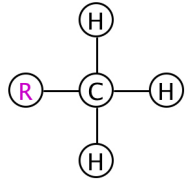
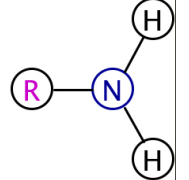
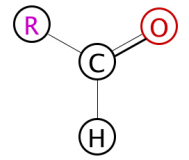
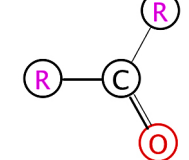
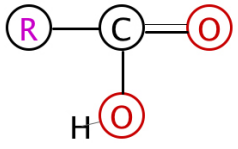
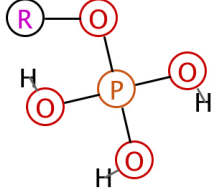
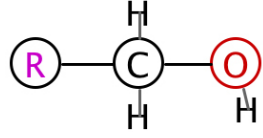


# Chemistry Review

The basic “building blocks” of living organisms are atoms or elements. Thirteen elements (C, H, O, P, K, I, N, S, Ca, Fe, Mg, Na, and Cl) are sometimes described as making up approximately 99.9% of any living organism by weight. Individual atoms can interact with one another to form molecules or compounds, and the forces holding them together are called bonds. Four types of chemical bonds important to living organisms are:

1. **Covalent bonds** – Formed when the atoms involved share one or more electrons.
2. **Ionic bonds** – Formed when one atom loses one or more electrons, and another atom picks it/ them up. The ions (charged particles) formed are attracted to one another.
3. **Hydrogen bonds** – Formed when the atoms of polar molecules (those with uneven electron sharing) are attracted to one another (positive regions attracted to negative regions).
4. **Van der Waals bonds/forces** – Involved when the protons of one molecule exert a slight “pull” on the electrons of another.

Different molecules have different characteristics or features that influence their chemical properties. A group of atoms with a particular function or chemical feature is called a functional group, and many of these play significant roles within living systems. Some important functional groups you should be familiar with include:

<p><b>Methyl Group</b> Hydrophilic Not ionized R-CH<sub>3</sub></p>		<p><b>Amino Group</b> Hydrophilic Basic Can be ionized as NH<sub>3</sub><sup>+</sup></p>	
<p><b>Carbonyl Aldehyde</b> Hydrophilic (polar)</p>		<p><b>Carbonyl Ketone</b> Hydrophilic (polar)</p>	
<p><b>Carboxyl Group</b> Hydrophilic (acidic) Can be ionized as R-COO<sup>-</sup></p>		<p><b>Phosphate Group</b> Hydrophilic (acidic) Can be ionized as R-PO<sub>4</sub><sup>-</sup></p>	
<p><b>Hydroxyl Group</b> Hydrophilic (polar) Can be involved in Hydrogen bonding</p>		<p><b>Sulphydryl Group</b> Hydrophilic (polar) Can be involved in disulfide bonding</p>	