



6th INTERNATIONAL CONFERENCE ON FOODOMICS - ICF2020

Foodomics 2020: from Data to Knowledge

<http://www.foodomics.org>

Cesena | 14-16, October 2018

1. FoodOmics for food safety

Food safety is an important issue where omics technologies coupled with statistical and bioinformatics tools can offer solution.

Food allergy prevalence is increasing over time becoming a significant public health problem. The reliability of the omics-based strategies for allergen (and mycotoxins) quantification in food and in the digestome, and to validate biomarkers associated to allergic phenotypes is increasing. On the one hand the use of multiple-omics technologies will improve the understanding of allergenicity, on the other it will allow food allergens identification, so helping the food industry in the production of hypoallergenic foods.

In addition, in the last years quantitative analysis of molecular and functional changes has been introduced in multiple levels of biological organization used in traditional toxicology testing. The core of this new strategy, termed systems toxicology, are the “omics” techniques.

2. FoodOmics for the formulation of new food

The development of new industrial food technologies represents a new challenge that aims to improve and support sustainability, food and nutrition security, population growth, nutrition, bioactive bioavailability, health and well-being. Food engineering is at a crossroads and should embrace open innovation while formulating new products. The “foodomics vision”, combining the evaluation of food, processing, digestion, absorption and health & wellness outcomes by omics technologies is at the basis of a new era in food engineering and technology.

Enginomics represents a cutting-edge science that harmonizes the food processing and human digestion in a holistic way using new technologies for modelling and simulating the main human metabolic processes. Exploring human digestive processes using big data and food engineering support will contribute to an improved production of food for future.

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3. FoodOmics for understanding the impact of environmental exposure

The cumulative effect of environmental stressors, their interaction with genetic factors and key susceptible developmental stages determines disease risks. The exposome - representing all non-genetic exposures (including exposures from our diets, our lifestyles, and our behaviours) experienced during the life course- is recognized to be extremely challenging due to its dynamic, heterogeneous, and still unknown nature. In this scenario, advances in new and emerging -omics technologies are opportunities to characterize internal and external domains of the exposome in a more holistic way.

Exposomics is the new science that analyse the human response to exposure to the diet/lifestyle/environmental factors through innovative omics technologies. The use of omics analyses provides high throughput exposomics datasets that can help understanding in an unbiased manner chronic diseases pathophysiology in the context of industrialization, drastic lifestyle changes, urbanization, and pollution.

4. FoodOmics for animal nutrition

It is a fact that all animals, not only humans, must feed themselves and that proper nutrition is at the basis of their health, well-being and performance. Feedomics is an emerging field in animal research that, as well as foodomics, integrates a range of omics technologies. This approach can help elucidating the complex interactions among feed, environment, genetics, physiology, and the symbiotic microbiota with the final aim of improving overall animal welfare and health, productivity, and product quality.

The aim of the feedomics approach is not only animal nutrition but also human nutrition and sustainable development in the food animal industry from “farm” to “fork” through the feed and food industry.

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