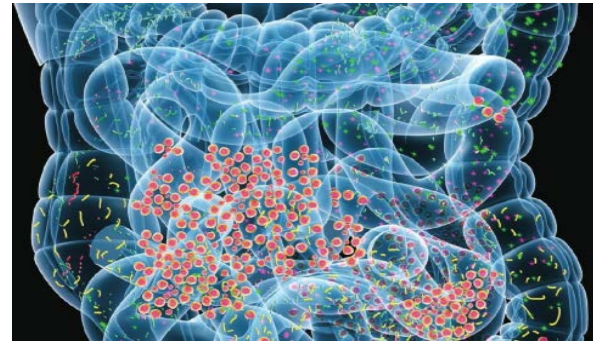


CONSORTIUM IN THE AREA OF FOOD AND NUTRITION

BIOACTIVE COMPOUNDS FROM BASIC FOODS AND THEIR ACTION ON THE INTESTINAL MICROBIOTA AND PATHOPHYSIOLOGY (FUNCTIONAL FOODS)



FUNCTIONAL FOODS: PARTNERS

Partners from universities and research centres:

University of Zaragoza

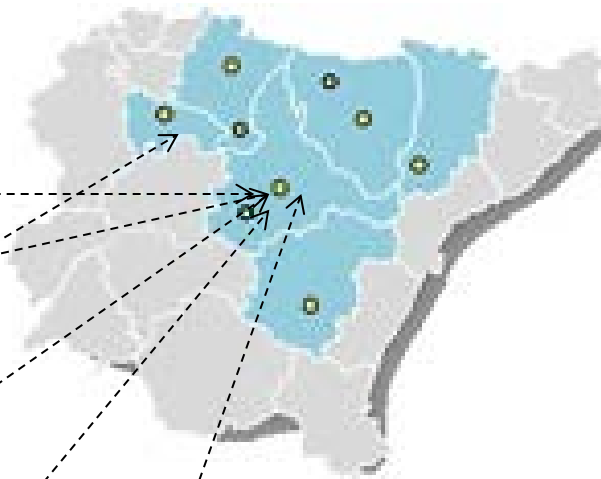
Institute of Health Research (Zaragoza)

University of La Rioja

Hospital Clínico Universitario (Zaragoza)

Hospital Miguel Servet (Zaragoza)

Campus Iberus Area



Companies:

Novapan

Villacorona

Omica

Aserhco



➤ Group of Biochemistry of Milk Proteins

M. Calvo, Lourdes Sánchez, D. Pérez, D. Ripollés, J. A. Parrón

- Isolation and characterization of milk proteins with biological activity (antibacterial, antiviral, antioxidant)
- Effect of technological treatments on the structure and activity of milk proteins: heat treatment, high pressure, electric pulses,...
- Effect of enzymatic hydrolysis on the activity of milk proteins: bioactive peptides

➤ Group of Physiology

J. E. Mesonero, Laura Grasa, P. Arruebo, M. A. Plaza, M. Castro, E. Latorre

- Study of the interaction between microbiota and the intestinal tract, and its contribution to intestinal physiopathology
- Analysis of the involvement of pro and anti-inflammatory factors in intestinal homeostasis
- Effects of the activation of Toll-like receptors and NOD receptors on the intestinal serotonergic system
- Analysis of the involvement of serotonin in the regulation of intestinal motility



➤ **Group of Molecular Ecology of Resistance to Antimicrobial and Food Safety**

Carmen Torres, M. Zarazaga, C. Lozano, C. Alonso, P. Gómez

- Resistance to antibiotics in bacteria from human, animal, food and environmental origin
- Study of genetic platforms of acquisition and mobilisation of resistance genes: implications in food safety, human and animal health
- New antimicrobials of interest in nutrition and in human and animal therapeutics
- Antimicrobial peptides produced by bacteria of food and intestinal origin



➤ **Group of Microbial Biotechnology**

Fernanda Ruiz, C. Tenorio

- Microbial biotechnology
- Probiotics: lactic acid bacteria
- Prebiotics: polifenols from grapes
- Antimicrobial and antioxidant activity of grape extract
- Microbiology and enology



INSTITUTE OF HEALTH RESEARCH



➤ Group of Microbiology

Julián Pardo, Antonio Rezusta, Y. Gilaberte, E. Gálvez, M. Arias, P. Jaime,

- Antimicrobial activity of natural compounds against resistant bacteria and fungi
- Study and genotyping of multi-resistant microorganisms
- Metagenomic analysis of fecal samples
- Mouse models of inflammatory intestinal disease and colorectal cancer

COMPANIES

- **Novapan:** bakery with a Slow Baking line (bread made with sourdough)
- **Villacorona:** the biggest dairy industry in our region producing whey
- **Omica:** centre that works on nutrition, health and sport
- **Aserhco:** centre for rehabilitation and health



FUNCTIONAL FOODS: OBJECTIVES

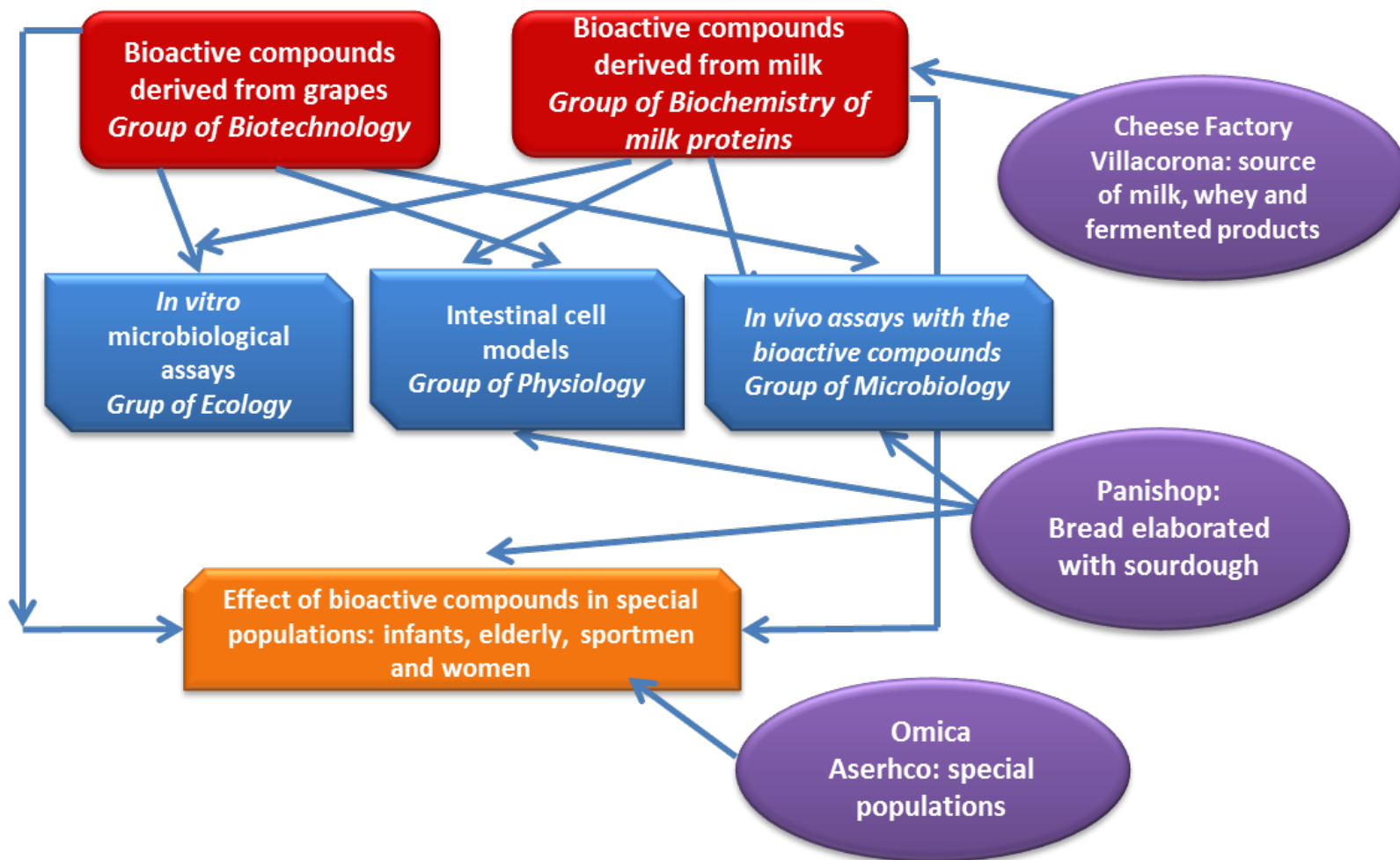
➤ GENERAL OBJECTIVES:

- Promote the scientific exchange and transfer of knowledge among research groups and companies
- Collaborate at scientific level in planning multidisciplinary research and share results among all the groups
- Explore the possibility of joint application to national and European calls for research projects

➤ SPECIFIC OBJECTIVES :

- Analyze the potential of bioactive components from basic foods on intestinal microbiota and on antibiotics and antimycostatic resistant microorganisms
- Analyze the effect that the technological processes, such as fermentation, hydrolysis or preservation treatments, exert on food bioactive compounds
- Study the beneficial effects of some foods and derived compounds on intestinal physiopathology
- Evaluate the potential of the beneficial food components on special populations (infants, elderly people, sportmen and sportwomen)

FUNCTIONAL FOODS: INTERACTION BETWEEN PARTNERS



1. PARTICIPATION IN APPLICATION FOR EUROPEAN PROJECTS

❖ JOINT ACTION “NUTRITION AND COGNITIVE FUNCTION”. June 2015

PROJECT COMMENCE: Alterations of the COmmensal Microbiota and postnatal developMENTal regulation of enteric neurotransmitter pathways

- Univ. of Padova and University of Insubria (Italy), INRA of Toulouse (France), Campusiberus (Spain)

❖ INTERREG SUDOE. November 2015

Network of research in foods with functional properties and their action on the microbiota and health (**FuncBioNet**)

- Univ. of Zaragoza, Univ. of La Rioja, Hospital Universitario Ramón y Cajal (Spain), INRA (France), Univ. de Trás-os-montes e Alto Douro (Portugal), Campus Iberus (Spain)
- Companies: Villacorona, Societé Lallemand, Novapan, S.L

❖ INTERREG POCTEFA. December 2016

Network to obtain bioactive compounds from agrofood products and study their activity with the aim to transfer knowledge to industry (**FuncBioNet**)

FUNCBIONET: POCTEFA 2016

★ SPANISH PARTNERS:

University of Zaragoza

Group of Biochemistry of Milk proteins
Group of Physiology

Institute of Health Research

University of La Rioja

Group of Molecular Ecology of Resistance to Antimicrobial
Group of Microbial Biotechnology

★ COMPANIES

★ Villacorona: dairy industry

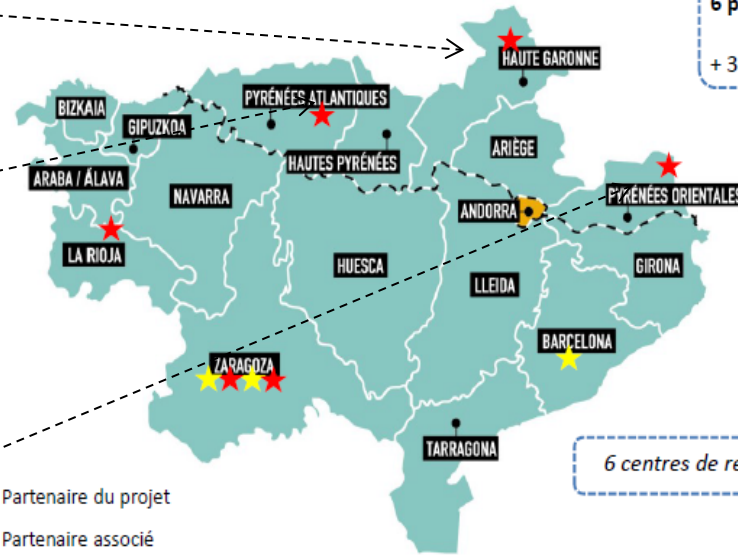
★ Novapan: bakery
with a line in Slow Baking

Distribution in POCTEFA area



★ Biolbérica: extraction of functional and bioactive ingredients from animal tissues

Distribution in POCTEFA area



★ FRENCH PARTNERS: INRA-TOULOUSE

Effect of bioactive compounds in intestinal permeability and activation of immune system

CNRS-PAU

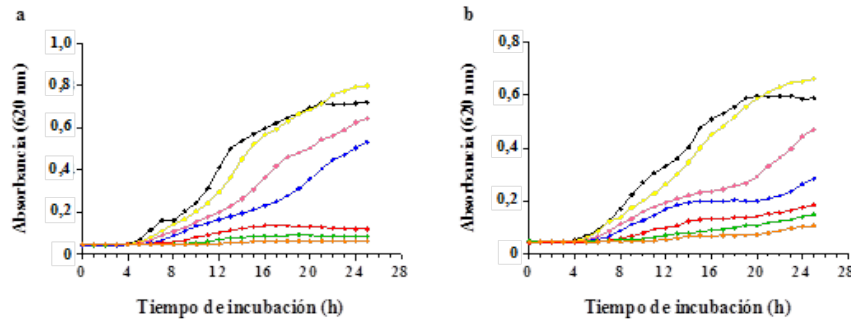
Analysis of bioactive components in food by mass spectrometry

UNIVERSITY OF PERPIGNAN- VIA DOMITIA

Biosensors to evaluate the antioxidant capacity of food components

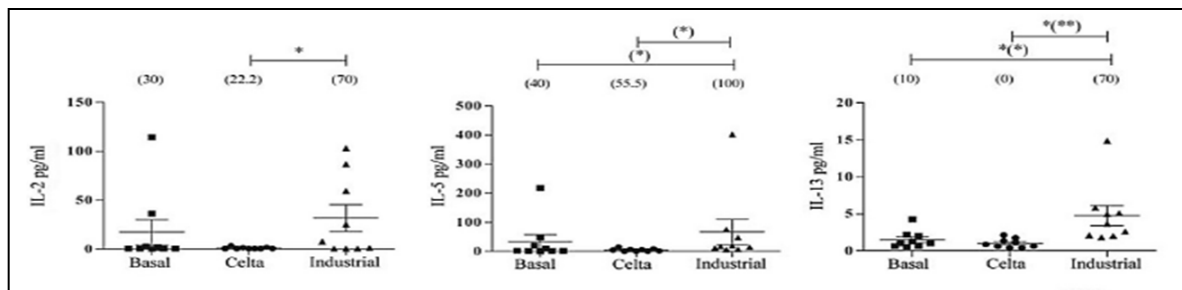
2. COLLABORATIONS BETWEEN GROUPS OF THE CONSORTIUM

- ❖ Evaluation of the antibacterial activity of the milk protein lactoferrin on resistant bacteria (University La Rioja-University of Zaragoza)



S. aureus sensitive (a) and resistant to metacillin (b) in Muller-Hinton at 37°C. PBS (●); 0.156 mg/ml (●); 0.312 mg/ml (●); 0.625 mg/ml (●); 2.5 mg/ml (●); 5 mg/ml (●); 10 mg/ml (●)

- ❖ Influence of consumption of bread elaborated with sourdough on the microbiota and inflammatory markers in the intestine (Institute of Health Research-Novapan)



Levels of IL-2 in mouse fed with bread elaborated by industrial procedure or with sourdough

(Arias et al., Journal of Functional Foods, 2017)

THANK YOU
DZIEKUJĘ