Nutritional strategies to boost health

Biochemical and Physiological approaches

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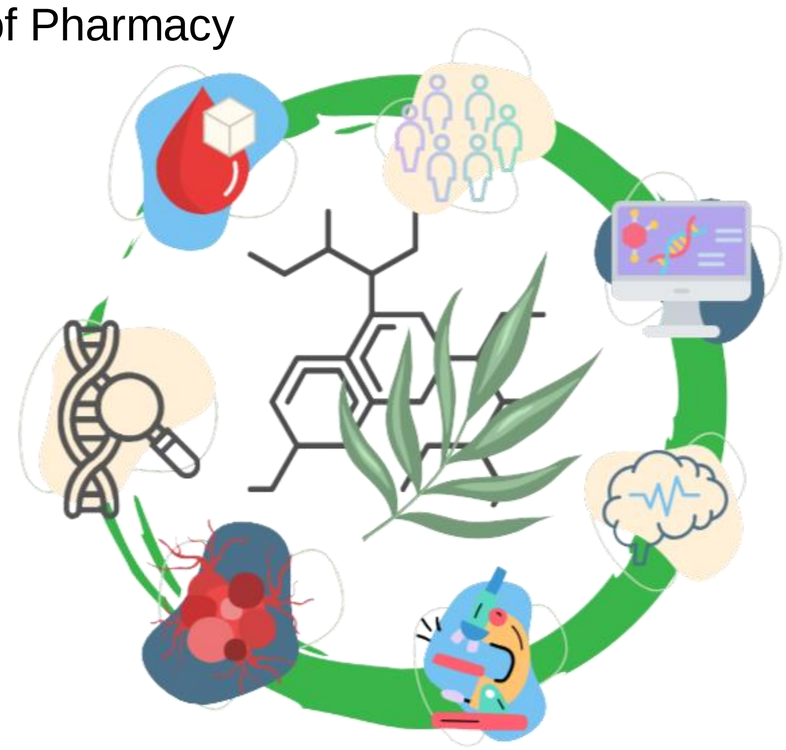

National Impact

Our research has a significant impact at a national level, promoting the **improvement of public health** through the **identification of potential biomarkers of diseases, and foods and supplements** that positively influence the human health. These studies allow us to develop **personalized solutions for the prevention and treatment of diseases**, reducing the risk of chronic diseases and improving the quality of life. Furthermore, they **foster innovation in the food and pharmaceutical sectors**, contributing to a **healthy and sustainable economy** and strengthening the country's competitiveness at an international level.

International impact

Internationally, our research has a growing impact on global health, promoting personalized approaches in disease prevention and treatment. It helps develop functional foods and supplements that optimize health by reducing the burden of chronic disease. Furthermore, it **stimulates collaboration between scientists, industries and research institutions**, **accelerating innovation** and **promoting sustainability worldwide**. Adopting these findings can improve public health and promote more effective health policies around the world.

Roles in scientific societies/Networks/Research centers

Unit of Nutrigenomics and Molecular Biology

NuGO Association | DOHaD | SIB | COST | ISNN

Unit of Biochemistry, Clinical Biochemistry & Proteomics

ItPA | SIB

Unit of Physiology

SIF | ABCD

Source of funding

Unit of Nutrigenomics and Molecular Biology

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Unit of Biochemistry, Clinical Biochemistry & Proteomics

Progetto **PRIN** 2022 Codice Progetto 2022LW54KC; Progetto Ministero della Salute cup:F95E23000140001

Unit of Physiology

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Characterizing Studies

Unit of Nutrigenomics and Molecular Biology

Study of the relationship between the human genome, nutrition and human health focusing on analyzing how epigenetic and nutritional factors influence well-being and disease prevention. This approach includes a combination of in vitro studies, cohort studies, clinical trials and meta-analyses, with the aim of understanding the underlying biological mechanisms that determine the functioning of the human body. Our research explores biological pathways related to aging, protection against oxidative stress and chronic inflammation. We investigate how specific nutrients, bioactive compounds and supplements can modulate gene expression and DNA methylation, thus influencing cellular responses and complex diseases onset. Meta-analyses allow us to synthesize data from numerous clinical and observational studies, providing evidence-based recommendations about effects of diet and nutrition on health. Finally, clinical trials aim at providing direct evidence on the effects of specific nutritional interventions on health.

Unit of Biochemistry, Clinical Biochemistry & Proteomics

Use of a Proteomic approach and system biology in different fields such as endocrine diseases, cancer, autoimmune diseases and diabetes. In this context the aim is to investigate the physiopathological mechanisms of diseases and to define potential biomarkers of diagnosis and treatment. Another interest concerns the investigation of post translational modifications in particular acetylation in type I and type II diabetes (in vitro models). Additionally, proteomic applications in nutrition are being investigated to evaluate the potential of nutraceuticals in mitigating oxidative stress and inflammation, specifically in neuronal and microglial cell cultures.

Unit of Physiology

The aim of the research is to investigate the presence of biologically active compounds present in medicinal plants and in food of nutraceutical interest. Furthermore, the research is focused on the structural and functional characterization of the bioactive peptides present in sprouts for the important role played in prevention of cardiovascular disease, inflammatory, neurodegenerative disorders, tumors and aging.

International collaborations

Unit of Nutrigenomics and Molecular Biology

- University of Antwerp, BE
- ETH Zurich, CH
- The Lifelines Biobank, NL
- Quadram Institute, UK
- AST Macerata, IT

Unit of Biochemistry, Clinical Biochemistry & Proteomics

- University of East Anglia, Norwich, UK
- University of Pisa

Unit of Physiology

- University of Florence

Relations with SME:

Unit of Nutrigenomics and Molecular Biology

- Fertitecnica Colfiorito S.r.l.
- Arca S.r.l. Benefit