

CEA – PARIS-SACLAY CENTER FONTENAY-AUX-ROSES SITE

The Fontenay-aux-Roses site of the CEA (Alternative Energies and Atomic Energy Commission) was created in 1946 for the development of nuclear sciences in France. It is now part of the CEA Paris-Saclay Center. The former nuclear facilities are being decommissioned and replaced by world-leading high-technology platforms for life and health sciences.

TEAMS AT THE FONTENAY-AUX-ROSES SITE

- ▶ The **François Jacob Institute of Biology (IBFJ)**;
- ▶ Several **start-ups**: Theranexus, Acubens, Axenis, Brainvectis;
- ▶ **Industrial teams** working closely with research units: Oncodesign, Servier, LFB (laboratory for plasma fractionation and biotech);
- ▶ Teams from the **Nuclear Energy Division (DEN)** in charge of **nuclear decommissioning** (decontamination, dismantlement, etc.);
- ▶ The **Nuclear Safety and Protection Division (DSSN)**; The **General and Nuclear Inspection Division** of the CEA;
- ▶ The **CEA archives**;
- ▶ Several **support teams** (security, technical infrastructures, general management).

François Jacob Institute of Biology

As part of the Fundamental Research Division (DRF) of the CEA and across its departments and services, the François Jacob Institute of Biology (IBFJ) employs cutting-edge technologies to ensure its primary missions of studying the effects of radiation and toxins on living organisms, developing innovative therapies for infectious, neurodegenerative and genetic diseases, and exploring human and environmental genomes.

Developing new approaches to emerging diseases

IDMIT (Infectious Disease Models and Innovative Therapies) is a national infrastructure dedicated to the study of infectious diseases. The IDMIT teams study pathophysiology and organism-pathogen



Aerial view of the CEA/Fontenay-aux-Roses site.

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10
hectares

1 200
employees (including associated sites)

Associated sites:

Évry: Génoscope and the National Center of Human Genomics Research;

Paris: Immuno-Hematology Research Department (SRHI) at the Saint-Louis Hospital;

Caen: Research Laboratory and Open Facility for Radiation Biology with Accelerated Ions.

interactions in such settings as HIV infection, chikungunya, influenza, tuberculosis, etc.

They also carry out preclinical research and develop novel preventative, vaccinal and therapeutic approaches for infectious diseases.

Studying the effects of radiation and toxins on living organisms

The teams at IRCM (Research Institute for Cellular and Molecular Radiobiology) study cellular responses to ionizing radiation and certain toxic entities (nanoparticles, endocrine disruptors, etc.). They focus particularly on stem cell response to radiation exposure, the mechanisms of damage transmission and the resulting long-term consequences. Their work contributes to cancer research and the improvement of radiation therapy and protection protocols.



Adjusting a flow cytometer CEA-IRCM.

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From left to right: Preclinical research involving a 7-Tesla MRI of the brain, MIRCen/CEA/Inserm; immunological study in a high-security microbiology lab, CEA/IDMIT; preclinical research using a PET scan, MIRCen/CEA/Inserm. © P. Stroppa / CEA - C. Dupont / CEA

Conceiving innovative therapies

The Molecular Imaging Research Center (MIRCen) and the Department of Innovative Therapies (STI) conceive new genetic and cellular therapies for hereditary blood diseases (beta thalassemia, sickle-cell anemia) and neurodegenerative disorders (Alzheimer's, Parkinson's and Huntington's diseases, etc). Their teams participate in the preclinical and clinical validation of new therapies, deploying a translational research approach to get laboratory innovations to the patient's bedside as fast as possible. MIRCen furthermore coordinates NeurATRIS, a national infrastructure for translational research in neurosciences.

The mission of the Department of Prion Disorders and Related Infectious Agents (SEPIA) is to develop and evaluate research strategies in response to public health issues raised by prions and prion-like or atypical pathogens.

The Immuno-Hematology Research Department (SRHI) studies mechanisms of immunological tolerance in the setting of tissue grafts and of immunological escape in the setting of tumors.

Exploring biodiversity and interpreting genomes

The teams within the French National Research Center for Human Genomics (CNRGH) deploy their genome analysis expertise and sequencing capacities to interpret the human genome, understand pathologies and forward the development of diagnostics and therapies. With similar know-how and technologies, researchers at Genoscope have turned their attention to the exploration of biodiversity. They also analyze genomes with the goal of bringing energy-frugal biological processes (biocatalysis, synthetic biology, etc.) to industry. The IBFJ also coordinates France Génomique, a national infrastructure to ease access to France's genomics and bioinformatics capacities for research.

AN ENVIRONMENT FOR EXCELLENCE

Research at Fontenay-aux-Roses is carried out collaboratively with national and international academic institutions, notably within the framework of the **Paris-Saclay University**. Most teams are "mixed research units" counting members from not only the CEA but also such institutions as Inserm, the CNRS, Institut Pasteur, or various universities to name a few. IBFJ is located within a veritable environment for excellence, the **Bièvre Scientific Valley**, in the company of several South Ile-de-France medical centers (public hospitals, the Gustave Roussy Institute, etc.). It is also affiliated with **Medicen Paris Region**, a competitiveness cluster for innovative health technologies and novel therapies.

Decommissioning nuclear facilities

The CEA's Fontenay-aux-Roses site was home to France's first nuclear reactor (Zoé) and its first laboratories for research on nuclear fission and fusion, nuclear fuels, and the treatment and conditioning of spent fuel and other nuclear waste. The nuclear decommissioning of the site is underway and scheduled for completion by 2034.

Preparing a shielded line for evacuation. A shielded line comprises several "hot cells", i.e., workstations at which radioactive substances can be safely handled using telemanipulators.

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