Multidisciplinary approaches in foodomic studies

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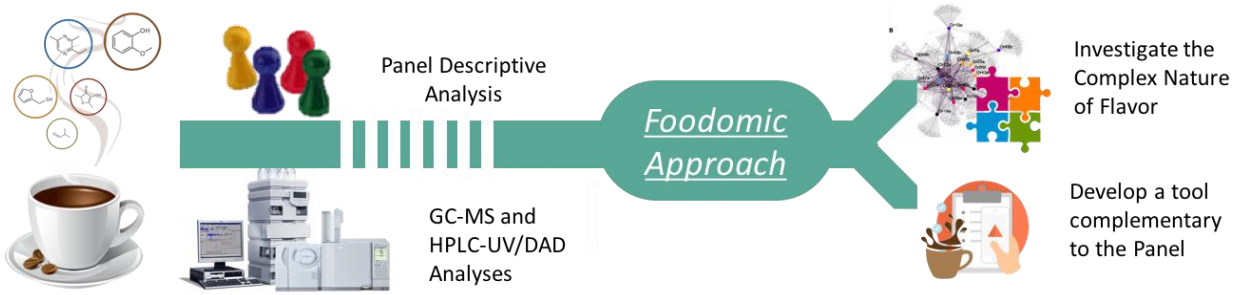
Between the "-omics" disciplines "*Foodomics*"[1,2] is the analytical approach that, in food chemistry, aims to an even more global characterization of the food to define its chemical, physical, sensory and nutritional properties in order to meet always more aware and demanding customers.
A particular brunch of foodomic, focused on linking the chemical composition to the sensory properties of food, assumes particular relevance in the case of recreational foods (like coffee), which choice and consumption is driven more by the pleasure given its intake than by its nutritional properties.
This study aims to investigate the relationship between the chemical composition of coffee flavor and its sensory impact.
This ambitious task has been faced by a multistep project:

- in the first step different analytical platforms and sampling strategies have been used to simulate the panel experience during sensory descriptive analyses[3] (HS-SPME-GC-MS, di-SPME-GC-MS and SBSE-GC-MS to simulate aroma perception and the HPLC-UV/DAD to simulate the tasting experience) and better understand how aroma and taste contribute to the flavor definition.
  the second step involved the definition of the chemical fingerprint of six different sensory notes coupling an informative (but also suitable for routine analyses) platform (HS-SPME-GC-MS) to a chemometric data elaboration.
- a molecular sensory science approach has been used to chemically characterize the *Woody* sensory note on the same coffee samples and obtain an inter-approach validation for the developed "Sensometric" approach.
- a large part of the project has been focused on the data elaboration archived by chemometric tools like PCA, MFA, PLS-DA, parametric and non-parametric regressions to model a prediction tool able to define the coffee quality in cup.

Chemometric models and the *–omic* approach represent a step forward the conventional food flavor analysis because allow a better and more comprehensive investigation of the complex pool of interactions behind the food flavor and moreover, even if the panel's contribution cannot be replaced by the chemical analysis[4], they can be a valid support for quality control purposes.



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