridge" connection on your map, linking information storage (nucleic acids) to functional execution (proteins).

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## **CONNECTING THE MAP: UNDERSTANDING DEHYDRATION SYNTHESIS AND**

## **HYDROLYSIS**

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No concept map is complete without a central process that unites most of these molecules.

### **Dehydration**

**Synthesis (Condensation)** and **Hydrolysis** are the chemical processes that build and break down polymers.

### **Review Answer Insight:**

- **Dehydration Synthesis:**  
Removes a water molecule to link two monomers together (used to form glycosidic bonds in carbs, peptide bonds in proteins, and phosphodiester bonds in nucleic acids).
- **Hydrolysis:**  
Adds a water molecule to

break a polymer into monomers (the process of digestion in the human body).

Ensure your map has a side-note or a central node for these two processes, as they are the "verbs" of biochemistry.

### COMMON PITFALLS TO AVOID WHEN REVIEWING YOUR ANSWERS

As you check your work against reliable **Organic Molecule Concept Map Review Answers**, watch out for these frequent errors:

1. **Misattribution of Functions:**

Saying that "Starch" provides structural support (it does not; Cellulose

does). Saying that "Enzymes" are primarily made of lipids (they are proteins).

2. **Confusing Monomers:**

Forgetting that the monomer of a nucleic acid is a nucleotide, not a nitrogenous base. The base is only one part of the nucleotide.

3. **Ignoring R-**

**Groups:** Listing all amino acids as identical. The R-group is what differentiates them (polar, nonpolar, charged).

4. **Polysaccharide Confusion:**

Mixing up the functions of starch (energy) and cellulose (structure). Both

are made of glucose, but the type of glycosidic bond changes the function entirely.

5. **Unsaturated vs. Saturated:** Forgetting that unsaturated fats have double bonds (kinks) which make them liquid, while saturated fats have no double bonds (straight chains) making them solid.

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## HOW TO USE THIS GUIDE FOR EFFECTIVE STUDYING

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Reading these **Organic Molecule Concept Map Review Answers** is just the first step. To truly benefit:

- **Draw from Memory:** Try to recreate the concept map without looking at your notes. Start with the four central boxes (Carbs, Lipids, Proteins, Nucleic Acids).
- **Branches and Sub-branches:** Add the monomers, bonds, and functions.
- **Cross-Link:** Draw connections between branches. For example, link "DNA" to "Protein Synthesis" to "Enzymes." Link "Glucose" to "Cellular Respiration" (energy).
- **Color Code:** Use different colors

for Structure, Function, and Chemical Properties. This engages visual memory.

- **Explain Aloud:** Walk through the map verbally.

Explain to an imaginary classmate why cellulose is different from starch. If you can't explain it simply