

BE CAREFUL: TWO ODOURS CAN CREATE ANOTHER!

Anything we smell in our environment is rarely emitted by a single molecule and generally comes from a mix of many different odorous molecules. Some of these mixtures can give rise to an “aroma blend” in which the combined aroma of the mixture is different from the smell of each of the individual molecules contained in the mixture. Thus, when a molecule that smells like strawberries and a molecule that smells like caramel are mixed, the result smells like... pineapple!

To understand this phenomenon, researchers from the CSGA examined the odorous and molecular properties of several hundred molecules known to be associated with the aromas of strawberry, caramel or pineapple.

From a sensory standpoint, molecules which smell of strawberry are also often associated with the odours of caramel or pineapple, or even with the odours of apple, banana or pear. Conversely, several molecules only smell of caramel or only smell of pineapple, but only one molecule is described as smelling of both caramel and pineapple.

From a molecular standpoint, an odorous molecule is made up of a sequence of atoms. The chains are of varying length and flexibility according to the number of atoms and the nature of the links connecting those atoms together. For example, "caramel" molecules are rather small and rigid while "pineapple" molecules are long and flexible. So "caramel" and "pineapple" molecules have nothing in common. Conversely, "strawberry" molecules have a wide variety of molecular characteristics, none of which are specific to them.

To conclude, while "caramel" and "pineapple" molecules are very dissimilar, "strawberry" molecules have some characteristics in common with "caramel" molecules, for example their lesser flexibility. These analyses suggest that strawberry smelling molecules possess complex properties that may enable them to reveal their pineapple note when combined with a molecule smelling of caramel. And now we just need to find out what these properties consist of!

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To know more

Tromelin A, Koensgen F, Audouze K, Guichard E, Thomas-Danguin T (2020) Exploring the characteristics of an aroma-blending mixture by investigating the network of shared odors and the molecular features of their related odorants. *Molecules*, Basel (Swiss).

Key-words

Odour; olfaction; aroma blend; perception; molecule; molecular properties

