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Lyon-Grenoble
Auvergne-Rhône-Alpes
centre

INRAE

Presentation of the **Lyon-Grenoble-Auvergne-Rhône-Alpes centre**

August 2025

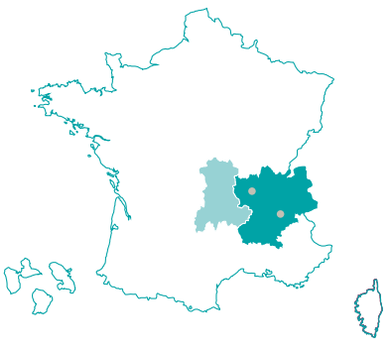
Pascal BOISTARD
President of the Lyon-Grenoble Auvergne-Rhône-Alpes centre

"Located in a rich and diverse region in terms of geographical (relief, climate), economic and human resources, the Lyon-Grenoble Auvergne-Rhône-Alpes centre is the latest INRAE centre to be created. Its units, located in the Lyon and Grenoble metropolitan areas and in the Haute-Savoie region, contribute to the research activities carried out at the University campuses of Lyon-Saint-Etienne, Grenoble Alpes and Savoie Mont Blanc."

THE LYON-GRENOBLE AUVERGNE-RHÔNE-ALPES RESEARCH CENTRE

INRAE features one of its largest operations in the Auvergne-Rhône-Alpes region, with some 1,400 staff in total in 41 separate units. It is composed of 2 research centres: the Clermont-Auvergne-Rhône-Alpes centre and the Lyon-Grenoble Auvergne-Rhône-Alpes centre.
Within the 22 research units – including 10 joint units of which INRAE is co-supervisor – a research support unit and 7 shared facilities (experimental halls, technical platforms), the 500 employees of the INRAE Lyon-Grenoble Auvergne-Rhône-Alpes centre are spread across a large part of the Rhône-Alpes area in 9 regional sites.
The centre's activities cover a wide range of fields: water and associated ecotechnologies; natural, health and environmental risks; territories and socio-ecosystems; the integrative biology of plants and their adaptation to their environment; human nutrition and its links with health. The centre's research units thus contribute to the work of 11 of the Institute's 14 scientific divisions.

The centre's International Partnerships are mainly structured around the Horizon Europe programme. As part of this, our centre is involved in 2 major projects:
- DRyVER: guaranteeing biodiversity, functional integrity and ecosystem services in drying river networks. This project brings together a multidisciplinary consortium of 25 experts from 11 European countries, 3 South American countries, China and the USA.
- MULTISOURCE: developing new tools to improve the natural treatment of water cycles in urban areas. This project involves some 20 European, Brazilian and Vietnamese partners around INRAE.



A DYNAMIC REGIONAL ENVIRONMENT

Research at the Lyon-Grenoble Auvergne-Rhône-Alpes centre benefits from a highly dynamic environment and economic fabric fostering the development of many partnerships. The centre has also developed major collaboration projects with many local authorities in the region. Thanks to its research, the centre supports public policies and offers cutting-edge expertise at all levels, based on top-level research, in fields involving key societal challenges such as the environment, risks, territories and food.

REGIONAL INTEGRATION

INRAE has two research centres in the Auvergne-Rhône-Alpes region: Clermont-Auvergne-Rhône-Alpes and Lyon-Grenoble Auvergne-Rhône-Alpes. These two centres contribute to a shared scientific plan divided into six multidisciplinary thematic areas. The research themes are part of 6 of the 8 areas of excellence identified by the Region in its Regional Plan for Higher Education, Research and Innovation (SRESRI). They contribute to strengthening INRAE's role in Auvergne-Rhône-Alpes in the fields of the environment and human nutrition.

Our main partners in the region

Our research priorities

1 WATER, WATERSHEDS, AQUATIC ECOLOGY AND ASSOCIATED ECOTECHNOLOGIES

2 NATURAL, HEALTH AND ENVIRONMENTAL RISKS

3 TERRITORIES AND SOCIO-ECOSYSTEMS: QUALIFICATIONS, TRAJECTORIES AND SUPPORT

4 INTEGRATIVE BIOLOGY OF MODEL AND CULTIVATED PLANTS AND ADAPTATION TO THEIR ENVIRONMENT

5 HUMAN NUTRITION, DIETARY COMPLEXITY AND HEALTH

6 AGROECOLOGY OF GRASSLAND FARMING SYSTEMS, PRODUCT QUALITY AND ANIMAL HEALTH

1


1

Aquatic systems are subject to multiple and changing constraints in a context of global change.

The sustainable management of these systems requires thorough knowledge of their ecological functioning and their relationship with their environment. Among other things, this involves studying the ecology and functioning of ecosystems in relation to their river basins, food webs and the biology of aquatic organisms, the risks and effects linked to these physical, chemical and biological constraints. It also involves close communication between researchers, water management bodies and citizens. The research conducted by the units involved in this field concerns rivers, lakes and the soil-water-atmosphere interfaces that modify incoming and outgoing material and energy flows, as well as ecotechnologies for the recovery and treatment of urban effluents. The main research themes are:
i) knowledge of the environmental forcing impacting aquatic environments, ii) knowledge of aquatic biodiversity, iii) knowledge of the effects and causal links between environmental forcing and the response of organisms and ecosystems, iv) long-term characterisation of evolution, v) ecotechnologies for the recovery and treatment of urban effluents.

Research units:
- Alpine Centre for Research on Lake Ecosystems and Aquatic Food Webs (CARRTEL) joint research unit
- Institute for Environmental Geosciences (IGE) joint research unit
- Laboratory for Ecology of Natural and Man-impacted Hydrosystems (LEHNA) joint contract research unit
- Plant and Cell Physiology Laboratory (LPCV) joint research unit
- Reduce, Reuse, Recover Wastewater Resources (REVERSAAL) research unit
- Functioning of hydrosystems (RiverLy) research unit

Joint scientific organisations:
- Rhone River Basin Study Area (ZABR)
- Alps Study Area (ZAA)
- OLA (Alpine Lakes Observatory)
- Biodiversity, Water, Environment, City and Health (BioEEnViS) research federation
- Observatory for Sciences of the Universe of Grenoble(OSUG) joint service unit (UMS)
- FREE-Alpes research federation
- Urban Hydrology Field Observatory (OTHU) federation
- Feyssine Hall (water treatment)
- Hydraulic and Hydromorphology Laboratory (HHLab)
- REFLET platform (vegetated systems for wastewater treatment)

Academic partners:
- CEA
- CNRS
- ENTPE
- Grenoble INP
- IRD
- Claude Bernard Lyon 1 University
- Grenoble Alpes University
- Savoie Mont Blanc University

2


2

Global change, in all its components (climate, urbanization, pollution, etc.), has led to new risk situations for societies as well as for water resources and ecosystems. At the same time, the strong societal demand to reduce risks has been amplified by the media coverage of disasters and crises.

Thus, the research aims to prevent and reduce these risks. The relevant issues include people, agricultural activities... ecosystems and, more broadly, the social, economic and environmental vulnerability of the territories. The scope covers health and environmental risks.

Research units:
- Alpine Centre for Research on Lake Ecosystems and Aquatic Food Webs (CARRTEL) joint research unit
- Institute for Environmental Geosciences (IGE) joint research unit
- Viral Infections and Comparative Pathology (IVPC) joint research unit
- Laboratory for Mountain Ecosystems and Societies (LESSEM) research unit
- Observatory for Sciences of the Universe of Grenoble (OSUG) joint service unit (UMS)
- Reduce, Reuse, Recover Wastewater Resources (REVERSAAL) research unit
- Functioning of hydrosystems (RiverLy) research unit
- Epidemiology of Animal and Zoonotic Diseases (EPIA) joint research unit

Joint scientific organisations:
- Alpine Lakes Observatory (OLA)
- Alps Study Area
- Rhone River Basin Study Area (ZABR)
- Biodiversity, Water, Environment, City and Health (BioEEnViS) research federation
- Feyssine Hall (water treatment)
- Hydraulic and Hydromorphology Laboratory (HHLab)
- Flow Structures and Risks Platform (study of avalanches, landslides, etc.)
- REFLET platform (wetland systems for wastewater treatment)

Academic partners:
- ANSES
- CEA
- CNRS
- ENS Lyon
- INSA Lyon
- Inria
- IRD
- Météo France
- Claude Bernard Lyon 1 University
- Grenoble Alpes University
- VetAgro Sup

3

This research stems from an awareness of the urgency of environmental issues, the impossibility of dissociating their ecological, economic and social dimensions but also, more generally, from the challenges of transition and adaptation to changes in ecosystems and societies in the territories.

Due to this growing complexity, the notion of socio-ecosystems emerged, as well as the need to take into account the challenges of maintaining, preserving and restoring ecosystems in a context of global change.
The aims of this theme are i) to understand ongoing transformations in socio-ecosystems, by studying their trajectories and the interactions between ecological and socio-economic dynamics with a multi-scale approach, ii) to identify levers and design methods that adapt to global changes in the territories, in order to support their stakeholders and guide public policies.

Research units:

- Laboratory for Mountain Ecosystems and Societies (LESSEM) research unit
- Rural Studies Laboratory (LER) joint contract research unit
- Observatory for Sciences of the Universe of Grenoble (OSUG) joint service unit (UMS)

Academic partners:

- CNRS
- Grenoble Alpes University
- IRD
- ISARA
- Météo France

4

The work of this research theme aims to develop a more sustainable agriculture.

In association with agronomic solutions, plant breeding can offer solutions by selecting varieties adapted to new constraints (yields, changes in eating habits, climate change, etc.). This requires in-depth fundamental knowledge which, when integrated at the crop system scale and associated with technological and methodological innovations (new agronomic practices, precision farming), will help to design innovative crop systems. The main research themes concern: i) the organization and functioning of plant genomes, ii) the development and architecture of different plant organs, iii) interactions between crop plants and their biotic environment, iv) crop plant adaptations to abiotic stresses, v) new market opportunities for plant products, vi) robotics and technologies for tomorrow's agriculture, vii) ecology, interactions and community dynamics, agro-ecology.

Research units:

- Agroecology and environment (AGE) joint contract research unit
- Functional Biology, Insects and Interactions (BF2i) joint research unit
- Characterization and Surveillance of Pesticide Resistance (CASPER) joint contract research unit
- Grenoble Applied Economics Laboratory (GAEL) joint research unit
- Microbial Ecology Laboratory (LEM) joint research unit
- Plant and Cell Physiology Laboratory (LPCV) joint research unit
- Plant Reproduction and Development (RDP) joint research unit

Academic partners:

- ANSES
- CEA
- CNRS
- ENS Lyon
- INSA Lyon
- Inria
- ISARA
- Claude Bernard Lyon 1 University
- Grenoble Alpes University
- VetAgro Sup

5

In recent decades, we have seen a significant increase in life expectancy in developed countries. However, the ageing of populations has been accompanied by a rise in more or less disabling pathologies that alter the quality of life and at an increasingly significant societal cost.

In this context, understanding the relationship between food and health is a major research focus of INRAE teams. The objective is to be able to propose nutritional strategies to prevent or minimize metabolic and/or age-related diseases, while taking into account the challenge of sustainable nutrition. The main research themes concern: i) food quality and nutritional optimization, ii) understanding the mechanisms of metabolic regulation through nutrition, iii) the relationships between the intestinal microbiota, diet and host health.

Research units:

- Cardiovascular diseases, Metabolism, Diabetology and Nutrition Laboratory (CarMeN) joint research unit
- Grenoble Applied Economics Laboratory (GAEL) joint research unit
- Institute of Functional Genomics of Lyon (IGFL) joint contract research unit

Academic partners:

- CNRS
- ENS
- Inserm
- Claude Bernard Lyon 1 University
- Grenoble Alpes University

6

Livestock farming activities are being increasingly questioned due to environmental, economic and social issues.

Understanding how livestock systems work and their components is a key element in understanding their capacity for adaptation and resilience and characterising the qualities of the products and services that result from them. This is particularly the case for grassland systems. The key challenges of this theme are: i) adapting resources (animal and plant) to the economic, social and environmental context of livestock farming; ii) the development of user-friendly technical innovations; iii) objectifying the links between grassland farming systems and the quality of the products that result from them; iv) the design and multi-criteria assessment of multifunctional, innovative and sustainable grass-based livestock farming systems, as well as territorialized streams.

Research units:

- Viral Infections and Comparative Pathology (IVPC) joint research unit
- Microbial Ecology Laboratory (LEM) joint research unit
- Wild Rodents, Health Risks and Population Management (RS2GP) joint contract research unit
- Epidemiology of Animal and Zoonotic Diseases (EPIA) joint research unit
- Stem Cell and Brain Research Institute (SBRI) joint contract research unit

Academic partners:

- CNRS
- Inserm
- Ecole pratique des Hautes Études (EPHE)
- Claude Bernard Lyon 1 University
- Grenoble Alpes University

For the latest news
and a research update
www.inrae.fr/en/centres/lyon-grenoble-auvergne-rhone-alpes

PARTNERSHIPS, TECHNOLOGY TRANSFER AND INNOVATION

The centre has built privileged links within the very rich local ecosystem in ESR[1], in particular through the creation of multiple framework agreements, as well as with local or regional economic partners such as the CNR[2]. Joint laboratories with SMEs and start-ups (Viewpoint, Scimabio) have also been set up. In addition, the centre's research teams have been working closely with the RMC Water Agency and the Metropolis of Lyon for many years and it is strongly involved in ZABR[3], which is co-chaired by an INRAE researcher. With the support of the SATTs[4] in Lyon (Pulsalys) and Grenoble (Linksium), INRAE aims to support more projects towards the economic world.

1. ESR: Higher Education and Research
2. CNR: Compagnie Nationale du Rhône
3. ZABR: Rhone Basin Study Area
4. SATT: Technology Transfer Accelerator

A few key projects illustrating our research themes and partnerships

Sentinel alpine areas - INRAE / Les Ecrins National Park

The "Alpine Sentinels" structuring project includes 5 long-term observation entities: Sentinel Alpine Pastures, Sentinel Lakes, Sentinel Refuges, Sentinel Flora and the ORCHAMP Observatory. This project by the LESSEM unit is led by the Alps Study Area, which brings together researchers and local land managers and aims to promote the good practices identified and raise awareness among managers, local authorities and citizens about the links between lifestyles and environmental dynamics.

Decentralised urban water management - INRAE + 20 European and non-European partners - MULTISOURCE project (European H2020 programme)

The aim of the MULTISOURCE project is to show the relevance of a range of nature-based solutions for urban water treatment. It also aims to develop innovative tools, methods and models to guide those involved in city-wide planning and those responsible for the long-term operation and maintenance of wastewater treatment and reuse systems. MULTISOURCE will provide new knowledge on nature-based solutions and their capacity to remove various contaminants and effectively reduce chemical and biological risks, as well as their ability to integrate into their environment and contribute to the improvement of urban habitats. MULTISOURCE will allow the use of such solutions to be increased and will promote local water reuse and minimise the discharge of untreated urban wastewater into the environment.

Research on emerging health risks INRAE/Lyon 1 University/EPHE

After COVID-19, the question of the emergence of the next health risk is already being raised. According to the OIE (World Organisation for Animal Health), 60% of infectious diseases in people are zoonotic, and 70% of these are transmitted by wildlife. These risks are increasing with globalisation, climate change and changes in human behaviour. In addition to setting up surveillance networks, it is necessary to develop upstream interdisciplinary work combining biology, ecology, epidemiology, modelling, economics and social science, to allow a better overall understanding of emerging diseases and provide tools to better deal with them. In this context, the work of researchers at the IVPC UMR has led to several important advances in recent years on certain viruses and emerging diseases that highlight the ability of viruses to manipulate their host.

The role of mechanical signals in plants - 2020 ERC Advanced Grant for the MUSIX project INRAE/ENS de Lyon/Claude Bernard University/Inria/CNRS

During their development phase, living organisms change form and therefore also their structure. The associated mechanical stresses affect cell behaviour and development. The MUSIX project proposes a multi-scale approach that takes into account the structure and molecular dynamics of the elements of the internal skeleton of the cell, including the integration of mechanical conflicts between neighbouring cells growing at different speeds. The aim is to understand how cells integrate these mechanical signals to create plant organs with a reproducible shape. The main technical advance of MUSIX is the introduction of a new high-throughput single cell system in which the cell wall is replaced by a synthetic framework of which the geometry, chemistry and mechanics can be controlled.

A nutrition labelling system adopted in France: INRAE / CNRS / Grenoble INP / UGA

Thanks to the results of the studies carried out by researchers at the GAEL UMR, the NutriScore nutrition labelling system was chosen as the official labelling system for food products in France.

VIEWTOX: the centre's 1st Associate Partnership Laboratory

INRAE employee opening a ToxMate

ViewTox, an Associated Partnership Laboratory (APL) created by the INRAE Lyon-Grenoble Auvergne-Rhône-Alpes centre and ViewPoint.

The preservation of water resources and aquatic biodiversity is a major societal concern, one of the priorities of which is to limit the discharge of toxic contaminants into the aquatic environment. In this context, legislation is increasingly including the self-monitoring of industrial and urban discharges. A partnership between Viewpoint, a company specialised in the development of video analysis devices for monitoring the behaviour of organisms, and the ecotoxicology laboratory of the RiverLy unit, led to the co-development of the ToxMate system for assessing water quality on site, online and in real time via video monitoring analysis of the locomotor behaviour of 3 species of aquatic invertebrates (crustaceans, snails and leeches).

The objectives of this LPA are to deepen knowledge on the behaviour of aquatic species for use in video monitoring, the development of new fields of application of methodology (industrial discharges) and understand the link between the nature of chemical contamination and the diversity of responses of animal species.

Project supported by the Auvergne-Rhône-Alpes Region.

INRAE: AN OVERVIEW

The French National Research Institute for Agriculture, Food, and Environment (INRAE) is a major player globally in research and innovation. Gathering a community of **12,000 people** with **274 units** including fundamental and experimental research, spread out throughout **18 regional centres** in France.

Internationally, **INRAE is among the top research organisations in agricultural and food sciences, plant and animal sciences, as well as in ecology and environmental science**. It is the world's leading research organisation specialising in **agriculture, food and the environment**.

Faced with a growing world population, climate change, the depletion of resources and declining biodiversity, the Institute has a major role to play in providing the knowledge base supporting the necessary acceleration of **agricultural, food and environmental transitions**, to address the **major global challenges**.

KEY FACTS & FIGURES LYON-GRENOBLE AUVERGNE-RHONE-ALPES CENTRE

The teams

23 research units and a research support unit including 10 joint research units with INRAE co-supervision

498 INRAE staff in 2022:

- **335** members of staff with tenure (49% and 51%)
- **163** contract workers: (49% and 51%)

Resources

€44,65 million budget of which **€10,7** million come from the units' own resources (contractual and non-contractual)

7 joint infractures

19,352 m² of built heritage

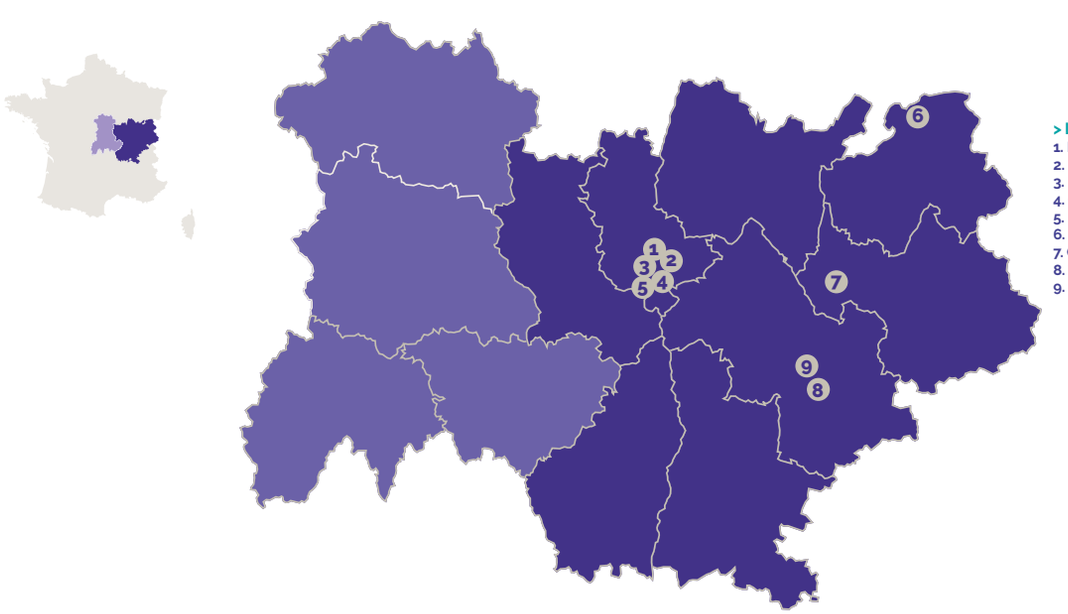
Results

Nearly **350** per year in peer-reviewed journals

Nearly **3,000** hours of teaching in 2022

300 contracts in 2022: **14** are linked to calls for projects from the National Research Agency and **2** are funded by the European Horizon Europe programme.

MAP OF THE THE LYON-GRENOBLE AUVERGNE-RHÔNE-ALPES CENTRE SITES



> List of locations
1. La Doua
2. Bron
3. Marcy-l'Étoile
4. Gerland
5. Lyon-Sud
6. Thonon-les-Bains
7. Chambéry
8. Saint-Martin-d'Hères
9. Grenoble Presqu'île scientifique

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