

# Module 3: Organic Molecules — Keys to Success

## Learning Objectives

By the end of this module, you should be able to:

1. Explain why carbon is central to organic chemistry
2. Distinguish between monomers and polymers
3. Describe dehydration synthesis and hydrolysis
4. Compare the four classes of biomolecules
5. Explain protein structure and denaturation

## Key Terms to Know

- **Organic Molecule** — Carbon-based molecule
- **Functional Group** — Chemical group that determines molecule properties
- **Monomer** — Single building block unit
- **Polymer** — Chain of monomers
- **Dehydration Synthesis** — Building polymers by removing water
- **Hydrolysis** — Breaking polymers by adding water
- **Carbohydrate** — Sugars and starches; quick energy source
- **Lipid** — Fats, oils, waxes; long-term energy storage
- **Protein** — Amino acid polymers; structure, enzymes, transport
- **Nucleic Acid** — DNA and RNA; genetic information
- **Amino Acid** — Monomer of proteins (20 types)
- **Peptide Bond** — Bond between amino acids
- **Denaturation** — Loss of protein shape and function
- **ATP** — Adenosine triphosphate; energy currency

## Key Comparisons

Biomolecule	Monomer	Function	Example
Carbohydrate	Monosaccharide	Energy	Glucose, starch
Lipid	Fatty acid + glycerol	Energy storage	Fat, oil
Protein	Amino acid	Structure, enzymes	Hemoglobin
Nucleic Acid	Nucleotide	Genetic info	DNA, RNA

## Study Tips

1. **Know the monomers** — Monosaccharide, amino acid, nucleotide
2. **Understand the reactions** — Dehydration = build; Hydrolysis = break
3. **Draw protein structure levels** — Primary through quaternary
4. **Compare starch vs. cellulose** — Same monomer, different linkage