

It is always an appealing and uncertain adventure to initiate a new journal. This difficulty is even more evident these days when the number of new journals keeps growing practically every week. This astonishing emergence of new journals makes increasingly difficult for specialists to keep up to date with the expanding volume of information published. Trying to overcome this important drawback, this new journal, Current Opinion in Food Science (COFS), has been thought for helping readers by providing in a systematic manner the views of experts on current advances in food science in a clear and readable form, together with the evaluations of the most interesting papers, annotated by experts, from the great wealth of original publications. Therefore, as the Foodomics Section Editor of this new journal, it is for me a pleasure to write this editorial for the first issue of Current Opinion in Food Science (COFS) devoted to Foodomics. For the newcomers to this modern discipline, the first question to be answered is: what is Foodomics? Although the word "Foodomics" is being used in different web-pages and scientific meetings since 2007 (see e.g.), Foodomics was defined for the first time in a SCI journal in 2009 by our group as "a discipline that studies the food and nutrition domains through the application and integration of advanced omics technologies to improve consumer's well-being, health, and confidence". Thus, Foodomics is not only a useful concept that comprises in a simple and straightforward expression many emerging terms related to food and nutrition (e.g., nutrigenomics, nutrigenetics, microbiomics, toxicogenomics, nutritranscriptomics, nutriproteomics, nutrimetabolomics, etc.), but more importantly, Foodomics is a global discipline that includes all the working areas in which food (including nutrition) and advanced omics tools are put together. This innovative combination now allows us to deeply explore different aspects related to food safety, food quality & traceability, food bioactivity, food & health, etc.

The second question to be answered is: Is it really necessary a new discipline as Foodomics? It is clear that we all enjoy a good meal, but now consider if we could enjoy a safer, higher quality, more tasteful meal and simultaneously we could improve with that meal our health, enhance our body defenses and fortify our homeostasis. This is the main innovation provided by Foodomics, i.e., to apply 21st century omics tools (e.g., transcriptomics, proteomics, metabolomics) and bioinformatics to boost food science investigations, including those related to speed up the resolution of food safety issues, to improve food quality and food traceability and, to understand at molecular level every feature regarding the bioactivity of food and food ingredients on our health. The complexity of the challenge addressed by Foodomics is huge. Just consider that, unlike pharmaceuticals, the simultaneous presence of a variety of compounds in a single meal, with diverse chemical structures and concentrations, and with numerous targets with different affinities and specificities increases enormously the difficulty of studying food safety and bioactivity. Moreover, it has also to be considered here that many food compounds can have positive, neutral or negative effect on our health, and more importantly, our knowledge on how they act at molecular level is still reduced.

An additional proof of the complexity of studying food activity on health is the limited number of studies published on the effect of specific natural compounds, nutrients, or diets on the transcriptome-proteome-metabolome of organisms, tissues, or cells. As a matter of fact, the work published following a Foodomics approach in 2012 by our group, was the first publication in which the effect of a food ingredient was investigated against colon cancer proliferation at the three expression levels (transcriptome, proteome and metabolome). To the best of our knowledge, at this moment there is only another work published in which the variations at the three levels of expression (transcriptome, proteome and metabolome) were simultaneously interrogated trying to understand the effect of a given food ingredient. The limitations generated here by the current bioinformatic tools, the lack of information in the databases (e.g. on the identity of many metabolites), our poor knowledge on many molecular processes taking place in cells, or the difficulty to combine the huge data generated by transcriptomics, proteomics and metabolomics approaches (e.g., via systems biology) are still critical here. We are still far to achieve the dream of a personalized diet, since at this moment we can only see small pieces of the colossal picture entitled "Food & Health". We need to keep working, probably for a long number of years, before getting the necessary perspective (and knowledge) on this complex and fundamental topic. In spite of these limitations, the global outlook that Foodomics proposes is a good response to solve many of the complex issues and drawbacks above mentioned. As a proof of its usefulness, since the first definition of Foodomics in 2009 in a SCI journal, the use of omic approaches in food science and nutrition has quantitatively evolved and grown as can be easily checked in any database (see e.g., ISI-Web of Knowledge, Scopus, etc.). The Foodomics concept has also become more and more popular, because it is the ideal frame and distinctive stamp of any work in which an omic approach is used to investigate food safety, quality, and traceability or bioactivity issues. As an example of this growth, there are already several Foodomics labs around the world (search e.g., for Foodomics research at CSIC or at RIKILT), there are international conference on Foodomics in Italy ([www.foodomics.eu](http://www.foodomics.eu)), France ([www.cepia.inra.fr/Evenements/journee-Foodomics-Rennes](http://www.cepia.inra.fr/Evenements/journee-Foodomics-Rennes)) and India ([www.srmuniv.ac.in/node/10112](http://www.srmuniv.ac.in/node/10112)), and several journals have already devoted special issues to this discipline (see e.g., TrAC-Trend in Analytical Chemistry, Electrophoresis, Journal of Proteomics, Foods, Genes & Nutrition). Besides, Foodomics is also getting instruments companies, which now use this term in their presentations and stands.

In summary, our main idea for coining Foodomics was not only to use it as a flag of the new times for food analysis, but also to highlight that the investigation into traditional and new problems in food science in the post-genomic era can find exciting opportunities and new answers through the use of omics tools. Indeed, as already mentioned in the preface of the first book devoted to this expanding discipline [10] "Foodomics is opening a new and unexpected land still wild, still unexplored to a new generation of researchers who, using the everyday more powerful omics technologies, can find original search possibilities and innovative answers to crucial questions not only related to food science, but also related to its complex links with our health".

The interest of the scientific community in Foodomics and the different trends in this hot area of research are well documented by the present special issue of *Current Opinion in Food Science*. Namely, in this issue 11 review papers on Foodomics are presented by several of the most recognized experts in this field. Namely, this special issue includes review papers devoted to: (i) Foodomics and food toxins, (ii) the use of Foodomics in microbiological investigations, (iii) the employ of genomics tools in food safety, (iv) the use of proteomics to study fruits and beverages, (v) the benefits and limitations of using infrared technology in Foodomics, (vi) the definition of food quality by NMR-based foodomics, (vii) the use of Foodomics to investigate food allergies, (viii) Foodomics approaches to understand the human gut microbiome, (ix) metabolome responses to physiological and nutritional challenges, (x) Foodomics for discovering biomarkers of food consumption in nutrition studies and (xi) Foodomics for personalized nutrition. As the editor of this first special issue of *Current Opinion in Food Science* devoted to Foodomics, I would like to thank all authors who accepted my invitation submitting their valuable contributions to this new journal. Finally, I am grateful to Elsevier's team (especially Jacky Kennedy and Wendy Hurp) for the contribution given to the preparation of this special issue.