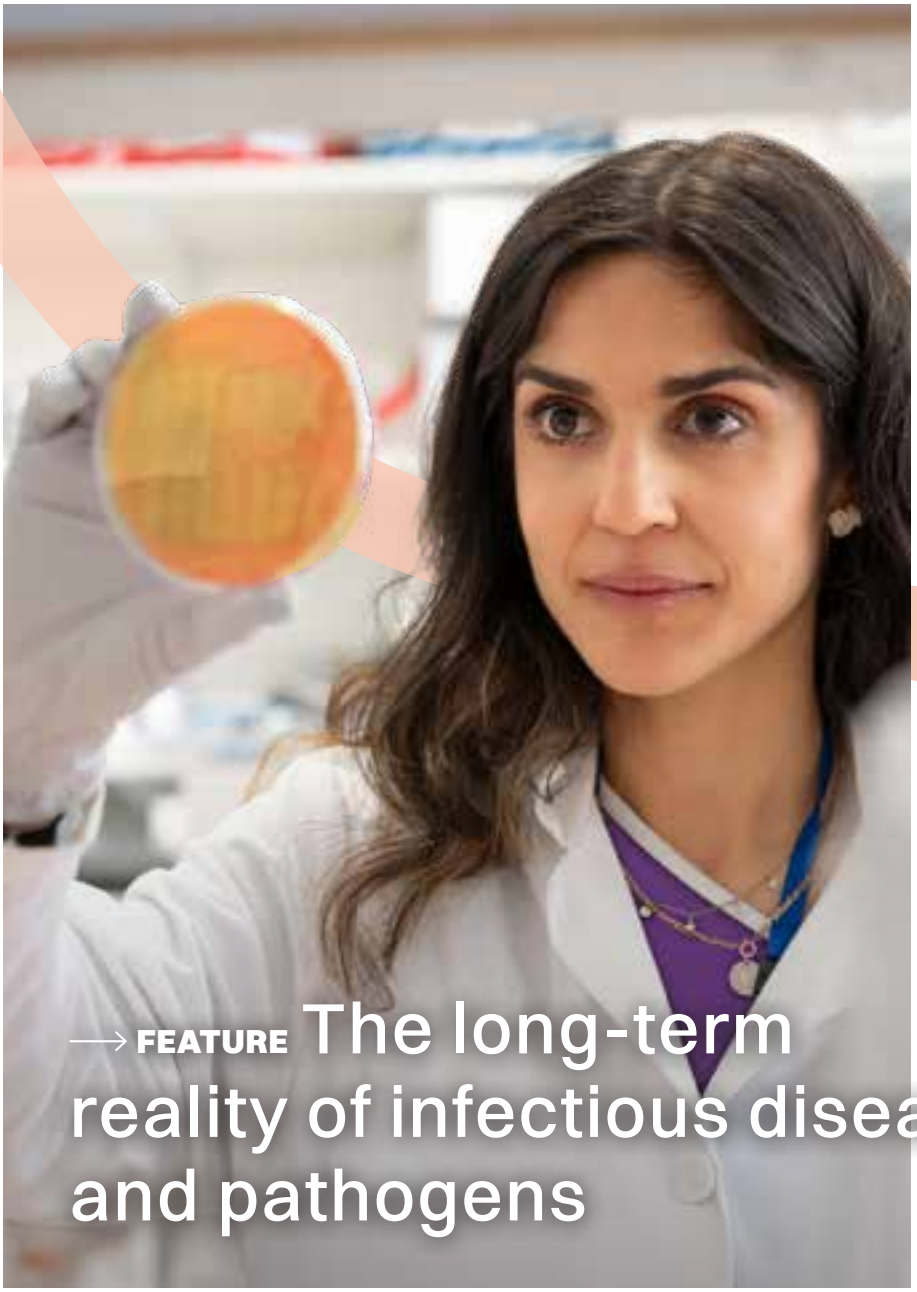
INSTITUT Pasteur

ANNUAL REPORT 2025



→ **FEATURE** The long-term reality of infectious diseases and pathogens

FEATURE

Cover photos

Feature "When dealing with infectious disease threats, a long-term view can be helpful"

Left: Joana Maria De Abreu Carvalho Pereira is a postdoctoral fellow in the Chromatin and Infection research unit. One of the laboratory's aims is to determine the role of chromatin modifications induced by bacteria-host interactions and their long-term consequences

Right: Mosaic clones of neural stem cells

The Institut Pasteur by the numbers

€402.5
million in revenue in 2025, as reported in the Institut Pasteur's financial statements. These statements, featured in the financial report, concern the Institut Pasteur in Paris, Institut Pasteur de la Guadeloupe, Institut Pasteur de la Guyane and Institut Pasteur de Nouvelle-Calédonie

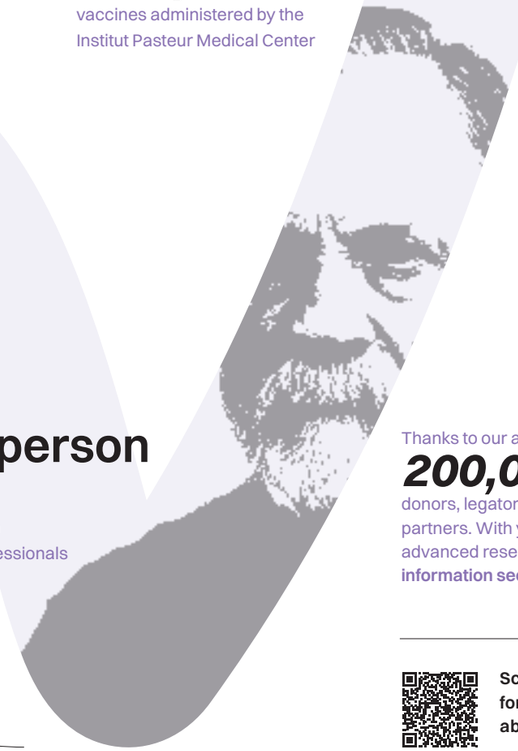
68
invention disclosures

93
nationalities

64,451
vaccines administered by the Institut Pasteur Medical Center

3,213
staff members

over **40** in-person classes
attended by more than 900 students and professionals from 85 countries



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Scan the QR code for more information about our institute

Continuing to rise to scientific challenges in an uncertain world

YVES SAINT-GEOURS
CHAIRMAN OF THE BOARD OF GOVERNORS

YASMINE BELKAID
PRESIDENT

At a time of global instability punctuated by attacks on academic freedom and scientific truth, the Institut Pasteur remains true to its values and committed to serving knowledge and human health. Yves Saint-Geours, Chairman of the Board of Governors, and Professor Yasmine Belkaid, President, look back at the scientific achievements of 2025, changes in governance and the ambitions of the Pasteur 2030 Strategic Plan.

In 2025, the Institut Pasteur continued to demonstrate extraordinary scientific dynamism. What were some of the most striking achievements?

Y. B.: Yes, the vitality of our research is quite remarkable. Our discoveries about bacterial immunity are opening up multiple therapeutic prospects; we have revealed a novel immunotherapy strategy to treat blood cancer, identified promising avenues to improve the efficacy of antibiotics, elucidated the mechanisms underlying postpartum breast cancer, and demonstrated the harmful effects of certain food additives on the gut microbiota. The Institut Pasteur's scientists published a total of more than 1,100 scientific papers in 2025.
We were also awarded new Chairs of Excellence and doubled our European funding. I am excited about our ability to explore new frontiers of knowledge, especially the application of artificial intelligence (AI) to biology, an area where we are among the top institutes worldwide. Our scientists are already using AI to better anticipate future pandemics, predict phage efficacy and cell fate, and analyze complex images in record time, and we are actively working on developing these applications over the coming years.

"In the current context, the role of our institute is more important than ever. We will continue to do our utmost to protect and promote science, both in France and worldwide"

YASMINE BELKAID

Y. S.-G.: Every day I have the privilege of witnessing the extraordinary vibrancy of young minds through new recruitments [see for example the section on the five-year group on p. 9]. Discoveries rooted in scientific excellence make the Institut Pasteur an attractive place to work, providing a solid foundation for our future. In 2025, our call for applications to establish new five-year research groups elicited more than 200 high-caliber applications from all over the world. The Institut Pasteur's vitality and reputation are its strongest assets.

There were changes in governance this year with the arrival of Alban Hautier and Jean-Michel Molina. How do these appointments support the Institut Pasteur's ambitions?

Y. B.: The arrival of Alban Hautier as Senior Executive Vice-President, Professor Jean-Michel Molina as Medical Director and Antoine Lekieffre as Vice-President Legal Affairs has considerably strengthened our management team. They have already begun to make a positive impact among their teams and the wider Institut Pasteur community. Alban Hautier, a highly respected senior civil servant, is already drawing on his considerable experience and skill to help modernize and better protect the Institut Pasteur. Jean-Michel Molina is an internationally recognized clinician and scientist, especially in the field of HIV. His experience will be invaluable in forging closer links with the Paris Public Hospital Network (AP-HP) and the medical community, guiding clinical research and public health activities, strengthening vaccine development and improving pandemic preparedness.

Y. S.-G.: With his experience in the General Inspectorate of Finance and his previous role in determining the French higher education and research budget, Alban Hautier has extensive expertise in administrative and budget management and a thorough knowledge of the French research ecosystem. He knows the Institut Pasteur well, having previously sat on the Board of Governors. He will play an essential part in modernizing our business model. We now have a tight-knit team with a complementary set of skills to drive through essential changes.

You mentioned the business model. What is the state of the Institut Pasteur's finances today, and what are you doing to guarantee long-term stability?

Y. S.-G.: In light of our operating deficit, we have embarked on a thorough analysis of our business model to identify structural solutions. This will mean imposing stringent controls on spending, reorienting some strategic projects and actively seeking new sources of funding. We are conducting this review in conjunction with the President, the Board of Governors, members of the Institut Pasteur General Meeting Board and scientists, in full transparency and dialog with all staff at the Institut Pasteur. We are on the right path – our research remains as outstanding as ever, we have a remarkable success rate in international calls for tenders, and public donations – our main source of income – have even increased.

• • •

"We have embarked on a thorough analysis of our business model to identify structural solutions."

YVES SAINT-GEOURS

Y. B.: In an increasingly deregulated world, with science under growing threat, we have a collective duty to protect our institute, as our independence and our ability to invest in the future of science are by no means guaranteed. This requires us to bring spending under control, with clear priorities and efforts that have already begun. In terms of revenue, the initial signs are positive, especially income from philanthropy, which increased by 10% in 2025 following a concerted communication campaign. The priority for the new Director of Innovation, currently under recruitment, will be to boost revenue from industrial partnerships over the coming years.

"In 2025, the Institut Pasteur was more present than ever on the public stage. Our scientists made multiple media appearances, and society looked to us to defend science."

YASMINE BELKAID

Science has come under direct attack in recent months. What position is the Institut Pasteur taking on disinformation and censorship of certain research topics?

Y. S.-G.: You are right to say that science is facing an unprecedented assault. Yet paradoxically, this situation is actually giving us a greater realization of the Institut Pasteur's vocation and the importance of our work. We want to pursue research that benefits human health, as an institution open to society. As we wage this battle for science, we need to uphold these values. This is not a moment for scientists to withdraw into isolation; rather it gives a new focus to our work and a new legitimacy to the Institut Pasteur.

Y. B.: The first thing to say is how concerned we are, as both scientists and citizens, at the brutal attacks currently being leveled against science in the United States. In 2025, our scientists made more media appearances than in any previous year, and society looked to us to defend science. We were invited to share our views at the Aix-en-Provence Economic Forum and the "Rendez-vous de l'histoire" in Blois, and even at a government seminar. Our scientific priorities, especially our focus on the links between climate and health, vaccine development and women's health, are taking on new meaning as we are seeing them come under threat in other countries. In a world that seems to be closing in on itself, we are committed to pursuing our collaboration with European and international partners like EMBL, with Pasteur Network member institutes, and as a member of leading consortia like DURABLE and AFROSCREEN.

What lies ahead in 2026 and in connection with the Pasteur 2030 Strategic Plan?

Y. B.: 2025 was the first year of implementation of our Strategic Plan. We are already seeing the effects, with the development of cross-cutting projects that will position the Institut Pasteur at the forefront of major scientific frontiers like artificial intelligence and microbiome research. Talented young scientists are joining us to work on key topics. The multiple research contracts and awards secured in 2025, our strong relationships with our partners, the trust that the public and our donors place in us, and of course the unwavering commitment of our scientific teams are all reasons to look to the next decade with confidence.

Y. S.-G.: I have absolute confidence. Our mission is a noble one: to serve humanity and knowledge. Although we may experience turmoil, we can have peace of mind as we persevere in our efforts, trusting in our values and the power of our community.

"Our mission is a noble one: to serve humanity and knowledge"

YVES SAINT-GEOURS

The Institut Pasteur's science by the numbers

1,132
papers published
This figure includes papers published by the Institut Pasteur in Paris, Guadeloupe, French Guiana and New Caledonia.
Source: Web of Science (articles, reviews and letters excluding preprints)

19 laboratories involved in National Reference Centers (CNRs), 13 coordinating and 6 associated laboratories, for the period 2023-2027

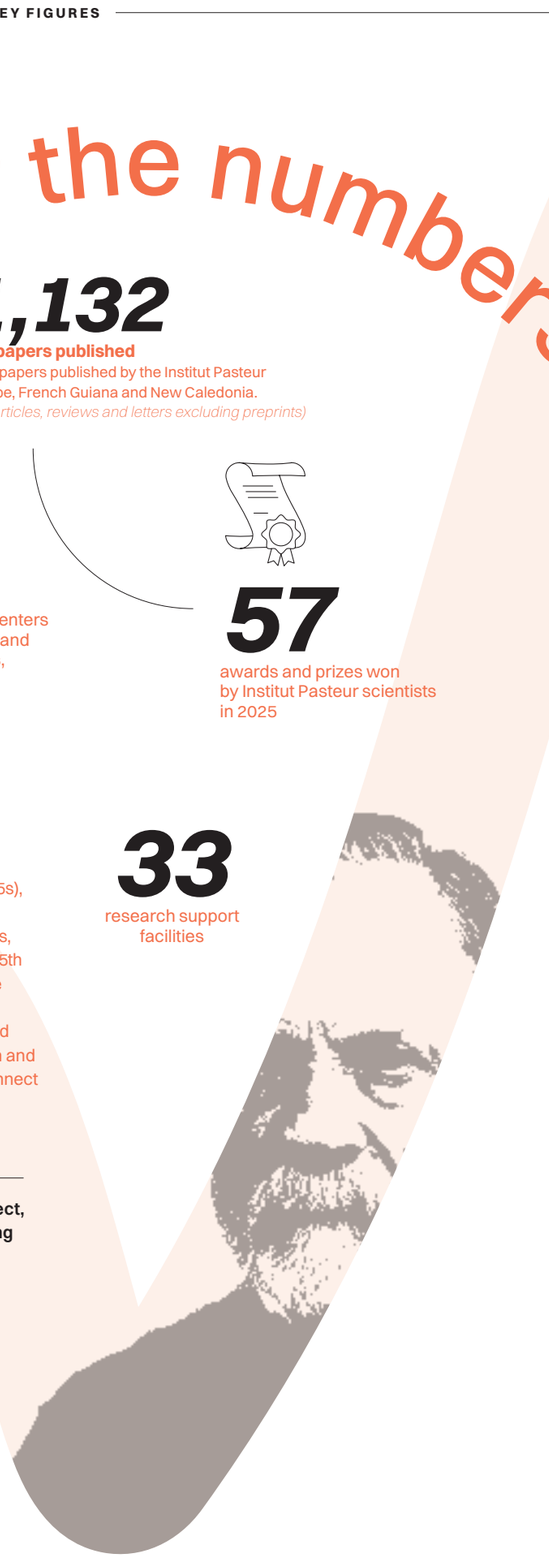
57
awards and prizes won by Institut Pasteur scientists in 2025

143
research entities (as at 01/01/2026), including 106 research units, 12 five-year units (U5s), 13 five-year groups (G5s) and 12 laboratories. The teams are divided between our two campuses, the Institut Pasteur – rue du Docteur Roux (Paris' 15th arrondissement) and the Hearing Institute – rue de Charenton (Paris' 12th arrondissement), a joint Institut Pasteur/Inserm/CNRS center established with the support of the Fondation Pour l'Audition and Paris City Council, and hosting the Institut reConnect

+ 7 teams working off campus at partner institutions (Imagine Institute, CIRI, IBENS, etc.)

Learn about the Institut reConnect, a center of excellence for hearing and speech disorders

33
research support facilities



3 new research entities established by the Institut Pasteur in 2025

Appointments and awards in 2025

APPOINTMENTS

Election to learned societies or academies (membership)

- French Academy of Sciences: **Yasmine Belkaid**
- Academia Europaea: **Simon Cauchemez** **Benoît Chassaing** **Christophe D'Enfert** **Aziz El-Amraoui** **Mélanie Hamon**
- EMBO: **Mart Krupovic**
- Royal Society: **Yasmine Belkaid**
- Académie royale de Belgique: **Frédéric Barras**
- Université de Liège (honorary doctorate): **Yasmine Belkaid**

Honors from the Grande Chancellerie

- Chevalier of the National Order of Merit: **Fernando Arenzana** **Aude Bernheim** **Sylvain Brisse** **Patrick Trieu-Cuot**

PRIZES AWARDED IN 2025 IN FRANCE

- CNRS Silver Medal: **Anne-Lise Giraud-Mamessier**
- CNRS Bronze Medal: **Nicola Festuccia**
- Jean Valade Prize (FRM): **Thomas Bourgeron**
- "Ruban Rose Avenir" Award: **Han Li**
- French National Academy of Medicine Award: **Yasmine Belkaid**
- Lamonica Grand Prize for Neurology (French Academy of Sciences): **Pierre-Jean Corringer**
- Charles-Louis de Saulses de Freycinet Prize (French Academy of Sciences): **Hervé Bourhy**
- Louis Pasteur Medal (French Academy of Sciences): **Eduardo Rocha**
- Molecular and Cellular Biology, Genomics Medal: **Romain Levayer**
- Béatrice Denys Foundation Prize: **Brice Bathellier**
- Paris Region Innovators Award: **Brice Bathellier**
- 2025 Top Inventors List: **Jean-Baptiste Masson**
- Distinguished Article Award at the International Society for Biomolecular Archaeology convention: **Maria Lopopolo**
- Dominique Dormont PhD Thesis Prize from ANRS-MIE and the French Society of Virology: **Maël Gourves**
- Jacques Monod Prize – Fondation de France: **Adrià Sogues**
- L'Oréal Young Talent Award
  - PhD Catégory: **Léah Friedman** (T. Gregor's lab) **Eulalie Liorzou** (C. Berthelot's lab) **Marie Robert** (D. Duffy's lab)) **Yolène Duchaude** (IP Guadeloupe)
  - Postdoc category: **Marion Guerin** (C. Grandjean's lab – acting) **Sabrina Mechaussier** (N. Michalski's lab)
- Chancellerie des Universités de Paris Prize: **Antonin Verdier** (B. Bathellier's lab) **Nell Saunders** (O. Schwartz's lab)
- French Neuroscience Society Award: **Antonin Verdier** (PhD student in B. Bathellier's lab)
- Villa M grant: **Diego Delbry**
- René & Andrée Duquesne Award: **Carmen Buchrieser**
- Vallery-Radot Prize: **Molly Ingersoll** **Pablo Navarro**
- Georges, Jacques and Elias Canetti Prize: **Céline Loot**
- Ágnes Ullmann Prize: **Sarah Merkling** **Nicola Festuccia**
- Institut Pasteur Young Scientist Award
  - PhD Catégory: **Clara Mendia** (A. El Amraoui's lab)
  - Postdoc category: **Raphaël Jager-Madot** (O. Schwartz/ L. Chakrabarty's lab)
- France 2030 Chair of Excellence in Biology and Health: **Simonetta Gribaldo** **Marc Lecuit**

INTERNATIONAL PRIZES

- 2025 European (ERC) funding ERC Proof of Concept: **Rayan Chikhi**
- European Study Group for Epidemiological Markers Young Investigator Award: **Carla Parada Rodrigues**
- EMBO Gold Medal: **David BIKARD**
- EMBO Young Investigator Program (EMBO YIP): **Thibault Brunet** **Sebastian Baumgarten**
- Vallee Scholar Award: **Aude Bernheim**
- FEMS-Lwoff Award for Achievements in Microbiology: **Carmen Buchrieser**
- Padma Shri Award & Distinguished International Fellow, American Society of Tropical Medicine and Hygiene (ASTMH): **Chetan Chitnis**

Our partners : a global constellation of scientific stakeholders

The Institut Pasteur's partnerships take many different forms across the biomedical research spectrum. They encompass alliances between institutes, liaison with academic supervisory authorities, agreements with hospitals, competitive funding, and bilateral or multilateral cooperation. These are the foundations on which the Institut Pasteur has built its ability to respond to current and future health challenges.

Pasteur Network: a global alliance fighting disease

As founding member of the Pasteur Network, the Institut Pasteur is central to a scientific alliance that is unique worldwide. With over 30 members spread across 25 countries on every continent, the network plays a vital role in tackling global health challenges through science, innovation and public health initiatives. It draws on scientific and technical resources in a variety of ecosystems, with over 50 national reference laboratories, several biosafety level 3 laboratories, and 17 WHO Collaborating Centers on hand to address emerging health threats.

FIND OUT MORE ON THE PASTEUR NETWORK WEBSITE

Sustained operational support from the Institut Pasteur

In addition to its scientific projects, the Institut Pasteur (Paris) provides its members with fundamental support. This includes support for 57 staff members working abroad, technical, logistical and quality support provided to 12 institutes (through the department in charge of CSR and technical resources), and training on funding acquisition delivered by the Grants Office to 12 institutes.

Ambitious scientific consortia

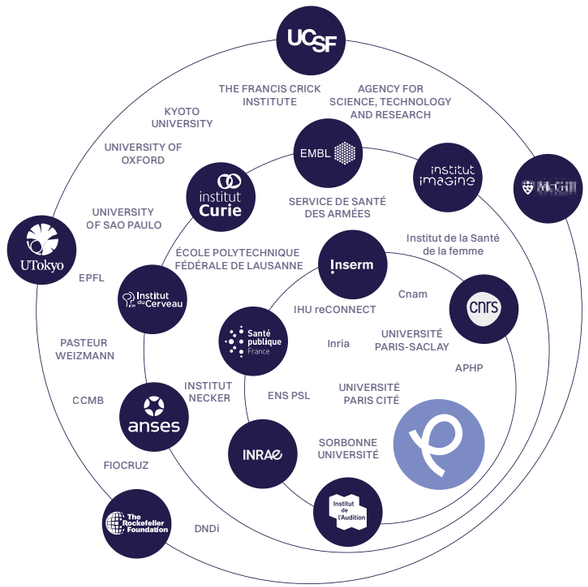
In 2025, the Pasteur Network launched a number of large-scale collaborative projects. The European Union funded a vaccine clinical trial led jointly by the Institut Pasteur (Paris) and the Institut Pasteur de Dakar. An ambitious pandemic preparedness program, funded by a New York-based foundation with the involvement of six African institutes from the network, is also currently being rolled out. An outbreak investigation task force has recently been deployed to Madagascar to tackle mpox – concrete proof of the network's rapid response to global health emergencies.

Investing in future scientific links

The SPARK (Seeded Partnerships for Advancing Research & Knowledge) program seeks to strengthen ties between scientists at the Institut Pasteur (Paris) and early-career scientists from the Pasteur Network. The first funded projects have already sparked fresh collaborations between research teams. Alongside this, 35 Calmette and Yersin grants were awarded, representing a total investment of €384,000 in international scientific mobility for postdoctoral fellows, PhD students, interns and students from Africa, the Americas, Asia-Pacific and the Euro-Mediterranean region.

A multifaceted partnership ecosystem

In addition to the long-standing Pasteur Network scientific alliance, the Institut Pasteur also cooperates with a network of top institutions and organizations both in France and worldwide.



Our academic and scientific partnerships in France

The Institut Pasteur develops research and teaching partnerships with the top French research organizations and universities. Almost 23% of scientists based on the Paris campus are members of partner institutions – see below. This daily meeting of institutional cultures, academic rigor and clinical reality forms part of the distinctive value offered by the campus.

- Partner research organizations (CNRS, Inserm, INRAE, CNAM, Inria, École polytechnique, Imagine Institute).
- Partner universities (Paris Cité University, Université PSL, Sorbonne University, ENS/PSL, Paris-Saclay, University of Oxford).
- Hospitals and clinical partners (Paris Public Hospital Network (AP-HP), Paris Psychiatry and Neurosciences University Hospital Group (GHU).

In addition to this, the Vaccinology and Immunotherapy Center (CVI) coordinates collaborations with partners in hospitals, academia and industry in connection with the 2030 French National Vaccines Program.

Our international partnerships

At international level, the Institut Pasteur also has access to a network of bilateral and multilateral cooperations with major organizations. These include, to name just some: the University of Oxford (antibiotic resistance), EMBL (see inset), EUGLOH (European University Alliance for Global Health), ERASuD (an alliance promoting cooperation with low- and middle-income countries), WHO (8 Collaborating Centers hosted at the Institut Pasteur, Paris), WOAH (a leading international center for animal health) and DNDi (neglected tropical diseases).

French and European competitive funding

The Institut Pasteur's partnerships are coupled with a strong track record on accessing competitive funding, both in France and beyond, reflecting the quality of its research and ability to form long-standing consortia.
Public subsidies from the French government account for approximately 16% of the Institut Pasteur's income (see p. 44-45 for details of our business model) and are used to support the Institut Pasteur's public service missions, in particular through the National Reference Centers. French funding is mainly provided by the ANR and ANRS-MIE. At European level, the Institut Pasteur has 26 ongoing ERC grants, one of the highest success rates achieved by a European research institution. The Institut Pasteur is involved in the Horizon 2020, Horizon Europe, EU4Health/HERA and EDCTP programs and plays a coordinating role in large-scale consortia including DURABLE and the European Vaccine Hub.

EMBL: a landmark alliance in the field of infection biology

The partnership between the Institut Pasteur and EMBL (European Molecular Biology Laboratory) combines the Institut Pasteur's expertise on infectious diseases and immunology with EMBL's capabilities in relation to computational biology, structural biology and advanced organoid systems. This strategic collaboration supports flagship projects led jointly by the two institutions' teams (see p. 27 for further details of David Bikard's project).

SCAN THE QR CODE FOR MORE INFORMATION ABOUT THE ALLIANCE WITH EMBL

INTERVIEW WITH SARAH MERKLING
Head of the Insect Infection and Immunity five-year group

Mosquitoes: opening the black box of virus transmission

In December 2024, the Institut Pasteur issued an international call for applications to establish new groups that would conduct research aligned with the Pasteur 2030 Strategic Plan. Sarah Merkling was one of the winning early career scientists. She told us about her research project and why she wanted to do it at the Institut Pasteur.

What I'm researching

My research involves studying the interactions between mosquitoes and viruses. When a mosquito bites us, it takes some of our blood to produce its eggs. The blood which has entered the mosquito's body can be contaminated with a virus if the person who was bitten was infected. The virus may then be transmitted to another person who is bitten by the infected mosquito. But we know hardly anything about what happens in the mosquito's body in between the two bites. How does the virus enter the body? How does it spread from one organ to another? What immune responses are triggered? It's all a complete black box!

How I go about it

We freeze a whole previously infected mosquito and then slice it into ultrathin sections. With highly advanced imaging techniques, we zoom in to the cellular scale to track the virus' progress in the body. In the meantime, we use algorithms to analyze the vast reams of data produced to try to understand why, within the same species, some mosquitoes are carriers and others are not.

What the purpose is

From a fundamental perspective, the purpose is to help better understand how pathogens interact with their hosts, whether humans or insects. From an applied perspective, the idea is to pinpoint the mechanisms the virus uses to circulate in the mosquito's body to try to block it, and in so doing, curb spread of the disease. If we can identify the molecule that facilitates circulation, we will be able to develop a vaccine to stimulate the production of antibodies to target it in humans. When it bites us, the mosquito will suck up the antibodies, and these antibodies will block viral spread and transmission by mosquitoes.

Why do this at the Institut Pasteur?

The Institut Pasteur has all the expertise needed for this project, and the Pasteur Network provides direct contact with local teams who have in-depth knowledge of mosquitoes and can help us understand mosquito ecology and epidemiology. Plus, at the Institut Pasteur, we are surrounded and supported by a community of passionate people who take risks and invest 100% of their energy into advancing science.

A word of advice for tomorrow's scientists

In a world as competitive as academic research, it is easy to have "imposter syndrome" and feel out of place. But it is a wonderful world with a vibrant, internationally-minded community. My advice to future scientists would simply be to go for it! Researchers come from all disciplines and backgrounds. They are often seen as exceptional, but they are above all exceptional in their diversity and humanity!

SCAN THE QR CODE TO SEE THE OTHER SCIENTISTS SELECTED TO INITIATE THEIR OWN RESEARCH GROUP

AI, a tool for exploring new frontiers

The Pasteur AI initiative, launched in late 2025, aims to make artificial intelligence a driver of biology research. Laurent Essioux runs the project and explains the issues involved: from pathogen modeling to data governance and including the upskilling of research teams.

INTERVIEW WITH LAURENT ESSIOUX
Director of the Research and Resource Center for Scientific Informatics (C2RI) at the Institut Pasteur

What is the role of artificial intelligence at the Institut Pasteur?

L. E.: In late 2025, we launched the Pasteur AI initiative with a clear ambition: to position AI at the center of biology research. It focuses on several levers – internally to help unlock AI's potential [we already publish many scientific papers every year showcasing research using AI, ed.], and externally to contribute to the development of AI in biology and increase our visibility. Internally, we are recruiting new expertise, upskilling our teams and building an AI-ready data ecosystem. Externally, we are strengthening our academic partnerships – with PR[AI]RIE, Université Paris Cité, Inria and EMBL/EBI – and we are developing industrial collaborations. We aim to leverage AI to attract new talent and philanthropic support.

What does AI actually bring to scientific research?

L. E.: What sets AI apart is its ability to resolve and optimize computational analyses with unprecedented speed and performance. This means we can address biological questions in an innovative way and speed up discoveries. AI also helps us to understand the inherent structure of data (protein sequences, genomes, images, etc.) and to generate new plausible data. It provides a novel toolbox to explore new frontiers. This is illustrated by our flagship project, Ágnes, a digital twin of bacteria (see page 33). The aim of this computational tool is threefold: to predict bacterial phenotypes (characteristics) from their genomes, particularly to predict their antimicrobial resistance or virulence; to generate novel protein sequences with synthetic biology optimizing their properties; and to be searchable by scientists in the manner of a living knowledge base. These three aims – predict, generate, search – illustrate the fundamentally new capabilities that AI can bring to biology.

How is the framework for data management shaping up with the growing importance of AI?

L. E.: Without a sound, structured, accessible data foundation, AI cannot achieve its full potential. This is the challenge of our AI-ready data: investing in our infrastructure, adopting large-scale standardization and improving campus-wide data access, and being able to share it responsibly (according to sensitivity) with our colleagues and the scientific community.

How is the governance of the initiative structured within the Institut Pasteur?

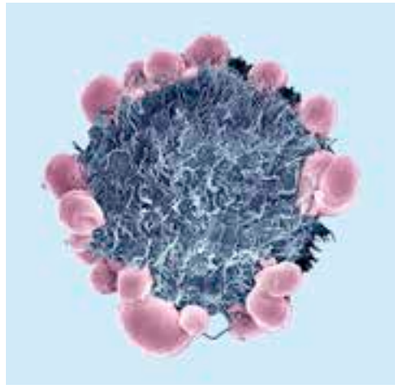
L. E.: We initially adopted an open, collaborative approach to define our strategy. Since then, our actions have been based on existing initiatives or been handled by small groups of people. We laid the groundwork, which included the launch of a joint CNRS/Institut Pasteur call for applications for the position of AI research director, recruitment of a new G5 head with strong AI literacy applied to virology, and recruitment of a head for the new AI division within the Bioinformatics Hub. In addition to these recruitments, we are committed to fostering a collective dynamic by offering lectures on AI for PhD students, reinforcing training, and incorporating AI into our internal call-for-proposal programs.
This approach relies on a broad-based engaged community and is crucial for ensuring that AI permeates our entire scientific community.

Leveraging AI to accelerate science

Whether it is used for analysis, correlation or decoding, AI is gaining prominence as a research tool to speed up data processing and expand the scope of what can be achieved. Here, we provide an overview of some of its applications that are already proving beneficial as well as the different types of AI used by the Institut Pasteur.

1

scPRINT
Identifying early markers in precancerous tissues
Trained on over 50 million human and animal cells, scPRINT is the first French AI model capable of predicting gene networks and understanding the mechanisms underlying gene expression. It was developed jointly under the coordination of Laura Cantini's[1] team and operates like a large language model that is able to run tasks specific to cellular biology, analyzing huge volumes of data and using these to produce detailed representations of cell state. It has already been successfully used to decode novel markers in precancerous prostate tissue.



Epithelial cell membrane protrusions involved in phenomena such as apoptosis (cell death) and cell movement

2

STORIES
Tracking the evolution of cells to unravel the mysteries of disease
Scientists in the Machine Learning for Integrative Genomics team have developed a new method[2] for monitoring cell development without the need for continual observation. Using their approach, it is possible to simultaneously compare a cell's gene expression and the progression of its spatial position. STORIES is thus able to chart the trajectory and changes in the state of a given cell, shedding light on the influence of environments on cell fate, particularly in the initial stages of diseases.

3

The fate of bacterial DNA within cells
Scientists at the Spatial Regulation of Genomes Unit joined forces with several collaborators to investigate how a host cell responds when foreign DNA enters its nucleus. Using an AI model developed by the French Natural History Museum (MNHN), they simulated a huge number of scenarios (over 10,000 hypotheses) and thus determined[3] that the composition of the foreign DNA directly influences its fate within the nucleus of the cell it is seeking to enter. Depending on its GC content, it either adapts easily to this new environment or folds into a globular shape within the nuclear space.

The key to AI

Artificial intelligence (AI):
a generic term for a range of methods enabling machines to perform complex tasks.

Machine learning:
algorithms using statistical models to make predictions and classifications.

Deep learning:
a machine learning technique using algorithms that are inspired by the human brain to learn from unstructured data.

Generative AI:
an AI category capable of producing new content – text, images, sound, etc. based on trained models. Examples: ChatGPT (Open AI), Claude (Anthropic) and LeChat (Mistral).

CPU:
the computer's brain that executes routine commands and programs, and processes operations sequentially.

GPU:
originally designed for video games, this graphics processing unit handles thousands of calculations simultaneously and is ideal for training AI and deep learning algorithms.

1. scPRINT: pre-training on 50 million cells allows robust gene network predictions. Nature Communications, vol.16. https://doi.org/10.1038/s41467-025-58699-1
2. STORIES: learning cell fate landscapes from spatial transcriptomics using optimal transport. Nature Methods, vol. 23. https://doi.org/10.1038/s41592-025-02855-4
3. Sequence-dependent activity and compartmentalization of foreign DNA in a eukaryotic nucleus. Science, vol. 387. https://doi.org/10.1126/science.adm9466

Opinion

Better anticipating pandemics

BY SIMON CAUCHEMEZ
Head of the Mathematical Modeling of Infectious Diseases Unit

"Artificial intelligence offers significant opportunities in terms of improving preparedness for health crises. It can speed up heterogeneous data analysis, improve surveillance, refine certain forecasts and help with earlier detection of signs triggering action. It can also augment investigations of variants, transmission dynamics and interactions between biological, environmental and behavioral factors. However, in order for it to make a genuine contribution, stringent conditions must be in place in terms of high-quality, widely accessible and representative data; robust, explicable and rigorously evaluated models to limit bias; and a sufficiently robust ethical framework given the public health challenges faced. The aim is not to pit AI against existing approaches, but rather incorporate it judiciously in epidemiological methods. Its value will be measured not just by its technical performance, but also its ability to make concrete improvements to public health decision-making. To achieve this, cooperation between research bodies, public authorities and civil society will prove crucial."

GLOSSARY

*** Mycolactone** is a toxin that naturally inhibits Sec61, a protein secreted by the bacteria responsible for Buruli ulcers. Enodia Therapeutics is seeking to harness this discovery to degrade pathogenic proteins with a view to treating cancer, inflammatory diseases and viral infections.

Enodia Therapeutics: from science to drug

A new milestone was set with Enodia Therapeutics in efforts to find a therapeutic application for a breakthrough on the mechanisms of action of mycolactone* achieved through research conducted by the Immunobiology and Therapy Unit. The startup, founded with biotech incubator Argobio Studio and supported by the Institut Pasteur's Innovation Accelerator, closely combines scientific excellence with biotech development expertise. The value of the approach taken received initial recognition in the form of a fundraising deal worth €20.7 million completed in late 2025. Machine learning lies at the platform's core, helping to guide the design of more selective small molecules, thus paving the way for a new generation of approaches to fight pathogenic proteins.

"This venture shows just how essential it is to establish links between research and industry, learn to collaborate with people whose expertise is different to our own, and develop skills that don't always come naturally to scientists."

CAROLINE DEMANGEL
Head of the Immunobiology and Therapy Unit, President of the Enodia Therapeutics Scientific Advisory Board and Chair of the Institut Pasteur Scientific Council

The Institut Pasteur's AI infrastructure

Roughly **10,000** CPU cores and **100** GPUs including a dozen latest-generation units capable of running LLMs

A storage system of **20,000** terabytes

4. Artificial intelligence for modelling infectious disease epidemics. Nature, vol. 638. https://doi.org/10.1038/s41586-024-08564-w

Supporting and enabling developments in AI

1

Information Systems Department

The DSI has developed a hybrid architecture for the AIs hosted within the Institut Pasteur's infrastructure, based on three principles:

- Confidentiality: sensitive data are hosted internally on proprietary servers. Infrastructure is based on local models ensuring that data never leaves the Institut Pasteur.
- Sovereignty: proprietary and local infrastructure ensures independence and service continuity.
- Cost optimization: a pay-per-use model for occasional use, with costs of intensive use recouped via a local infrastructure.

2

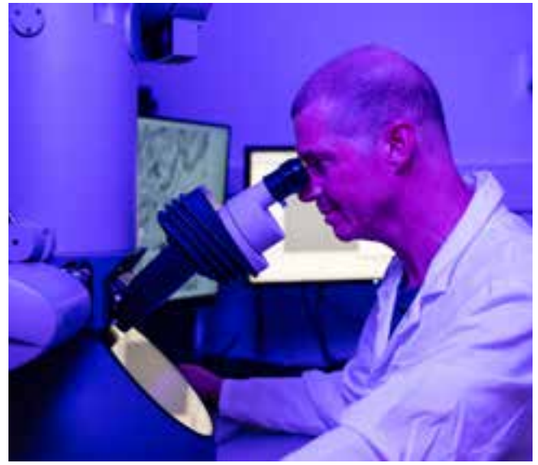
Department of Technology

The Institut Pasteur's core facilities have the expertise to convert a particular need from a laboratory or product from its research into a tool that can be widely adopted and used by all. For example, the Image Analysis Hub provides all of campus with a ready-to-use set of deep learning image analysis methods based on research conducted in Jean-Christophe Olivo-Marin's laboratory.

3

Human Resources Department

To help all scientific and administrative teams develop their skills, a training program focusing on acculturation and everyday usage of generative AI was offered throughout 2025. This notably included online training, a masterclass, and seven themed webinars.



In the Ultrastructural BioImaging Platform

Education, the institute's mission applied to AI

Courses and workshops for PhD students

Since 2024, a 2.5-day artificial intelligence theory course has been offered to all PhD students to help them improve their research skills in areas such as image processing, HTS data analysis, neuroscience and structural biology. This is supplemented by a series of practical workshops specific to structural biology and protein folding, applications in neuroscience, and high-throughput genomic screening.

Inauguration of PR[AI]RIE-PSAI

The Paris School of AI, led by PSL University in collaboration with Université Paris-Cité, the CNRS, Inria and the Institut Pasteur, opened its doors for the 2025/26 academic year. It offers a full spectrum of programs from bachelor's to PhD, as well as continuing education, in touch with the latest scientific innovations. The venture also serves as an AI research accelerator through support to several Institut Pasteur scientists in the form of PhD grants and postdoctoral fellowships. PR[AI]RIE-PSAI fosters industrial partnerships in an innovative way, with the aim of forming a global public-private hub of excellence.

Joana Maria De Abreu Carvalho Pereira is a postdoctoral fellow in the Chromatin and Infection research unit. One of the laboratory's aims is to determine the role of chromatin modifications induced by bacteria-host interactions and their long-term consequences.

The long-term reality of infectious diseases and pathogens

The impact of pathogens extends far beyond the acute phase of infection.

Some can have long-term consequences, with ramifications that we are barely beginning to grasp. Others outmaneuver our defense strategies and develop resistance that can only be overcome with increasingly innovative therapies. And yet others only really reveal their secrets centuries after first being identified. This is the (very) long-term reality of infectious diseases and pathogens.

Introduction

When dealing with infectious disease threats, a long-term view can be helpful

In the Chemogenomic and Biological Screening Platform

AUDE BERNHEIM AND OLIVIER SCHWARTZ,
joint leaders of the "Infectious disease threats" scientific priority at the Institut Pasteur

Infectious disease threats force us to see time differently. First, they remind us that microbes existed well before humans and that their temporal horizon corresponds to the sweeping timescale of life on Earth. They also show us that our biological history, immunity, vulnerabilities and adaptive capabilities have developed in the context of an ancient, continuous, inextricable relationship with the microbial world. Lastly, they force us to work at several timescales simultaneously, from the urgency of emerging diseases to the years or even decades of our immune memory, and zooming out even further to give us the historical hindsight we need to understand where we come from.

At the Institut Pasteur, this approach is rooted in our lengthy history. For more than 140 years, it has been a place where knowledge has been created, expanded, shared and transformed. This continuity is a strength that we need to preserve. It enables us to train up new generations of scientists, to develop synergies between disciplines, experimental approaches, clinical observation and surveillance, and to build a collective research memory. In our field, what we create will only last if we pass it on to the next generation.

A long-term vision is also necessary for discovery. Research cannot advance if it is merely a frantic quest for instant results. It progresses through trial and error, doubts, changes of tack, sometimes long periods of uncertainty. It takes time to ask the right questions, test a theory, check a result and make sure it can be reproduced. This constant rigor is what gives scientific knowledge its value and makes it worthy of our trust.

In a world that is moving at an ever faster pace, this approach to time may seem out of step. There is increasing pressure for speed, performance and instant visibility. Tools are changing, including with the explosion of artificial intelligence, which is opening vast new horizons. But just because things are moving faster, it should not stop us from thinking, asking questions, inventing. Major breakthroughs often happen when we take the time to explore the periphery, to step away from the beaten track and make space for new ideas.

That is why a long-term vision is not a byword for inertia; it is precisely what makes things happen. When a disease breaks out, when resistance or a new threat emerges, the only reason we can respond quickly is because patient, rigorous research has been carried out in advance, sometimes over years or even generations. When it comes to infectious disease threats, a long-term vision is not an optional extra. It is a scientific responsibility, a societal commitment to produce sound knowledge that can be shared and passed on, that can spur action and illuminate the public debate so that we can respond more effectively to the threat of infectious diseases.

Case study

Long COVID: the after-effects of an epidemic

Research conducted in recent years by several Institut Pasteur teams has revealed the mechanisms used by SARS-CoV-2, the virus responsible for COVID-19, to persist and disrupt the function of different parts of the body well beyond the acute phase of infection.

ANTHONY COLEON
PhD student in the Lyssavirus, Epidemiologyand Neuropathology Unit

"Infection appears to affect the production of dopamine, a neurotransmitter involved in regulating emotions and memory."

After 779 million reported cases worldwide,[1] COVID-19 no longer graces our news feeds, but the virus responsible for it has not left the laboratory – or the bodies of some patients. Although in most cases, the virus disappears within a week or two of infection – or at the very least is no longer felt in the upper respiratory tract –, we know that it is capable of persisting for much longer, almost silently, in some parts of the body, its presence betrayed by a few stray symptoms.

A study coordinated by Michaela Müller-Trutwin's team in 2023[2] demonstrated that the virus can remain hidden in viral reservoirs in the lungs of some individuals for up to 18 months after infection. In 2021, Guilherme Dias de Melo, a scientist in the Lyssavirus, Epidemiology and Neuropathology Unit, revealed the mechanisms underlying anosmia, or loss of smell, and showed that some patients experience continued inflammation in the olfactory nervous system several months after infection.[3]

A long-term impact with multiple consequences

This phenomenon, known as "post-COVID-19 syndrome" or "long COVID," is characterized by a series of symptoms that appear within three months of initial infection and last for at least two months. According to a study conducted by Santé Publique France in 2022,[4] 4% of adults in France suffer from long COVID, experiencing neurological, cardiac, respiratory, digestive, psychiatric or dermatological symptoms. Other international studies suggest prevalence in the region of 6 to 20%.
For those people affected, such chronic symptoms – including "brain fog," depression, impaired memory and anxiety – are by no means trivial and can soon become debilitating. More than two-thirds of patients in a cohort monitored by the Paris Public Hospital Network (AP-HP)[5] report having had to take time off work, and fewer than 10% are in full remission 12 months after infection.

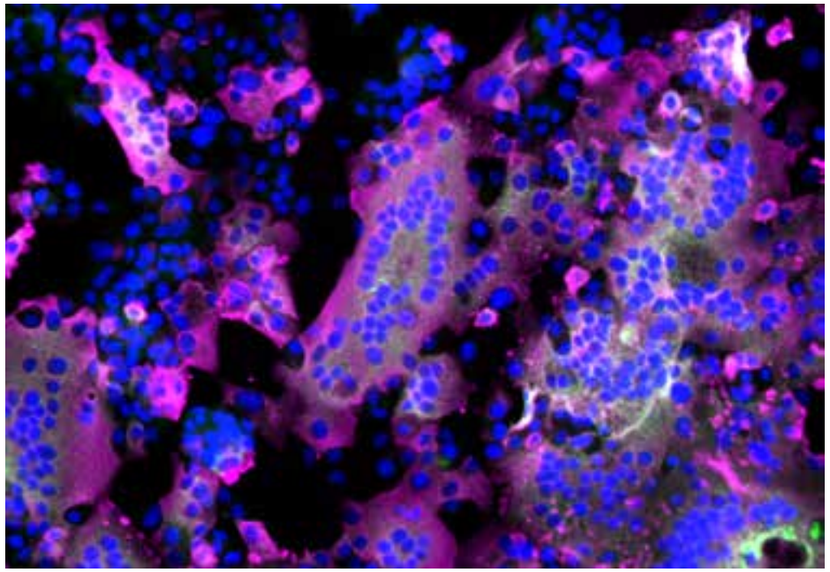
Revealed: how long COVID dysregulates brain cells

Although the symptoms are clear, the underlying mechanisms are not yet fully understood. But for scientists in the Lyssavirus, Epidemiology and Neuropathology Unit, the patterns and consequences of inflammation are becoming increasingly clear. In 2025, PhD student Anthony Coleon and his colleagues revealed viral activity in the brainstem and showed how the virus dysregulates neurons.[6] "We first detected viral RNA of SARS-CoV-2

• • •

Adult health is determined at the embryo stage

Elisa Gomez Perdiguero and her Macrophages and Endothelial Cells group are trying to unlock the secrets behind the production of certain immune cells. They are particularly focusing on how disruptions to the embryo can impact disease throughout a person's lifetime. The immune response is also thought to be determined during pregnancy, with infections or inflammations changing the programming of certain macrophages – cells involved in immune defense. Another building block in our understanding of the development of the immune system!



Fluorescence microscopy of cells infected with the SARS-CoV-2 virus

• • •

in the nervous system of infected animals 80 days after the acute phase of infection," explains the scientist. "We then revealed viral replication activity in tissues, suggesting that the virus is capable of infecting new cells at low levels."

Once the culprit and the crime site had been identified, all that was left was to determine the weapon. The scientists studied the consequences of this viral RNA on brain function and observed a dysregulation of the genes associated with neuronal metabolism and activity – a phenomenon reminiscent of what we see in other neurodegenerative diseases like Parkinson's. "Infection appears to affect the production of dopamine, a neurotransmitter involved in regulating emotions and memory," says Anthony Coleon. This would explain the emergence of symptoms of depression, impaired memory and anxiety.

"Our study is the first to reveal the long-term biological impact of SARS-CoV-2 infection in animal models," adds Guilherme Dias de Melo. "We are continuing our research to understand how infection induces a loss of dopaminergic neuron function. This could have very real consequences for treating patients. The dysregulated genes that we identified represent potential targets for research on therapeutic molecules," he concludes.

6 to 20%

of people infected with SARS-CoV-2 are affected by long COVID

1. COVID-19 Dashboard. World Health Organization. https://data.who.int/dashboards/covid19/cases

2. SARS-CoV-2 viral persistence in lung alveolar macrophages is controlled by IFN-γand NK cells. Nature Immunology, vol. 24. https://doi.org/10.1038/s41590-023-01661-4

3. COVID-19–related anosmia is associated with viral persistence and inflammation in human olfactory epithelium and brain infection in hamsters. Science Translational Medicine, vol. 13. https://doi.org/10.1126/scitranslmed.abf8396

4. Enquête Affection post-Covid, 22 mars-8 avril 2022 (Post-COVID-19 symptoms survey, March 22-April 8, 2022). Santé Publique France. https://www.santepubliquefrance.fr/en/infection-a-coronavirus/surveysstudies/post-covid-19-symptoms-also-known-long-covid-france-july-21-2022

5. Patients with Long COVID continue to experience significant symptoms at 12 months and factors associated with improvement: A prospective cohort study in France (PERSICOR). International Journal of Infectious Diseases, vol. 140. https://doi.org/10.1016/j.ijid.2023.11.038

6. Hamsters with long COVID present distinct transcriptomic profiles associated with neurodegenerative processes in brainstem. Nature Communications, vol. 16. https://doi.org/10.1038/s41467-025-62048-7

Focus

Physician-scientists: a critical interface to respond to health challenges

In 2025, the Institut Pasteur launched its MD-PhD program to train up the next generation of physician-scientists capable of tackling the long-term impact of diseases.

The aim of this program, developed under the Pasteur 2030 Strategic Plan, is to strengthen the links between scientific research and clinical practice by providing training for physician-scientists, via a PhD thesis or a research internship, so that they develop expertise in both fields. The ability to work at the intersection of theory and practice is crucial in responding to increasingly complex health issues such as emerging infections, growing resistance to antibiotics, the impact of climate change on health and the rise of chronic diseases. These challenges require responses that link treatment with a thorough understanding of disease.

The program is open to medical students, physicians, pharmacists and veterinarians. The example of Kieran Toms, a PhD student in the Biology of Infection Unit, illustrates the philosophy behind the program. "Before starting my PhD, I worked as a doctor in a London hospital, where I treated several patients who had a form of tuberculosis affecting the central nervous system. That was when I developed an interest in bacterial brain infections, which led me to embark on a PhD exploring another such infection, neurolisteriosis," he explains. "Creating links between basic science and clinical practice is crucial to ensure that our lab-based research leads to real progress in the practice of human medicine."

In the Membrane, Cytoskeleton and Cell Division Unit

PROFESSOR JEAN-MICHEL MOLINA,
Institut Pasteur
Medical Director

"In the 21st century, we need physicians who understand not only the needs of their patients and the biological mechanisms underlying disease, but also the research processes that can result in effective therapeutic solutions – in short, trained physicians who are connected to the landscape of scientific research."

Long-term battles

Antimicrobial resistance: a long-term battle

Pathogens are continually evolving and developing ways of resisting antimicrobial treatments. This phenomenon requires constant surveillance and long-term investment to understand the underlying mechanisms and develop innovative therapies.

Threats

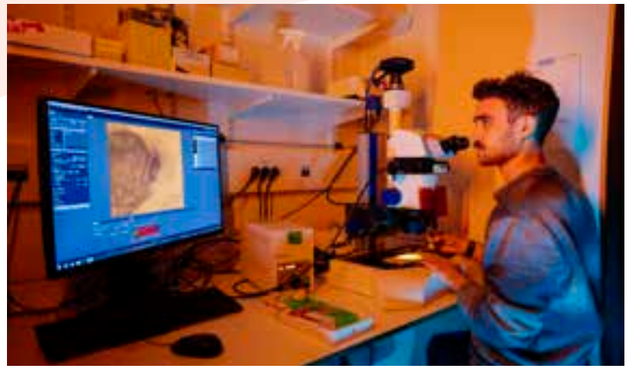
Forms of resistance that we are keeping a close eye on include re-emerging diseases, viruses we thought had been contained, and pathogenic fungi that are progressing at an alarming rate.

Cholera

Scientists in the National Reference Center for Vibrios and Cholera at the Institut Pasteur analyzed the spread of a strain that is resistant to ten antibiotics, including two of the three recommended for treating this re-emerging disease.[1] Cholera was reported in Yemen in 2018, and since then in Lebanon, Kenya, Tanzania and Mayotte. Worsening health and hygiene conditions and population movements following armed conflicts are particularly contributing to the re-emergence of the disease.

Mpox

The Structural Biology of Infectious Diseases Unit has examined the action of tecovirimat, the most commonly used drug to treat mpox infections.[2] The scientists studied the interactions between the antiviral and a key enzyme in the virus to gain a clearer picture of how it works and pave the way for the development of novel therapeutic approaches, since tecovirimat is becoming increasingly ineffective in treating some variants of the virus.



In the Cell Death and Epithelial Homeostasis Unit

Antifungal resistance

Increasing numbers of pathogenic fungi are developing resistance to antifungal treatments, especially first-line azoles. Given the few antifungal molecules available and the high fatality rate of fungal infections, the rise in antifungal resistance requires close surveillance and research. One fungus in particular, *Aspergillus fumigatus*, responsible for severe lung infections, has developed resistance in part because of the widespread use of fungicides in agriculture. *Candida auris*, which colonizes hospital environments and is also developing resistance to azoles, has caused outbreaks in hospitals in South America, the United States and South Africa. These two pathogens are among those being monitored closely by the National Reference Center for Invasive Mycoses and Antifungals at the Institut Pasteur.

Whooping cough (Pertussis)

The whooping cough outbreak in France in 2024 was on an unprecedented scale, with 150,000 cases. Scientists in the National Reference Center at the Institut Pasteur sought to characterize the strains involved in this resurgence.[3] Among other findings, they identified the emergence of strains resistant to macrolides, the main class of antibiotics used. Although the number of resistant strains is still low, the likelihood of them spreading highlights the need for both surveillance and widespread vaccination.

Super antibiotics

Although we have been using antibiotics for decades, there are still gaps in our knowledge of how they work. Scientists in the Bacterial Genome Plasticity Unit have recently revealed how aminoglycosides, antibiotics used to treat infections such as *E. coli* and *Klebsiella pneumoniae*, are able to enter bacteria by using sugar transporters to cross their membranes.[4] Capitalizing on this discovery, the scientists successfully doubled the number of transporters, increasing the rate of entry and the efficacy of antibiotics in even the most resistant bacteria.

Novel molecules

A collaboration between scientists from the Institut Pasteur and Chimie ParisTech has led to the development of a novel class of molecules – aptamers modified with ruthenium complexes – to tackle *Streptococcus pneunomiae* bacteria, responsible for pneumococcal disease.[5] Their method, adapted from techniques developed to target cancer cells, required seven years of research. By modifying DNA strands with ruthenium complexes, which are excellent photosensitizers used in photodynamic therapy, they can successfully target and destroy the bacteria. This strategy represents a novel therapeutic pathway in tackling antimicrobial resistance.

Innovative therapies

Luckily, pathogens are not alone in demonstrating increasing ingenuity. Scientists are doubling down to keep one step ahead, boosting the efficacy of antibiotics and developing novel therapeutic strategies.

1. Long-Distance Spread of a Highly Drug-Resistant Epidemic Cholera Strain. New England Journal of Medicine, vol. 391-23. https://doi.org/10.1056/NEJMc2408761
2. Structural insights into tecovirimat antiviral activity and poxvirus resistance. Nature microbiology, vol. 10. https://doi.org/10.1038/s41564-025-01936-6
3. Resurgence of Bordetella pertussis, including one macrolide-resistant isolate, France, 2024. Eurosurveillance, vol. 29-31. https://doi.org/10.2807/1560-7917.ES.2024.29.31.2400459
4. Uridine as a potentiator of aminoglycosides through activation of carbohydrate transporters. Science Advances, vol. 11-36. https://doi.org/10.1126/sciadv.adw7630
5. Selection of Ruthenium Polypyridyl Complex-Modified Aptamers for Photodynamic Therapy against Streptococcus Pneumonia. Journal of the American Chemical Society, vol. 147-47. https://doi.org/ 10.1021/jacs.5c13224

In short

Charting the progression of pathogens

From chikungunya to sleeping sickness, in 2025 the Institut Pasteur continued surveillance, diagnostics and vaccine innovation efforts as part of its commitment to tackling emerging diseases.

Chikungunya: status report for summer 2025

Chikungunya is appearing earlier and gaining new ground. Cases of the disease, transmitted to humans by bites from *Aedes* genus mosquitoes, are closely monitored every year in France. In 2025, the first cases were detected in May, earlier than usual, and in more French regions, especially the Grand Est – unprecedented territory for a virus previously only found in the Mediterranean basin.
Research carried out with the Pasteur Network institutes in French Guiana, Guadeloupe and New Caledonia, areas where *Aedes* mosquitoes have been circulating for many years, is particularly valuable in tackling this potentially severe disease, which can cause symptoms that last for weeks or even years in the case of joint pain.

Mapping the threat – a collective effort

The aim of the EMa-Tigre project, which stands for "Emergence of vector-borne diseases related to tiger mosquitoes," is to map the risk that arboviruses transmitted by *Aedes albopictus* will spread in France in a context of climate change. Laboratory research has shown that the mosquito is capable of transmitting at least 25 viruses, including dengue, West Nile, Zika and chikungunya. The project is funded by the Crédit Mutuel Alliance Fédérale Foundation and coordinated by the Arboviruses and Insect Vectors Unit at the Institut Pasteur, in conjunction with public health bodies (the French General Directorate of Health and regional health agencies), academic partners and mosquito control experts.

Sleeping sickness: stepping up surveillance

In collaboration with Lucy Glover's team at the Institut Pasteur in Paris, the team led by Brice Rotureau, Head of both the Parasitology Unit at the Institut Pasteur de Guinée and the Trypanosome Transmission Group at the Institut Pasteur in Paris, has developed a novel molecular test, known as SHERLOCK4AAT, to detect the main species of trypanosomes that infect animals, including the species that causes sleeping sickness in humans.[1] Trypanosomes are transmitted by tsetse flies, which become infected after biting an animal carrying the pathogen. Identifying circulating species of trypanosomes is useful for several reasons: first, it benefits human health, as even though sleeping sickness now only affects 500 people each year, some parasites can stay in the body for several months or even years, hindering the goal of eliminating the disease by 2030; second, it is important for animal health, as the affected animals are mostly livestock (cattle and pigs) and their infection upsets economic conditions for farmers and their communities; and finally it serves a public health purpose, helping guide prevention policies.

Institut Pasteur on the front line of European vaccine innovation

The Institut Pasteur is a founder member of the European Vaccines Hub (EVH), launched in May 2025 by eleven leading institutions in five countries. The aim of EVH is to significantly reduce the development time of new vaccines to less than four months after identification of a pathogen by improving synergies between key players in the field. In France, the Institut Pasteur will be the coordinating institution for preclinical research activities and will work in close collaboration with partners including Inserm, ANRS-MIE, CEA and AP-HP.

1. A SHERLOCK toolbox for eco-epidemiological surveillance of African trypanosomes in domestic pigs from Western Africa. *eLife*, vol. 14. https://doi.org/10.7554/eLife.106823.3

Long-term science

History through the prism of biology

Understanding the history of pathogens, even ancient pathogens, can guide our response capabilities today.

In the Microbial Paleogenomics laboratory

The origins of leprosy

Countering the widespread belief that leprosy was introduced to the American continent by European settlers from 1492 onwards, a team of scientists from the Microbial Paleogenomics laboratory at the Institut Pasteur, the CNRS and Colorado State University recently discovered that a second species responsible for leprosy has actually been infecting humans for at least a thousand years.[1] *Mycobacterium lepromatosis* is clearly less well known than *M. leprae*, the main pathogen responsible for the disease that still affects 200,000 people worldwide every year. But what it lacks in notoriety, it makes up for in perseverance. An analysis of nearly 800 archaeological samples has revealed the widespread historical presence of the pathogen in North and South America, from Canada to Argentina. This discovery significantly shifts our understanding of the history of leprosy, especially as the project also revealed new lineages, including one more than 9,000 years old that is still active.

1,000 years, at least, that *Mycobacterium lepromatosis* has been infecting humans

The stealthy strategies of the plague bacillus

Despite three pandemics, the first from the 6th to the 8th century, the second – the most deadly in history – from the 14th to the early 19th century, and the last which began in the mid-19th century, we still have a lot to learn about plague. The latest finding, revealed by a team from the Institut Pasteur and McMaster University, is that a gene in the bacterium responsible for bubonic plague, *Yersinia pestis*, is thought to have evolved to enable it to extend the duration of pandemics.[2] A reduction in the number of copies of the pla gene in the later stages of outbreaks extends the lifespan of infected hosts, especially rodents, enabling them to keep spreading the bacteria for longer. The plague bacillus was therefore able to persist by making itself less virulent, especially in more sparsely populated environments.

1. Pre-European contact leprosy in the Americas and its current persistence. Science, vol. 389. https://doi.org/10.1126/science.adu7144

2. Attenuation of virulence in Yersinia pestis across three plague pandemics. Science, vol. 388. https://doi.org/10.1126/science.adt3880

In the National Reference Center (CNR) for Meningococci and *Haemophilus influenzae*

Meningitis B in Rennes: hunting the invisible strain

In early 2025 in Rennes, a series of cases of invasive meningococcal B infections led to nearly 100,000 young people being vaccinated in the space of a few weeks. The Meningococci and Haemophilus Influenzae CNR at the Institut Pasteur played a key part in responding to this crisis. How did a local alert turn into a large-scale public health drive? We piece together the full story, from the detection of the first cases to the coordinated response.

Before the outbreak: active monitoring
There is a well-oiled procedure for dealing with invasive meningococcal infections – as with any notifiable diseases. Any cases are reported to the Regional Health Agency (ARS) by the hospital, and the strain or biological material is sent to the CNR. The CNR uses whole-genome sequencing to characterize strains and monitor their circulation, and it produces a monthly dashboard, an annual report and a database that covers several decades. In France, there are approximately 600 cases each year, or an incidence of around 0.9 cases per 100,000 population.

1 A family cluster and a rare strain
In early 2025 in Rennes, the first sign of something unusual was a cluster of three cases in a blended family. Those affected were aged 14 to 18, and one of the cases was fatal. Initially, the most plausible theory seemed to be that transmission was limited to the family unit. But the strain soon rang alarm bells for the CNR – it was a rare strain generally found among immunocompromised individuals. So the CNR requested an immunological panel for the family. It came back negative. The theory of a family-based cluster could no longer explain the situation.

2 A microbiological link
The turning point came with the screening performed by the CNR using its database, updated over many decades based on cases from all over France. Focusing on cases in Brittany, the laboratory found that a second cluster had occurred a few weeks earlier at a business school in the Rennes area. The two episodes had not been linked by the field investigation, but the analyses showed that the same rare clone was responsible.

3 Alert level raised
The CNR informed Santé publique France and the ARS. A new investigation to find a link between the two clusters proved unsuccessful. Meningitis can only be spread by person-to-person contact. The lack of a clearly identified chain of transmission suggested that the strain had been introduced several times and was circulating among an immunologically naive population. The theory of isolated cases no longer stood up, and a broader response would be needed.

4 Discussions to prepare a response
An emergency group with representatives from the CNR, Santé publique France, the ARS, Rennes university hospital and the French General Directorate of Health discussed how to respond. There were many questions: was it definitely the same clone, was this clone unusual, and above all was the vaccine available in France effective for this strain? Using whole-genome sequencing and bacteriological and bioinformatic analyses, the CNR soon confirmed that it was. The cases mainly affected young people aged 15 to 25. The CNR called for widespread vaccination across the Rennes metropolitan area.

5 Vaccination and heightened surveillance
Vaccination was offered to 110,000 young people. The uptake was unusually high: with more than 96,000 doses administered in three months, vaccine coverage was much higher than the average uptake of 15% generally prompted by this type of campaign among teenagers and young adults. Several factors made a difference: parents were informed via traditional media, and young people also received the information via social media; experts from the CNR made media appearances to explain the situation and calm any hype; and vaccine access was facilitated by authorizing pharmacists to deliver vaccinations. Local family physicians and primary care providers were also extremely proactive, and pop-up vaccination centers were set up near schools and universities. During this phase, surveillance was stepped up, and any meningitis B cases in Brittany were sequenced immediately.

6 After the crisis: continued monitoring and feedback
Surveillance went back to normal after a few months. No new cases linked to the strain were detected, although other meningitis B cases continued to be reported in Brittany. Feedback after the event justified the decision to vaccinate and the emergency information campaign. The impact also went beyond the local area, with the CNR sharing its data and expertise within the European laboratory network that it coordinates. This enabled a link to be established between the Rennes episode and a previous British episode involving a similar strain, and in early 2026 scientists were able to verify that a meningitis case in Cherbourg was not biologically linked to the ongoing Canterbury outbreak, despite hasty assumptions to the contrary in the media.

BY MUHAMED-KHEIR TAHA AND ALA-EDDINE DEGHMANE
Director and Deputy Director of the National Reference Center (CNR) for Meningococci and *Haemophilus Influenzae*

SAMY TAHA
Physician-scientist in the CNR-associated research unit

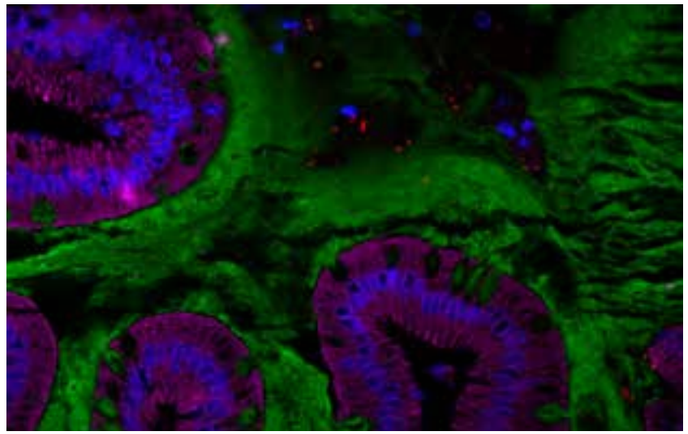
WATCH THE INSTITUT PASTEUR'S DEBUNKING VIDEO ABOUT MENINGITIS
(VIDEO IN FRENCH, ENGLISH SUBTITLES AVAILABLE)

How our microbiota* affects our health

GLOSSARY

*** microbiota** refers to the collection of microorganisms that inhabit a specific environment

The gut microbiota includes around 40,000 billion microorganisms, making it our body's most densely populated microbiota by a significant margin. However, this extremely dense population is not immune to disruptions – food, stress, antibiotics and pollutants can all shake its delicate balance. The resulting disorders have repercussions for our gut health and also, more surprisingly, our mental health.



Human intestinal slice representing the gut microbiota

Insights into the gut microbiota

As Head of the Microbiome-Host Interactions laboratory, Benoit Chassaing explores mechanisms leading to gut microbiota disruption and their effects on our health, with a particular focus on the onset of certain chronic inflammatory diseases and colorectal cancers. His team has investigated the impact of emulsifiers, additives found in all types of food. These substances, used to improve the texture and extend the shelf life of processed products, are added to goods such as dairy and bakery products, ice cream and infant formula. "Our research clearly shows that emulsifiers bring about lasting changes in the quality of the gut microbiota. They play a role in reducing our microbial diversity and encouraging the development of certain types of "bad" bacteria. In an ambitious clinical trial, we recently demonstrated that in patients with Crohn's disease, reducing intake of these additives increased the chances of achieving remission," he explains.

The impact of these emulsifiers is by no means limited to individuals and can affect future generations. In mice, Benoit Chassaing's team demonstrated that emulsifier consumption during gestation can disrupt the gut microbiota of offspring from birth. This is thought to significantly increase susceptibility to chronic inflammatory gut disorders and obesity in adulthood.[1]

In vitro gut models shedding light on our microbiota

The laboratory developed an in vitro model consisting of 48 independent mini-microbiota reproducing conditions in the gut. This setup enabled Benoit Chassaing's team to observe variations in the sensitivity of these different gut ecosystems to carboxymethyl cellulose (CMC for those familiar), a very common emulsifier. Their research, published in *Gut*,[2] revealed two major breakthrough findings: (1) we are not all born equal in our response to emulsifiers – some people are sensitive to them, while others are resistant; (2) a specific signature predictive of this sensitivity can be identified using a simple molecular assay.

"These discoveries could be used in the near future to determine an individual's sensitivity or resistance to emulsifiers so that everyone can be offered a personalized nutrition program," comments Benoit Chassaing.

BENOIT CHASSAING
Head of the Microbiome-Host Interactions laboratory

"Our discoveries could be used in the near future to determine an individual's sensitivity or resistance to emulsifiers."

In the Microbiome-Host Interactions laboratory

When our microbiota plays tricks with our brains

Could gut microbiota health affect brain function? For the team working on the "When Gut Bacteria Changes Brain Function" project led by Pierre-Marie Lledo, Head of the Institut Pasteur's Perception & Action Unit, this has been beyond question for the past several years.

Back in 2020, their research[3] with Gérard Eberl's unit (Institut Pasteur) demonstrated in mice not only that the gut microbiota was linked with the brain, but it could also affect it through distinct biological mechanisms. More specifically, an imbalance in gut microbiota composition can lead to symptoms of depression by disrupting the endocannabinoid system or by causing tryptophan, an amino acid precursor to the "happiness" hormone serotonin, to virtually disappear. These chemical changes impair nerve activity in the hippocampus, the brain region behind memory formation and emotional regulation. The team's findings showed that in cases of gut dysbiosis (microbiota imbalance), removal of part of the vagus nerve, which connects the brain and gut, is sufficient to help guard against depression[4] and cognitive decline.[5]

In 2022, working alongside Gérard Eberl and Ivo Boneca's units (Institut Pasteur), the same team revealed.[6] "cross-talk" between gut

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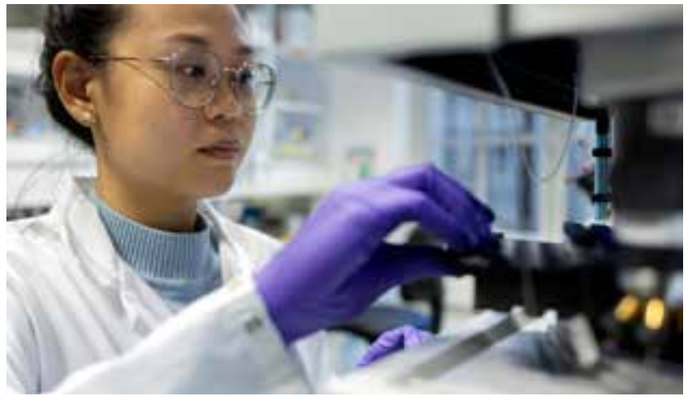
European efforts to tackle antimicrobial resistance

The Institut Pasteur and European Molecular Biology Laboratory (EMBL) have launched a large-scale initiative to advance interdisciplinary research in the field of infection biology. One project seeks to develop a new form of personalized therapy to limit the proliferation of antibiotic-resistant gut bacteria. It is coordinated by Till Strowig (Helmholtz Centre for Infection Research (HZI)) with the involvement of David Bikard (Synthetic Biology Unit, Institut Pasteur).

1. Maternal emulsifier consumption alters the offspring early-life microbiota and goblet cell function leading to long-lasting diseases susceptibility. *Nature Communications*, vol. 16. https://doi.org/10.1038/s41467-025-62397-3. July 29, 2025

2. *In vitro* microbiota model recapitulates and predicts individualized sensitivity to dietary emulsifier. *Gut*, vol.74. https://doi.org/10.1136/gutjnl-2024-333925. January 27, 2025

3. Effect of gut microbiota on depressive-like behaviors in mice is mediated by the endocannabinoid system. *Nature Communications*, vol. 11. https://doi.org/10.1038/s41467-020-19931-2. December 11, 2020



In the Biology and Genetics of the Bacterial Cell Wall laboratory

• • • bacteria and neurons in the hypothalamus (linked to appetite and body temperature regulation), with constant cross-talk between the gut and brain occurring under normal conditions. There is a risk of metabolic diseases (obesity, diabetes, etc.) if this axis is disrupted. "All this research encourages us to explore brain functions not by focusing on the organ itself, as we have done for centuries, but by taking a much broader view of the complex and interdependent mechanisms underlying mental function based on interaction between the brain and the endocrine, metabolic or bacterial system," concludes Pierre-Marie Lledo.

4. Gut microbiota changes require vagus nerve integrity to promote depressive-like behaviors in mice. *Mol Psychiatry.* 2023 Jul;28(7):3002-3012

5. Age-associated gut microbiota impair hippocampus-dependent memory in a vagus-dependent manner. *JCI Insight.* 2022 Aug 8;7(15):e147700. doi: 10.1172/jci.insight.147700

6. Bacterial sensing via neuronal Nod2 regulates appetite and body temperature. *Science*, vol. 376. https://doi.org/10.1126/science.abj3986. April 15, 2022

7. Maladaptive immunity to the microbiota promotes neuronal hyperinnervation and itch via IL-17A. *PNAS*, vol. 122. https://doi.org/10.1073/pnas.2525146122. December 22, 2025

Mapping the microbiota

In November, the Institut Pasteur and INRAE unveiled their open-source software capable of analyzing gut, oral and skin microbiota with unprecedented precision. For the first time, using gene catalogs specific to each ecosystem, Meteor2 offers simultaneous multifaceted characterization of the species, strains and functions present. By breaking down analytical silos, the tool provides the means to gain a more comprehensive picture and therefore a better understanding of the role of microbiota in health.

Thin-skinned

Of all the microbiota, the skin microbiota, which forms an interface between our bodies and the outside world, may be among those whose disruptions manifest most visibly. But does that equate to them being fully understood? Several projects are under way at the Institut Pasteur to try and advance our knowledge of this highly sensitive environment.
In late December, a framework collaboration agreement was signed with L'Oréal to develop joint research projects in the fields of skin microbiota and skin immunology. The first project within the scope of this collaboration involved a study coordinated by Clarisse Ganier from the Meta-Organism Unit on the role of sex hormones in skin immunity. Some skin diseases affect more women than men, which may be partly attributable to estrogen, progesterone or testosterone. Scientists from the same unit have recently published[7] the findings of their study of the biological mechanisms of psoriasis. Their research has revealed a novel circuit connecting the immune system, skin microbiota and the skin's sensory nerves.
Lastly, a clinical trial was launched for a Stage 2 hidradenitis suppurativa treatment, since existing treatments still offer insufficient efficacy. Led by dermatologists Maïa Delage and Aude Nassif at the Institut Pasteur Medical Center and conducted at several hospitals in France, it seeks to demonstrate the efficacy of a novel combination of four antibiotics. The results are expected in 2028.

Mental Health, cognition and neurodegeneration: unlocking the brain's secrets

Mental health issues, chosen as national cause of the year in 2025, affect one in five people in France, especially younger generations. Although mental disorders and conditions are generally well described, there is still much mystery surrounding the underlying mechanisms. Several Institut Pasteur projects are seeking to shed light on these gray areas.

In the Structures and Signals in the Neurogenic Niche laboratory

Elucidating the mechanisms of depression

More than a quarter of the world's population will experience a depressive episode at some point in their lifetime. But for 30% of patients, conventional treatments are ineffective – so there is an urgent need to explore novel therapeutic avenues, based on a better understanding of the mechanisms underlying depression.

This is the aim of Mariana Alonso, who leads the Emotional Circuits group within the Institut Pasteur's Perception & Action laboratory. Her team explored the negativity bias – a tendency towards an overly negative perception of sensory information and day-to-day situations.

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Exploring the effects of toxoplasmosis on neurological development

The team led by Pauline Spéder, Head of the Structures and Signals in the Neurogenic Niche laboratory, is working to improve understanding of the brain mechanisms triggered by infection with the parasite *Toxoplasma gondii (T. gondii)*, which causes toxoplasmosis. Around 30% of the world's population is infected with *T. gondii*, often without knowing it. The pathogen can remain dormant in the brain for long periods without causing symptoms, but it can be more serious in vulnerable populations, especially children, during acute or reactivated infections. The aim of the team's project is to elucidate the effects of brain infection with *T. gondii* on neurodevelopmental and cognitive disorders.

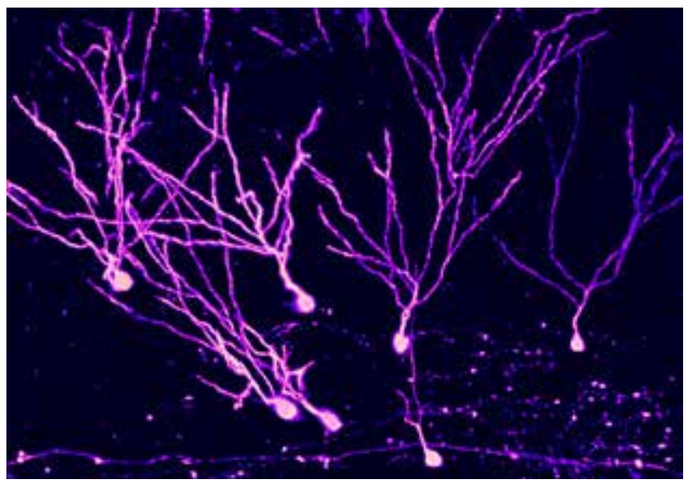
TOXOPLASMA GONDII: **THE CAT PARASITE** (VIDEO IN FRENCH, ENGLISH SUBTITLES AVAILABLE)

This phenomenon, which can drive depression and bipolar disorder, remains poorly understood.

The scientists revealed the role of certain neurons in the amygdala in this negative perception.[1] They demonstrated that in a depressive state, the neurons involved in encoding positive stimuli are less active than usual, while those responsible for encoding negative signals are overactivated. In other words, depression seems to induce a dysfunction of the amygdala circuits involved in encoding environmental messages, and this in turn further encourages the negative valence bias typical of depression.

“We were able to at least partly reverse the negative emotional bias induced in mice, and the related depressive behavior, by overactivating the neurons involved in the positive encoding of environmental stimuli. This is an interesting avenue to explore for the development of novel therapies,” explains Mariana Alonso.

UNDERSTANDING DEPRESSION WITH MARIANA ALONSO
(VIDEO IN FRENCH, ENGLISH SUBTITLES AVAILABLE)



New neurons produced in the brain of an adult mouse

The research paved the way for a novel clinical trial[2] coordinated by Chantal Henry, a psychiatrist at the Centre hospitalier Sainte-Anne and a scientist in the Institut Pasteur’s Perception & Action Unit. The trial, known as “EMOKET,” will test the efficacy of a novel rapid-acting antidepressant on negativity bias in patients and measure the restoration of normal activity in the amygdala using brain imaging.

Improving understanding of communication between brain cells

Following 20 years of dedicated effort, the team led by Chiara Zurzolo, Head of the Membrane Traffic and Pathogenesis Unit at the Institut Pasteur, made a major breakthrough when they demonstrated the existence of nanotubes for the first time *in vivo*, observed using fluorescence microscopy in zebrafish. Nanotubes, discovered *in vitro* in 2004, are thin membranes linking cells that are used to transfer various cell components. The scientists also found that nanotubes play a role in enabling pathogenic amyloid proteins involved in neurodegenerative diseases like Parkinson’s to circulate between cells. This discovery sheds new light on the mechanisms by which these toxic aggregates spread in the brain. The twofold demonstration – the existence of nanotubes *in vivo* and their involvement in the spread of amyloids – opens up major new avenues in our understanding of how neurodegenerative diseases spread and the potential identification of novel therapeutic targets.

PARKINSON'S & NANOTUBES, INVISIBLE TUNNELS IN OUR BRAIN
(VIDEO IN FRENCH, ENGLISH SUBTITLES AVAILABLE)

1. Disrupted basolateral amygdala circuits supports negative valence bias in depressive states. *Translational Psychiatry,* vol. 14. https://doi.org/10.1038/s41398-024-03085-6. September 19, 2024

2. Translational study of the neural circuits underlying the negative emotional biases of depressive disorders and their response to ketamine - EMOKET French National Research Agency. https://anr.fr/Projet-ANR-21-CE37-0030

Aleksandra Deczkowska is Head of the Brain-Immune Communication five-year group. This laboratory strives to elucidate the nature of interactions occurring between immune cells and the brain to help better understand how these communication pathways contribute to brain function. This research falls under scientific priorities 3 and 4 of the Pasteur 2030 Strategic Plan.

CHECK OUT OUR SCIENTIFIC PRIORITIES

The Institut Pasteur doubles down on pathogens

SCIENTIFIC PRIORITY #1 **INFECTIOUS DISEASE THREATS** *Leaders : Aude Bernheim, Olivier Schwartz*

This scientific priority involves more than a hundred interdisciplinary teams studying all types of pathogens – viruses, bacteria, fungi and parasites. The aim is twofold: to understand pathogens at molecular level, then use that knowledge to develop effective tools for surveillance, prevention and treatment.

In the Spatial Regulation of Genomes Unit

103

research entities involved

3

scientific outreach initiatives to explain infectious diseases and raise public awareness of future health challenges

(partnership with The French Virologist, "Nuit Blanche 2025," and France Télévisions documentary "Hunting invisible dangers – our scientists tackling the global threat of viruses and bacteria")

This first priority in the Strategic Plan involves all the Institut Pasteur's experts on infectious disease threats – whether viral, bacterial, fungal or parasitic – at a time when antimicrobial resistance (or AMR, a broad term encompassing resistance to antibiotics, antivirals, antifungals and antiparasitics) requires us to improve both our understanding and our ability to respond.

A dual aim: understanding pathogens and taking effective action

The first step is to develop a mechanistic understanding of how pathogens infect, develop and evade our defenses. This knowledge is then turned into operational drivers at every level, from surveillance and preparedness to therapeutic and preventive strategies. To achieve this twofold goal, we draw on a community of more than a hundred research entities, adopting an interdisciplinary approach involving microbiology, immunology, virology, parasitology, ecology, chemistry, engineering and data science.

Three core principles

The first principle is that interdisciplinarity breeds creativity. We bring together biologists, chemists and bioinformaticians at the outset of each project and encourage unconventional approaches to spark discoveries.

Second, state-of-the-art technologies like artificial intelligence can accelerate the scientific cycle by linking heterogeneous data, identifying testable hypotheses and rapidly devising effective experiments. And third, we need to look beyond academia, using suitable formats to foster dialog and share our questions, methods and results with other communities and society at large.

In 2025, the focus for Scientific Priority 1 was to develop this collective dynamic. Several events, such as workshops on AI and infectious diseases, provided opportunities to bring together different disciplines and scales, from fundamental biology to crisis preparedness. An internal call for seed grant funding was launched to support collaborative projects with high potential, aimed at speeding up the path to proof of concept and creating links between teams. Finally, a new antimicrobial resistance initiative was launched, involving a survey among the AMR scientific community to map needs, priorities and opportunities with a view to developing a flagship interdisciplinary project.

Pasteur in Action

"Virtual bacteria": a major step forward

The aim of the "Virtual bacteria" project is to develop digital twins of pathogenic bacteria. These AI models are capable of integrating molecular and functional information at several scales (data on growth, virulence and resistance; genomic, microscopic and transcriptomic data, etc.) to simulate bacterial behavior and generate testable predictions. The aim is not to replace experimentation but rather to speed up the scientific cycle by linking heterogeneous data and prioritizing hypotheses to rapidly devise experiments that address specific questions: What happens if these bacteria encounter a given antibiotic? How does a mutation change the way bacteria spread? Which weak point can be exploited? etc.

The project harnesses the unique Pasteurian ecosystem, with high-throughput screening, systems automation and modeling, expertise in language models applied to genomes, access to large-scale sequencing datasets, collaboration with National Reference Centers (CNRs) and collections of bacterial strains, and guidance on using these strains and accessing predictive data.

Progress in 2025:

- The focus in 2025 was the operational framework – a coordination team was set up, composed of five scientists from three departments (Grégory Batt, Aude Bernheim, David Bikard, Rayan Chikhi and Laurent Essioux).
- The team determined the scientific scope, identified priority use cases, began producing an inventory of usable data sources and clarified needs in terms of expertise and infrastructures.
- This stage laid the foundations for an interdisciplinary approach that will be crucial for turning the "digital twin" concept into robust, effective demonstrators.
- The project is designed to be incorporated into the Institut Pasteur's digital ecosystem and is based on in-house computing capabilities (computing power of around ≈70 GPUs – see definition on p. 11), supplemented by national resources if needed.

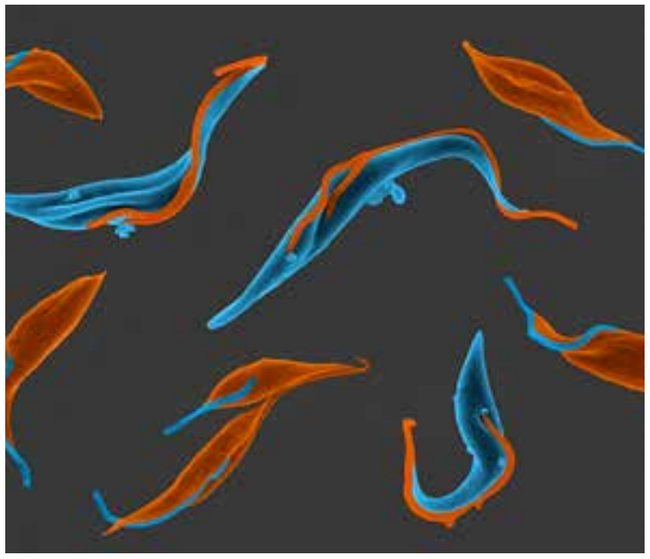
Environment and health: on the front line against future epidemics

SCIENTIFIC PRIORITY #2

ENVIRONMENTAL TRANSITIONS AND HEALTH

Leaders: Philippe Bastin, Anna-Bella Failloux, Arnaud Fontanet, Sarah Merkling

Priority 2 of the Pasteur 2030 Strategic Plan investigates the impact of climate and environmental changes on infectious disease emergence, including ever-increasing vector-borne threats, and aims to strengthen pandemic preparedness capabilities across the institute.



Mix of trypanosomes with normal or reduced length flagella

KEYWORDS

- Infectious disease ecology
- Vector-borne diseases
- Pandemic preparedness
- Climate change
- One Health

Since the early 2000s, 10 major outbreaks have highlighted a dramatic rise in emerging infectious diseases, driven by deforestation, wild meat hunting, intensive farming, climate change and global human mobility. Vector-borne diseases cause over 17% of infectious diseases and 700,000 annual deaths (WHO); climate-driven expansion of *Aedes* mosquitoes' range is increasing the risk of dengue, Zika and chikungunya in previously unaffected regions – including France, with a record number of indigenous chikungunya cases in 2025. The outlook for malaria, the deadliest vector-borne disease, is equally grim, as extreme weather events are predicted to intensify outbreaks in endemic areas and competent mosquito vectors invade urban areas.

Reproducing the full life cycle of vector-borne pathogens is essential for tackling them effectively but requires dedicated infrastructure. To address this threat and over decade-long infrastructure gaps, the Institut Pasteur is building a unique Center for Vector-Borne Disease Research, operational by 2028. This will establish the institute as the world's first research center studying the vast majority of WHO-identified vector-borne pathogens, merging research in virology, parasitology and bacteriology with entomology and imaging at all levels (molecules in pathogens and host cells, vectors, tissue, organs and whole model organisms). In connection with the Pasteur Network, this initiative continues the legacy of Nobel laureates Laveran and Nicolle, pioneers of medical entomology who established field-based malaria and typhus control strategies in endemic countries during the early twentieth century.

This priority area leverages the Pasteur Network's 32 members across 25 countries, including 17 in disease emergence hotspots, that served as national and WHO reference laboratories during Ebola, pneumonic plague, COVID-19, and mpox outbreaks. The Pasteur Pandemic Preparedness Initiative (P3i) structures readiness around 4 pillars: organizational and logistical preparation for crisis management, surveillance strengthening through National Reference Centers and the CIBU (Biological Emergency Response Unit), the new Center for Vector-Borne Disease Research, and rapid development of diagnostic tools and vaccines. In 2025, the Institut Pasteur was identified as a key partner of the European Vaccines Hub (EVH), a €170 million funding initiative, coordinating preclinical studies on vaccine and monoclonal antibody prototypes against major pandemic threats. The recently reactivated Outbreak Investigation Task Force (OITF), now coordinated by a dedicated epidemiologist (Michael Casera), ensures rapid field deployment of multidisciplinary response teams supporting local authorities in the early stages of outbreaks. Partnerships with IRD, CIRAD, INRAe, ANRS Emerging Infectious Diseases, Inserm, and the IBEID (Integrative Biology of Emerging Infectious Diseases) LabEx and its 50 laboratories boost this capacity.

By 2030, this priority aims to advance recognized expertise in infectious disease with a special focus on vector-borne diseases, improve surveillance for more environmentally friendly control, and recruit and train up the next generation of scientists to address these environmental transitions and health challenges. The ultimate objective is to maintain the Institut Pasteur's global leadership in elucidating complex interactions between the environment, pathogens, and public health protection.

New G5 team: Insect Immunity and Infection - Sarah Merkling

This laboratory, launched in 2025, uses high-resolution single-cell analysis to identify how to reduce virus transmission by mosquitoes and develop innovative strategies to control vector-borne diseases. See page 9

"What is most important is recruiting and training the next generation to carry on our work, ensuring that the Institut Pasteur maintains research momentum while strengthening expertise against vector-borne diseases and anticipating future outbreaks."

Pasteur in Action

Mpox response and African institute capacity boosting

Following WHO's August 2024 emergency declaration, the Institut Pasteur launched a major initiative to tackle mpox in sub-Saharan Africa with the support of the Stavros Niarchos Foundation (SNF). Building on previous work from Institut Pasteur teams that helped identify a rope squirrel species, *Funisciurus anerythrus*, as a reservoir for the mpox virus, this project reflects the Institut Pasteur's commitment to studying emerging infectious diseases at the environment-health interface. The initiative involves 7 Paris campus teams with 6 institutes in sub-Saharan Africa (Cameroon, Central African Republic, Côte d'Ivoire, Guinea, Niger and Madagascar). Following the expansion of mpox variants I and II on the African continent, the project will use serological testing to assess the true prevalence of the ongoing epidemic in at-risk populations (exposed to the animal reservoir in forest areas or sexual transmission in urban areas). It will provide crucial surveillance data to inform WHO and Africa CDC decision-making.
The project will further strengthen response capacities to future pandemic threats through four pillars: developing molecular and serological diagnostic tests; real-time genomic sequencing of variants; characterizing viral evolution; and integrating data into mathematical models optimizing vaccine deployment strategies in affected countries. This initiative addresses post-COVID preparedness gaps by introducing permanent genomic and serological surveillance capabilities in the Pasteur Network's African institutes, serving beyond the current emergency to detect and control future zoonotic threats.

Cancer, neurodegenerative diseases, allergies – exploring the origins of chronic diseases

SCIENTIFIC PRIORITY #3 **ORIGINS OF DISEASES** *Leader: Gérard Eberl*

Priority 3 of the Pasteur 2030 Strategic Plan focuses on an alarming reality: chronic, non-communicable inflammatory diseases are affecting ever younger populations. The Institut Pasteur is harnessing its expertise in systems biology, microbiome science and modeling to elucidate the origins of these genetic, environmental or tissue imbalances and devise novel prevention strategies.

In the Biomaterials and Microfluidics core facility

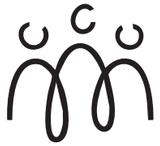
Chronic, non-communicable inflammatory diseases (cancer, neurodegenerative disorders, asthma and allergies) are rising at an alarming rate and affecting ever younger populations. According to the World Health Organization (WHO), by 2050 the number of cancer cases is expected to rise by 70% and the number of people with neurodegenerative diseases by 170%! These conditions, often associated with environmental exposure, diet or infections, reflect sometimes lasting disruptions to homeostasis (the body's ability to maintain its internal balance), which increase vulnerability to other diseases. Drawing on its expertise in systems biology, computational modeling and translational research, the Institut Pasteur is seeking to understand how these imbalances trigger, exacerbate or maintain pathological processes.

Elucidating tissue physiology
An initial focus area is the development, structure and function of tissue barriers (such as the gut, lungs and skin) and vital organs, especially the brain. State-of-the-art preclinical models, including organoids developed with the Imagine Institute and Institut Necker-Enfants Malades (INEM), are being used to study the impact of environmental stressors on tissue resilience, regeneration and repair.

The host as "metaorganism"
This second area explores the host as a metaorganism by analyzing the interactions between the microbiome (bacteria, viruses, fungi and other symbionts), physiological processes, the metabolism and the immune system. The aim is to use metabolomics, genomics, computational biology and deep learning approaches (one area of artificial intelligence) to identify novel antimicrobial strategies and shed light on the role of microbial ecosystems in chronic inflammation. Research on organoids involves collaborations with the Institut Curie and Imagine Institute.

Understanding long-term disease development
This final scientific area looks at the long-term development of diseases, especially the sequelae of infections, inflammation and nutritional imbalance. The Institut Pasteur draws on its expertise in infectious diseases to analyze post-infectious syndromes, particularly long COVID, and their links with chronic inflammation, neurodegenerative disorders and cancer.

This approach also looks at genetics, sex and age to help understand variations in susceptibility and sequelae, in conjunction with the "Milieu Intérieur" LabEx and iWISH Women's Health Institute at Université Paris Cité.
The aim is to redefine prevention and treatment of non-communicable diseases by restoring tissue homeostasis and boosting long-term resilience.



50%

of the world's population could be affected by asthma or allergies by 2050
(source: WHO)

Pasteur in Action

Pooling scientific expertise to understand the origins of diseases

When Scientific Priority 3 in the Pasteur 2030 Strategic Plan was launched in 2025, the first step was to foster interdisciplinary dialog on the origins of diseases.

"Sci-lunch" events were an effective format for informal discussion, presentations and scientific conversations. The lunches soon led to the development of contacts and networks, facilitating scientific monitoring over multiple disciplines and opening up horizons beyond the Institut Pasteur with guest speakers from academia, medicine and industry. These events also highlighted specific examples of interdisciplinary collaboration, especially through feedback from postdoctoral fellows who had developed their own collaborative projects after obtaining internal seed grant funding. As well as bringing scientists together, the "sci-lunches" improved scientific communication on campus, a key dimension for this scientific priority which by its nature is interdisciplinary and cross-cutting, involving various scientific departments.

We also engaged in discussions with the scientific coordinators of Priority 4 (see next page) on the subject "The influence of environmental stress factors on disease emergence." These talks highlighted a number of areas of convergence which have served as the basis for a position paper, currently under preparation. The paper will clarify the Institut Pasteur's scientific positioning, consolidate existing synergies and facilitate the development of future initiatives and collaborations.

These various measures strengthened links between scientific teams and departments, leading to collaborative projects and helping to structure what is a particularly broad scientific priority.

Exploring periods of vulnerability, from embryogenesis to old age

SCIENTIFIC PRIORITY #4 **HEALTH & DISEASE AT THE EXTREMES OF LIFE**

Leaders: Ana Cumano, Darragh Duffy, Philippe Sansonetti, Chiara Zurzolo

This priority focuses on two key phases of life: the first 1,000 days, when health trajectories are set; and old age, characterized by immune decline and chronic inflammation. It also explores the influence of biological sex on these mechanisms to identify novel drivers for prevention and resilience, via a cross-cutting approach in conjunction with other research areas on campus.

Early life development and aging are periods in which we are more vulnerable to disease, but they also offer unique windows of opportunity for prevention. In infants, the immune system is still maturing. In the latter stages of life, immune decline and chronic inflammation increase susceptibility to infection, cancer and neurodegenerative diseases. Yet the biological mechanisms behind these transitions are still only partly understood.

Scientific Priority 4 of the 2030 Strategic Plan draws on expertise in developmental biology, immunology, microbiology, neuroscience, genomics and data science to study immunity, inflammation and tissue resilience at the extremes of life. Making use of the Institut Pasteur's state-of-the-art core facilities and longitudinal cohorts, the scientists explore interactions between infections, immunity, metabolism and aging, as well as the mechanisms involved in genomic instability, regulation of X and Y chromosomes, DNA repair, mitochondrial and lysosomal dysfunction, cellular senescence, stem cell depletion and immune remodeling.

Early immune programming at the start of life
The first 1,000 days of life, from conception to age two, have a lasting impact on health trajectories (see opposite). But the mechanisms behind this early programming are not yet well characterized. The Institut Pasteur's work is in line with national initiatives on early-life health and fertility, and involves close collaboration within France and the Pasteur Network. Our experts use experimental models, organoids, systems immunology, epidemiology and clinical research as they seek to identify early biomarkers for dysfunctions and vulnerabilities.

The biology of healthy or unhealthy aging
With the global population of over-60s set to double by 2050, understanding the mechanisms underpinning physiological and pathological aging is a major biomedical challenge. The Institut Pasteur is studying how chronic age-related inflammation, metabolic dysregulation, and dysfunction in cellular organelles such as mitochondria and lysosomes can remodel tissue function and modify responses to infection, vaccination, cancer and neurodegenerative diseases.
The Pasteur 2030 strategy sets out to identify cellular resilience mechanisms and vulnerability factors that can be targeted, with the aim of extending healthy life expectancy and preventing age-related functional decline.

How do the first 1,000 days of life influence our health trajectories?

1 **During pregnancy,** maternal physiology, immune adaptations, the microbiota, nutrition and environmental exposure interact with fetal development.

2 **At birth,** microbial transmission, breastfeeding, close contacts and initial exposure to infections and vaccines influence the maturation of the immune system and metabolic programming.

3 **In infants,** disruptions to these interactions are associated with asthma, allergies, obesity, diabetes and neurodevelopmental disorders, as well as increased susceptibility to infectious diseases.

4 **Interactions between early-onset infections, the maturation of the immune system and vaccine responses** are key to understanding health trajectories and better protecting the mother-child dyad.

Pasteur in Action

Improving visibility, consistency and structure

In 2025, the coordinators of the "Health at the extremes of life" scientific priority focused on improving the visibility and consistency of this research area, establishing a clear structure based around the topics of development, early life, aging, and mother and child health.

An initial step was to map existing projects on campus onto these topics. The resulting map provides an overview of expertise, themes and research dynamics and serves as a tool to improve scientific coordination and target funding, especially philanthropic support. At the same time, the "Late-Life Diseases" symposium helped structure research on aging at the Institut Pasteur by establishing joint priorities via flagship projects.

A series of monthly "Mother and Child" seminars was held to address major challenges in reproductive health and the mother-child dyad, while also promoting interdisciplinary dialog. The international symposium "Sex Differences in Immunity," organized in partnership with the Milieu Intérieur project and the European Federation of Immunological Societies (EFIS), brought together experts in immunology, sex-linked biology and translational research.

A Translational Science Day on the integrative biology of the mammary gland and lactation, organized with the Institut Pasteur Medical Department, was held as a means of connecting basic and clinical research – a priority for the Institut Pasteur. A joint event was organized with Scientific Priority 3, "Origins of diseases," at the Fondation Hugot (Collège de France), to explore the impact of environmental stressors, such as infections, the microbiota and immune responses, on disease programming throughout life.
Two five-year groups (G5s) were recruited to conduct research related to this scientific priority, following the Institut Pasteur's international call to attract early career scientists. Finally, the Seed Grants call, launched in 2025, will fund new interdisciplinary projects in 2026 led by pairs of PhD students, postdoctoral fellows and engineers, on topics within this research area.

Agnes Ullmann building, the former hospital. In the early 20th century, the Institut Pasteur hospital marked a turning point in the history of hospital architecture. For the first time in Europe, patients were placed in isolation. The hospital closed in 1999. The entire building was restored and refurbished between 2019 and 2023.

A human-centered, sustainable, inclusive campus: looking beyond the science

HR development, environment, gender equality, inclusion and ethics are all key focus areas at the Institut Pasteur, addressed on a daily basis by operational teams and staff on campus. These measures are part of a broader cross-cutting strategy within the Pasteur 2030 Strategic Plan.

From onboarding to AI: HR initiatives that meet practical needs

In 2025, the Human Resources Department developed various initiatives designed to meet the needs of staff on campus, as part of a wider approach aimed at consolidating the Institut Pasteur's HR fundamentals.

There was a focus on the international community, with various measures to onboard staff from outside France, address their requirements and help them settle in: opportunities for discussion with HR teams about administrative procedures, dedicated webinars (on income tax), accessible resources (HR FAQ, intranet and online training) and the continued development of the "Settling and Living in France" initiative.

Implementation of the Skills Development Policy continued, winning a Best Learning Strategy silver trophy in 2025. The policy encompasses a variety of formats, with in-person training, online resources and courses suited to different profiles on campus. New for 2025, the "AI events" series on acculturation and uses of artificial intelligence proved highly successful, with 1,000 participants across all formats. The series included webinars and masterclasses on practical applications of AI in the workplace.

In connection with Pasteur 2030, a program was launched to support managers in their managerial practices, including discussions and training. In 2025, a forum and conference on positive workplace relationships laid the

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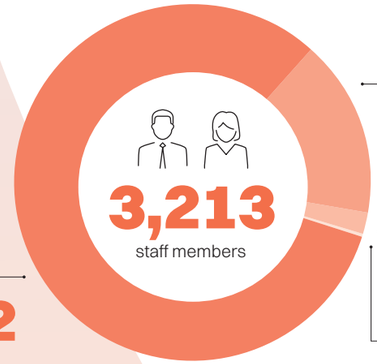
Our human capital

93
nationalities on campus (employees and OREX)

2,592
Institut Pasteur employees



549
employees from external research organizations (OREX)

56
interns* (figures at December 31, 2025)

16
scientists with grants

58.1 %
scientists and research engineers out of a total of 3,141 Institut Pasteur employees and OREX

41.7
average age of employees

526
people hired in 2025 (excluding fixed-term to permanent contracts), 44.3% of whom were scientists

Skills development and career support

€4,189 k
invested in professional training (teaching costs, time spent training and compulsory contributions)

46,189
training hours including 12,872 hours for OREX and interns

11,033
staff registered on training courses (Institut Pasteur employees, OREX and interns)

195
Number of scientists supported by CARE, the career development service for scientists

FIND OUT MORE ABOUT CSR AT THE INSTITUT PASTEUR IN OUR COMMUNICATION ON ENGAGEMENT (2022-2024)

foundations for the initiative and informed the ongoing discussions.

Finally, the measures to improve disability inclusion pursued since 2023 with the support of the Disability Office are beginning to make a significant difference – the number of employees at the Institut Pasteur who reported having a disability rose by 48.5% between 2023 and 2025.

From lab to planet: action on social and environmental issues

We are aware of our social responsibilities and pay close attention to the social, environmental and economic impact of all our activities. The Institut Pasteur supports the United Nations Global Compact and its ten principles on human rights, labor standards, environmental protection and anti-corruption. The CSR Department regularly submits a report to the UN on the Institut Pasteur's commitments, detailing the efforts made by all teams on campus.

We are committed to sustainable development and especially to reducing the environmental impact of our activities. In 2025, several practical measures were adopted to improve our environmental performance in tangible ways.

One stand-out project, supported by a multidisciplinary team, was FreezeClean, designed to transform laboratory practices by optimizing the use of -80°C freezers to reduce our carbon footprint and lessen energy consumption.
The GreenTeam drove a collective effort on campus, with over a hundred ambassadors implementing specific initiatives such as:

- BioShelf, co-developed with the CSR Department – a tool to connect scientists so that they can share laboratory products.
- RegenBox, a device for recharging alkaline batteries.
- The "Pasteur, Tomorrow" lecture series, co-organized with the CSR Department, to promote environmental and societal topics.

These initiatives were accompanied by a concerted training drive, with more than 600 staff completing Climate Fresk® training since 2023. Various measures were also taken to promote biodiversity on campus, including the installation of insect hotels and bird boxes, "Fête de la Nature" events and posters to raise awareness.

Efforts to improve sustainable mobility also moved up a gear, with the support of internal stakeholders (the CSR and Real Estate and Technical Departments and the cycling section in the CSE), with mechanics workshops, training, equipment and team challenges, resulting in "Pro-Cycling Employer" certification in 2025.

Gender equality in the workplace

59.2%
female staff at the Institut Pasteur

68.1%
of 2025 recruits were women

49.2%
of scientists are women

57.8%
of research engineers and 68.7% of research technicians are women

99/100
Gender Equality Index in 2025 (third year running)

40.7%
of governing body members are women
(Since 2023, the share of women has risen by more than 9 percentage points, from 31.6% to 40.7%, an increase of nearly 30%)

33.5%
of scientific entity heads are women

Diversity, equity and inclusion – from policy to culture

A key milestone was reached in the implementation of the Institut Pasteur's Diversity, Equity and Inclusion (DEI) strategy. After developing the policy in 2024, 2025 was an opportunity to consolidate governance, improve interdepartmental coordination and foster a culture rooted in equity, safety and respect.

These efforts resulted in a packed agenda in 2025, with 37 DEI and intercultural events and 17 information sessions on cognitive bias, inclusion and preventing gender-based and sexual violence. The monthly Diversity Fresco provided a space for dialog and discussion. Other initiatives include the dedicated DEI intranet, a twice-monthly newsletter, a steering group with more than 20 members, three new affinity groups, the Pasteur Queer Club and the Babel language network (with 120 active members).

Key measures planned for 2026 include mandatory DEI training, an internal reporting system, and general and academic mentoring programs. We will also continue to promote the "One Pasteur" vision, breaking down silos to work better together. "One Pasteur" also means promoting the role of women in science and creating more equitable working environments, in pursuit of inclusive science.

CHECK OUT OUR COMMITMENTS TO ETHICS, INTEGRITY AND COMPLIANCE

Ethics, confidence, transparency: strong foundations

Through our Ethics Charter, we at the Institut Pasteur are committed to responsible, ethical, transparent research, conducted with fairness and respect for human dignity. We are proud to be a non-profit foundation with recognized charitable status and are constantly striving to act in the public interest and to uphold the universal, generous, human-centered vision of Louis Pasteur. Many of our commitments go beyond mere compliance with legal or regulatory obligations, and we guarantee their effective application by ensuring that our committees are fully independent.

In the Virus Sensing and Signaling five-year unit

Sustainable development in figures

+600
people completed Climate Fresk training, with 44 workshops organized since 2023

2
"Pasteur, Tomorrow" lectures were held

14
departments are involved in CSR governance

+115
cyclists participated in the cycling challenge, covering more than 10,000km

Our revenue in 2025 and how it was used

The Institut Pasteur has a funding model based on diverse, mostly private funding sources. This model has guaranteed the institute's independence since its inception in 1887, which was made possible by an international appeal for funds. In a difficult economic context, a reflection process has been initiated to update this model and secure our capacity to advance science for the benefit of public health.

Revenue

According to the Institut Pasteur 2025 Statement of source and application of funds, the revenues reported in the income statement amounted to **€402.5** million, with the following breakdown:

Public donations

33.9%

Own income and revenue

22.5%

Private research contracts + public funding

22.9%

Public subsidies

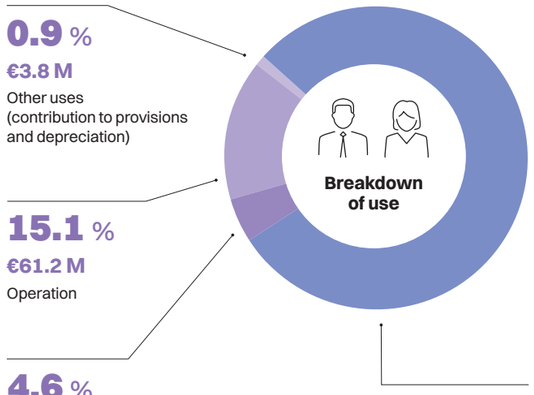
16.1%

Industrial revenue

4.6%

Use

The revenues reported in the income statement are earmarked as follows: Institut Pasteur mission areas €295.9 M, fundraising proceeds not used during the fiscal year earmarked for mission areas €25 M, operation €61.2 M, fundraising expenses €18.6 M and contribution to provisions and depreciation €3.8 M, implying a deficit of €2 M.



The Institut Pasteur's assets

As a foundation officially recognized for its charitable status since 1887, the Institut Pasteur has a duty to grow the assets it has built up over time. Efficient asset management generates income and guarantees its ability to fulfill missions of public interest over the long term. The institute has four main types of productive asset (see below).

En 2025	€M	%
Total	**977**	**100**
Property	135	14
Securities	644	66
Private equity/strategic partnerships	158	16
Cash	40	4

Productive assets account for 2.9 times the Institut Pasteur's annual operating costs excluding contracts (ratio set out in late 2025). These assets generated €34.4 M during the 2025 fiscal year, reported in the income statement.

Income statement

In 2025	€M
Total	**34.4**
Property	6.3
Securities	24.8
Cash	3.3

In addition to its productive assets, the Institut Pasteur owns all its buildings in rue du Docteur Roux in Paris and its scientific equipment, reported on its balance sheet as tangible capital assets. It also owns its brand name and a portfolio of patents, which are not reported on the balance sheet but in the income statement for their revenue from license agreements.

Public gifts and donations

Public gifts and donations account for a third of the funding sources relied upon by the Institut Pasteur; €136.5 M was raised in 2025.

For each **€100** raised:

- **€77** Mission areas (research, public health, education)
- **€11** Fundraising expenses
- **€12** Operating expenditure

Income statement

The financial statements presented in the financial report concern the Institut Pasteur foundation in Paris, Institut Pasteur de la Guadeloupe, Institut Pasteur de la Guyane and Institut Pasteur de Nouvelle-Calédonie.

In 2025	€M
Institut Pasteur Paris operating revenue	**- 66.0**
Contrib. IP Guadeloupe, Guyane, N.-Calédonie	-1.9
OPERATING INCOME	**- 67.9**
Institut Pasteur Paris financial result	**64.1**
Contrib. IP Guadeloupe, Guyane, N.-Calédonie	0.5
FINANCIAL INCOME	**64.6**
Institut Pasteur Paris non-recurring income	**1.3**
Contrib. IP Guadeloupe, Guyane, N.-Calédonie	
NON-RECURRING INCOME	**1.3**
NET INCOME	**-2.0**

In 2025, net income showed a deficit of €2 M, slightly higher than in 2024 (€-1.3 M), €1.4 M of which was due to the institutes outside mainland France.

The situation in relation to 2024 is due to an improvement in "non-operating" (financial and non-recurring) items of €1.6 M and an increase in operating deficit of €2.3 M.

"For the past four years we have observed a decline in the assets/budget ratio which is threatening our independence and ability to invest in the Institut Pasteur's future. During the 2025 fiscal year, we implemented initial measures to better manage expenditure with a more frugal approach to operation and suspension of major real estate investments. This last measure did not include scientific projects such as the vaccinology center. At the same time, philanthropy has witnessed remarkable growth. Working groups are continuing to advance their work on philanthropy, assets, innovation and payroll to adapt our business model and secure our trajectory.

A big thank you to our valued philanthropists – your growing generosity is our primary resource"

ALBAN HAUTIER, Senior Executive Vice-President of the Institut Pasteur

Thank you for your loyal and generous support

In 2025, nearly a third of our resources came from private donations and legacies from individuals and companies. Your generosity is what gives our scientists the means to pursue their research.

Funding from donors, partner companies and foundations enabled our 1,800 scientists to advance human health in 2025. Nearly 200,000 donors offered their support. More than 31,000 of them opted to set up a standing order so that they could spread their donations over the entire year. In October 2025, the 19th edition of Pasteurdon rallied our generous donors alongside Pasteurdon patrons Kad Merad and Julia Vignali, as well as the presenters and journalists from our 50 TV and radio media partners.

Thank you to our key partner, the Fondation Pour l'Audition

The Fondation Pour l'Audition has supported the Hearing Institute (an Institut Pasteur/Inserm/CNRS center) since its inception in 2019. In 2025, the Fondation Pour l'Audition signed a 4-year extension to its partnership agreement with the Institut Pasteur, the host foundation for the Institut reConnect.
It is a key partner in our hearing and speech research. Thanks to its support, both in-kind and financial, the Institut reConnect has two additional hospital sites, namely the Audiology Research Centers at Pitié-Salpêtrière and Necker-Enfants Malades hospitals (AP-HP).

Major donors and family foundations
On January 13, 1886, following the success of the rabies vaccine developed by Louis Pasteur, Count de Laubespin became the Institut Pasteur's first major donor. He was the first to believe in the establishment of an institute where research, public health and scientific teaching would come together under the same roof. This outpouring of generosity continues today: the ongoing support of our major donors provides our scientists with the best possible conditions to advance knowledge in biomedicine, enabling them to pursue bold, creative and rigorous research driven by curiosity and characterized by excellence. We would sincerely like to thank the many people who have joined our Major Donors program.
We particularly extend our thanks to Mr. and Mrs. Janbon, the Lefoulon-Delalande Foundation (under the aegis of the Institut de France), the Fondation John Bost, the members of the Explore program and the donors to the G5 initiative for their very generous contributions.
As an individual or family foundation joining the Major Donors program, you will be involved throughout the year in the research that you have chosen to support. You will receive scientific publications of interest to you as well as the Institut Pasteur quarterly newsletter. Moreover, you will have access to the "Pasteur Class" (a monthly biology course for major donors), regular meetings with scientists and "bespoke" meetings arranged to suit your needs, as well as lectures and laboratory tours. We will listen carefully to your requirements and work with you to develop your donation project.

FOR FURTHER INFORMATION, PLEASE CONTACT CAROLINE CUTTÉ ON +33 (0)1 45 68 81 04, CAROLINE.CUTTE@PASTEUR.FR

Donations from companies and foundations
Once again this year, we would like to express our heartfelt thanks to our sponsors, companies and foundations, whose tireless commitment enables our scientists to push back the boundaries of science, for the benefit of human health. Pasteurdon, our major annual appeal, uses various methods including charity-linked products to involve customers in the fundraising process. In 2025, the fifth edition of "Les Rendez-Vous de Louis," an event for benefactors, explored the mechanisms underpinning longevity. Joining the Benefactors Circle is an opportunity to engage in a unique dialog with science and encourage scientific progress.

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- Foundation S – Sanofi Collective
- Mutuelle du médecin

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- CRÉDIT MUTUEL ARKÉA
- Fondation Bullukian
- Fonds de dotation Villa M
- SCOR
- Société Générale
- Terres d'Entrepreneurs

International fundraising
The International Philanthropy Unit continued its work in 2025. A targeted strategy and more active dialog with our international partners attracted new sponsors and donors from outside France. Their perennial support reflects the development of a relationship of trust with our teams, giving scientists the resources to work on ambitious research programs in line with the Institut Pasteur's strategic priorities, some in collaboration with our international institutional partners, especially in the United Kingdom.
The Institut Pasteur's sister foundations in the United States, the United Kingdom and Switzerland are actively involved in these efforts. The organization of quality events and exclusive meetings between donors and scientists strengthens the support of our sponsors in these three countries and expands our network of committed local partners. This collaborative approach creates the conditions for effective international philanthropy that is increasingly making a difference to research and wider society.

Legacies and gifts
In 2025, the Institut Pasteur was grateful to receive 167 new legacies worth €53.8 million, as well as €22.3 million in life insurance gifts. Our six legal experts and life insurance manager are responsible for handling the associated estate administration in accordance with AFAQ's ISO 9001-2015-certified procedures, a guarantee of quality. Two members of the Gifts Office have been assigned to testator development and relations with a view to promoting legacies among the public and answering any questions regarding this means of making a final contribution. A media campaign to promote gifts was run in August using the same TV spot as in previous years. Our generous testators receive a special six-monthly "Gifts" newsletter and are invited to scientific lectures given by our researchers. The Institut Pasteur is very grateful to everyone who has chosen to support it with a legacy, donation or life insurance gift.

In 2025, four events with experts were held as part of the Think Tank on Philanthropic Trusts, coordinated by the Legacies and Gifts Department. Topics discussed included impact investing, citizen involvement in environmental and social issues, and the challenges of philanthropy in democratic societies.

The seventh edition of the Conference on Philanthropic Trusts was held in December 2025. All these events result in the regular publication of podcasts, videos and articles at **philanthropie.pasteur.fr** and on social media.

Board of Governors

The Board of Governors makes decisions on all Institut Pasteur matters. It gives its opinion on the strategic policies proposed by the President, votes on budgets, and approves the financial statements contained in this annual report.

BOARD OF GOVERNORS BUREAU

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MORE INFORMATION ABOUT THE BOARD OF GOVERNORS AT PASTEUR.FR

Scientific Council

The Scientific Council advises on all issues relating to scientific policy, organization, and research and teaching programs. The Council is consulted on all research and teaching unit creation, closure and merger decisions.

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Vice-chair: Gerald Spaeth
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Other Pasteurian members: Arnaud Echard, Ivo Gomperts Boneca and Louis Lambrechts
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CHECK OUT THE SCIENTIFIC ROLE OF EACH MEMBER AT PASTEUR.FR

Management of the Institut Pasteur

The Institut Pasteur is run by the President, who reports to the Board of Governors. The President, a figure from the world of science, prepares and implements strategic planning. He or she is supported by a management team comprising an Executive Board and a Senior Management Board.

CHECK OUT THE FULL INSTITUT PASTEUR MANAGEMENT TEAM AT PASTEUR.FR

This annual report was designed and produced by Bergamote, an agency certified by AFNOR (grade*** – Exemplary), which, like the Institut Pasteur, is a member of the United Nations Global Compact aimed at encouraging companies and organizations to adopt socially responsible attitudes.

This edition was reduced to just 52 pages to optimize production processes (less paper used and fewer setup changes). The smaller page count also reduces mailing costs.

This document was printed by an Imprim'vert and ISO 14001 certified supplier on Nautilus paper made from 100% recycled materials sourced from sustainably managed forests (FSC® certified). This paper is also fully biodegradable and recyclable. Vegetable inks were used.

Print copies were limited to support responsible paper use and save on resources as much as possible.

This report was produced in line with the Institut Pasteur's procurement policy, which is guided by a buyers' code of ethical conduct and part of the Institut Pasteur's Charter for the Prevention and Management of Conflicts of Interest. This procurement policy implements environmentally friendly practices and promotes sustainable initiatives; it defines the missions of the Procurement Department and sets out the Institut Pasteur's values and commitments in its dealings with suppliers.

Head to page 42 of this report for our sustainable development commitments, and to our dedicated web page for our broader commitments:

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