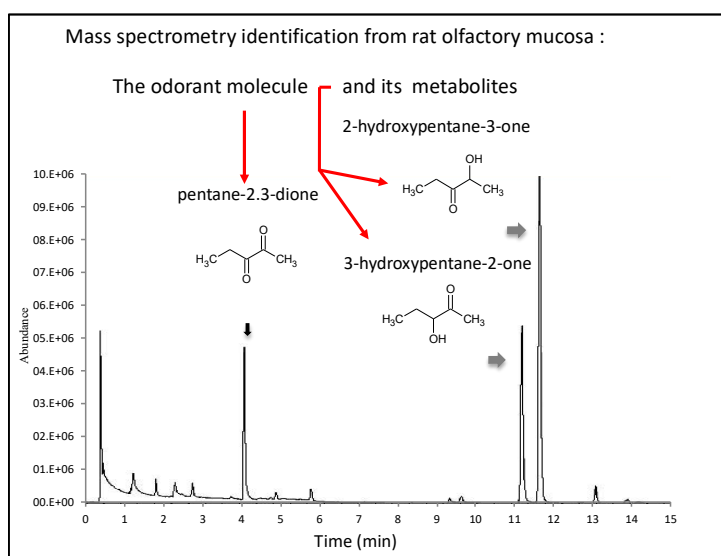


## WHEN THE NOSE CREATES NEW ODOURS

### Episode 2. The Rat

In mammals, odours are detected in the depths of the nasal cavity, within the olfactory mucosa. The olfactory response results from the stimulation of olfactory receptors by odorous molecules. In order to avoid saturation of the receptors and maintain olfactory sensitivity, it is essential that the odorous molecules are quickly eliminated. Studies conducted at the CSGA by Jean-Marie Heydel's group have shown that enzymes near the receptors modify the chemical structure of odorous molecules to make them inactive. However, in some cases, it is possible that the transformation of molecules by these enzymes may generate new entities (called "metabolites") with specific odorant properties, which may contribute to the overall perceived odour.

In order to better understand these phenomena, Aline Robert-Hazotte, a doctoral student supervised by Jean-Marie Heydel and Philippe Faure, has developed a technique based on mass spectrometry that makes it possible to analyze in real time the metabolites resulting from the transformation of odorous molecules by the enzymes present in the rat's olfactory tissues. This work, carried out in collaboration with other members of the CSGA, has shown that enzymes in peripheral olfactory tissues are capable of generating very quickly (in the order of a hundred milliseconds) metabolites with different or similar odorant properties from the initial molecule. Thus, from any odorous molecule, whatever its chemical nature (ester, aldehyde, quinone...), this technique allows us to systematically analyze the corresponding metabolites likely to participate in the olfactory perception. This type of analysis could be important in the formulation of new aromatic mixtures in the agri-food or fragrance industry.



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### To know more

Robert-Hazotte A, Schoumacker R, Semon E, Briand L, Guichard E, Le Quere JL, Faure P, Heydel JM. 2019. Ex vivo real-time monitoring of volatile metabolites resulting from nasal odorant metabolism. *Sci Rep.* 9(1):2492.

### Key words

Olfaction ; odor ; odorant ; enzyme ; mass spectrometry ; rat