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Proteomics and Metabolomics

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Animals Models

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Nutrigenomics and Proteomics

PRONUTRIGEN

Research Center



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Introduction

The research center of Nutrigenomic and Proteomic – PRONUTRIGEN, was founded with the support of 'Enrica and Romeo Invernizzi' foundation and it is located in Piacenza at the Università Cattolica Del Sacro Cuore, Faculty of Agricultural, Food and Environmental Sciences.

PRONUTRIGEN combines multidisciplinary expertise and research infrastructures belonging to the institutes of Zootechnics Microbiology, Chemistry, Oenology and Food Engineering, Feed and Food Science and Nutrition and to the Department of Sustainable Plant Science.

The scientific activity is devoted to the understanding of the interplay between nutrition, microbial ecology, gene and protein expression and the metabolism of livestock, model animals and plants. These activities include *in vitro* and *in vivo* experiments aiming to:

- evaluating the nutritional profile of different diets and their nutrients (nutritional profiling), with particular attention to functional components;
- assessing the effect of diets and pre and pro-biotic components on animal transcriptomic and proteomic profiles, metabolism and immune response;
- studying *in vitro* models, to evaluate the transformation of functional components during digestion;
- evaluating effect of different diets or single nutrients, pre and pro-biotic, on the gut microbial ecology and gene expression and on the interactions between microbiota and the host.

PRONUTRIGEN employs the cutting-edge post-genomic techniques (transcriptomics, proteomics and metabolomics) and has active collaborations with several national and international research groups.

The research center of Nutrigenomic and Proteomic – PRONUTRIGEN is composed by four areas:

- **Proteomics and Metabolomics**
- **Animals Models**
- **Gut Microbiota/Rumen end Microbial Ecology**
- **Bioinformatics**

Proteomics and Metabolomics - Services:

- Characterization of protein or peptide profiles of biological samples (animals, plants, microorganisms);
- evaluation of the alteration in the protein or peptide profile of animal, plant or microorganisms in response to biotic and abiotic factors;
- characterization of metabolic profiles from biological samples (animals, plants, microorganisms) in response to biotic and abiotic factors;
- characterization of functional compounds (Phenolic, alkaloids, oligosaccharides compounds);
- analysis of structure of metabolites ;
- screening and structural analysis of food contaminants (xenobiotics and deriving from food contact materials).

People

LUIGI LUCINI: area manager, expert in proteomic and metabolomics.

MARCO TREVISAN: full professor, head of the Agilent 6550 iFunnel Q-TOF LC/MS system platform.

Animals Models- Services:

- biochemical and immunological analysis of blood and biological samples. Characterization of the blood metabolic profiles related to dietary, pharmacological, environmental and technological treatments;
- chemical and nutritional analysis of feed and food;
- analysis of volatile Fatty Acids and Organic Acids in the rumen and faeces;
- evaluation of milk composition and its physical-chemical properties following animal nutrition, environmental, technological modifications, and animal diseases.

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People

ERMINGIO TREVISI: associate professor, expert in animal physiology and animal welfare evaluation.

FRANCESCO MASOERO: full professor, expert in animal nutrition.

ANDREA MINUTI: researcher, expert in physiology and animal nutrition.

Gut Microbiota / Rumen and Microbial Ecology- Services:

- microbial DNA extraction using different extraction methods and protocols;
- analysis of intestinal microbiota variation caused by dietary changes, supplement of probiotics and prebiotics;
- quantification of specific bacterial groups through real-time PCR;
- evaluation of colonization and persistence of probiotic bacteria administered with diets.

People

VANIA PATRONE: researcher expert in molecular genetics of microorganisms.

MARIA LUISA CALLEGARI: researcher expert in ecology of microorganisms.

Bioinformatics - Services:

- analysis of big data from -omic technologies: genotyping, proteomics, metabolomics, flow cytometry;
- advanced analysis of Next Generation Sequencing data. Experience in the agro-food, microbiological and human;
- development of software and database for the management of complex biological data;
- set up of experimental designs and statistical analysis to investigate genetic and complex data in the agro-food, human and microbiology sector.

People

RICCARDO NEGRINI: researcher: expert in statistical analysis applied to genetics of livestock.

MARCELLO DEL CORVO: researcher: expert in bioinformatics analysis of NGS data.