

Giving photochemistry a hand

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Making molecules with the right handedness - either a left- or a right-handed arrangement of atomic groupings - is of critical importance to the pharmaceutical industry, as the two different 'handed' forms (called enantiomers) of some drugs can have very different physiological effects. Controlling this molecular arrangement is challenging and often possible only for very specific types of reaction.

That's why the process devised by Thorsten Bach and colleagues will be welcomed. In a Letter published in this week's Nature, the team propose a way to control enantiomer selectivity in a reaction induced by light. Such 'photochemical' processes are quite common in synthetic chemistry, as well as being essential to the natural process of photosynthesis. Often they involve moving an electron from one molecule, or part of a molecule, to another, and it is such a photoinduced electron transfer process that Bach and colleagues have now brought under control.

The researchers do this with a catalyst: an organic molecule that guides the reaction along the right path and then moves off to do the same to another molecule. The catalyst in this case is a molecule that sticks to the reactant molecule (which is to be transformed into a product molecule with a particular handedness), absorbs light and then uses the energy to take an electron from the reactant. As a result of this electron transfer, the reactant becomes rearranged into a product molecule with the desired handedness - here, the catalyst acts as a kind of glove that only the correct hand will fit. A News and Views article by Yoshihisa Inoue accompanies this research.

Source: Nature Publishing Group

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