ANNUAL REPORT

Institut Pasteur de Lille

Live better for longer

2024

RESEARCH AND PREVENTION AT THE SERVICE OF HEALTH FOR ALL

A PRIVATE FOUNDATION RECOGNISED AS A PUBLIC UTILITY SINCE 1898

ANNUAL REPORT 2024

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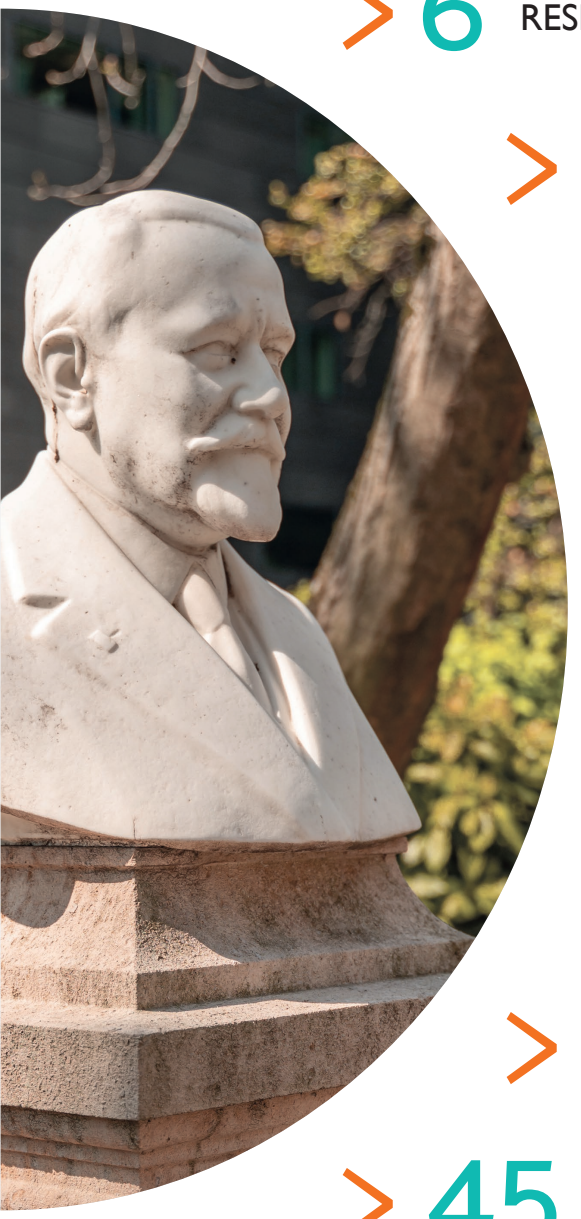


Interview

with **Professor Frédéric Batteux,** Director of the Institut Pasteur de Lille

» What were the Institut Pasteur de Lille's highlights in 2024?

2024 was a particularly significant year for the Institute, for both the research centre and the prevention centre, as well as the Foundation as a whole.
For the research centre, scientific output has continued to be strong, with a quality and publication rate by researchers that has secured Institut Pasteur de Lille's teams' place among the leading major research institutes, across all of our areas of expertise: infectious and emerging diseases, metabolic diseases, cardiovascular diseases, neurodegenerative diseases, diabetes, obesity, and cancers. Our teams' scientific work quality was praised during the HCERES evaluation where 80% of our teams were deemed excellent, 25% of whom were remarkable, i.e. the highest evaluation level. These results demonstrate the quality and particularly innovative nature of our research and the strength of the scientific project around infectious diseases and age-related diseases. This project was launched more than 10 years ago, and is highly pertinent at a time when the effects of an ageing population are beginning to be felt. To support this strategy's success and promote multidisciplinary and cross-disciplinary collaboration, a major property investment project was launched, allowing some of our teams to move this year into a fully renovated building specifically designed for 21st-century research. This cross-disciplinary approach is reflected in the growing number of multidisciplinary projects focused on host–pathogen interactions, as well as in the development of new technologies such as "organs-on-a-chip," which facilitate collaborative projects among multiple teams across the campus. All of this makes Institut Pasteur de Lille's teams highly attractive, with 3 new researchers joining us in 2024.
For the preventive healthcare centre, the year was marked by a reorientation of our strategy, expanding our well-established expertise in nutrition and physical activity toward the development of broader initiatives in global health. This reorientation meant reorganising the team, which is never easy, but which should allow us to respond more effectively to our prevention missions aimed at the most vulnerable. In addition, 2024 was marked by the rollout of tele-expertise and teleconsultation services in vaccinology and travel medicine, as well as by the deployment of the latest SAGE 2 software across our prevention centres in Lille, Tourcoing, and the Artois region. And finally, our links have been strengthened with the research centre, particularly around environmental health issues.
The Foundation's administrative teams were mobilised in all areas to support the Institute's scientific and medical teams. Considering the current strained financial context, the teams were tasked with improving our presence and boosting public and institutional stakeholders' awareness of the core needs required to undertake an ambitious scientific and medical project. Processes were reviewed to make them ever more agile, responsive, and financially efficient. Our teams intensified their efforts to be ever more present and attentive to the Institute's personnel and partners. This period demonstrated our determination to review our processes and organisational structures to ensure that every euro raised is a euro well spent.

» For 130 years, the Institut Pasteur de Lille has been both a world-renowned research centre and a major player in public health in the Hauts-de-France region. What is your view of this dual mission?

The Institut Pasteur de Lille was founded in 1894 by Louis Pasteur, who appointed Albert Calmette as its first director. Calmette was a doctor and founded both the research centre where he developed the BCG vaccine and, given the urgent health situation at the time, the prevention centre - the first French centre dedicated to combating tuberculosis. Since then, we have upheld this tradition of research and prevention, focusing on the major public health challenges of our era: infectious and emerging diseases, age-related illnesses, and global healthcare initiatives to help the most vulnerable populations, both within our prevention centre and beyond. Our goal is, of course, to maintain these two entities, which, beyond our history, represent our strength and uniqueness and shape our ambition, especially by reinforcing the links between these two Pasteur units, be it preventing infectious diseases or tackling chronic conditions such as diabetes, obesity, cardiovascular, and neurodegenerative diseases, which hit the population particularly hard when other risk factors combine with advancing age. These are fully-fledged clinical studies in prevention that originate from our research laboratories and are carried out in our medical preventive healthcare centres. For example, more than 2,000 socioeconomically vulnerable prediabetic individuals were monitored over three years to improve understanding of the

pathophysiological factors influencing progression to disease, while giving participants access to the highest level of expertise in fundamental research. We are also working with a Lille-based company to integrate AI into the assessment and monitoring of vulnerable people as part of their preventive care pathway.

» How does having the status of a private foundation of public interest help the organisation be more effective in serving the public good?

This status, like that of Institut Pasteur de Paris (from which our Foundation is independent), stems from our history of conducting research aimed at combating the major health challenges of our time. Public support and generosity are at the core of this mission since their donations allow us to support research, invest in high-level equipment (in particular a mass spectrometer this year) and in brand new laboratories where our teams can develop high-level research (delivery in 2024 of a 4,000 m2 research centre building). But being a private foundation also gives us the flexibility to welcome new talent and new teams who add their expertise and experience to our work. This was the case for two new teams this year, one working on metabolic diseases, the other on onco-haematology.

» In a world and at a time when everything is constantly evolving, how does the IPL continue to keep up with all the changes? What does the future hold for the IPL?

Stagnation is not an option in the world of research. We must constantly anticipate, innovate, surprise. While intuition is a key part of research, carrying it out requires ever greater resources. First, there is the staff: only top-level researchers and technical engineers can conduct the ambitious research that we undertake. Then there is the technological side, as we must constantly invest in tools of the trade, which, it should be emphasised, are becoming increasingly complex and, therefore, more costly. Bearing these in mind, we must maintain solid foundations if we are to carefully plan our strategic project. We did this 10 years ago by putting age-related diseases at the core of our strategic project. And it proved to be a winner, as ageing is and will continue to be a major public health concern. As before, we must continue to think about and anticipate future challenges, so that we are ready when the time comes and can strengthen our scientific lead to stay at the forefront of the largest French research institutions. While discussions on these critical issues are still ongoing, our focus will likely centre on the communication between diseased organs in individuals with multiple chronic conditions, as well as the host-pathogen interactions in those made vulnerable by illness. Finally, prevention will be a key component of this project, with our centres striving not only to contribute but also to take an active role by enhancing our epidemiological and interventional research, especially in preventing age-related chronic diseases, while making increasing use of digital tech and AI.

Perrine Quivron, Deputy Director and **Frédéric Batteux,** Director of the l'Institut Pasteur de Lille

» Finally, please can you tell us about some of the upcoming achievements in the fields of research and prevention?

It is hard to pin them all down, given the high energy and drive of the Institute's teams. But if we have to pick a few, in the field of infectious diseases and vaccination, the Campus teams won a national call for projects for the development of new vaccines. This recognition crowns past achievements, particularly the development of a new whooping cough vaccine, now entering the final phase of clinical trials in the United States. This achievement will allow the Institute to keep up its momentum in this long-standing area of expertise. In the field of age-related diseases, our research on the mechanisms underlying Alzheimer's disease has gained global recognition, and our innovative approaches are paving the way for new therapeutic possibilities. As for metabolic diseases and diabetes, the development of personalised medicine strategies that leverage our high-throughput genetic analysis capabilities is closer than ever, alongside cell therapies such as pancreatic islet transplantation for treating Type 1 diabetes. Finally, in the area of prevention, the Institut Pasteur de Lille has actively embraced the development of digital tools augmented with AI algorithms, working with regional public and private partners to enhance our prevention assessment and, most importantly, the daily support and monitoring of individuals, particularly the most vulnerable.

The coming year promises to be full of achievement, as the teams at the Institut Pasteur de Lille are dedicated to advancing scientific and medical frontiers with an inclusive and human-centric approach, thanks to and driven by the generosity of our donors.

The research

Research at the Institut Pasteur de Lille focuses on infectious and emerging diseases and diseases linked to age and lifestyle: diabetes, obesity, cardiovascular and neurodegenerative diseases, and cancer. These chronic diseases, which often occur in the same individual, will be a major public health challenge in the coming years as the population ages.

The research we conduct aims to improve understanding of the cellular and molecular determinants of these chronic diseases, how they interact with each other, become more complicated and weaken us, particularly in terms of infections and the emergence of cancers. A better way of understanding these diseases will mean that we can prevent and treat them more effectively in the future.

Risk factors and molecular determinants of diseases linked to ageing

UMR1167 "RID-AGE"
University of Lille / Inserm / Lille University Hospital / Pasteur Institute de Lille
Professor Philippe Amouyel

This unit analyses, explores and deciphers changes in and the impact of risk factors and molecular determinants of the main chronic diseases (cardiovascular and neurodegenerative) associated with ageing. They aim to offer new preventive healthcare and treatment options, paving the way for personalised medicine and longer disability-free life expectancy.
The teams that make up this unit work closely together, adopting a cross-disciplinary approach. Over the last ten years, this unit has made significant advances in understanding age-related diseases, paving the way for practical preventive healthcare procedures and the discovery of new drugs. It has gained international recognition with a strong focus on the general public, helping us to live better and for longer.

The research teams

PUBLIC HEALTH AND MOLECULAR EPIDEMIOLOGY OF AGE-RELATED DISEASES
> *Aline Meirhaeghe*

MOLECULAR DETERMINANTS OF CARDIAC REMODELLING AND HEART FAILURE
> *Florence Pinet*

MOLECULAR DETERMINANTS OF ALZHEIMER'S DISEASE AND RELATED SYNDROMES
> *Jean-Charles Lambert*

INTEGRATIVE STRUCTURAL BIOLOGY*
> *Isabelle Landrieu*

GLYCATION: FROM INFLAMMATION TO AGEING
> *Eric Boulanger*

MOLECULAR AND CELLULAR PATHOPHYSIOLOGY OF METABOLIC DISEASES
> *Jean-Sébastien Annicotte*

More information about UMR1167

Highlights

ARTIFICIAL INTELLIGENCE APPLIED TO RADIOLOGY AND MEDICAL DIAGNOSIS

This pioneering study, published in 2024, evaluated the performance of an open-source large language model (LLM) similar to ChatGPT for the automated analysis of 2,398 emergency brain MRI reports from a French reference and tertiary care centre (Lille University Hospital). The model used (Vicuna-7b) demonstrated outstanding performance: 98% sensitivity and 99.3% specificity for detecting headaches in the clinical indications, 96% sensitivity for distinguishing normal from abnormal scans, and the ability to establish causal links between observed anomalies and symptoms with 88.2% sensitivity. These results illustrate the ability of artificial intelligence models to process complex medical text data with accuracy close to that of human experts, while ensuring the confidentiality of health data.
This work, developed by Dr Aghiles Hamroun, is part of a research initiative aimed at making better use of the wealth of unstructured medical data in an era of rapidly expanding hospital data warehouses. It illustrates the potential of artificial intelligence models to standardise and automate the analysis of complex textual data, thereby helping to unlock the value of data generated through clinical practice.
These advances reinforce the role of digital technologies in improving research strategies and public health practices.

Le Guellec B, Lefèvre A, Geay C, Shorten L, Bruge C, Hacein-Bey L, Amouyel P, Pruvo JP, Kuchcinski G, Hamroun A. Performance of an Open-Source Large Language Model in Extracting Information from Free-Text Radiology Reports. Radiol Artif Intell. 2024 Jul;6(4):e230364. doi: 10.1148/ryai.230364. PMID: 38717292; PMCID: PMC11294959:

THE ROLE OF THE X SEX CHROMOSOME IN THE ONSET OF ALZHEIMER'S DISEASE

For methodological reasons, the X chromosome was not included in the main genome-wide studies of Alzheimer's disease. To address this situation and better characterise the genetic component of Alzheimer's disease, Dr Céline Bellenguez conducted an in-depth study of the X chromosome involving 115,841 cases/proxies of Alzheimer's disease (52,214 clinically diagnosed cases) and 613,671 controls. The researchers used several analytical models to identify seven chromosomal regions of interest on the X chromosome that warrant further analysis.

Le Borgne J et al. X-chromosome-wide association study for Alzheimer's disease. Mol Psychiatry, 2024 Dec 4.doi: 10.1038/s41380-024-02838-5. Online ahead of print.

NEURODEGENERATIVE DISEASE: A PROMISING APPROACH FOR SPECIFICALLY DESTROYING NEUROTOXIC PROTEIN AGGREGATES

Tau proteins aggregate in the brain in a number of neurodegenerative diseases, leading to neurotoxicity. In a jointly-published article in the journal Science, Dr Isabelle Landrieu developed a strategy for targeting and destroying aggregated forms of the tau protein without degrading the normal protein. The new molecular tools developed can be used to investigate biological mechanisms that lead to abnormal protein deposition within cells, as is particularly the case in Alzheimer's disease. The therapeutic potential of these constructs, by inducing the degradation of tau protein, is currently under investigation.

Jonathan Benn1†, Shi Cheng1*†, Sophie Keeling1, Annabel E. Smith1, Marina J. Vaysburd2, Dorothea Böken1, Lauren V. C. Miller2, Taxiarchis Katsinelos1,2, Catarina Franco2, Elian Dupré3,4, Clément Danis3,4,5, Isabelle Landrieu3,4, Luc Buée5, David Klenerman1,*
Leo C. James2, William A. McEwan1*. Aggregate-selective removal of pathological tau by clustering-activated degraders. Science 385, 1009–1016 (2024).*

THE ORBE PROJECT: THE IMPACT OF URBAN DEVELOPMENT ON CARDIOVASCULAR HEALTH

The ORBE project, led by Dr Luc Dauchet, aims to assess the combined effects of urban heat islands, heat waves, and walkability on cardiovascular morbidity and mortality in France. He will study the exacerbating effect of urban planning (walkability and heat islands) on the impact of heat waves on the risk of cardiovascular events in the general population (cardiovascular disease morbidity registries) and in a vulnerable population (patients with end-stage renal disease). The project is innovative in its cross-cutting and interdisciplinary approach to regional analysis.

ALZHEIMER'S PROJECT

The AXA Mutuals support the project: "Characterising the genetics of Alzheimer's disease through high-throughput sequencing in the French population" led by Prof Jean-Charles Lambert. The aim is to conduct an in-depth characterisation of the genetics of Alzheimer's disease using the most modern genetic tools to support diagnostic processes and the development of innovative therapeutic approaches.

Cancers

Canther UMR9020 / CNRS U1277

CNRS / Inserm / Université de Lille / CHU de Lille / Institut Pasteur de Lille / Centre Oscar Lambret

Dr Isabelle Van Seuningen

The CANTHER joint research unit "Cancer heterogeneity, plasticity and resistance to therapies" (CNRS - Inserm - University of Lille - Lille University Hospital - Pasteur Institute of Lille - Oscar Lambret Centre) (www.canther.fr) conducts cancer research at the ONCOLille Interdisciplinary Cancer Research Institute (www.oncolille.eu), with the support of the Pasteur Institute of Lille. This unit, headed by Dr Isabelle Van Seuningen, focuses primarily on gaining a better understanding of the molecular and cellular mechanisms of resistance to treatment and identifying new markers and therapeutic targets to overcome this resistance. CANTHER is also interested in tumour dormancy and residual disease, two phenomena at the root of recurrence and relapse after treatment. Thanks to its multidisciplinary teams, which include clinicians, the unit conducts research ranging from basic research through to preclinical and clinical research. The ultimate goal of CANTHER's research is to propose new therapeutic approaches for better care, improved monitoring and increased survival rates for cancer patients. Since the discovery of the first cancer genes, oncogenes, at the Institut Pasteur de Lille, researchers have been attempting to identify the molecular and cellular mechanisms by which a normal cell becomes a tumour, resists and escapes treatment, and sometimes becomes metastatic, while taking into account the tumour microenvironment.

The research teams

SENFIB TEAM SENESCENCE, FIBROSIS AND CANCER
> *Corinne Abbadie*

TARGET TEAM EFFICACY AND RESISTANCE TO TARGETED ANTI-TUMOUR THERAPIES
> *David Tulasne*

More information about CANTHER

The SenFib team: "Senescence, Fibrosis and Cancer" / *led by Professor Corinne Abbadie*

The SenFib team studies the cellular mechanisms linking senescence and fibrosis, two processes that play a central role in the initiation and progression of cancer during ageing. These processes, induced by cancer therapies (chemotherapy and radiotherapy), can also contribute to treatment resistance, disease relapse, and the development of secondary primary cancers. The team aims to identify new molecules that eliminate senescent and/or fibrotic cells, thereby reducing their harmful impact on cancer progression and therapeutic outcomes.

Highlight

In 2024, **the SenFib team**, led by Professor Corinne Abbadie, obtained **ANR funding for the STARNASH project** (Targeting long non-coding RNAs, an innovative therapeutic strategy to limit NASH progression and hepatocarcinoma development), coordinated by **Dr Nicolas Pottier**, in collaboration with Dr Philippe Gual (Nice) and Dr Cyril Sobolewski (Infinite, Lille). This year also saw the publication of a study led by **Professor Vanessa Dehennaut** in **Cell Death & Disease**, which, in the context of colorectal cancer, demonstrated that **inhibiting O-GlcNAcylation** - a dynamic post-translational modification that regulates protein function and cellular stress responses - when combined with low doses of conventional chemotherapy, can reduce treatment side effects while maintaining therapeutic efficacy. This study was also made possible thanks to the **OrgaRES platform**.

Dr **Bruno Lefebvre**, Senior Lecturer at the University of Lille, and **Thomas Comptdaer,** (Assistant Engineer, University of Lille) have joined SenFib to develop a project on the relationship between the **Tau protein**, **senesence** and **cancer**.

Loison I, Pioger A, Paget S, Metatla I; OrgaRES Consortium; Vincent A, Abbadie C, Dehennaut V. Inhibition of O-GlcNAcylation redirects the response of colon cancer cells to chemotherapy from senescence to apoptosis. Cell Death Dis. 19 octobre 2024 ; 15(10):762. DOI : 10.1038/S41419-024-07131-5. PMID: 39426963; PMCID: PMC11490504:

The Target team "Efficacy and resistance to targeted antitumour therapies" / *led by Dr David Tulasne*

Certain advanced forms of **prostate cancer** overexpress both the MET receptor and the ETS family transcription factors. In 2024, we demonstrated that MET and these transcription factors cooperate to induce cell invasion responses that promote tumour growth. Under these conditions **targeted therapies against MET**, used for other cancers, have been effective in experimental models of prostate cancer tumorigenesis. These findings pave the way for **new therapeutic strategies for these patients**.

Highlight

The Target team participates in the **INCa national programme for the certification of research networks on cancers with poor prognosis (LABREXCMP24).** The **COALA network** certified in 2024 for 5 years *"Curing lung adenocarcinoma with oncogenic addiction"* will aim to better understand the molecular alterations that cause **lung cancers** and to suggest new therapeutic approaches, with objectives in line with those of the team.

Dr **Leslie Duplaquet**, a young researcher currently working at the Dana-Farber Cancer Institute in Boston, was awarded a **prestigious grant by the Fondation de France** at the end of 2024 to develop her original research project within the Target team. She will seek to understand the **early stages of chemotherapy resistance observed in small cell lung cancer**, a particularly aggressive form of lung cancer. She will sit the CRCN examinations for Inserm (Css2) and CNRS (section 24) in 2025.

Carouge E, Burnichon C, Figeac M, Sebda S, Vanpouille N, Vinchent A, Truong MJ, Duterque-Coquillaud M, Tulasne D. and Chotteau-Lelièvre A. Functional interaction between the MET tyrosine kinase receptor and ETS transcription factors promotes prostate cancer progression. Mol Oncol. 2025 feb. ; 19(2):474-495. DOI: 10.1002/1878-0261.13739.

Cardio-metabolic diseases

RNMCD U1011
Inserm / University of Lille / Lille University Hospital / Institut Pasteur de Lille
Professor Bart Staels

This unit, headed by Professor Bart Staels, employs more than 130 people, including researchers, teachers, doctoral and post-doctoral students, engineers and technicians. The six teams in this research unit study the mechanisms behind alterations in lipid and glucose metabolism and the immune system, which occur in pathophysiological conditions. In particular, the researchers are studying metabolic syndrome, metabolic steatohepatitis MASH (formerly known as NASH) and type 2 diabetes, as well as its associated cardiovascular complications (atherosclerosis, heart failure, heart valve disease). To achieve this, researchers use complementary molecular and cellular biology approaches, as well as (patho)physiological approaches and integrated technological expertise.

New insights into the regulation of food intake in obesity and MASH / *David Dombrowicz*

GDF-15 is a circulating factor whose primary role is to activate neurons in the brain involved in regulating food intake. Blood levels of GDF-15 are altered in many diseases, including obesity, but the molecular mechanisms underlying these changes are poorly understood. Laurent L'Homme (Team 3 - D. Dombrowicz) elucidated the regulatory mechanisms of GDF-15 in obesity and in a metabolic liver disease with an inflammatory component: MASH. He demonstrated a major role of the immune system, in particular macrophages, in the production of GDF-15 in obesity, thereby contributing to the development of MASH. As liver disease progresses, the liver becomes the main source of GDF15, the production of which is induced by hepatocyte stress that activates two specific transcription factors. These findings open up new perspectives in the control of satiety *via* GDF-15 and could lead to the development of new treatments for metabolic and inflammatory diseases, including obesity. *L'Homme et al. Nat Commun 15, 7173 (2024).*

The research teams

INTER-ORGAN DIALOGUE IN CARDIO-METABOLIC DISEASES
> *Bart Staels*

HEART DISEASES, BLOOD FLOW ABNORMALITIES AND HAEMOSTASIS
> *Sophie Susen*
> *Eric Van Belle*

IMMUNOMETABOLIC DIALOGUE IN OBESITY AND ITS COMORBIDITIES
> *David Dombrowicz*

INTEGRATED TRANSCRIPTIONAL ANALYSIS OF LIVER DISEASES
> *Philippe Lefebvre*

NUCLEAR RECEPTORS AND CIRCADIAN RHYTHMS IN PHYSIOPATHOLOGY
> *Hélène Duez*

ENDOTHELIAL-MESENCHYMAL TRANSITION (EMERGING ATIP-AVENIR TEAM)
> *Anna Rita Cantelmo*

PROFESSOR BART STAELS AMONG THE MOST CITED RESEARCHERS IN THE WORLD

Clarivate publishes an annual list of Highly Cited Researchers, a ranking of scientists whose recent publications have enabled them to demonstrate significant and widespread influence in their field(s) of research. In 2024 **Professor Bart Staels**, University Professor and Director of the 'Nuclear Receptors, Metabolic and Cardiovascular Diseases' unit (University of Lille, Lille University Hospital, Inserm) at the Institut Pasteur de Lille, was included in this prestigious list.
Professor Bart Staels' work studies key mechanisms in our bodies to better contain diseases such as **cardiovasculaires** and **métaboliques** problems. By identifying new solutions for treating these conditions, his research is helping to improve the management of these diseases and the health of many people around the world.
It should be noted that among the global population of scientists and social scientists, *"highly cited reseachers"* represent one in every 1,000 individuals.
This recognition comes on top of the Anitschkow Prize awarded in 2024 by the European Atherosclerosis Society (EAS), which praised the excellence of his work.

Identification of a mechanism involved in fibrosis / *Philippe Lefebvre*

In their advanced stages, chronic liver diseases lead to the development of liver fibrosis, which is characterised by an excessive accumulation of scar tissue. This fibrosis is caused by the activity of cells called myofibroblasts. A recent study by our laboratory has demonstrated that protein modification through a process called O-GlcNAcylation is essential for the activation of myofibroblasts and the development of liver fibrosis *(Very et al. Cell Death Dis 2024)*. This mechanism links metabolic changes to alterations in gene expression, playing a crucial role in the pathological activation of cells *(Very et al Trends Cell Biol 2024)*.

Disruption of circadian rhythms and pneumococcal infection / *Hélène Duez*

In collaboration with François Trottein's team (CIIL, Pasteur Lille), we have shown that the alteration of circadian rhythms due to the deregulation of Rev-erb alpha in alveolar macrophages could be behind an increased susceptibility to pneumococcal infection, the leading cause of pneumonia in elderly people. Rev-erb alpha, a nuclear receptor that we have shown to be involved in metabolism and inflammation, could represent an interesting therapeutic target in this context. (ANR support and two CPER-CTRL contracts).

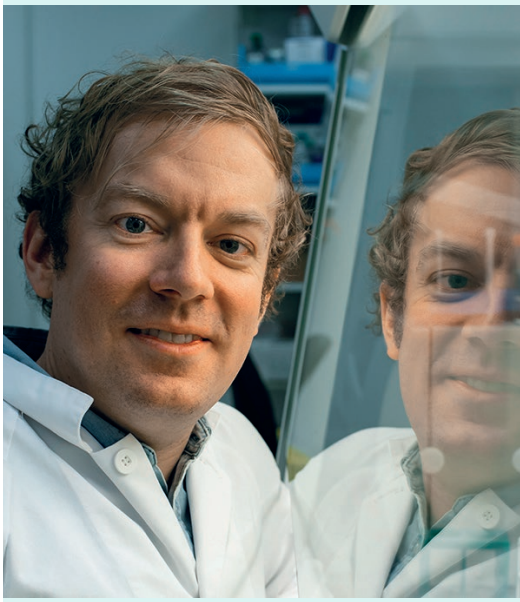
Slowing down a key process to protect blood vessels / *Anna Rita Cantelmo*

Dr Anna Rita Cantelmo's Atip-Avenir team is studying endothelial-mesenchymal transition, a process involved in cardiovascular diseases. The researchers discovered that the influx of calcium into the mitochondria plays a key role in this phenomenon and have developed a strategy to block it. Their promising results pave the way for new therapeutic approaches against vascular diseases such as peripheral artery disease.
(Lebas et al. Science Advances 2024).

To find out more:

Jonas Sondergaard welcomed

following the international call for tenders by the Institut Pasteur de Lille



Following the international call for proposals launched by the Institut Pasteur de Lille on the theme *"Multi-omics Data Analysis,"* Unit 1011 and Team 3 (D. Dombrowicz) hosted Jonas Sondergaard to develop a project on the analysis of human immune system heterogeneity in MASH with a view to developing personalised medicine approaches. J. Sondergaard, from Osaka University, is a specialist in mass cytometry. He has developed original bioinformatic approaches for the analysis of complex immunological data. J. Sondergaard received financial support from the ERDF programme for the internationalisation of research laboratories.

Discovering new drugs

M2SV U1177
Inserm / Institut Pasteur de Lille
Professor Benoît Déprez

More information about www.deprezlab.fr

The research team

M2SV: MEDICINES AND MOLECULES TO ACT ON LIVING SYSTEMS
> *Professor Benoît Déprez*

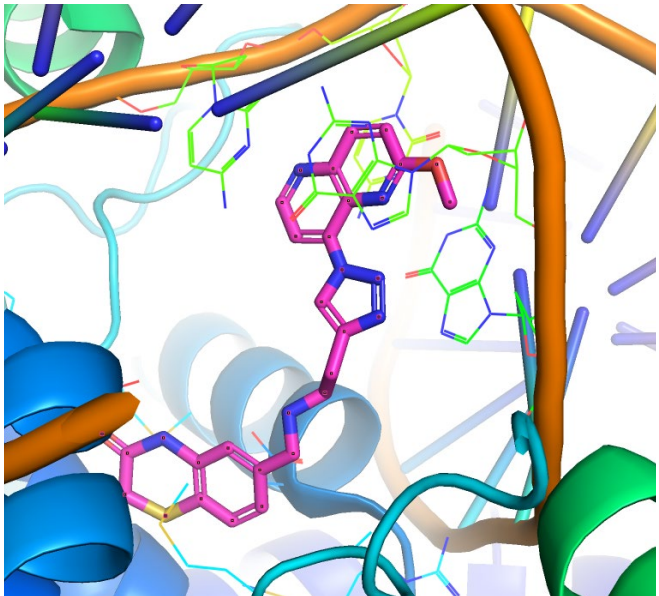
Boosting antibiotics against Gram (-) bacteria / *Dr Marion Flipo*

Dr Marion Flipo presented the results of her project on the development of efflux pump inhibitors at the Gordon Research Conference "New Antibacterial Discovery and Development" in the United States. This family of allosteric inhibitors of AcrB potentiates the activity of antibiotics on multi-resistant strains of *K. pneumoniae*. This work, carried out in collaboration with the teams of Dr Ruben Hartkoorn (CIIL), Dr Laurye Van Maele (CIIL) and Prof. Richard Bonnet (Clermont-Ferrand University Hospital), marks a new approach to combating antibiotic resistance.

What are Gordon Research Conferences?

The **"Gordon Research Conferences"** are a series of scientific meetings organised by the non-profit organisation of the same name. The meetings, launched by chemist Neil Gordon of John Hopkins University, were first held in the United States in 1931, and then after 1990 in Europe and Asia. These meetings provide an international forum for the presentation and discussion of cutting-edge research in the fields of biological, chemical, physical and engineering sciences and their interfaces. Participation is by invitation only, and meeting venues are chosen partly for their secluded nature to encourage an informal community atmosphere. Contributions are confidential in order to encourage free discussion among experts in a field, often on unpublished research.

A new family of molecules to block the mechanochemical activity of gyrase, a bacterial enzyme that generates DNA supercoiling/ *Professor Nicolas Willand*



In 2024, Professor Nicolas Willand's team (M2SV, Drug Discovery Centre) invented a new chemical family of *Mycobacterium tuberculosis* gyrase inhibitors, whose activity and mode of action were characterised at the atomic level in collaboration with Dr Stephanie Petrella's team at the Pasteur Institute in Paris. The molecule, called BDM71403, has proved to be more potent against the bacterium than the reference compound currently on the market, gepotidacin. Structural analysis using high-resolution cryo-electron microscopy, carried out in collaboration with Dr. Stéphanie Petrella's team, provided detailed information on the ternary complex formed by Mtb gyrase, double-stranded DNA and BDM71403.

Impact of the healthcare sector on the environment

In 2024, the European **"Prewapharm"** programme, which brings together Belgian, German and Dutch researchers and our team, was selected for funding. This project, starting in 2025, aims to reduce the presence of pharmaceutical molecules in surface water. The various aspects of the project aim both to reduce the discharge of pharmaceutical molecules and to improve the efficiency of purification systems. In this project, our laboratory is developing analytical methods to assess the effectiveness of water treatment plants in removing not only active pharmaceutical ingredients but also their degradation products. The results of the project will also enable the development of drugs that are more easily removed by waste water treatment plants.

Did you know?

In 1905, Albert Calmette studied the biological and chemical processes at work in waste water treatment plants at the Institut Pasteur de Lille, and facilitated the installation of France's first biological waste water treatment plant in La Madeleine, near Lille. Still experimental at the time, this waste water treatment model foreshadowed those in use today.

Nature produces complex molecules that can be used as building blocks to design new drugs.

The teams led by Professors Nicolas Willand, Jean-Louis Hilbert, Rénato Froidevaux and Philippe Hance have decided to collaborate and combine their expertise to **identify new anti-infectives** derived from regional natural resources such as chicory. Thanks to the support of the University of Lille and the European Union (PEARL project, co-funded by Marie Skłodowska-Curie Actions and the ANR), two "twin theses" have been launched. Following the development of a process to isolate large quantities of these molecules, Dr Ruben Hartkoorn's team assessed their biological activity against various bacteria. New analogues were then synthesised by chemical modifications (Dr Francesca Ruggieri) or by biocatalysis (Dr Juan Mosheim Rodriguez) from the previously isolated lactones. Very promising results have been obtained. Experiments are underway to select the best antibiotic candidates.

Zinc Proteases / *Rebecca Déprez-Poulain*

Within Rebecca Déprez-Poulain's team, which specialises in the **discovery of zinc protease inhibitors** for therapeutic purposes. Among the enzymes targeted by this team are Insulin Degrading Enzyme (IDE) and endoplasmic reticulum aminopeptidases (ERAPs).

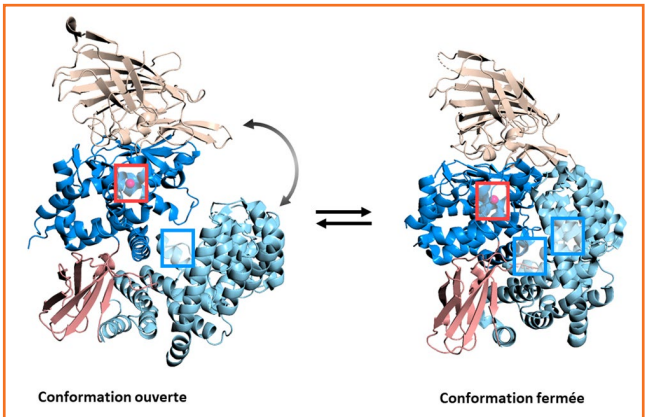


Image of the three-dimensional structure of ERAPs, showing a balance between an open and a closed form, with potential drug interaction sites conserved or not between the two forms.

Treating skin ulcers in diabetics

Damien Bosc's work on the IDE continues. Dr Bosc is developing macrocycles to promote the healing of skin ulcers associated with Diabetic Foot, one of the serious complications of diabetes that leads to numerous amputations. The team has also characterised the role of IDE in the liver. They have shown that IDE is an essential component of cellular resistance mechanisms to lipid stress. These results have been published in the *British Journal of Pharmacology*.

Modulating antigen presentation with small molecules

Ever more potent and selective ERAP inhibitors are being developed. The team has been awarded funding from the Leo Pharma Foundation to study the role of ERAPs in psoriasis and guide the development of new drugs for this indication. It continues to collaborate on rare diseases linked to ERAPs (Behcet's disease, chorioretinopathy) and cancer immunotherapy with leading European researchers in the field within the Capstone consortium coordinated by Rebecca Deprez-Poulain.

Diabetes

L'UMR1283/8199 is led by Professor Philippe Froguel and Doctor Amélie Bonnefond. This team is studying metabolic functional (epi)genomics and its abnormalities in type 2 diabetes and associated diseases It employs over 60 people, including researchers, lecturers, PhD students/post-docs, engineers, and technicians. The unit is the originator of the LabEx-EGID, the EquipEx-LIGAN-PM, a genomics platform for personalised medicine, and the IHU PreciDIAB.

U1283 Inserm - UMR8199 CNRS

Université de Lille / CHU de Lille

Professor Philippe Froguel

The research team

METABOLIC FUNCTIONAL (EPI)GENOMICS AND ITS ABNORMALITIES IN TYPE 2 DIABETES AND ASSOCIATED DISEASES

> *Amélie Bonnefond*

Type 2 diabetes (T2D) and its associated disorders, particularly obesity, have reached pandemic proportions worldwide. They are now major causes of morbidity and mortality, thus representing a heavy burden on public health. Type 2 diabetes results from a progressive deterioration in insulin secretion by pancreatic cells (located in the islets), against a backdrop of reduced insulin action in the organs and tissues that are sensitive to it.

Obesity is clinically defined as a body mass index (BMI) greater than 30 kg/m². The inability to fully comprehend the systemic and multi-organ pathophysiology of T2D and obesity has hindered the development of more effective therapeutic and preventive strategies.

Although the environment is the main determinant of these diseases at the population level, one striking fact remains: there is a persistently high risk among individuals who share the same environment. Type 2 diabetes and obesity are complex polygenic conditions, with heritability estimated at between 40 and 70%.

To date, thanks to genome-wide association studies (GWAS), several hundred genes associated with susceptibility to type 2 diabetes and BMI have been identified by our team and other research groups. However, a major challenge remains: more than 90% of loci identified by GWAS are located in non-coding, intronic or intergenic regions, which limits our ability to understand their functional role and the mechanisms by which these DNA variants influence the risk of disease.

The team's primary objective is to improve care and disability-free life expectancy for patients with T2D and other metabolic disorders, including obesity, by identifying new pathways involved in the pathophysiology that leads to the discovery of new therapeutic targets, and by identifying and characterising specific genetic variants leading to precision medicine and, where possible, personalised medicine.

More information about U1283/UMR8199

Highlights

THE DELTA OPIOID RECEPTOR, A NEW TARGET FOR TREATING TYPE 2 DIABETES

Researchers from Amélie Bonnefond's team have demonstrated the therapeutic potential of the delta opioid receptor in the treatment of type 2 diabetes, thanks to major advances in human genetics.

Human genetics now offers an exceptional opportunity to identify new therapeutic targets and develop innovative treatments to improve the management of patients with diseases such as type 2 diabetes. A recent study by the team looked at opioids - primarily known for their analgesic effects - and their influence on metabolism, particularly body weight and blood sugar regulation. However, the mechanisms by which these substances intervene in these processes are still poorly understood.

To shed light on these mechanisms, Dr Bonnefond's team studied the gene **OPRD1**, which encodes the delta opioid receptor (DOP), to assess its potential role in type 2 diabetes. They have sequenced this gene in 6,000 people and analysed each of the mutations identified in the laboratory. The results revealed some particularly interesting observations:

- mutations causing a **loss of function** of the gene lead to weight gain, while paradoxically reducing the risk of hyperglycaemia;
- conversely, mutations causing a **gain of function** promote weight loss but increase the risk of developing type 2 diabetes.

These findings are consistent with epidemiological data obtained from opium addicts.

To further investigate the mechanisms involved, the team also discovered that, in humans only, the **OPRD1** gene is active in the beta cells of the pancreas, which are responsible for insulin production. It has been observed that the expression of this gene is reduced in people with type 2 diabetes. Inhibition of the delta receptor improves insulin secretion in these cells. It modifies several major biological pathways, including those related to nerve growth, the biological clock, and the nuclear receptors.

In conclusion, based on an in-depth genetic analysis, Amélie Bonnefond's team demonstrated the essential role of the delta opioid receptor in regulating human metabolism. These results suggest that it could represent a promising therapeutic target for the treatment of type 2 diabetes. This outlook is all the more important in 2024, when 80% of patients still do not achieve their glycaemic control targets.

https://www.nature.com/articles/s41467-024-51004-6

PREVENDIAB STUDY - PREVENTING DIABETES IN VULNERABLE POPULATIONS: A PUBLIC HEALTH ISSUE

Diabetes is a rapidly growing disease that affects 5.4% of the French population. In the Hauts-de-France region, diabetes affects 6.2% of the population, one of the highest rates in France. This chronic disease, which has serious complications, particularly affects people living in precarious conditions, where its prevalence is up to twice as high. Faced with this alarming inequality, the Institut Pasteur de Lille and the Centre National PreciDIAB have launched a large-scale study: PrevenDIAB.

As part of the PrevenDIAB study, each participant is guided towards a care pathway in collaboration with their general practitioner. Since January 2022, more than 2,000 participants have joined this programme, which is specially designed for people living in precarious conditions. These volunteers undergo a full health check-up at the Institut Pasteur de Lille health examination centre. The objective: understand the specific causes of the disease in this population, particularly socio-economic, behavioural and environmental factors, to better prevent and delay the onset of diabetes and its devastating effects on ageing.

Personalised support is provided to encourage new, healthier lifestyle habits. At the same time, researchers are exploiting the wealth of data collected to identify early risk markers, enabling intervention even before diabetes develops.

Infectious and inflammatory diseases

U1019 / UMR9017
Inserm / CNRS / University of Lille / Lille University Hospital / Institut Pasteur de Lille
Dr Jean Dubuisson

The Lille Centre for Infection and Immunity (CIIL), directed by Jean Dubuisson, comprises 18 research teams. The centre, set up in 2010, employs over 200 people, including researchers (including 2 ERCs), lecturers, PhD students/post-docs, engineers, and technicians. The researchers at this centre are biologists specialising in the study of pathogens and/or the immune response. The presence of chemists and biophysicists within the CIIL is an additional advantage, enabling us to offer technological developments in the fields of chemical protein synthesis and mechanobiology.

More information about U1019/ UMR9017

The CIIL is developing projects on the molecular and cellular mechanisms involved in infectious and also chronic inflammatory diseases. They aim to apply this knowledge to developing innovative approaches to diagnosing, treating and preventing these diseases while analysing their impact in the field.

The research teams

CHEMOGENOMICS OF INTRACELLULAR MYCOBACTERIA
> *Priscille Brodin*

MOLECULAR AND CELLULAR VIROLOGY
> *Jean Dubuisson*

INTEGRATIVE BIOLOGY OF APICOMPLEXAN PARASITES
> *Mathieu Gissot*

OPPORTUNISTIC INFECTIONS, IMMUNITY, ENVIRONMENT AND LUNG DISEASES
> *Philippe Gosset*

BIOLOGY OF APICOMPLEXAN PARASITES
> *Jamal Khalife*

CELLULAR MICROBIOLOGY AND PHYSICS OF INFECTION
> *Frank Lafont*

CHEMICAL BIOLOGY OF FLATWORMS
> *Oleg Melnyk*

RESEARCH ON MYCOBACTERIA AND BORDETELLA BACTERIA
> *Nathalie Mielcarek*

TROPICAL BIOMES AND IMMUNOPATHOPHYSIOLOGY
> *Sylviane Pied*

PLAGUE AND YERSINIA PESTIS
> *Florent Sebbane*

BACTERIA, ANTIBIOTICS AND IMMUNITY
> *Jean-Claude Sirard*

INFLUENZA, IMMUNITY AND METABOLISM
> *François Trottein*

PULMONARY IMMUNITY
> *Philippe Lassalle*

ECOLOGY AND PATHOPHYSIOLOGY OF INTESTINAL PROTOZOA
> *Éric Viscogliosi*

CHEMICAL BIOLOGY OF ANTIBIOTICS
> *Ruben Hartkoon*

MECHANOBIOLOGY OF HOST-MICROBE INTERACTIONS
> *Alexandre Grassart*

CHRONICITY OF VIRAL INFECTIONS
> *Fernando Real*

BACTERIAL PVC SUPERPHYLUM
> *Damien Devos*

Highlights

DISCOVERY OF NEW THERAPEUTIC TARGETS AGAINST BACTERIAL AND PARASITIC INFECTIONS

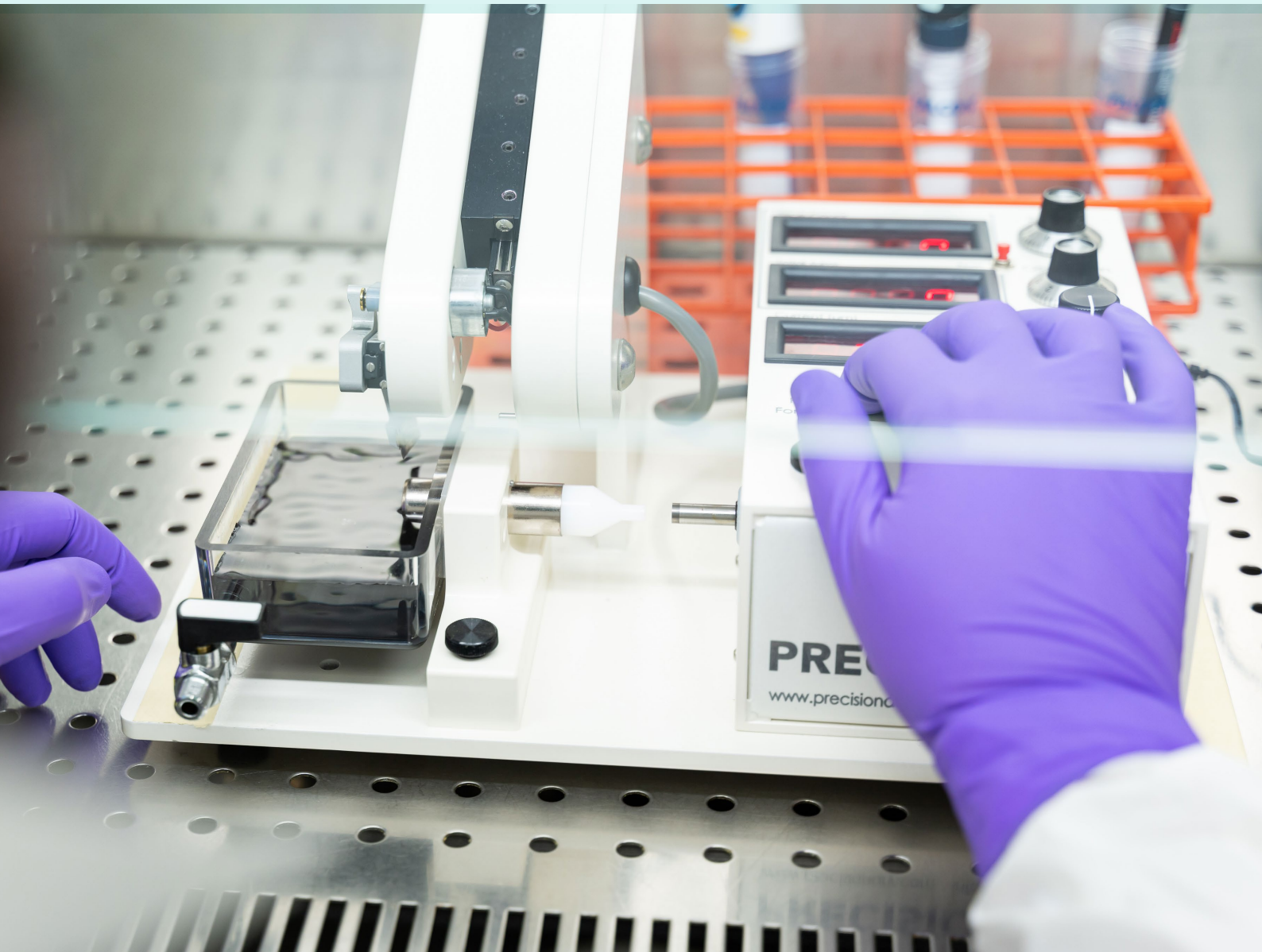
In a recent study published in thejournal PNAS, Françoise Jacob-Dubuisson's team identified a novel mechanism developed by certain bacteria to evade mammalian immune defences. The bacterial enzymes used to synthesise these defensive weapons, known as "bufferins", could represent very interesting therapeutic targets for controlling bacterial infections. In addition, Mathieu Gissot's team has identified a new mechanism that enables the Toxoplasma gondii parasite to produce the energy reserves it needs to survive in the brain (PLoS Biology). This discovery could help eliminate latent forms of the parasite that cause a disease in humans with potentially fatal complications.

AIR LIQUIDE SPONSORSHIP

Muriel Pichavant from the "Opportunistic Infections, Immunity, Environment and Lung Diseases" team received support from the Air Liquide Foundation for the PolluInf project, which aims to understand the immune mechanisms involved in vulnerability to respiratory infections during peaks in PM2.5 pollution, with a view to ultimately proposing prevention strategies, identifying biomarkers of susceptibility and suggesting therapeutic approaches.

MOSAIC PROJECT FUNDING

The MOSAIC project coordinated by Alexandre Grassart (MoHMI team) is funded by the French government under the France-2030 programme, the University of Lille and the European Metropolis of Lille. Bringing together numerous laboratories specialising in biology, medicine and engineering, as well as cultural stakeholders from the Hauts-de-France region, MOSAIC will aim to better understand the complex mechanisms linking viral infections and chronic diseases through the development of new alternative and innovative models commonly referred to as "organs-on-chips".



Translational research on diabetes

RTD U1190
Inserm / University of Lille / Lille University Hospital / Institut Pasteur de Lille
Professor François Pattou

This laboratory, headed by Professor François Pattou, employs over 40 people, including researchers, clinical researchers, lecturers, PhD and post-doctoral students, engineers and technicians. Together with the units led by Philippe Froguel and Bart Staels, it forms the European Genomics Institute for Diabetes (EGID) research federation.

More information about U1190

The research team is located on the Lille University Hospital campus, in the Faculty of Medicine Research Unit, and includes a Biotherapy Platform for the production of human islets, an animal facility (rodents and mini-pigs) and the DiabInnov platform (industry-university platform). Clinical studies are conducted at the Huriez Hospital, adjacent to the laboratory. The research unit focuses on translational research into diabetes, and in particular, into human islets of Langerhans transplantation (type 1 diabetes) and metabolic surgery (type 2 diabetes). At the same time, more fundamental research in these areas is being developed.

Highlights

A MAJOR BREAKTHROUGH IN THE FIELD OF OBESITY

Non-alcoholic fatty liver disease is an excess of fat in the liver that is not related to alcohol consumption but is often associated with obesity. One of the current challenges is predicting the progression of the disease. The team of Professor François Pattou (Univ Lille, CHU de Lille, Inserm U1190, EGID, Institut Pasteur de Lille), internationally renowned in the field, has made a major breakthrough. The researchers analysed and followed over 1,000 patients developing this condition over several years. By cross-referencing complex genetic, transcriptomic, metabolic, histological and clinical data, researchers identified two groups of patients whose clinical progression of the disease differs, particularly in terms of the risk of cardiovascular complications. This work, published in the prestigious journal Nature Medicine, could enable personalised treatment to be offered to patients to better control the progression of the disease.

Data-driven cluster analysis identifies distinct types of metabolic dysfunction-associated steatotic liver disease Violeta Raverdy et al. Nature Medicine.

PANCREATIC ISLET TRANSPLANTATION IN TYPE 1 DIABETES PATIENTS WITH KIDNEY TRANSPLANTS

Professor François Pattou's team at the Institut Pasteur de Lille has demonstrated that pancreatic islet transplantation in type 1 diabetic kidney transplant patients improves patient life expectancy. This work published in the prestigious journal *Lancet Diabetes Endocrinology* could enable widespread use of pancreatic islet transplantation in patients.

Technological platforms

Technological platforms enable our teams to develop innovative therapeutic approaches and advance high-level research.

Technological platforms

PLBS - UAR 2014 CNRS -US 41 Inserm)
Dr Sophie Crespin

PLBS unit platforms

BICEL: BIOIMAGING CENTRE LILLE, CELLULAR IMAGING AND CYTOMETRY PLATFORM
> *Frank Lafont*

ARIADNE-SCREENING, HIGH-CONTENT, HIGH-THROUGHPUT SCREENING PLATFORM
> *Florence Leroux*

P3M: PLATFORM FOR PROTEOMIC ANALYSIS AND MODIFIED PROTEINS
> *Jean-Michel Saliou*

PLEHTA: PLATFORM FOR EXPERIMENTATION AND HIGH-TECH ANIMAL RESEARCH
> *David Hannebique*

BILILLE: BIOINFORMATICS, BIOANALYSIS AND BIOSTATISTICS
> *Guillemette Marot*

GO@L-TAG: APPLIED TRANSCRIPTOMICS AND GENOMICS PLATFORM
> *David Hot*

SINBIOS: IT SUPPORT PLATFORM FOR BIOLOGY AND HEALTH
> *Karl Oulmi*

At the forefront of academic research in Lille and supporting the 35 teams at the Institut Pasteur de Lille, they are also accessible to the entire scientific community, particularly biotechnology companies and those specialising in pharmaceutical research.
To provide researchers with the best possible support, the Institut Pasteur de Lille provides technological platforms combining exceptional instruments, dedicated staff and specific expertise.

At the heart of this public-private ecosystem, technological platforms demonstrate the Institut Pasteur de Lille's strong commitment to excellence in research, which every day enables everyone to live in good health.

Other platforms:

ARIADNE - ADME
> *Florence Leroux*

NMR - NUCLEAR MAGNETIC RESONANCE
> *Isabelle Landrieux*

LIGAN MP - GENOMICS AND METABOLIC DISEASES
> *Philippe Froguel*

CRB - BIOLOGICAL RESOURCE CENTRE
> *Philippe Amouyel*
> *Amandine Flaig*

PEPTIDE CHEMISTRY
> *Oleg Melnyk*

The **RMN platform** develops cutting-edge methodologies to facilitate the analysis of complex samples, as demonstrated in this publication concerning the SERFBIRD pulse sequence. *(Anal Chem 2024 doi: 10.1021/acs.analchem.4c00315)* which allows for improved spectrum resolution. The 600 MHz spectrometer probe that we have available is also used to study the fluorine nucleus, including in biology projects, as you can read in this collaborative article with Dr Pau Bernado (UMontpellier), published in Chemistry *(doi: 10.1002/chem.202403718)*, on the use of 19F for the study of the huntingtin protein.

8

LILLE PLATFORMS IN BIOLOGY AND HEALTH (PLBS)

More information on PLBS

100

ENGINEERS AND TECHNICIANS

54

EXPERTS

Highlights concerning PLBS

As part of the Resist-Omics CPER 2021-2027 **the GO@L and BICeL platforms** have acquired two major pieces of equipment for single-cell sequencing library preparation (Chromium 10x Genomics) and a latest-generation cell sorter (Aurora spectral sorter), which are now available to all teams at the Pasteur Lille campus for single-cell omics projects.

More information on GO@L and BICeL

The Bililleplatform, in partnership with UMR8576 UGSF, platform was able to acquire 22 Nvidia L40S GPUs funded through EquipEx+ MuDiS4LS and the CDP "Protein Interaction Evolution". This equipment, deployed within the shared cluster of the University of Lille, will be made available to the entire scientific community via the platform. These resources are particularly well-suited to the application and development of Artificial Intelligence approaches.

More information about Bililleplatform

The BICeL platform organised a National Training Initiative (NTI) in microscopy: APIPHOT. This event provided the first opportunity for the scientific community to gain national visibility for the "Le 1894" event space, with the support of the IPL, which covered the cost of renting the space.

The P3M and Bililleplatforms initiated the implementation of an integrated service offering including statistical analysis of proteomics data. This analysis pipeline is the counterpart to the existing pipeline for transcriptomic analyses, and together they herald the launch of the integrated multi-omics portal: MOICan (Multi Omics I Can).

More information about P3M

First call for projects for IT assistance and support launched by the **SINBIOS platform**, established in 2022. In this context, three teams from the Pasteur Lille campus received support to implement management solutions for their research data.

More information about SINBIOS

PLBS staff were authors on 51 publications in 2024, including 10 publications as first, second, penultimate, or last author. Among these publications, 41% were published in top-tier (rank A) scientific journals.

More information about PLBS

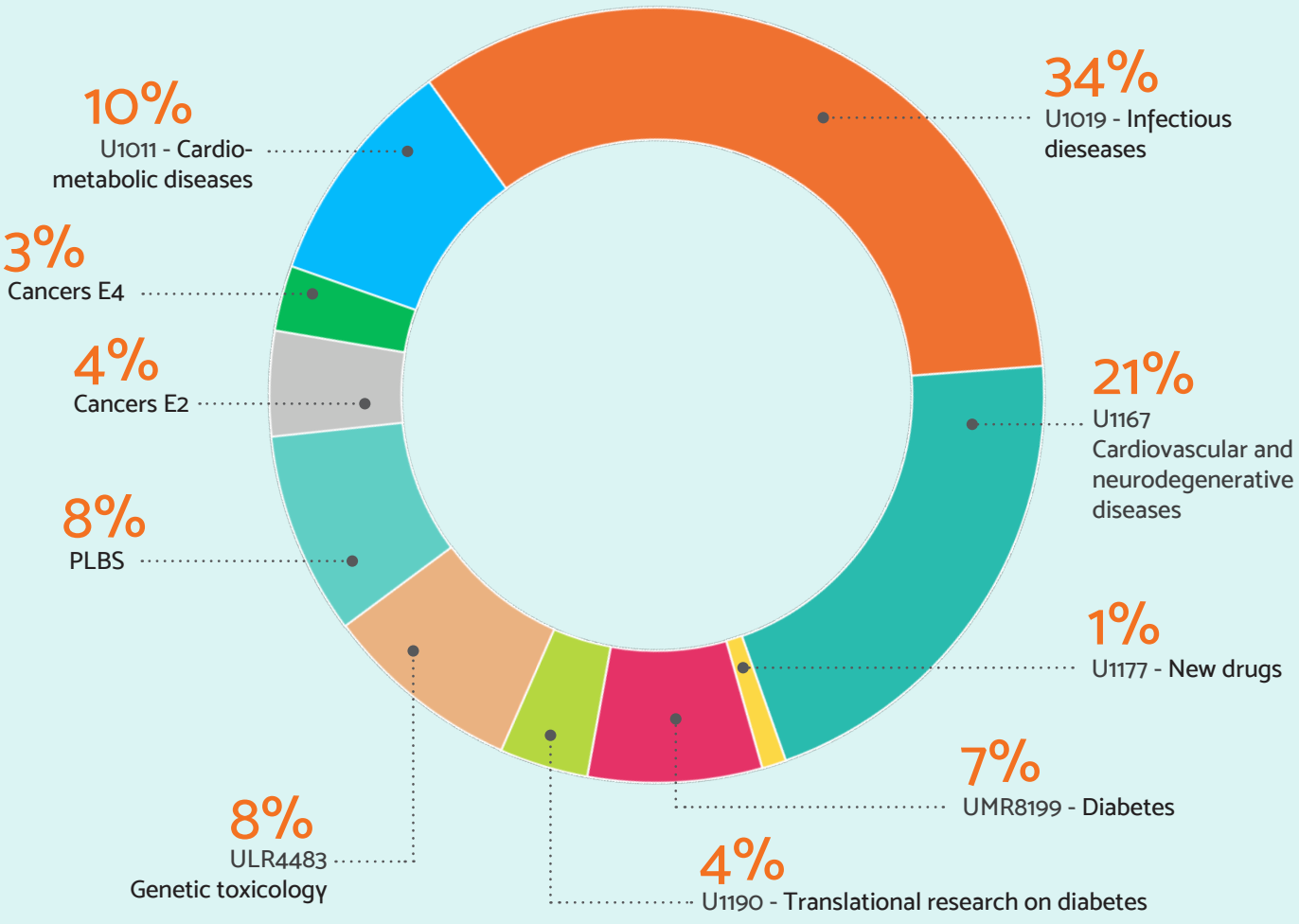
Scientific publications 2024

Publications in international journals including Nature, Nature Genetics, the New England Journal of Medicine, the Lancet, PLoS One, PLoS Medicine, and Gut reflect the excellence of the research. Bibliometrics, including a quantitative evaluation of impact factors in prestigious journals, reflects the scientific community's interest in the discoveries that are reported and cited in this way.

Bibliometrics evaluates research activity by applying statistical methods to scientific publications (bibliography of articles, signatures of articles, keywords and authors, etc.). It is used to measure the scientific output and reputation of a researcher, a laboratory, an institution, a country or an area of research.

592 **SCIENTIFIC PUBLICATIONS IN 2024**

Source SAMPRA




Scientific research serving the future

Prevention, a long-standing

For over 130 years, the Institut Pasteur de Lille has placed research and prevention at the heart of its mission. The institute committed itself to protecting vulnerable populations, which led to the opening of France's first preventorium dedicated to combating infectious diseases in 1901. Today, this tradition is still upheld by the Prevention, Health and Longevity Centre, which is continuing this work.

Our prevention activities are structured around **4 main areas**:

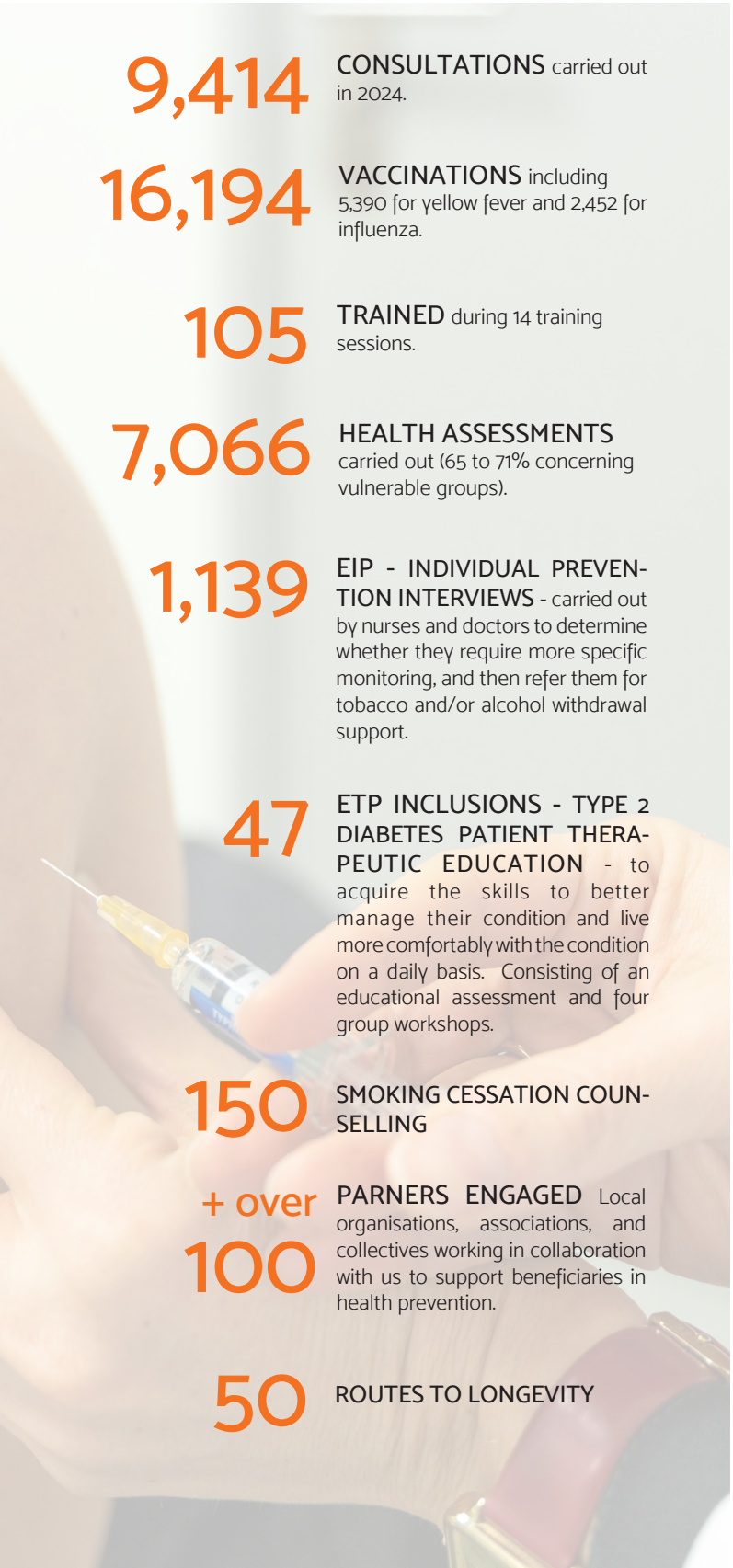
- **Health assessment**: prevention and monitoring.
- **Vaccination and international medicine centre**: assessments, consultations and vaccination monitoring.
- **Action-Research**: innovative public health studies and interventions across the Hauts-de-France region.
- **Health training and education**: public awareness and support programmes, sharing knowledge about prevention and longevity.

commitment


PROPHYLAXIE DU PALUDISME (à remplir par le médecin)
Déjà prescrit
OUI
par l'IPL
NON
par le médecin traitant
PROPHYLAXIE
MÉDECIN
Nivaquine®
Nivaquine® + Paludrine®
Savarine®
Lariam®
Malarone®
Doxypalu®/Granudoxy G®
Protection contre les piqûres de moustiques
Date
OUI
NON

Our internal news

ON THE INSTITUT PASTEUR DE LILLE CAMPUS



9,414 CONSULTATIONS carried out in 2024.

16,194 VACCINATIONS including 5,390 for yellow fever and 2,452 for influenza.

105 TRAINED during 14 training sessions.

7,066 HEALTH ASSESSMENTS carried out (65 to 71% concerning vulnerable groups).

1,139 EIP - INDIVIDUAL PREVENTION INTERVIEWS - carried out by nurses and doctors to determine whether they require more specific monitoring, and then refer them for tobacco and/or alcohol withdrawal support.

47 ETP INCLUSIONS - TYPE 2 DIABETES PATIENT THERAPEUTIC EDUCATION - to acquire the skills to better manage their condition and live more comfortably with the condition on a daily basis. Consisting of an educational assessment and four group workshops.

150 SMOKING CESSATION COUNSELLING

+ over 100 PARNERS ENGAGED Local organisations, associations, and collectives working in collaboration with us to support beneficiaries in health prevention.

50 ROUTES TO LONGEVITY

STRENGTHENING OUR PARTNERSHIPS IN ORDER TO PROVIDE PREVENTIVE SUPPORT THROUGH OUR HEALTH ASSESSMENTS TO PEOPLE IN PRECARIOUS SITUATIONS.

SINCE ITS FOUNDATION, THE INSTITUT PASTEUR DE LILLE HAS BEEN COMMITTED TO SUPPORTING THIS GROUP AND GETTING THEM BACK ON TRACK WITH THEIR TREATMENT.

WHAT'S NEW ON OUR SITE

APPOINTMENT SCHEDULING FACILITATED BY Doctolib

TRAINING

LAUNCH OF THE DIU IN PREVENTIVE HEALTHCARE: A TRAINING PROGRAMME THAT IS UNIQUE IN FRANCE

In 2024, the Prevention, Health and Longevity Centre contributed to the **Inter-University Diploma in Preventive Healthcare (DIU)**, a unique interdisciplinary programme offered by the universities of Nantes, Brest, Lille, Rennes and Angers.

Aimed at healthcare professionals as well as those involved in prevention in companies, associations or the public sector, this training course aims to strengthen preventive health skills, both within and outside the healthcare system. The programme addresses major current issues: mental health, chronic diseases, addictions, health communication, etc. It is a powerful lever for responding to public health challenges and encouraging innovative practices in prevention.

PARTICIPATION IN NATIONAL STUDIES

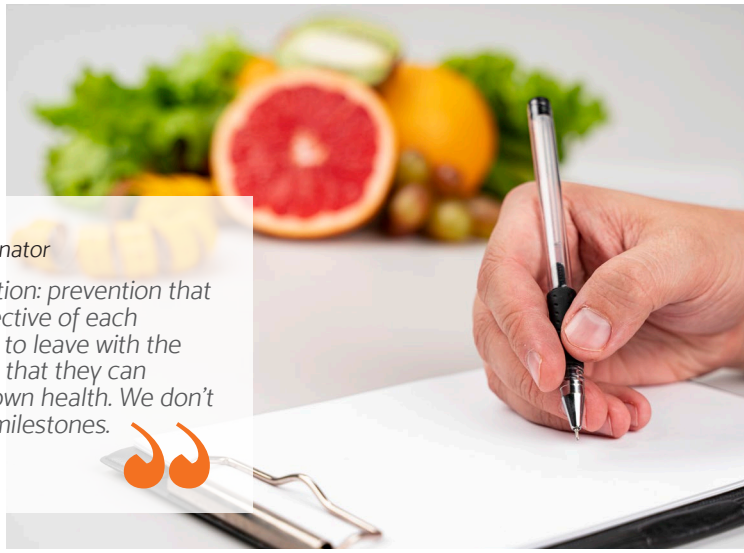
CONSTANCES epidemiological cohort to investigate the causes of multifactorial diseases by collecting medical and biological data. The CPSL carried out 560 preventive examinations for HDF participants in 2024.

SUPPORT FOR CAREGIVERS

in collaboration with France Travail: **25 longevity programmes and follow-ups completed** on nutrition, stress management, physical activity, and sleep. The results are expected this year.

Insight from Christelle, *health assessment coordinator*

Our job is prevention. But not top-down prevention: prevention that hears, that understands, and supports. The objective of each assessment is for the person we are supporting to leave with the tools they need for their own health journey. So that they can become independent and take charge of their own health. We don't provide ready-made answers: together, we set milestones.



ON THE TOURCOING AND ARTOIS SITES

Our decentralised preventive healthcare centres offer accessible preventive healthcare for all, in collaboration with the CPAMs (French social security offices) in Tourcoing, Lens and Béthune:

- **Preventive Health Examinations (EPS)**
- **Individual Preventive healthcare Consultations (IPC)**
- **Therapeutic patient education (TPE) (tobacco and alcohol)**
- **Support for vulnerable groups**

Partner insight
Madame Sabine Michée, Training Manager at AFPA - Village des solutions

Working with the Institut Pasteur de Lille enables us to offer essential preventive medical care to our patients.

ACTION-RESEARCH SERVING PREVENTIVE HEALTHCARE

SAFE STUDY

This is a study conducted on preventive cardiovascular healthcare in women. The Safe study is a 10-session "diet and physical activity" preventive healthcare programme aimed at improving cardiovascular health. We followed 50 women for nearly a year to complete this study.

PINEAPPL STUDY

Epidemiological study on the relationship between lifestyle, microbiota and inflammation levels conducted in six cities in France (Lille, Paris, Marseille, Dijon, Colmar and Bordeaux). Approximately 100 people were recruited in Lille in 2024. A total of 3,000 people are expected to participate in the study in France, including 400 in Lille.

PRÉVENDIAB STUDY

2,011 people recruited between 2022 and 2024. A study aimed at evaluating the causes of the onset and complications of diabetes. A three-year follow-up of the cohort began in March 2025 (see page 17).

Our internal news

INITIATIVES CARRIED OUT IN THE REGION IN PARTNERSHIP WITH LOCAL ORGANISATIONS

56 EDUCATIONAL PROJECTS | **16** FUNDERS | **31** EXPERTISE

NEXANS SUPPORT

OCTOBER TO DECEMBER 2024

As part of a mental health awareness programme, we supported Nexans through a series of workshops led by our neuropsychologist. From the mural on burnout to practical sessions on stress management, sleep, and self-confidence, employees benefited from a supportive space for discussion, underpinned by the attentiveness and expertise of our facilitator.

ANDES PROJECT LAUNCH

SUPPORTING LOCAL ORGANISATIONS: THE "EVERYDAY WELLBEING WITH MY GROCERIES" PROGRAMME

In 2024, the Prevention, Health and Longevity Centre entered into a partnership with ANDES and COS Consulting to roll out the "Everyday wellbeing with my groceries" programme. This initiative aims to structure preventive healthcare support for food aid organisations, continuing the work carried out with social centres and local projects.

The first year laid the foundations for the programme. A programme design phase identified the needs of both organisations and beneficiaries, while also establishing strategic partnerships. Awareness-raising webinars were organised in October to mobilise stakeholders in the region and initiate the first actions.

The project is now entering its operational phase with the implementation of Prevention Assessment Frameworks (PAFs) in November. The first three sessions are scheduled, marking the start of field testing. The aim is to refine the scheme in 2025 in three pilot areas, before rolling it out across the entire region in 2026.

With the launch, the Prevention, Health and Longevity Centre is stepping up its commitment to structuring and disseminating preventive healthcare measures by supporting local stakeholders and contributing to a sustainable and inclusive approach.

ANDES partner insight

Corinne Schadkowski, consultant, health and environment project manager for ANDES

Valérie Gheeraert, ANDES network coordinator

Expertise, professionalism, conviction and good humour... these are just some of the qualities we found in the team at the Institut Pasteur, who worked with us in 2024 to jointly develop a programme dedicated to preventive healthcare in Epiceries Solidaires food banks: "Everyday wellbeing with my groceries"

REGIONAL ROLLOUT OF PREVENTIVE HEALTHCARE PROGRAMMES

In 2024, the Prevention, Health and Longevity Centre continued the rollout of its **Sens'Actifs Séniors** and **Mes Rendez-Vous Actifs** in Hauts-de-France, in partnership with the ARS. As a result of these initiatives, **354 professionnals from 132 organisations** were made aware of the **Sens'Actifs Séniors** programme, while **Mes Rendez-Vous Actifs** mobilised **47 professionnals from 25 organisations**. These activities were supported by a **regional video conference session** bringing together **51 professionnals from 28 organisations**.
Each programme is complemented by specially designed teaching kits, facilitating the roll-out of preventive healthcare activities across the country.

PARTICIPATION OF OUR VACCINATION AND INTERNATIONAL MEDICINE CENTRE

ANTI-RABIES CENTRES DAY

is an event organised every two years by the National Rabies Reference Centre, based at the Pasteur Institute in Paris.

Its main purpose is to bring together all professionals (doctors, nurses, biologists, etc.) working in anti-rabies centres in France - these are facilities specialising in post-exposure care (after a bite or scratch from an animal potentially carrying rabies) and rabies vaccination.

OLYMPICS AND PROFESSIONAL INTEGRATION: A SPORT & HEALTH DAY IN RAISMES

A DAY FOCUSED ON INCLUSION AND WELLBEING, IN COLLABORATION WITH LOCAL EMPLOYMENT SERVICES ACROSS THE AREA.

Organised around fun and educational sporting events, this **Olympics & Professional inclusion** day helped young people supported by local employment services to recognise the importance of health and wellbeing in their journey towards employment.
Our Health Education and Training teams were on hand to lead the day's activities, alongside numerous partners involved in the health village.

Video recap:

OUR FLAGSHIP EVENTS

IN 2024, WE ORGANISED MORE THAN 10 EVENTS FOCUSED ON PREVENTION.

2ND EDITION OF SPRING PREVENTION, HEALTH AND PRECARIOUSNESS

It was a day full of discussions and discoveries, meetings and emotions. A coming together of individuals, associations and organisations working towards the same cause, all looking in the same direction.
It was a packed day of awareness-raising, knowledge sharing, information exchange and education on preventive healthcare.

We wanted to let you relive the event on video.

Video recap:

We sincerely thank all partners, sponsors, speakers, service providers, participants, and organisers from **the Prevention, Health and Longevity Centre** who worked with us to make this day memorable.

SMV COLLOQUIUM
(SOCIÉTÉ DE MÉDECINE DES VOYAGES)

The SMV (Société de Médecine des Voyages) Congress brought together experts from all over France for discussions on women's health when travelling abroad.
Organised in collaboration with the Prevention and Health Centre at the Institut Pasteur de Lille, this event provided an opportunity to discover innovative practices and reinforce the importance of preventive healthcare.
All the participants, speakers, and partners contributed to making this conference a real success!

Insight from Christophe RAPP, *Chairman of the SMV*

The Autumn Day, an annual event in the provinces, focuses on "the travelling woman", with a particular emphasis on the specific health risks faced by women when travelling. Organised in collaboration with the CVI in Lille (an all-female team), the event brought together experts to share practical advice and travel medicine recommendations with doctors.

Video recap:

Outlook and ambitions

In 2025, our ambition is to strengthen our collaborations and ensure the long-term future of our prevention programmes.

Increasing strategic partnerships with public health stakeholders.

Developing our action-research initiatives to measure the impact of what we do.

Making prevention even more accessible, in particular *via* our websites, external activities and events.

FOR 130 YEARS, WE HAVE BEEN TAKING ACTION WHERE IT ALL BEGINS: BEFORE DISEASE STRIKES.
OUR MISSION: TO TRANSFORM PREVENTION INTO A LEVER FOR THE FUTURE FOR ALL.

Expertise

Microbiological safety unit

One of the keys to preventing infections in humans is controlling our environment.
Preventing human infections depends in part on controlling the environment, as many microorganisms (viruses, bacteria, fungi) are transmitted through the air, water or contaminated surfaces. This control is essential in places that cater to vulnerable groups, such as hospitals or early childhood facilities, and also in high-traffic areas, including public transport. The pandemic heightened awareness of these issues among both the public and industry.

There are various control methods: disinfectants, air purifiers, ionisers, active lighting systems, antimicrobial textiles and functionalised surfaces. Their development and evaluation must be rigorous to ensure effectiveness and trust.

In this context, the Microbiological Safety Unit (USM), created in 2003 at the Institut Pasteur de Lille, plays a key role. This applied laboratory has facilities dedicated to bacteria, viruses and fungi, enabling pathogens to be studied under controlled conditions that closely resemble real-life situations. The USM is involved in everything from prototype design to final evaluation of devices, and works with manufacturers, hospitals and public authorities in the healthcare sector.

A collaboration at the heart of health safety.
Dr Michèle Vialette, head of the Microbiological Safety Unit (USM) at the Institut Pasteur de Lille, puts her expertise in microbiology and pathogen management to work for civil security stakeholders. With her experience in the Biotox Eaux network and expertise in biological agent detection methods, she assists the SDIS in assessing biological risks and analysing equipment designed to protect emergency responders.

Genetic toxicology

The Genetic Toxicology Laboratory has been in existence for over 40 years and is one of the largest genotoxicity centres in France.

Its role is to carry out studies, in accordance with international guidelines, to assess the genotoxic and mutagenic potential of chemical, pharmaceutical, cosmetic, biotechnological and agrochemical substances in compliance with GLP (Good Laboratory Practice) standards. The laboratory is inspected by ANSM, Cofrac and ANSES. 154 genotoxicity studies were conducted in 2024 for 30 different companies and organisations.

Project support

RESEARCH ADMINISTRATION AND CONTRACT MANAGEMENT DEPARTMENT

The Research Administration and Contract Management team supports the development and implementation of the scientific strategy of the Institut Pasteur de Lille: seeking funding to support research areas, preparing funding applications for programmes and projects.

Funding is sought from local authorities (the Region, MEL), national agencies (ANR, ANRS-MIE, PIA and France 2030), the European Commission, associations, foundations, and national and international manufacturers. Collaborative projects are developed in collaboration with IPL partner institutions: University of Lille, Inserm, CNRS, Lille University Hospital and other organisations with which the IPL collaborates, thereby actively contributing to the regional research ecosystem. The Research Administration and Contract Management team supports the development of the Institute's research activities and assists in their management.

ITS REMIT IS TO:

- Support the development of projects in accordance with the criteria and specific requirements of funders: compliance with financial regulations, administrative, ethical and legal rules in conjunction with the Legal Department, and any specific aspects of the project.
- Ensure the proper administrative and financial management of contracts: establish the necessary budgets for project implementation, provide day-to-day support for project management with managers, technology platform managers and researchers, and interact day-to-day with the Institute's support services: Purchasing, Accounting, Management Control, Human Resources, Legal Department, etc.
- Carry out the financial reconciliation of contracts: prepare summary statements of expenses specific to each funder, with certification by the statutory auditor where required, and monitor the receipt of funds.
- Establish indicators to monitor activity, measure the volume of contracts managed, anticipate deadlines, organise the allocation of management tasks, and support the evaluation processes of the units and the Institute...
- Organise scientific activities on campus by holding meetings of the Research Committee, Scientific Management Committee and Internal Scientific Committee, as well as through IPL science days, science breakfasts and the dissemination of research news.
- The team is also regularly called upon to respond to a range of mandatory surveys conducted by the Department for Research, the Observatory of Science and Technology, and other institutions.

The team aims to promote interaction and facilitate the work of research teams in their everyday lives so that they can focus on their core business.

€7 M
VOLUME OF RESEARCH CONTRACTS MANAGED

74
RESEARCH PROJECTS
supported in their application for funding

192
ACTIVE PROJECTS

PROMOTING RESEARCH

Promoting research sometimes also means becoming a shareholder in a company that develops a product based on our researchers' inventions!

An exclusive licence agreement was signed between **Iliad**, the American biotech company and the team of Camille Locht and Nathalie Mielcarek on 18 December 2013. It covers **BPZE1 technology**, **a new whooping cough vaccine** that uses genetically modified whole bacteria (BPZE1) to eliminate its toxicity, with the unique feature of being administered nasally.

A research collaboration was established between Iliad and the researchers, making it possible to obtain the scientific data essential for conducting a Phase I clinical trial, followed by a Phase II trial, the results of which proved highly relevant.

Iliad, a biotech company whose activities are based exclusively on the BPZE1 technology, was seeking funding and therefore proposed that the co-owners of the licensed technology, including the Institut Pasteur de Lille, convert part of their receivable (€1 million) into share subscription warrants (BSA).

In agreement with the other co-owners, the Institut Pasteur de Lille decided to convert these warrants and become a shareholder in Iliad, and now holds 1.22% of the company's equity.

Iliad has just received approval from the FDA (Food and Drug Administration) to launch a Phase III clinical trial, marking a further step towards the commercialisation of this vaccine!

12 PRIORITY PATENT FILINGS

63 PORTFOLIOS OF PATENTS IN FORCE

A committed campus

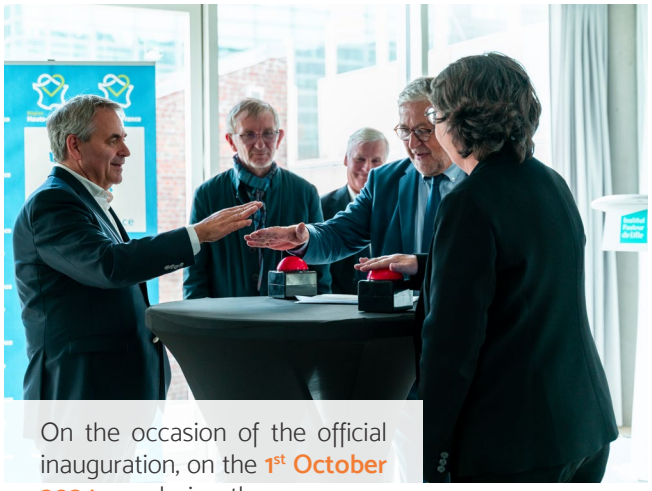
THE PASTEUR LILLE CAMPUS CONTINUES ITS TRANSFORMATION.

The first stage of refurbishment of the buildings used for research and prevention activities at the Institut Pasteur de Lille was completed in 2024. This milestone marks a turning point in the transformation of the Pasteur Lille Campus, which began over six years ago, with the aim of creating a true centre of excellence that is increasingly attractive, responsible and sustainable.

LE "1894"

In May 2024, Institut Pasteur Lille opened **"Le 1894"**, a space dedicated to hosting professional events focusing on scientific, social or economic themes. Managed by corporate event professionals, its 500 m² plenary room, 400-seat amphitheatre and rooftop terrace have already hosted conferences, seminars, award ceremonies, talks and corporate events since its opening. Integrated into the Campus's real estate strategy, Le 1894 is much more than a rental asset: it is first and foremost a venue, accessible to scientists for their conferences (some fifteen events dedicated to science in 2024) and a place for establishing new connections between the Institut Pasteur de Lille and local businesses.

INAUGURATION



On the occasion of the official inauguration, on the 1st October 2024, and in the presence of Sandrine Gaudin, Deputy Governor of the CEB, and Xavier Bertrand, President of the Hauts-de-France Region, partners and supporters of the Foundation, Jacques Richir, President of the Pasteur Institute of Lille, Frédéric Batteux, its Director General, and Didier Bonneau, its Deputy Director General, warmly thanked the 1,000 staff, 200 companies and all the partners and patrons who have worked alongside the Institut Pasteur de Lille over the years.

Camille Guérin Building

The new laboratories: The fully renovated 4,000 m² building can now accommodate the 150 scientists working on the discovery of new drugs and on the risk factors and molecular determinants of ageing-related diseases. These modern premises, located in the Camille Guérin building, support the development of research on our campus. Scalable and modular, they have been designed to adapt to research teams' needs.

EUROPEAN HERITAGE DAYS

The Institut Pasteur de Lille celebrated its 130th anniversary by opening its doors to anyone interested in science and heritage. Over two days, on 21 and 22 September 2024, nearly 1,000 people took the opportunity to discover the Institute's scientific, historical and architectural heritage through a varied programme accessible to all.
60 Pasteur staff welcomed visitors for an immersive experience at the heart of research. Guided tours of the campus were provided by Institute staff, who shared the history of the site from its creation in 1894 to the present day as they showed off the laboratories and technology platforms.
A playful and educational trail has been designed especially for families, allowing children and their parents to learn about the world of the infinitely small.
The public could also attend a scientific talk: Jean-Charles Lambert and Manon Lenain presented the latest advances in Alzheimer's disease research, exploring current avenues for treatment and prevention.

Would you like to find out how the campus has evolved since it was established?
You can listen to this podcast at home:

DEPLOYMENT OF A COLLABORATIVE PLATFORM

Since September 2024, the Institute has had a new intranet portal that also serves as a corporate social network. This new tool connects all 800 employees virtually, facilitating information sharing, the dissemination of news and discussions between teams.

In an environment where staff from several different organisations (Inserm, CNRS, University, Lille University Hospital, and the Institut Pasteur de Lille) work side by side, the implementation of this tool is an important lever for structuring discussions, supporting interdisciplinary work and promoting internal initiatives. More than just a communication tool, this new space aims to support collective dynamics to serve our Research and Prevention missions.

The name of the platform, **La Bananeraie,** is a nod to the history of the plot of land that was once home to a banana plantation..

CULTURAL MEDIATION, A MUSEUM DESIGNED AS A WORK OF ART

The museum, which skilfully combines art and science, is housed in Albert Calmette's former apartments.
Open to the public every weekend from 10.00 to 12.00 and from 14.00 to 17.00, it welcomed 3,500 visitors in 2024.
This year, audio-guided tours available through the Wevisites app complemented the cultural outreach programme. They allow everyone to explore the museum at their own pace and make it more inclusive.

Our museum:

Start-ups

Biotechnology is revolutionising the healthcare sector. At the heart of the campus, the Institut Pasteur de Lille is supporting the development of biotechnology projects, start-ups and companies, as well as innovation in healthcare. They have a shared objective: to develop promising therapeutic treatments, new services and products for analysis and diagnosis as a direct result of the fundamental research carried out in Lille.

GENOBIOME® POWERED BY GENOSCREEN

ENGINEERING FOR THE STUDY OF MICROBIOMES

GenoScreen offers ready-to-use genomic analysis solutions for studying microbiomes through its integrated **GenoBiome** solution: Gut, Skin and Soil. This offer combines scientific rigour, standardised protocols optimised for the matrix under study, and advanced bioinformatics expertise to support projects in health, nutrition, cosmetics and the environment. It is aimed at both industry (R&D, marketing, regulatory) and academic research, for targeted impact studies or exploratory analyses of microbiomes.

STARKAGE_ THERAPEUTICS

The year 2024 was marked by significant scientific advances for **StarkAge Therapeutics**, a company specialising in the development of therapies specifically targeting senescent cells. Our drug candidate, the anti-DPP4 ADC, demonstrated excellent preclinical results, showing high efficacy in multiple mouse cancer models, along with a remarkable absence of toxicity. These promising results were successfully presented at the American Association for Cancer Research (AACR) international conference in San Diego, confirming the scientific community's interest in our therapeutic approach. Building on these advances, we have also expanded our avenues of research to other age-related diseases, particularly fibrosis. This positive momentum was reinforced by a successful €1.5 million fundraising campaign in early 2024, thanks to the active support of Business Angels and BPI, illustrating the relevance and attractiveness of our innovative approach within the Institut Pasteur de Lille campus.

DEEPLEX HELP

THE DIAGNOSTIC KIT TO IMPROVE THE MANAGEMENT OF H. PYLORI

Deeplex HelP is a test developed and marketed by **GenoScreen** which enables the detection of *Helicobacter pylori* and its antibiotic resistance from a gastric sample. It enables accurate diagnosis, facilitating personalised therapeutic management in response to the growing challenge of antimicrobial resistance.

Societal commitments

LINE MANAGER:
A KEY PLAYER, SUPPORTED BY THE HUMAN RESOURCES DEPARTMENT AND DEDICATED TO SERVING EMPLOYEES

It is widely recognised that an organisation's success depends on a delicate balance, based on the joint efforts of three parties: the line manager, the employee and the human resources department. Each person's role is crucial, and it is through the harmonious coordination of these roles that a strong, committed and adaptable collective can be built.

The line manager is not only seen as a conduit for top-down information: they are perceived as a guide for everyday matters. They are not expected to know everything, but rather to create an environment that encourages listening, accountability and independence. Team projects need to be driven, developments supported, the purpose of actions clarified, and individual skills acknowledged.

If this role to be undertaken successfully, support must be provided by the Human Resources department, whose job is to support, equip, and guide managers. The manager is seen as an essential link on the ground, and it is through close collaboration that career paths can be supported, needs anticipated, working conditions improved, risks - particularly psychosocial ones - prevented, and skills developed.

The relationship with employees must also be maintained very carefully. Developments must be designed with them in mind, not just for them. Their involvement, feedback and commitment are at the core of group dynamics. It is through a three-way collaboration that structural changes can be initiated, fostering a managerial culture that is less hierarchical, more empowering, and more human-centred.

We in the human resources department aim to support this transformation step by step, recognising each individual's unique qualities and placing cooperation and people at the heart of everything we do.

DEVELOPING EMPLOYABILITY
1 development finalised and 2 underway

1.36%
TRAINING BUDGET
1.36% of the total payroll in 2024, representing €155,000 + 1% training tax

78/100
PROFESSIONAL EQUALITY INDEX
2023/2024 index published in 2025

7.94%
PERCENTAGE OF WORKERS WITH DISABILITIES

Fr: 7.6
ISR: 0.021

Accidents at work:

- Frequency rate (FR) = (number of accidents with lost time / hours worked) x 1,000,000
- Severity rate (SR) = (number of days lost due to temporary incapacity / hours worked) x 1,000

DURING 2024, THE MAIN THEMES WERE:

- Chemical risk management
- The roll-out of the action plan to control psychosocial risks and improve quality of life at work through measures targeting working conditions.
- Influencing and improving our environmental impact through our carbon footprint assessment
- One particular initiative was the Hauts-de-France Mobility Challenge during Sustainable Development Week, for which the campus won the Public Transport category.

KID CAMPUS: A UNIQUE INSIGHT INTO THE WORLD OF RESEARCH

In 2023, Kid Campus offered 300 children between the ages of 9 and 11 the opportunity to step into the shoes of a researcher for half a day through its workshops in the laboratories.

A visit to the Institut Pasteur de Lille Museum also gave them the opportunity to discover the foundation's history and its major scientific discoveries.

In return for this immersion in the world of research, some schools have been able to organise collections and solidarity challenges to support researchers.

Generosity

THE MOST AMAZING OPERA CHOIRS SINGING FOR HEALTH AND RESEARCH!

The **Rotary Club de Roubaix Est** organised a concert by the La Folia de Lille Symphony Orchestra at La Treille Cathedral on 31 May and 1 June 2024. These two evenings were fundraisers for medical research.

CHARITY COLLECTION AT JEANNE D'ARC DE LA MADELEINE SCHOOL

Invited to participate in the Kid Campus 2024 initiative, the Jeanne d'Arc de la Madeleine private primary school wanted to support our researchers! The children in Year 6 organised a range of fundraising activities and were proud to present the proceeds to us on 11 June 2024. Well done to the children for this wonderful intergenerational community project.

Institut Pasteur Lille Gala

On 14 November 2024, the Pasteur Institute in Lille celebrated its 130th anniversary with a special gala attended by 150 guests from the regional business community: decision-makers, business leaders and committed partners. This event was a fundraiser for the development of health research. The date for the 2025 Gala has already been set.

MEETING WITH FRANCK THILLIEZ

A special meeting with writer Franck Thilliez, author of numerous best-selling thrillers and patron of the Institut Pasteur de Lille, on Tuesday, 10 December 2024.

On the agenda: a discussion on the theme **"Plague and Pandemic: Between Science and Fiction"** with Dr Florent Sebbane (head of the "Plague and *Yersinia pestis*" team at the Institut Pasteur de Lille) followed by a book signing session for the **"Norferville"** collector's edition!

Dr Florent Sebbane

Bequests and life insurance

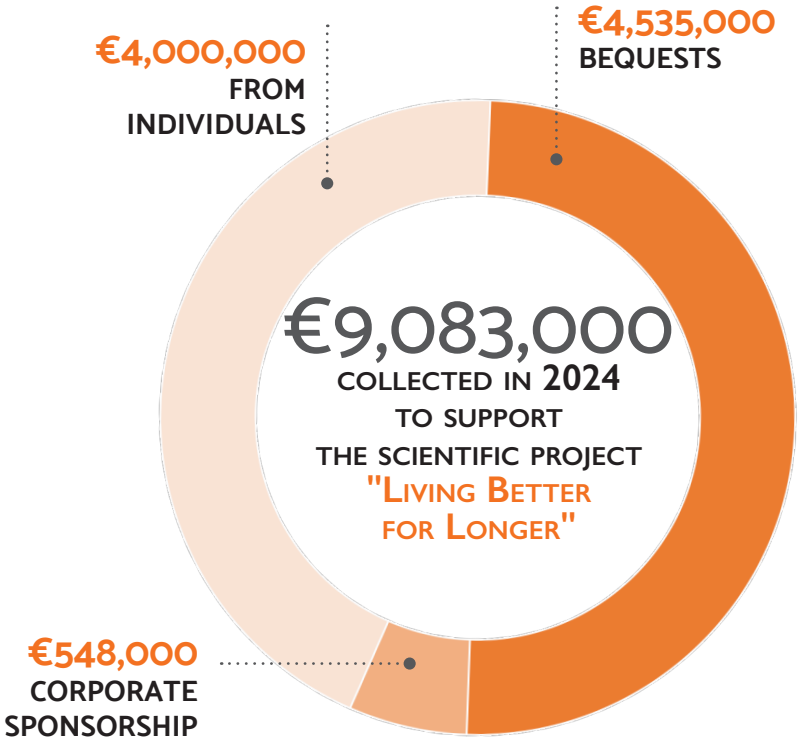
LEAVING A LEGACY TO THE PASTEUR INSTITUTE IN LILLE IS MY WAY OF CONTINUING TO WATCH OVER MY CHILDREN AND GRANDCHILDREN.

I have lived a happy life, I have suffered very little from illness, but many of my friends have not been so fortunate. And today, as certain diseases become more widespread and we see the emergence of new viruses, I want to protect the people I love. I have always placed my family's wellbeing and health at the top of my list of priorities. That is why I have decided to donate part of my estate to the Institut Pasteur de Lille. This part of my legacy, which will contribute to advances in research, is a way for me to continue to watch over my children and grandchildren when I am no longer here. I spoke to them about it and they were touched by my approach. I am happy with this choice, which reassures and comforts me.

Martine, aged 70

Philanthropy

FUNDRAISING TO SUPPORT RESEARCH



34
BEQUESTS AND LIFE INSURANCES
taken out during the year

18
COMPANIES
supported us

55,779
ACTIVE DONORS

THEY SUPPORTED US IN 2024

Aéroport de Lille
API Restauration
Air Liquide
Fondation Ausspar
Fondation des Mutuelles Axa
GSMC
Grain de Malice
Hepta
Kereis
L'Ecaille
La Laiterie
M comme Mutuelle
Ramery Energie
Paul
Synlab
Table du Colysée
Verspieren
Victoria Relocation

THEY BECAME OUR AMBASSADORS IN 2024

Damien Demaiter

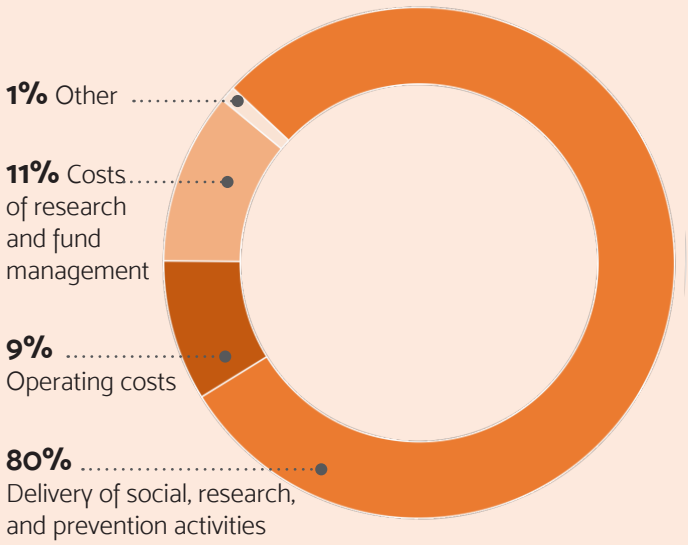
Over the past two years, I have had the honour of being an artist ambassador for the Institut Pasteur de Lille to support the Pasteur research. I am convinced that science and art both serve the same need to explore knowledge of life, opening up new avenues for understanding and reflection. Beyond the apparent contradiction between seemingly opposing domains - dreams and illusions on one side, pragmatism and tangible reality on the other - this collaboration is characterised by a sense of coherence. This is not limited to the organic abstraction that lies at the heart of my work, but extends to the collaborative process itself and which, curiously, seems to echo the images of the researchers' work, but also because these two worlds allow us to broaden our perspectives.

Aurélie Chrétien

Being an IPL ambassador is a deeply rewarding experience. My art allows me to show generosity and raise awareness among donors so that I can make a real contribution to the fight against disease. This commitment is a source of inspiration for me; it's a real driving force for a healthier world. For the Institut Pasteur de Lille Gala, I created several works, including one about Louis Pasteur. I will be renewing my support in 2025, at the Gala organised at the Domaine de Luchin, and I have created "DOGUES", a unique work of art.
All proceeds from their auction will be donated to the Institute: meaningful acquisitions.

FINANCES

USES: €36.6 M

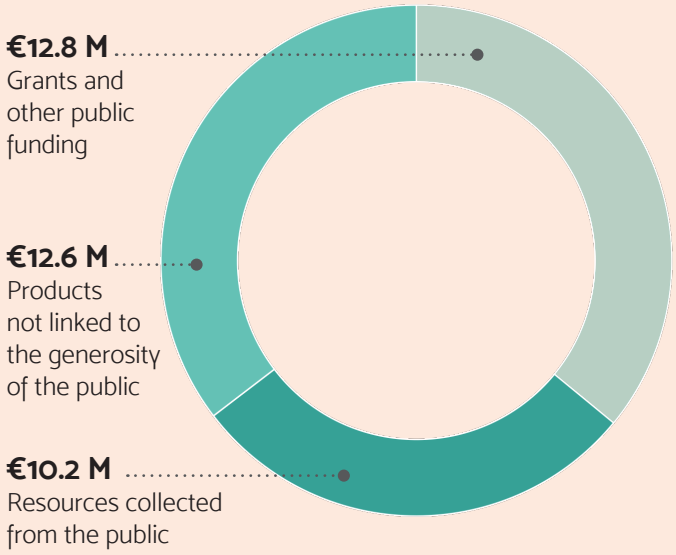


ZOOM

Breakdown of direct support by research theme

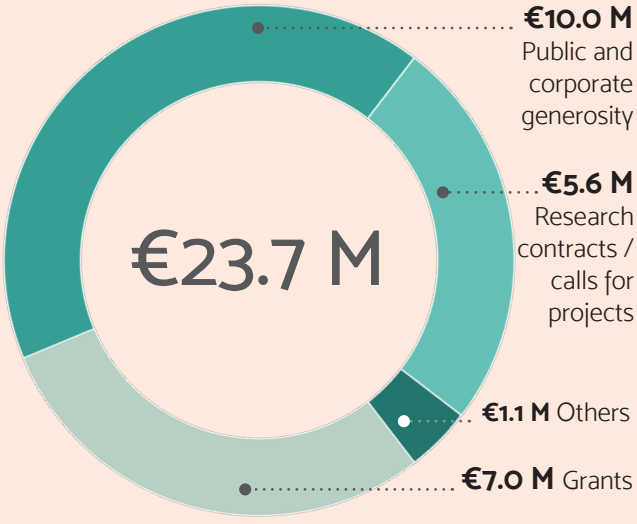
31.29%	Infectious and inflammatory diseases
24.10%	Technological platformsTechnological platforms
22.65%	Cardiovascular and neurodegenerative diseases
8.32%	Drug discovery
5.82%	Cardiovascular and metabolic diseases
4.08%	Cancers
3.05%	Cardiovascular and metabolic diseases
0.69%	COVID

RESOURCES: €35.6 M



ZOOM

Composition of research resources in 2024



SUPPORT:

MEMBERS OF THE BOARD OF DIRECTORS

COLLEGE OF FOUNDING MEMBERS

- **Mr Jacques RICHIR,** Deputy Mayor of Lille, Chairman of the Board of Directors of the Institut Pasteur de Lille
- **Madame Marie Christine STANIEC WAVRANT,** Departmental Councillor, Deputy Mayor of Lille
- **Mrs Johanne GOMIS,** Municipal Councillor Delegated to the City of Lille
- **Mrs Justine RATELADE,** Municipal Councillor Delegated to the City of Lille
- **Mrs Julie NICOLAS,** Municipal Councillor Delegated to the City of Lille

COLLEGE OF INSTITUTIONAL PARTNERS

- **Mrs Catherine LEFEBVRE,** Metropolitan Councillor, Representative of the Métropole Européenne de Lille (MEL) - *Member of the board - Secretary*
- **Mrs Manoëlle MARTIN,** Vice-President of Higher Education, Representative of the Hauts-de-France Region - *Vice-President*
- **Mrs Charlotte LECOCQ PARMENTIER,** Departmental Councillor, Representative of the Departmental Council of the Nord
- **Mrs Yasmine BELKAID,** Managing Director of the Institut Pasteur, Paris
- **Mrs Bénédicte SAMYN,** North West Regional Delegate of the Inserm, representing Mr Didier SAMUEL, CEO of the National Institute of Health and Medical Research (Inserm)
- **Mr Christophe MULLER,** Hauts-de-France Regional Delegate of the CNRS, representing Mr Antoine PETIT, CEO of the National Centre for Scientific Research (CNRS)
- **Mr Régis BORDET,** President of the University of Lille

COLLEGE OF QUALIFIED INDIVIDUALS

- **Professor Eric SENNEVILLE,** Tourcoing Hospital - University service for infectious diseases and travellers
- **Patrick VACOSSIN,** Notary, Nord Chamber of Notaries - *Member of the board - Treasurer*

COLLEGE OF FRIENDS OF THE FOUNDATION

- **Mr Thierry LETARTRE,** *Member of th board*

GOVERNMENT COMMISSIONER

- **Mrs Fabienne GIARD,** Regional academic delegate for research and innovation for the Hauts-de-France region

PERMANENT GUESTS

- **Representatives of the foundation's employees,** elected by the CSE and approved by the Board of Directors
- **Loïc Belhomme,** representing Ag2r – La Mondiale
- **Thierry Mathieu,** representing Synlab laboratories
- **Pierre de Ginestel,** representing Auchan

SCIENTIFIC STEERING COMMITTEE

- **Frédéric BATTEUX,** Managing Director
- **Perrine QUIVRON,** Deputy Managing Director
- **Fabienne JEAN,** Director of Research Administration and Contract Management
- **Philippe AMOUYEL,** Director of Unit U1167
- **Amélie BONNEFOND,** Future Director of Unit UMR8199/U1283
- **Benoit DÉPREZ,** Director of Unit U1177
- **Jean DUBUISSON,** Director of CIIL
- **Philippe FROGUEL,** Director of Unit UMR8199/U1283
- **Jean-Charles LAMBERT,** Future Director of Unit U1167
- **Frank LAFONT,** Future Director of CIIL
- **Camille LOCHT,** Director of Research Inserm
- **Nathalie MIELCAREK,** Head of International Relations (invited member)
- **François PATTOU,** Director of Unit U1190
- **Bart STAELS,** Director of Unit U1011
- **Isabelle VAN SEUNINGEN,** Director of Unit UMR9020/UMR1277

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- DONATIONS
- BEQUESTS
- CORPORATE COLLABORATIONS
- SPONSORSHIP
- SOLIDARITY EVENTS
- VOLUNTARY WORK

Institut Pasteur de Lille
Vivre mieux plus longtemps

pasteur-lille.fr

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