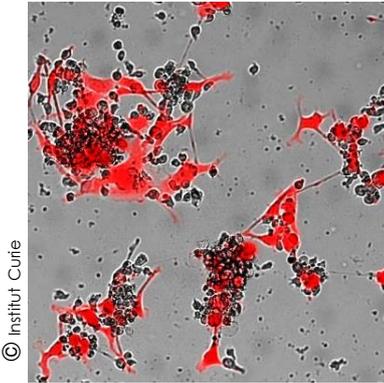


CellAction kicks off at Institut Curie: a unique platform in France to accelerate innovation and provide access to cell and gene therapies



Cell and gene therapies, most notably CAR-T (chimeric antigen receptor) cells, are becoming increasingly important in cancer treatment. They are central to CellAction (Cell therapy Acceleration and Innovation), the brand-new Paris-Saclay Cancer Cluster (PSCC) platform at Institut Curie. CellAction's medical-scientific expertise and exceptional facilities make it a uniquely integrated structure in France. Thanks to public-private collaborations, projects can be launched to accelerate the development of innovative anti-cancer drugs, from basic research to their transfer to the clinic and to patients.

Many cancers remain difficult to treat, and the development of innovative, personalized and sustainable oncology therapies is a major challenge for researchers and physicians alike.

Cell and gene therapies - including CAR-T cells - are highly promising new forms of immunotherapy that have gained ground over the last 10 years. While they are already part of the therapeutic arsenal against certain hematological cancers, the international scientific and medical community is in full swing to explore and **design optimized, more effective cell and gene therapy strategies that are less complex to manufacture, for a wider range of indications, including solid tumors**. This is the driving force behind the creation and today's opening of CellAction, the PSCC's cell therapy platform at Institut Curie.

Unprecedented in France, the PSCC cell and gene therapy platform opening at Institut Curie is a high-performance, integrated structure that brings together highly qualified scientific, clinical and technical expertise and cutting-edge equipment in a single location.

"This innovation-friendly environment has everything we need to develop, transform and transfer our most fundamental discoveries into increasingly effective cell-based therapies", enthuses Prof. Alain Puisieux, Director of Institut Curie's Research Center. "Future developments around the combination of immuno-epigenetics and CAR-T cells are the result of interdisciplinary thinking between researchers who soon realized the benefits for patients. This is a concrete illustration of the Curie model we advocate, from basic research to the patient's bedside".

"Developing innovative therapies for difficult-to-treat cancers is a major objective. Having demonstrated their efficacy in hematological cancers, we hope that future cell-based therapies will also be effective in solid tumors", adds Prof. Steven Le Gouill, Director of Institut Curie's Hospital Group.

CellAction teams will be working on the most innovative projects involving **all forms of cell and gene therapy: autologous, allogeneic and even in vivo delivery**.

Autologous CAR-T therapies (the only drugs marketed to date) involve harvesting and modifying certain cells of the patient's immune system (T lymphocytes). Once reinjected into patients, the modified T lymphocytes or "CAR-T cells", are capable of recognizing and destroying cancer cells.

Other forms of cell and gene therapy are being studied, such as allogeneic CAR-T, in which the CAR-T cells are no longer derived from the patients themselves, but from healthy donors. This should simplify and speed up access to these therapies.

Even further upstream, and a forerunner among the strategies under development, is "in vivo delivery", a totally innovative approach aimed at genetically modifying a patient's own T lymphocytes directly in vivo.

CellAction, a unique platform for developing innovative drugs

The facility boasts a wealth of expertise to support and monitor all types of project: target discovery and validation, cell engineering, *in vitro* and *in vivo* proof-of-concept, pre-clinical research... right through to a ready-to-manufacture product.

"Our ambition at CellAction is to develop innovative cell and gene therapy drugs with the best possible understanding of their mechanism of action. To achieve this, we have access to cutting-edge, high-performance equipment that will enable us to carry out highly complex projects and test the efficacy of our CAR-T cells and other cell therapies in our various models", explains **Dr. Marion Alcantara, hematologist, researcher at Institut Curie and medical director of CellAction.** *"CellAction's unique structure, based on the centralization of key expertise to go from research to transfer, will enable process development to be integrated directly into research projects, which is crucial for speeding up patient access to our drugs".*

CellAction's ambition is to create a dynamic of fruitful collaborations with industrial partners (start-ups, pharmaceutical companies), in particular with the Paris-Saclay Cancer Cluster, whose mission is to accelerate the development of innovative industrial projects. The aim is to jointly design ambitious programs to develop tomorrow's cell and gene therapies, thereby contributing to the development of French cancer research.

CellAction in brief and in figures

- > An **integrated structure** now based in Suresnes, to be permanently relocated to Institut Curie's Saint-Cloud site in 2025.
- > **600 square meters over time**
- > **Today:** 19 employees and **38 employees by 2030**
- > Financing: **13.7 million euros in total** (11.7 million euros from PSCC and 2 million euros from Institut Curie thanks to public generosity)
- > **Nearly 6 million euros worth of cutting-edge, high-performance equipment, unique in France**
- > Available on the platform: high-performance mass spectrometer, latest-generation spectral cytometry equipment, equipment for single-cell analysis, semi-automated closed system that manufactures modified cells (CliniMacs® Prodigy [Miltenyi]) combined with an electroporator (Miltenyi)...
- > 1 piece of equipment* unique in France: a cutting-edge instrument that measures avidity between immune cells and their targets (Z-Movi (Lumicks®))

New impetus for innovative clinical trials

CellAction is part of the 'Tumor microenvironment, immunology and cellular therapies' program of the Curie 2030 scientific project, as well as the EpCART¹ university hospital research project (RHU).

Thanks to the opening of the platform, Institut Curie's EpCART project will reach a new milestone: an early-phase clinical trial in selected poor-prognosis solid cancers is scheduled to start in 2026.

Combining immuno-epigenetics with CAR-T therapies, EpCART is the result of work by Dr. Sebastian Amigorena, CNRS research director and team leader in the Immunity and Cancer Unit (Institut Curie, Inserm), in collaboration with several Institut Curie research teams². Researchers

¹ Obtained in 2021, this Hospital-University Health Research (RHU) program [EpCART receives €10 million in funding over 5 years under the France 2030 Investissements d'Avenir Program](#). It is being carried out in partnership with Mnemo Therapeutics and AP-HP's MEARY cell and gene therapy center.

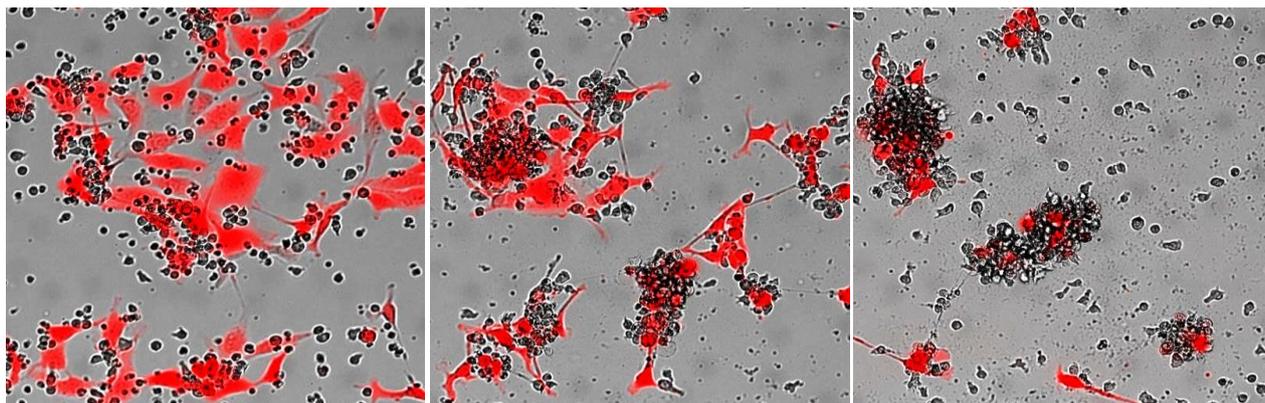
² notably Dr. Geneviève Almouzni's team, CNRS research director of exceptional rank, head of the Chromatin Dynamics team (CNRS/Institut Curie Nuclear Dynamics unit).

have recently shown³ that by inhibiting an enzyme responsible for certain epigenetic modifications, it is possible to render CAR-T cells capable of killing with more persistence, conferring a real benefit to this inhibition. **This epigenetic "reprogramming" of CAR-T cells enables long-lasting tumor control and prevents relapse, a unique approach in the fight against difficult-to-treat tumors.**

"It took over ten years to develop this revolutionary strategy, and before those years of basic research to understand how the immune system and epigenetics work, two flagship areas of research at Institut Curie," says Dr. Sebastian Amigorena, coordinator of RHU EpCART and scientific director of CellAction. "Today, we are delighted with the opening of CellAction and its environment of excellence, which will enable us to successfully complete our clinical trial by 2026, in close collaboration with the medical teams and our partners."

Another Institut Curie project is underway, in collaboration with Mnemo therapeutics: **work will evaluate this same immuno-epigenetic strategy that improves CAR-T cells function, not in solid tumors but in primary brain lymphoma, a rare hematological cancer that develops in the central nervous system.** A clinical trial is due to start in late 2025.

Other projects are also under evaluation, including a clinical trial of CAR-T cells in T-cell lymphomas (in collaboration with MedisSix Therapeutics), research projects on allogeneic CAR-T cells and in vivo delivery work.



CAR-T cells (black) kill tumor cells (red) over time. © Institut Curie

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³ Read the latest news on curie.fr in French : [Mise en évidence d'une enzyme clé pour des immunothérapies plus efficaces et durables](#)

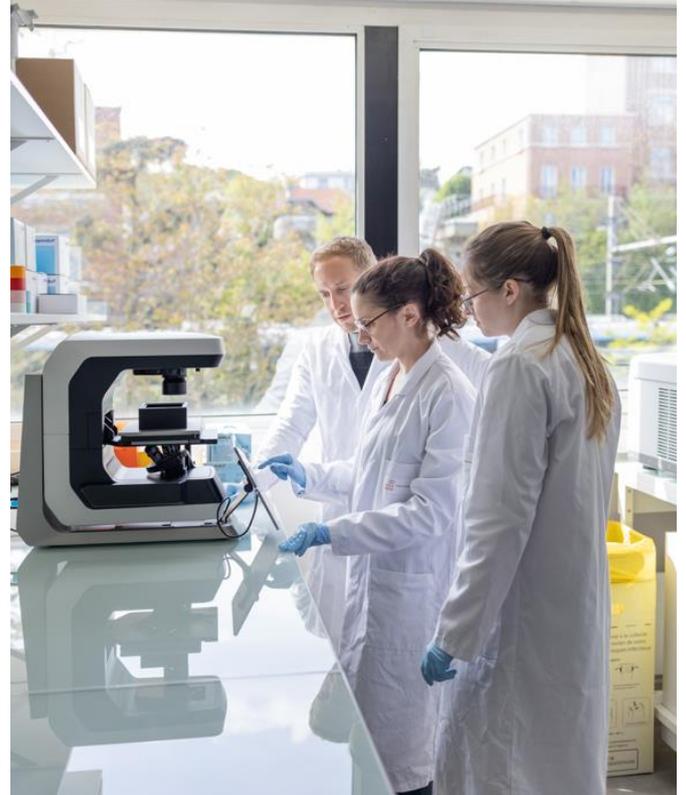
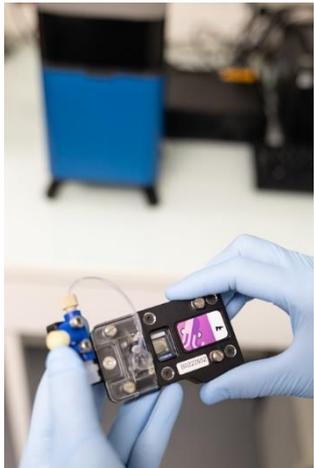


Photo top 2nd left: Portrait of Dr Marion Alcantara. © Institut Curie / VOISIN Thibaut. Top right: the latest-generation MACS Quant flow cytometer. © Institut Curie / LANG Thomas

The CellAction platform features the Z-Movi® (photos opposite and above): a patented microfluidic device unique in France, which subjects cells (target and effector) to an acoustic wave. The wave separates the cells more or less rapidly, depending on cell avidity (i.e. the forces and interactions between cells), providing precise information on cell-cell interactions. Above right: the CliniMACS Prodigy®: an instrument for "manufacturing" CAR-T cells, shown here in conjunction with an electroporator. © Institut Curie / LANG Thomas



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About Institut Curie

Institut Curie, France's leading cancer center, combines an internationally-renowned research center with a cutting-edge hospital group, which treats all types of cancer, including the rarest. Founded in 1909 by Marie Curie, Institut Curie has 3 sites (Paris, Saint-Cloud and Orsay) with over 3,700 researchers, physicians and health professionals working on its 3 missions: treatment, research and teaching. A private foundation with public utility status, Institut Curie is authorized to accept donations and bequests, and thanks to the support of its donors, is able to accelerate discoveries and improve patient treatment and quality of life. For more information: curie.fr, [Twitter](#), [Facebook](#), [LinkedIn](#), [Instagram](#)

About the PSCC

Founded by Gustave-Roussy, Sanofi, Inserm, Institut Polytechnique de Paris and Université Paris-Saclay, the Paris Saclay Cancer Cluster is the first winner of France 2030's "Biocluster" call for expressions of interest. The PSCC is backed by start-ups, biotechs and pharmaceutical groups, and has already been joined by UNICANCER, Institut Curie, AP-HP and Medicen. PSCC's ambition is to accelerate innovation in oncology and the development of new cancer treatments, medical devices and diagnostics in France. The Biocluster's mission is to support innovative projects at different levels of maturity by facilitating access to the resources they need (expertise, platforms, services, etc.) and by orchestrating strong interactions between all the players involved in innovation - researchers, experts, patient associations, healthcare professionals, start-ups, industrialists, investors, etc. - within a dynamic, high-potential ecosystem anchored in Villejuif. International in scope, the PSCC aims to position France among the world leaders in transforming science into value for patients and society as a whole.

<https://www.parissaclaycancercluster.org>



Since 2011, **Institut Curie has been certified "Carnot Curie Cancer"**. The Carnot certification is a recognition of excellence awarded to academic research organizations whose quality and involvement in partnership-based research have been demonstrated. Curie Cancer offers industrial partners the opportunity to implement research collaborations utilizing

the expertise of Institut Curie's research teams to develop innovative therapeutic solutions for cancer, from therapeutic target to clinical approval. Curie Cancer is a member of the Carnot FINDMED network, a group of thirteen Carnot institutes, to facilitate access to their technological platforms and to their innovations for very small and medium-sized companies in the pharmaceutical industry. Find out more:

<http://www.instituts-carnot.eu/fr/institut-carnot/curie-cancer> - <https://findmed.fr>