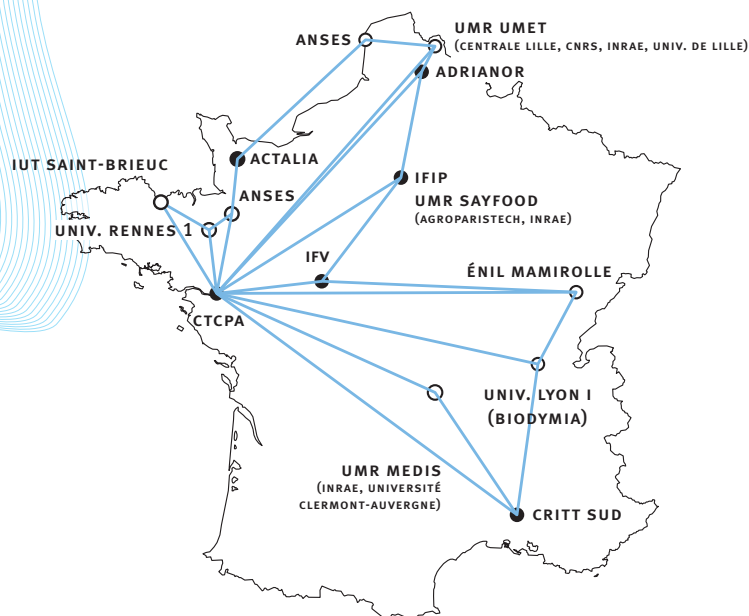




CHLEAN

HYGIENE OF EQUIPMENT



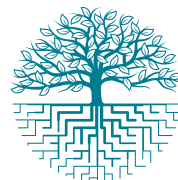
PARTNERS 2021-2025

JOINT TECHNOLOGICAL NETWORKS (RÉSEAUX MIXTES TECHNOLOGIQUES, RMT) ARE SCIENTIFIC AND TECHNICAL PARTNERSHIPS ESTABLISHED AND SUPPORTED BY THE FRENCH MINISTRY RESPONSIBLE FOR AGRICULTURE AND FOOD AND COORDINATED BY ACTIA FOR THE FOOD INDUSTRY.

THIS COLLABORATION OF KEY PARTNERS IN DEVELOPMENT, TRANSFER, RESEARCH AND EDUCATION CONSTITUTES A UNIQUE NETWORK IN THE FIELD OF THE HYGIENIC DESIGN OF EQUIPMENTS. POOLING THEIR SKILLS, LABORATORY EQUIPMENT, AND PILOT-SCALE UNITS PROVIDE A UNIQUE EXPERTISE TO COMPANIES AND AUTHORITIES IN FOOD INNOVATION, QUALITY AND SAFETY.

THE RMT ACTIA CHLEAN, COORDINATED BY THE CTCPA, BRINGS TOGETHER THIRTEEN PARTNERS. IT AIMS TO HELP FOOD COMPANIES IMPROVE THEIR PERFORMANCES, TAKING INTO ACCOUNT ECONOMIC AND SOCIETAL CHANGES, IN ORDER TO:

- CONTROL AND GUARANTEE FOOD SAFETY AND QUALITY WHILE LIMITING OR ELIMINATING THE USE OF PRESERVATIVES;
- LIMIT THE USE OF CHEMICALS ESPECIALLY DURING CLEANING AND DISINFECTION PROCESSES;
- DIVERSIFY FOOD SYSTEMS AND PRODUCTS, WHILE CONTROLLING THE MICROBIOLOGICAL AND CHEMICAL RISKS OF CROSS CONTAMINATION.



ACTIA



ACTIA NETWORK FOOD TECHNOLOGY INSTITUTES

ACTALIA

Actalia is a food technology institutes aiming at helping food manufacturers (from SMEs to international groups) in their process for innovation and quality management. Its general-interest missions aim at the constant improvement of scientific and technical knowledge and development of specific tools dedicated to foodborne operators. Hence Actalia, and especially its Food Safety unit, conducts research programs on diverse topics applied to foodborne microorganisms (bacteria, fungi, virus, protozoans): study of the impact of microbial development on food quality and safety, development of analytical tools, identification of contamination routes, assessment of the biocidal effect and study of the consequences of cleaning and disinfection procedures and food processing on the microbiota... This work can be carried out thanks to a multidisciplinary staff, several laboratories and a BSL3 pilot plant..



Contacts : Aurélie Hanin, a.hanin@actalia.eu - [Orcid](#)
& Sawsen Dehaine : s.dehaine@actalia.eu ([Sawsen Zouaghi](#) | [Semantic Scholar](#))

ADRIANOR

Adrianor is a food technology institutes with following objectives:

- Contribute to agro-food processing activities development, facilitating cooperation between scientific and technical research and the professions,
- Promote innovation in products and processes through experimentation,
- Help all sizes companies to improve their products quality 4) Contribute to the personnel training in food industries.



Contact: Anne-Laure Boutillier, a.boutillier@adrianor.com

CTCPA

The CTCPA supports companies of all sizes, from start-ups to groups, in their product development and manufacturing processes optimization, in the improvement of their industrial and environmental performance, as well as in the control of quality management and food safety. We offer audit-consulting-study services, tests in our technology halls, laboratory expertise in microbiology, packaging and nutritional quality. The CTCPA is also a professional training center.



Contacts: Catherine Stride, coordinator of RMT Actia Chlean : cstride@ctcpa.org
& Lwidge Lugros, llugros@ctcpa.org

IFIP

Ifip, the French Pork Institute, is the technical and scientific reference institute for the pork sector. It provides a point of contact for the national interprofessional pork federation (Inaporc) and the French federation of industrial pork butchers, caterers and meat processors (Fict), public authorities and professionals. It carries out research and development activities for the entire pork industry. It belongs to the network of farming institutes (ITA) and the network of food processing centers (ITAI). Among its various activities, linked to the RMT Actia Chlean topics, Ifip supports and trains professionals in optimizing their cleaning and disinfection procedures, with a constant concern for hygienic quality of surfaces in contact with food. For many years, Ifip has been involved in numerous research programs aimed at better characterizing the bacterial communities present on food processing surfaces and evaluating the impact of disinfectants on ecology and resistance to antimicrobials of these communities. The institute helps food processing companies of all sizes with their environmental monitoring including the surveillance of contaminants, especially bacterial pathogens, and assists them in resolution of occasional incidents of contamination.



Contact: bastien.fremaux@ifip.asso.fr - [Orcid](#)

IFV

French Institute of Vine and Wine (IFV) mission is to produce technical references for all players in the sector. It is administered by representatives of the wine industry and members of the board directors are appointed by the Ministry of Agriculture and Food. The IFV has the dual qualification of Agricultural Technology Institute and Food Technology Institute and is a member of the Carnot Plant2Pro Institute which aims to develop contractual research towards private actors in the plant sector. The mission of the IFV is in the general interest to conduct studies and carry out developments for the entire French wine industry, from the vine plant to the bottle. The priority areas of activity are: vine selection, varietal and nursery innovation, fight against vine decline, organic vines and wine, vineyard protection and reduction of inputs phytosanitary, agroenvironment and land management, competitiveness in the vineyard and in the cellar, transfer of results and the digital revolution.



Contact: pascal.poupault@vignevin.com

ACTIA NETWORK - INTERFACE PARTNER

CRITT AGROALIMENTAIRE SUD

The Critt Agroalimentaire Paca is a technical center created in 1989 by regional agri-food companies. Its aim is to help regional companies to perform in the long term at economic, social and environmental levels. The Critt's mission is to work alongside companies on a daily basis, in the field, to deploy its core business: technical support through innovation and technology transfer. The Critt contributes to the development of companies, whether it be in terms of processes, products or methods and organizations



Contact: sylvie.perret@critt-iaa-paca.com

PUBLIC SECTOR ORGANISATIONS

ANSES FOUGÈRES

Anses de Fougères Laboratory works in the fields of food safety area on veterinary drug residues (Department of residues and contaminants analyses directed by D. Hurtaud-Pessel), contaminants and biocides. It works on the efficacy of antimicrobials (antibiotics and disinfectants) used in veterinary medicine and food hygiene and the ability of bacteria to develop resistance to these products (Department of Antibiotics, Biocides Residues and Resistance, AB2R, managed by C. Soumet). It develops and validate physicochemical (LC/MS-MS) and biochemical methods for the screening of residues from food and biological matrices. It studies bacterial adaptation in the food environment and the contribution of biocides exposure in the development of cross resistance to antibiotics. Phenotypic techniques (Mic to biocides and antibiotics), molecular techniques (WGS, RT-qPCR) and meta-Omics are used.



Contacts : christophe.soumet@anses.fr - [Orcid](#)

[Dominique Hurtaud-Pessel, dominique.pessel@anses.fr](mailto:Dominique.Hurtaud-Pessel@anses.fr) - [Orcid](#)

arnaud.bridier@anses.fr - [Orcid](#)

valerie.gaudin@anses.fr - [Orcid](#)

ANSES BOULOGNE-SUR-MER

The Bacteriology and Parasitology of fishery and aquaculture products unit (B3PA - Boulogne-sur-mer site) of the Anses Food Safety Laboratory, devotes its reference and research activities to biological contaminants in fishery and aquaculture products and more specifically to two zoonotic pathogenic bacteria of interest to the sector: *Vibrio spp.* and *Listeria monocytogenes*, as well as to *Anisakidae*, parasitic nematodes. The main research topics of the B3PA unit are:

- the understanding of the distribution of these pathogens in this sector,
- their characterization by the identification of virulence and antibiotic resistance, and by the study of biofilm formation, and the viable but non culturable (VBNC) state,
- the study of the impact of external and internal factors on their behavior and pathogenicity,
- the antibiotic resistance in the microflora of the seafood products.



Contacts : graziella.midelet@anses.fr - [Orcid](#)

thomas.brauge@anses.fr - [Orcid](#)



EDUCATION & RESEARCH

BIODYMIA (ISARA, UNIVERSITY LYON 1)

Biodymia (Bioengineering and Microbial Dynamics at Food Interfaces) is an University Lyon 1 and Isara Lyon research unit. Its 20 people staff is committed to the development of innovative strategies for the preservation of perishable foods based on tailor-made packaging systems and/or biopreservation agents. Biopreservation agents considered are microorganisms such as bioprotective lactic acid bacteria as well as antimicrobial biomolecules (e. g. phenolic-rich plant extracts, bacteriocins, antimicrobial proteins or peptides...), which could advantageously replace some synthetic preservatives or biocides. In this context, control of microorganisms on the surface of foods and food-contact surfaces is particularly critical.



Contacts: nadia.oulahal@univ-lyon1.fr - [Orcid](#)

pascal.degraeve@univ-lyon1.fr - [Orcid](#)



ÉNIL BESANÇON-MAMIROLLE

The National School of Dairy Industry located in Besançon-Mamirolle is a training institution which depends on the Ministry of Agriculture and Food. It mainly provides level three type training, and participates in Higher Education (Bachelor's, Master's and Engineer's Degree), in three areas: dairy processing, water and effluent management, laboratory analyses. The training mission is complemented by Research and Development and vocational integration missions. The Énil is Erasmus+ accredited, promotes student international mobility and organizes exchanges with other European training institutions.



Contact: jean-louis.berner@educagri.fr



UMR MEDIS (INRAE, UNIVERSITY OF CLERMONT-AUVERGNE)

UMR 0454 Uca Inrae Medis (Microbiology, Digestive Environment and Health) research activities focus on the study of the interactions of food and digestive microbiota in humans and animals, with their environment. The Unit is organized around four thematic research axes «Zoonotic food pathogens», «Metabolic functions of the digestive microbiota and dysbiosis», «Innovation and development of in vitro models», and «Innovative galenics». Research work on bacterial adhesion and biofilm formation in foodborne pathogenic *Escherichia coli* and *Listeria monocytogenes* combines omics approaches (e.g. functional genomics, exoproteome, proteosurfaceome, proteovesiculoma) and functional and molecular genetics (e.g. deletion mutants, reporter genes, protein expression).



Contacts: michel.hebraud@inrae.fr - [Orcid](#)

Who is also the scientific head of the proteomic component of the metabolism exploration platform - PFEM

mickael.desvaux@inrae.fr - [Orcid](#)





UMR UMET (CENTRALE LILLE, CNRS, INRAE, UNIVERSITY OF LILLE)

Met-Pihm (Lille university - Inrae) activities concern:

- the characterisation of dairy fouling / microbial contamination (chemistry, morphology, adhesion, growth or deposition kinetics, development of in-situ sensors) on different surfaces (metal, polymers) functionalized or not,
- the evaluation of the cleanability and durability of these modified surfaces (cleaning kinetics, role of surface properties and equipment geometry, roles of cleaning and rinsing flows, modelling) and,
- the development of alternative cleaning methods that consume less water and energy, such as the use of biosurfactant-based flowing foams. All these research activities are carried out from a sustainable development point of view, and the environmental impacts of processes developed are systematically evaluated.

Contacts: anne-laure.fameau@inrae.fr (foam and biosurfactants) - [Orcid](#)
maude.jimenez@univ-lille.fr (surface alterations, surface engineering) - [Orcid](#)
thierry.benezech@inrae.fr (hygienic design, equipment cleaning, biofilms) - [Orcid](#)

UMR SAYFOOD (AGROPARISTECH, INRAE, UNIVERSITY OF PARIS-SACLAY)

The Comial team of the Sayfood Research Unit (AgroParisTech, Inrae) conducts its activities related to hygiene surface, particularly concerning the study of:

- the microorganism/surfaces interactions (bioadhesion and biofilms) by considering not only organic, mineral and microbial contaminants but also properties of the materials in contact (wettability, charge, topography...),
- physiological changes of microorganisms in connection with their adhesion to native or modified surfaces (biotic, abiotic, functionalized surfaces...).

It has developed and has been using for several years now a multidisciplinary approach integrating physical and physico-chemical analysis techniques of multi-scale surfaces (solid, liquid, biological and microbial surfaces), techniques for the detection and identification of contaminant microorganisms (cultural and molecular) as well advanced microscopy techniques.

Contact: morgan.guilbaud@agroparistech.fr - [Orcid](#)



UNIVERSITY OF RENNES 1 - IUT OF SAINT-BRIEUC

The work carried out in the laboratory of the Biological Engineering Department of the IUT of Saint-Brieuc-University of Rennes 1, mainly concerns surface hygiene and the fight against bacterial biofilms. They are based on two axes, one consisting in developing and studying functionalized antibacterial materials and the other in studying the physiological and genetic impacts of these treatments on adherent bacterial flora, with *Listeria monocytogenes* in particular as a model bacterium. This work is carried out in close collaboration with the Funmat team of the IETR UMR-CNRS 6164 located on the same site. New activities are currently being developed with the search for molecules of interest of marine origin. A project financed by European funds concerns the research and development of anti-biofilm molecules. The department benefits from extensive equipment in microbiology, molecular biology, physico-chemistry, biochemistry as well as a food technology hall.



Contact: christine.pissavin@univ-rennes1.fr - [Orcid](#)

