Chirality is a fundamental concept in many branches of science, especially in crystallography, organic chemistry, and biology. It deals with objects that cannot be superimposed on each other. This can be visualized in the context of a pair of enantiomers, which are mirror images of each other. In 1848, Pasteur observed that certain crystals can exist in two mirror-image forms, each with distinct physical properties. These two forms are called enantiomers.

### The Chirality of Molecules

In 1848, Pasteur noted that crystals can have two identical and yet opposing forms, which he called “opposite” forms. He interpreted this as the existence of two chiral molecules. The chirality of crystals is primarily due to the manner in which the constituent atoms or molecules are arranged. Asymmetric molecules have two chiral forms, generally in nature one of these forms is dominant.

**Our body is made up of basic chiral structures: amino acids, sugars…**

A chiral molecule in one form or another will not have the same effect on our bodies. This is the case with many drugs and medicines, as well as in the perception of tastes and smells.

**By examining crystals of tartaric acid, Louis Pasteur observed that two crystal forms, images of each other in a mirror, coexist in the same sample. He separated the crystals by hand and, by dissolving them separately in water, he found that the two forms have different optical properties: one form rotates the polarization plane of light in the opposite direction to the other. If instead of the two solutions does not deviate that light. These two forms are called enantiomers (Greek enantios “opposite”).**

**Table from Albert Edelfelt 1885 - Coll. Musée d’Orsay.**

All children have been faced with a problem of chirality by putting the right foot in the left shoe. Like a left hand cannot be superimposed on a right hand, a shoe is a chiral object as both shoes are not superimposable.

**Two enantiomers have identical physical and chemical properties in a symmetrical way. However, they are perceived differently by living organisms. In other words, depending on whether the molecule is in one form or another is not to have the same effect. This explains why a molecule of carvone can have a smell of mint green, while that of camphene has a scent of sweet, or garlic, as enantiomers are sensitive to chirality. It is the same for the taste: a molecule of asparagine has the bitter taste of the asparagus, while asparagine has a sweet taste. These differences in properties can be dramatic for drugs: the case of thalidomide, a molecule that gives pain relief and the other causes fetal deformations.**

**Source: Institut Néel-CNRS**