INSTITUTE of FOOD SCIENCES

NATIONAL RESEARCH COUNCIL

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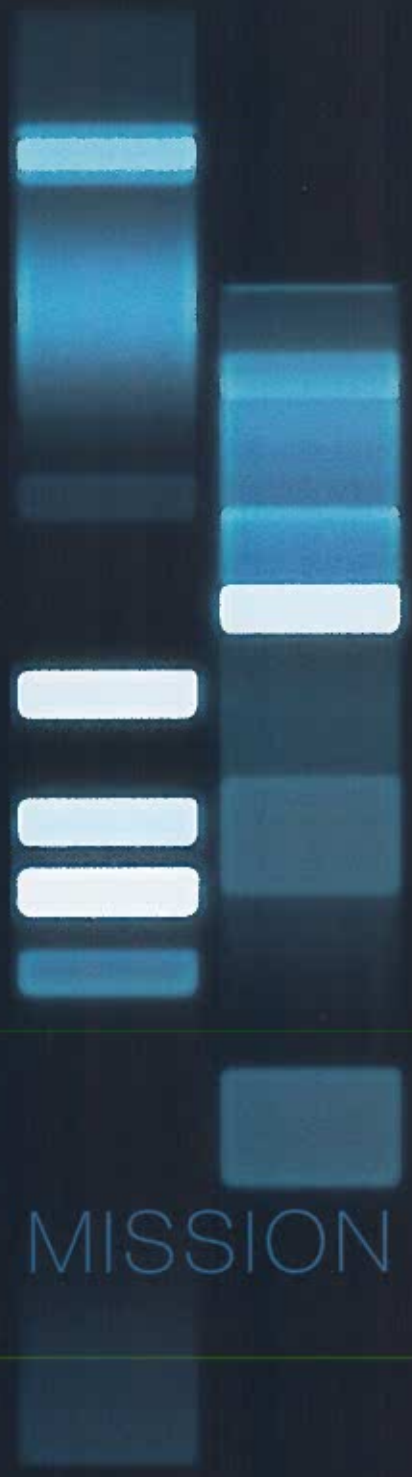
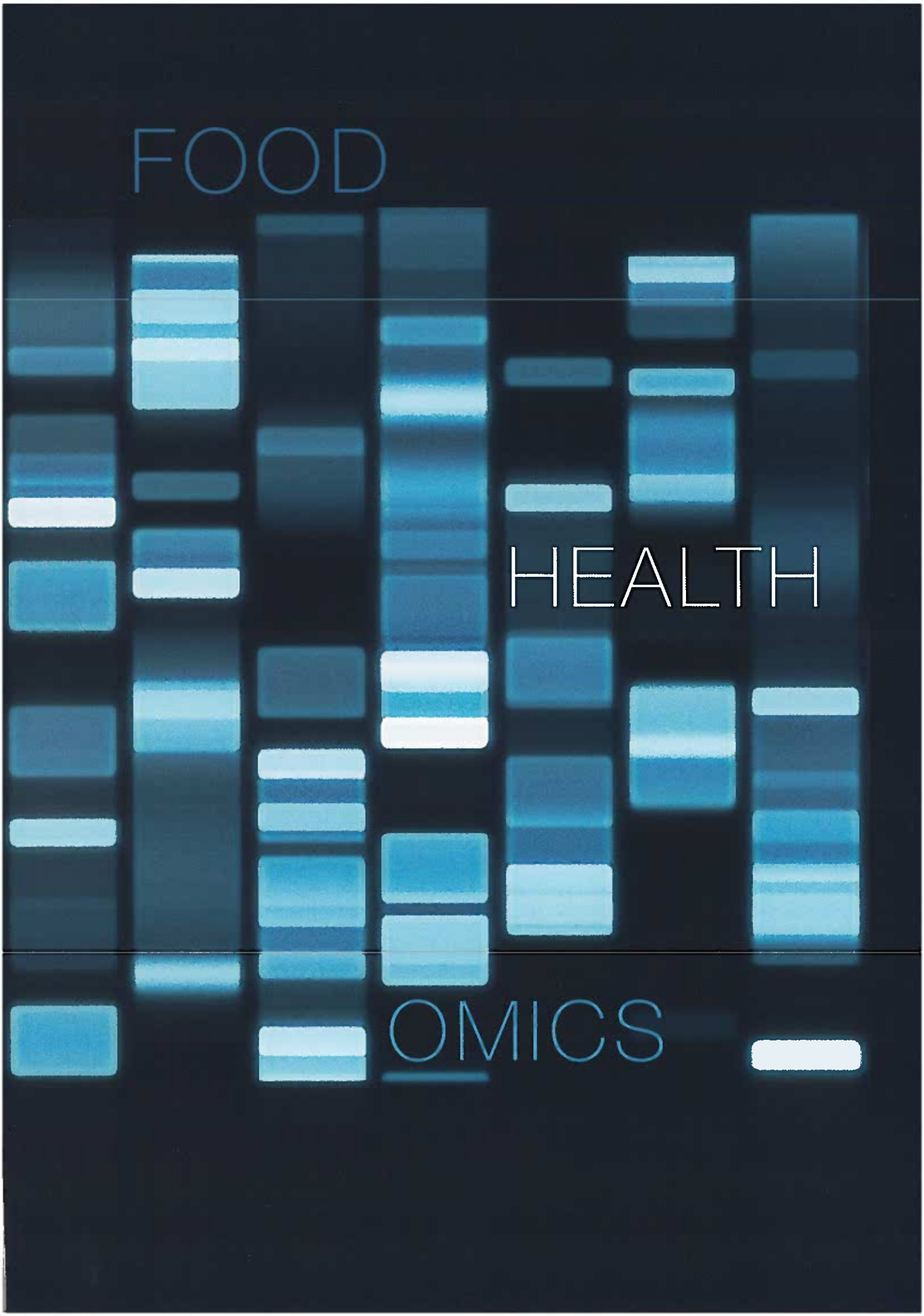


MISSION


FOOD
HEALTH
OMICS

MISSION

Research activities are aimed to assess food quality and safety and to investigate the relationship between food and health. Technology transfer is a relevant part of CNR-ISA mission. These features make CNR-ISA peculiar in both CNR and international research contexts.

FOOD

The FOOD PROGRAM stands out due to its multidisciplinary scientific approaches and outstanding continuous contributions to Food Biotechnology. These skills are applied in both basic and industrial investigations.

Topics

- Food quality and biodiversity.
- Development of: nutraceuticals, fortified, functional and novel foods.
- Characterization of biological and technological properties of food components and microorganisms, exploitable in the Food and Health sectors.
- Innovative processes of food transformation/storage.
- New active, smart and sustainable packaging systems.
- Valorization of products having a territorial dimension and monitoring of agro-food chain.

Applied methodologies

Chemical, biochemical, immunochemical, immunological, microbiological, cellular methods, molecular biology, microtechnology, sensory analysis; in vitro (bacteria and eukaryotic cells) and *in-vivo* (mouse) models.

HEALTH

The goal of the HEALTH PROGRAM is to study the relationship between nutrition, health and diseases. In this respect, the activities of the program are unique within the Department of Bio-Agrifood Sciences of the CNR.

The program includes research groups whose interest are related to chronic-degenerative diseases (cancer, cardiovascular); metabolic diseases (obesity, diabetes), food intolerance. In these years, by means of innovative and multidisciplinary approaches, the program improved knowledge on healthy properties of food and dietary factors, contributing to increase the well-being of human population (young, adult, elderly). Further applicative outcomes are expected in both public health and agro-food sectors.

The main areas of research of the health program are the following:
1. Epidemiology and population genetics (nutritional and genetic/ epigenetic determinants of obesity and related diseases).
2. Nutrition and metabolism (metabolic effects of traditional Mediterranean diet).
3. Chemopreventive mechanisms of phytochemicals.
4. Nutraceuticals and functional foods: pre-clinical and clinical approaches.
5. Immunobiology of intestine.

Skills:
Human nutrition: survey of eating habits, measurement of energy expenditure, markers of food intake, insulin sensitivity, glucose/lipid metabolism, lipase activity, gut hormones, marker of subclinical inflammation and oxidative stress.
Epidemiology: epidemiological, nutritional and genetic investigation on young and adult populations.
Public health nutrition.
Molecular sciences (protein biochemistry, molecular biology, cell biology, immunology, microbiology, genetics, nutrigenomics) applied to the relationship between nutrition and health.
Cell morphology: confocal microscopy, immuno-histochemistry, histology.

OMICS

The OMICS PROGRAM activity cross-cuts the research interests of the Institute and offers an advanced analytical platform, accessible to national and international collaborations with academic institutions, research institutes and industries.

The scientists participating to this program have a consolidated expertise in omics sciences, which includes.

1) Analytical methodologies based on mass spectrometry for proteomics and metabolomics, for the structural characterization of proteins, peptides, antioxidants, lipids, volatile molecules and other classes of biomolecules.

2) Informatics, bioinformatics, computational biology, data analysis and management, molecular modelling and docking.

3) Development of advanced optical biochips for specific detection of traces of compounds of interest for food safety, homeland security and Health.

4) Biophysical characterization of proteins by fluorescence spectroscopy (steady-state and time-resolved); circular dichroism; surface plasmon resonance, FRET, Ft-IR.

5) Characterization of molecular interactions (protein-protein; protein-DNA; small molecules-proteins).

6) Single molecule studies (FCS; SMD).

Research activity is focused on topics strategically relevant in food and life science, such as the complex relationship between food composition and human health, transformation and metabolic fate of food, characterization of components with beneficial or adverse biological activity, control of food authenticity, safety, and homeland security&environmental issues.

These studies are also aimed to provide the biological and molecular bases to the development of functional food and nutraceuticals.

TEAM











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Institute of Food Sciences, (ISA-CNR) (www.isa.cnr.it) is directed by Dr. Sabato D'Auria since October 1st, 2014. ISA-CNR holds a unique position within the National Research Council of Italy. In fact, it was established in 1994 to meet the need for establishing a national research center in which physicians, biochemists, food technologists and other different trained scientists could synergistically collaborate to contribute to improve human health through innovative biotechnological and nutritional approaches.

The research activities at ISA-CNR are focused on the study of food quality, food composition and food safety, the design and realization of advanced optical biosensors for safety and security as well as the relationship between food composition and health.
Technology transfer is a relevant activity in the mission of the Institute.

Many research activities at ISA-CNR are well integrated with the productive activities of local and national SMEs operating in agro-food and health fields. In this respect, relevant scientific achievements have been reached by ISA-CNR scientists as testified by the number of national and international patents and/or industrial collaborations.
The design and development of new optical bio/sensors for food safety and quality are new research lines established at the Institute.

The research activities performed at ISA-CNR are mainly funded by competitive national and international grants as well as by contracts of collaborations with food industries. These performances have attracted a high number of young researchers trained at different levels of their science career.
Education activities represent an important aspect of the Institute mission. Recently, a new technological hub has been realized at ISA-CNR in collaboration with the International Telematics University Uninettuno.
The research activities at ISA-CNR are organized in three main programs: FOOD, HEALH and OMICS.