



Consiglio Nazionale delle Ricerche

BIOMOLECULAR STUDIES ON MICROBIOMES:
AN OVERVIEW ON THE MULTI-YEAR EXPERIENCE
OF THE JOINT INTERNATIONAL RESEARCH UNIT
"MICROMENU" BETWEEN THE CNR AND
UNIVERSITÉ LAVAL

SPEAKER:
VINCENZO DI MARZO, PhD
vincenzo.dimarzo@cnr.it

2023
13 Aprile
ore: 10:00

The microbiomes are complex ecosystems constituted of different types of microorganisms (bacteria, archaea, yeasts and viruses, as well as, in some cases, unicellular prokaryotes, which together form different microbiota), as well as their genes, proteins and metabolites, through which these microorganisms communicate with their typical environments. The microbiota composition in different kingdoms, phyla and taxa depends on the surrounding environment and its changes and, in the case of animal microbiomes, on the genetics of the host. In animals, all exposed parts of the body (and, as suggested by recent evidence, internal organs too) conserve their specific microbiomes.

The gut microbiome is the best studied of the animal microbiomes, and is defined as the system of trillions of microorganisms belonging to thousands of species that populate the intestine of animals (the gut microbiota), together with their molecular components. The taxonomic composition of the gut microbiome is regulated by both innate and external factors, in a way that two different individuals will never have the exact same taxonomic profile, especially at the genus or species level. The host microbiomes, and in particular the gut microbiome, is deeply involved in the regulation or, instead, when they are pathologically altered, dysregulation of almost all physiological functions. They do so by producing, often following the processing of different nutrients, small molecule signals, such as short chain fatty acids (SCFAs), various tryptophan metabolites and secondary bile acids, among others, which can enter the host circulation or affect its enteric nervous system. However, still relatively little is known about the chemicals, especially in terms of small molecules, produced by the microbiomes.

The Joint International Research Unit on Chemical and Biomolecular Studies on the Microbiome and its Impact on Metabolic Health and Nutrition (JIRU-MicroMeNu), between the CNR and Université Laval in Quebec City, Canada, aims at investigating the known, or yet to be discovered, small chemicals produced by the microbiomes and understand the molecular mechanisms underlying their function in the various types of communication between the microbiota and their environments (e.g. host, soil, etc.). The JIRU-MicroMeNu was founded in 2016, and started its activities in 2017. Since then, it has been deeply involved in: 1) fostering, and in some cases sponsoring, joint research projects between the CNR and other Italian research and academic institutions and Université Laval, 2) training undergraduate and post-graduate students from both institutions, and 3) organising scientific conferences in Italy and Quebec. It exploits the unique infrastructures and expertise for microbiome research present at Université Laval and the exceptional expertise in small molecule chemistry, pharmacology and formulation present in some CNR institutes. In my presentation, I will highlight these activities and some of the most important scientific results achieved within the framework of the JIRU-MicroMeNu



gdl.outreach@icb.cnr.it
Seminari ICB
<https://meet.goto.com/915435757>



Istituto di
Chimica
Biomolecolare