

## 5.1: Introduction

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One of the most important properties of molecules in the biological world is three-dimensional shape. Organisms interact with molecules based to a large extent on molecular shape. Many compounds fit together with cell-based receptors (which are themselves molecules of very particular shapes). When this happens, a biological response results: a signal to the brain, the onset of cell division, or other possibilities.

Because shape can influence how two molecules fit together, it can affect physical properties as well as biological ones. For example, if a compound is made of molecules that cannot fit together easily, London dispersion interactions are limited, and so the compound is less likely to be a solid.

Stereochemistry refers to the three-dimensional arrangement of atoms. When two compounds contain the same atoms that are connected in the same order, but have different intrinsic shapes, they are stereoisomers.

In biology, stereoisomers result from chiral centers. Because biological molecules are comprised largely of carbon, and because carbon usually adopts a tetrahedral shape, there are often two different ways for four groups to be arranged around a carbon atom.

Stereochemistry are not just found in biology, however. Certain minerals contain right- or left-handed helices, and chiral molecules have been [observed by astronomers](#). It is even possible that some of the chiral molecules found in early biology were influenced by templates from meteorites or other astronomical debris.

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