


Institut Pasteur de Lille

Vivre mieux
plus longtemps



Report 2020





RENOWNED PRIVATE PUBLIC
UTILITY **FOUNDATION SINCE 1898**

pasteur-lille.fr

“

To know how to wonder is the first step on the road to discovery.

LOUIS PASTEUR

Editorial

In 2020

IN 2020, THE EXCELLENCE OF OUR RESEARCH WAS RECOGNISED IN THE FIGHT AGAINST INFECTIOUS THREATS

The COVID-19 pandemic has suddenly brought to light our vulnerability to the risk of infection. With it, research seems to have acquired a new status: it's now a factor of social stability. This crisis bears witness above all to the absolute need for reactive, efficient research with significant resources to be able to respond to emergencies and counter the appearance of new viruses and other bacterial infections in the future.

In February 2020, when the SARS-CoV-2 virus at the beginning of the COVID-19 epidemic appeared in France - the first three officially recorded cases were on 24 January - a team of 30 researchers from the Institut Pasteur de Lille, assembled as a Task Force, began their work to deal with the emergency. At the same time, our microbiological safety unit put its expertise into action in tests and processes for protection against microbes.

In just a few months, in our research laboratories, a promising drug was found, a vaccine route developed from a vaccine against whooping cough was investigated and a strategy to ultimately counteract the emergence of new coronaviruses was created. So, to anticipate future epidemics, the Institut Pasteur de Lille launched its INTHREPIDE programme, whose ambition is clearly stated: therapeutic innovation against epidemic infectious diseases.

Thanks to its knowledge and resources in medicinal chemistry, the Institut Pasteur de Lille has shown that it can play a major role in the search for a drug against SARS-CoV-2, thus showing itself to be one of the premier players in the fight against major infectious threats. All this available know-how has allowed us to move faster, further, shedding light on the importance of fundamental research. Because let's not forget: there's no small research and no small projects. Over the years, the Institut Pasteur de Lille's Campus has become an international site of excellence that attracts and recruits the best current researchers in their speciality, which we're very proud of.

Every day, our researchers advance their knowledge of the virus and the weapons we can use against pandemics. More than ever, their progress requires the support of our patrons. I would like to take this opportunity to salute their commitment in supporting us right from the start of the health crisis. Their generous assistance enabled the initial work to be carried out very quickly, which led to the identification of a promising molecule in the treatment of COVID-19, thus making the clinical trial phase possible. But the pandemic should not obscure all the other diseases on which researchers at the Institut Pasteur de Lille have been working for many years: Alzheimer's disease, diabetes, cancer, heart attack, etc. All donations, of whatever nature, are needed to face new threats as well as accelerate research that will allow us to live longer, healthy lives in years to come.

Finally, I would also like to salute the hard work of the teams from the Centre Prévention Santé Longevité (CPSL - Longevity Ill-Health Prevention Centre) who have been involved throughout this year in disseminating accurate, precise information to the general public and businesses on this new virus, raising awareness of best practices to follow and providing their microbiological expertise to those involved in the fight against viral contamination.

The foundation's microbiological safety unit also contributed through its expertise to answer questions related to the purification of air and surfaces.

Your support testifies to a strong commitment alongside our researchers and the excellence of French medical research.

Thank you for your faith and generosity

Prof Xavier Nassif
Managing Director

Contents

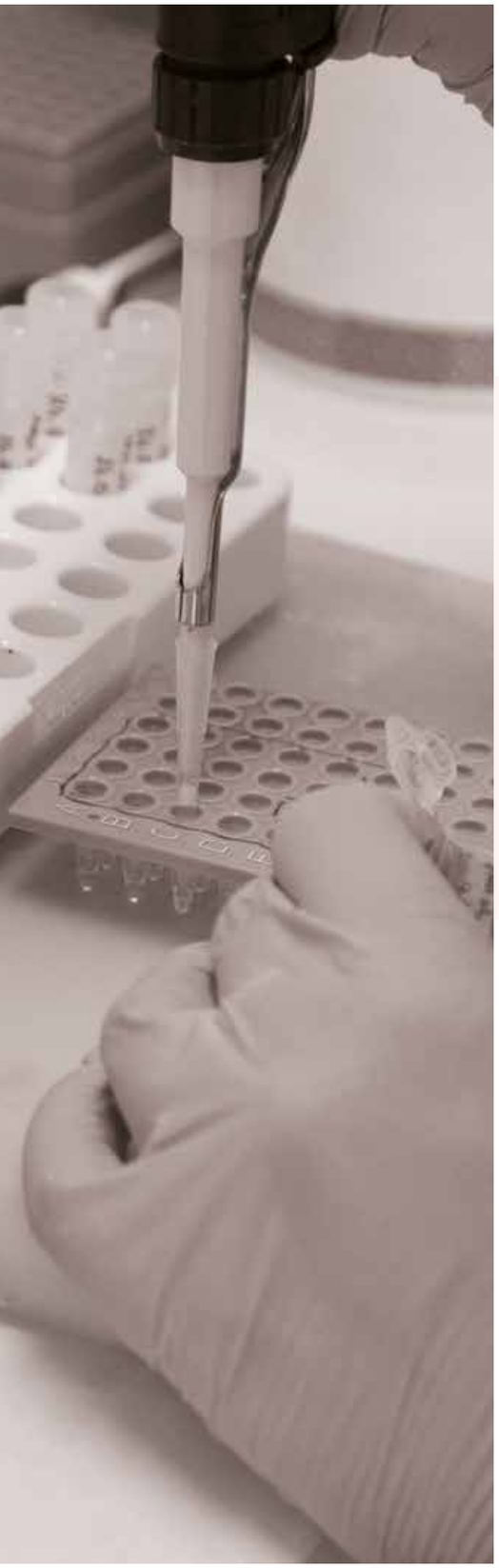
ACTIVITY REPORT 2020

Design and production:
Communication and Sponsorship Department -
Institut Pasteur de Lille, Karbone14, Cam&Lou

Photo credits:
©Institut Pasteur de Lille photo library
©Barbara Grossmann
©NikkoVP
©Sam Bellet
©Joaquim Dassonville Collectif-DR
©LaurentMayeuxREA
©Sophana_CIIL
©EGID
©rogerphoto - Adobe Stock
©Richard Villalon - Adobe Stock
©Nattakorn - Adobe Stock
©katemangostar -Unsplash.com
©freepik.com

THE INSTITUT PASTEUR DE LILLE *at the heart* OF THE PANDEMIC

In February 2020, **around thirty researchers from the Institut Pasteur de Lille** (CNRS, Inserm, University of Lille, Lille University Hospital), all experts in their field, met urgently. All volunteers, some of them put aside their fundamental research to devote themselves to this common challenge: **to quickly find an effective drug against the SARS-CoV-2 virus**. This special force then **began a race against the virus**, against the clock and against the competition. But the fight against this coronavirus has also been played out in another field, that of **prevention**, with the mobilisation of teams from the Centre de Prévention Santé Longévité (CPSL - Longevity Ill-Health Prevention Centre) at the service of all: general public, media, health professionals and businesses. The foundation's microbiological safety unit also contributed with its expertise to answer questions related to the **purification of air and surfaces**.



Research

RESEARCH / COVID-19 TASK FORCE: 30 RESEARCHERS MOBILISED TO MEET THE EMERGENCY

A campus with infectious disease specialists including a team working on the coronavirus since 2012 and a Drug Discovery Center bringing together a multidisciplinary team of 30 researchers, the best in their speciality: virologists, chemists, structuralists, epidemiologists, geneticists, engineers and pharmacologists.

A partner start-up, APTEEUS, specialising in the repositioning of drugs.

Leader: Prof Benoit Déprez, Scientific Director of the Institut Pasteur de Lille.

3 LINES OF RESEARCH

1. **In the** short term, therapeutic treatment in response to the health emergency through a strategy of molecule repositioning.
2. **In the medium term**, a vaccine in the form of a nasal spray, developed from work carried out by the Institute on the whooping cough vaccine.
3. **In the longer term** and over time, a pan-coronavirus treatment to anticipate mutations and treat all coronavirus conditions.

Prof Benoit Déprez,
Scientific Director
and Leader of the
Task Force

HOW DID THIS TEAM OF 30 RESEARCHERS GET ITSELF INTO BATTLE ORDER RIGHT FROM THE START OF THE PANDEMIC?
"The Institut Pasteur de Lille is fortunate to have research units, some of which are well suited to finding an antiviral that could be used quickly. The COVID-19 Task Force was therefore formed in less than 48 hours around the team of Doctor Dubuisson, who has worked for a very long time on coronaviruses, the structural biology team in the research unit of Professor Amouyel, my team dedicated to drug discovery, and bioTech APTEEUS, which has a library of the active ingredients of all drugs with marketing authorisation. We quickly defined 3 main objectives to combat SARS-CoV-2 and potentially related epidemics that could occur in the future, always by transfer from animals to humans.

THE SCIENTIFIC ADVANCES THAT WERE MADE IN JUST A FEW MONTHS FOLLOWED A HIGHLY REACTIVE APPROACH WITH THE ABSOLUTE COMMITMENT OF YOUR TEAMS. THEY ALSO REQUIRE HIGH-TECH EQUIPMENT AND FUNDING. HOW DID YOU FIND THEM?
The Institut Pasteur de Lille is a private, independent, non-profit research foundation recognised for its public utility. If in recent months, researchers have been able to make such rapid progress in their discoveries, it's thanks to the donations we have received from many donors and companies. But the fight against COVID-19 is unfortunately not over, and if we want to find a fully effective treatment for this virus and other coronaviruses in the future, we must continue to collect donations because they give us the means to advance our research.

Prof Benoit Deprez

HIGH-LEVEL TECHNICAL RESOURCES

The research teams at the Institut Pasteur de Lille have high-tech equipment:

- **A high-security P3 laboratory** which allows the safe handling of new and potentially dangerous pathogens.
- **A molecule screening platform that's** unique in Europe.
- **Fully automated observation and analysis tools**.
- **A pharmacopoeia made up of 200 000 molecules**, i.e. the largest collection of active ingredients bringing together all the drugs already marketed throughout the world.

"We already had experience in cultivating the virus and handling it which allowed us to save time on our research."

Dr Jean Dubuisson,
Director of CIIL and of the Molecular & Cellular Virology team

For many years, virologists have studied the hepatitis C virus, then from 2013, other viral models such as hepatitis E and coronaviruses, following the appearance in two patients hospitalised at Lille University Hospital of MERS-CoV, a new respiratory virus from Saudi Arabia.

"When SARS-CoV-2 arrived in France at the start of 2020, we already had experience growing and handling the virus, which saved us time in our research. So we quickly started our research on this new virus, which we didn't know much about at the beginning, and got a head start."

Dr Jean Dubuisson

Dr Sandrine Belouzard,
Virologist and CNRS researcher at CIIL.

Sandrine Belouzard joined the Institut Pasteur de Lille in 2009. A specialist in coronaviruses, she has been fully dedicated to the subject since 2013. In 2020, she was one of the only scientists authorised to work in the P3 high-security laboratory, the only place in the Institute where it's possible to handle the virus. It was she who characterised the effect of the drug candidate in several models of SARS-CoV-2 infection.

"We performed in vitro experiments on living cells derived from monkey kidney cells. We injected the active principle of the drug and then inoculated the virus to observe the reaction. This is where we spotted a molecule that made the virus react and proved its effectiveness against SARS-CoV-2. After conclusive tests carried out in vitro and on animal cells, we could proceed to the clinical trials stage prior to the marketing authorisation application. It's thanks to the excellent complementarity of the Task Force teams that we were able to achieve this result. Together, we produced work that individually we could not have done."

Dr Sandrine Belouzard

IN 2020, CREATION OF **THE CLINICAL MICROBIOLOGY UNIT**

Prof Anne Goffard,
Virologist at Lille University Hospital and researcher at CIIL

Professor Anne Goffard is a virologist at Lille University Hospital and a researcher at CIIL. A specialist since 2013 in research against coronaviruses, she has also developed expertise in managing exceptional health situations in laboratories. It was natural that she joined the Task Force, to which she brought her virological expertise. In 2020, she created the Clinical Microbiology Unit.

"This unit was created as a result of the SARS-CoV-2 pandemic. Its objective was to develop tools for characterising an emerging agent for research and industry. In particular, we worked on the CritiSARS project, led by Lille University Hospital, which aimed to identify new viral, inflammatory and immune markers of critical forms of the COVID-19 disease to help manage and treat affected patients."

Prof Anne Goffard

784 982 euros

ONE FIGURE

On 13 October 2020, the Hauts-de-France Region awarded the Institut Pasteur de Lille **a grant totalling 784 982 euros for its research into coronavirus**. Companies and donors helped mobilise **over one million euros in 2020 for COVID research**.

Prévention

PREVENTION / COMMITMENT OF THE TEAMS FROM THE LONGEVITY ILL-HEALTH PREVENTION CENTRE

The Longevity Ill-Health Prevention Centre, which brings together all the health and prevention activities of the Institut Pasteur de Lille, was involved in the fight against COVID-19 in 2020 by **mobilising its teams serving the public and businesses.**

PARTICIPATING IN THE NATIONAL EFFORT

In the midst of the pandemic, the Centre Prévention Santé Longévité (Longevity Ill-Health Prevention Centre) made its teams available to:

- **ARS** in terms of tracing
- **SYNLAB** as part of COVID-19 screening (PCR tests)
- Opening of **the vaccination centre** in early January 2021

Prof Daniel Camus,
Infectious Disease Doctor and Epidemiologist

"

Former head of the vaccination department at the Institut Pasteur de Lille, in 2003 he created the Centre for Prevention and Health Education, which became CPSL. He is currently a member of the Specialist Commission for "Infectious and Emerging Diseases" at the High Council for Public Health.

"I devoted 2020 to responding as an expert infectious disease specialist and epidemiologist to the many external requests that affected the Institut Pasteur de Lille. The aim was to ensure that the right information was transmitted so that the image and role of the Institute were evident and well established among the media and general public in particular. We also supported many partner companies as well as institutions in developing health protocols and training their staff in the right measures to adopt."

Prof Daniel Camus

VARIOUS **ACTIONS** WERE CARRIED OUT IN 2020

Technical support from our partners: **help developing health protocols, staff training** with a view to resuming activity**.** Lille Town Hall, Auchan, Hello Lille, etc.

- Distance training for health professionals: for CARSAT staff; for the NPDC Hospital Pharmacists Association, for the Occupational Health Institute of the North of France (ISTNF); for the Council of the Order of Midwives of Nord; for doctors practising in the private sector, etc.
- Information and awareness raising of the general public: organisation of webinars, response to letters and emails received via the METIS platform (medical advice for travellers, vaccinations)
- Media interventions.

FOCUS ON: THE HELLO LILLE CHARTER

In order to welcome visitors in the best possible conditions, Hello Lille and the Institut Pasteur de Lille have created **a health charter for tourism and events stakeholders**. This charter, broken down into **10 commitments**, is sent to various structures (from the hotel industry, culture, commerce) which undertake to **respect specific health measures to welcome visitors safely.**

Safety

EXPERTISE IN **MICROBIOLOGICAL SAFETY**

In 2020, **the MSU increased its expertise in the fight against bacterial and viral contamination**. The laboratory evaluated the performance of disinfection products and processes, decontamination devices for contaminated equipment or surfaces with antiviral activity (textiles, glass, metals etc). Among the many tests carried out, the laboratory notably developed device tests on HCoV-229E, a human coronavirus that's less pathogenic than SARS-CoV-2 and used as a model virus. **In one year, around a hundred products were tested.**

- Tests carried out in 2020: **filters, disinfectants, Blossum pouches, MoskitoFree collars, etc.**
- Targeted partnerships with major industrial players: **Saint-Gobain, Alstom, Dyson, etc.**

ONE FOUNDATION, *several ambitions*

By closely associating **research and prevention**, the Institut Pasteur de Lille relies on the expertise and complementarity of its teams to accelerate research and act for the health of tomorrow: **treatments, diagnostics, vaccines and innovative prevention protocols.**











Priorities

TWO PRIORITIES GUIDE **THE STRATEGIC PROJECT 2020 - 2024**

1

INFECTIOUS DISEASES, in the context of emerging epidemic risks and antibiotic resistance.

INTHREPIDE is the new therapeutic innovation programme directed against epidemic infectious diseases.

2

DEGENERATIVE DISEASES RELATED TO LIFESTYLE, extending lifespan and changes to the environment.

Research on diabetes, cardiovascular and respiratory diseases, neurodegenerative diseases, senescence, fibrosis and cancers.

Inthrepide

INTHREPIDE, AN INNOVATIVE RESEARCH PROGRAMME

OBJECTIVE: to identify new therapeutic principles against viral and bacterial infections.

IN 2020:

- **Repositioning of molecules against COVID-19**
- **Antiviral treatment targeting coronavirus proteases**
- **Entry into the clinic of the programme** built on exploiting new antibiotic modes of action capable of bypassing resistance mechanisms, in particular for species from the ESKAPE group, those highly virulent bacterial pathogens, resistant to antibiotics, and *Mycobacterium tuberculosis.*

Xavier Nassif,
Director General

“The Institut Pasteur de Lille is now recognised as one of the premier players in the fight against major infectious threats.

Research TEAMS ON THE FRONT LINE

An international centre for medical research, the Institut Pasteur de Lille Campus has **8 multidisciplinary, cross-cutting research units**. Their mission: **to respond to the major scientific and health challenges of today and tomorrow.**

The COVID-19 pandemic is one that mobilised many of our researchers in 2020. Despite this crisis and the great work of researchers against SARS-CoV-2, **the teams continued their research** carried out over many years into neurodegenerative diseases, diabetes, cancers, cardiovascular and respiratory diseases that also kill people each year.

Their research is the result of long-term work carried out **in partnership with the University of Lille, Inserm, CNRS, and Lille University Hospital**, as well as other players in the medical world: **Oscar Lambret Cancer Centre, Catholic University of Lille and INRIA of Lille.**

Research

8 RESEARCH UNITS,
34 TEAMS, MORE THAN 600 RESEARCHERS AND TECHNICIANS

1. Risk factors and molecular determinants of diseases linked to ageing
   U1167 - **Prof Philippe Amouyel**
2. Metabolic functional genomics and molecular mechanisms involved in type 2 diabetes and related diseases
   UMR8199 - **Prof Philippe Froguel**
3. Nuclear receptors, metabolic and cardiovascular diseases
   U1011- **Prof Bart Staels**
4. Drugs and molecules for living systems
   U1177 - **Prof Benoit Déprez**
5. Centre d'Infection et d'Immunité de Lille (CIIL- Lille Infection and Immunity Centre)
   U1019 - UMR9017 - **Dr Jean Dubuisson**
6. Translational Diabetes Research (TDR)
   U1190 - **Prof François Pattou**
7. Impact of the chemical environment on human health: Genetic toxicology laboratory
   Dr Fabrice Nesslany
8. Heterogeneity, plasticity and resistance to cancer therapies (Laboratoire Canther)
   UMR9020 - UMR1277 - **Dr Isabelle Van Seuningen**

AS WELL AS

TECHNOLOGICAL PLATFORMS ACCESSIBLE TO ALL SCIENTIFIC RESEARCH

The Institut Pasteur de Lille supports several technological platforms, 6 of which are part of the Joint Service Unit PLBS (Lille Platforms in Biology and Health).

UMS2014 - US41

1. **BICeL**: BioImaging Centre Lille, cell imaging and cytometry platform
   Manager: **Dr Frank Lafont**
2. **ARIADNE-Screening**, high-content and high-throughput screening platform
   Manager: **Dr Florence Leroux**
3. **P3M**: Proteomics and Modified Protein Analysis Platform
   Manager: **Jean-Michel Saliou**
4. **PLEHTA**: Animal Experimentation and High Technology Platform
   Manager: **Fabrice Infanti**
5. **Bililleé**: Lille bioinformatics, bioanalysis and biostatistics
   Manager: **Dr Guillemette Marot**
6. **TAG**: Applied Transcriptomics and Genomics platform
   Manager: **Dr David Hot**

- **ARIADNE – ADME**
  Manager: **Dr Florence Leroux**
- **RMN** - Nuclear Magnetic Resonance
  Manager: **Dr Isabelle Landrieu**
- **LIGAN MP** - Genomics and metabolic diseases
  Manager: **Prof Philippe Froguel**
- **CRB** - Biological Resource Centre
  Managers: **Prof Philippe Amouyel** and **Amandine Flaig**
- **Peptide chemistry**
  Manager: **Dr Oleg Melnyk**
- **High-security laboratory**
  Manager: **Dr Florent Sebbane**

Researchers
RESEARCHERS MOBILISED AGAINST COVID-19 BUT NOT ONLY...

UMR1011 - NUCLEAR RECEPTORS, METABOLIC AND CARDIOVASCULAR DISEASES

DIRECTOR: Prof Bart Staels

OBJECTIVE:to study the mechanisms behind alterations in lipid and glucose metabolism, and of the immune system occurring in pathophysiological conditions such as metabolic syndrome, non-alcoholic steatohepatitis (NASH) and type 2 diabetes, as well as its associated cardiovascular complications (atherosclerosis, heart failure, valve disease).

U1177 - DRUGS AND MOLECULES FOR LIVING SYSTEMS

DIRECTOR: Prof Benoit Déprez

OBJECTIVE: to design and synthesise drug prototypes with an innovative mode of action aimed at marked therapeutic progress in indications where the medical need is poorly met.

HIGHLIGHTS OF 2020

- **Severe COVID-19 and endothelium:**
patients with severe COVID-19 can develop damage to the endothelium, a tissue that lines the inner wall of blood vessels and the heart. This process can progress into endotheliopathy, which can complicate infection with the SARS-CoV-2 coronavirus. Endothelial damage is likely to be involved in the pathology and possible death of patients. A study carried out by Dr Sophie Susen's team, in close collaboration with Lille University Hospital, has shown that damage to the endothelium is not due to direct viral damage but to factors present in patients' blood. This study may help identify circulating factors directly involved in endothelial damage.

- **Fatty liver disease:**
no drug treatment exists to date against non-alcoholic steatohepatitis (NASH), also called soda or fatty liver disease. This disease, which can progress into cirrhosis, is growing: 1 in 5 people are affected in France. Dr Philippe Lefevre's team analysed more than 900 liver biopsies from obese patients. Using gene expression analysis and bioinformatics approaches, the team was able to very finely characterise a signature that reflects the evolutionary stage of the disease. This signature is different depending on gender. This work opens up interesting perspectives with future therapeutic applications.

BEAR IN MIND

Cardiovascular diseases are the leading cause of death for **over-65s**.
More than 140 000 deaths each year, or 400 deaths per day.
Almost 400 000 women are hospitalised each year for cardiovascular disease, **33% before the age of 65**.
1 in 4 heart attacks in women occur before the age of 65.

HIGHLIGHTS OF 2020

- **TB-Boost project:**
the drug candidate BVL-GSK098 has entered phase 1 clinical trials. From a collaboration established in 2011 with the group of Alain Baulard and Bioversys aimed at developing ethionamide boosters for treating tuberculosis, the team identified and optimised powerful compounds capable of overcoming resistance to ethionamide on multi-resistant bacterial strains. This scientific breakthrough resulted in the signing of a contract with GSK for the preclinical and clinical development of this chemical series. The entry into clinical development of the drug candidate BVL-GSK098 was completed in December 2020 with administration to the first healthy volunteer. The Phase 2A study is scheduled for mid-2021.

- **CAPSTONE project:**
the research team was awarded a European H2020-Marie-Curie European Training Network project (call 2020-grant agreement No 954992) for the period 2021-2024. Prof Rebecca Deprez-Poulain is the coordinator of this consortium made up of 10 beneficiaries, 9 partner organisations and including 7 manufacturers. This multidisciplinary project aims to train experts in structural biology, immunology, biochemistry, proteomics and medicinal chemistry to develop small molecules intended to treat autoimmune diseases and cancer, based on the modulation of endoplasmic reticulum aminopeptidases (ERAP). The 15 doctoral students will be recruited in 2021.

BEAR IN MIND

The Medication Discovery Centre of the Institut Pasteur de Lille has an **automated screening platform that's unique in France** and benefits from the 1st academic chemical library in Europe which brings together **200 000 molecules and compounds.**

U1019 - UMR9017 - LILLE INFECTION AND IMMUNITY CENTRE

DIRECTOR: Dr Jean Dubuisson

OBJECTIVE: to develop projects on the molecular and cellular mechanisms involved in infectious diseases as well as in chronic inflammatory diseases in order to apply this knowledge to the development of innovative approaches in the fields of diagnosis, treatment and prevention of these diseases while analysing their impact on the ground.

HIGHLIGHTS OF 2020

- **Antibiotics:** prolonged treatments with broad-spectrum antibiotics can decrease the defense mechanisms against pathogens and thus promote infections. A CIIL team has shown that prolonged treatment with vancomycin and colistin in mice worsens infection with *Pseudomonas aeruginosa*, the bacterium responsible for nosocomial infections in humans. This effect is associated with changes in the composition of the gut (but not pulmonary) microbiota and an alteration in myelopoiesis, the process of developing immune cells in the bone marrow. Treatment with Flt3 ligand, a factor capable of modulating haematopoietic activity, restores defence mechanisms.

- **Tuberculosis:** multi-antibiotic-resistant tuberculosis accounts for one third of mortality due to antimicrobial resistance. Standard diagnostic tests require cultures, which can take several weeks or only detect a reduced number of resistance-related mutations. The study published in the European Respiratory Journal describes for the first time a new molecular test, called Deeplex Myc-TB, directly applicable to clinical samples without culture, and capable of predicting resistance to

13 classes of anti-tuberculosis drugs. The results obtained on the basis of analysis of several thousand bacterial strains and clinical samples demonstrate its high degree of precsion compared to benchmark tests. These data support the wider use of this new test, already being used by WHO for surveillance studies of antibiotic-resistant tuberculosis. This molecular test was developed by the company Genoscreen with the collaboration of Doctor Philippe Supply's team (CIIL).

- **Whooping cough:** this respiratory disease is caused by the bacterium "*Bordetella pertussis*". It can be serious in frail people and infants. The disease tends to develop around the world: current vaccines are effective against the disease but do not prevent infection. Dr Camille Locht's team (CIIL) has developed a new vaccine called BPZE1, formulated from a strain of bacteria whose three main virulence genes have been mutated or removed. The article published in the prestigious journal The Lancet Infectious Diseases presents the results of a phase 1 clinical trial in humans. This work, carried out in collaboration with the Karolinska Institute in Sweden, is promising and fully justifies the continuation of phase 2 clinical trials, currently underway in the United States.

BEAR IN MIND

Microbial infections and inflammatory diseases remain major causes of mortality and morbidity worldwide.
1 in 4 deaths is due to infections, behind cardiovascular disease and twice as high as mortality from cancer.
This proportion is even **higher in children**, where infectious diseases are the leading cause of death.

U1190 - TRANSLATIONAL RESEARCH ON DIABETES (TRD)

DIRECTOR: Dr François Pattou

OBJECTIVE: to analyse, explore and understand the evolutions and determinants of the main chronic diseases (cardiovascular and neurodegenerative) linked to ageing.

HIGHLIGHTS OF 2020

- The unbiased RNA sequencing analysis of 207 pancreatic donors and confocal immunofluorescent imaging analysis on 665 islets from 12 pancreatic donors revealed an unprecedented level of heterogeneity of the SLC5A2 gene and expression of the SGLT2 protein in human alpha cells (Saponaro et al., Diabetes, 2020).

- Using the Western blot technique, the team demonstrated that the expression and regulation of proglucagon-derived peptides can be verified in primary islets in response to various metabolic stimuli (Acosta-Montalvo et al., Frontiers in Cell and Developmental Biology, 2020).

BEAR IN MIND

Over 4.5 million people in France have diabetes, but around a million of them don't know it.
The situation is particularly worrying in the **Hauts-de-France** region, where the combination of genetic and social factors leads to a risk of **type 2 diabetes and obesity** significantly higher than the national average: **5.5% of the population**.

UMR9020 - UMR1277 - HETEROGENEITY, PLASTICITY AND RESISTANCE TO CANCER THERAPY (CANTHER)

DIRECTOR: Dr Isabelle Van Seuningen

OBJECTIVE: to understand the mechanisms of resistance to cancer treatments to identify new markers of resistance and new therapeutic targets, in order to offer cancer patients adapted and better-targeted therapies (precision medicine).

HIGHLIGHTS OF 2020

• **COVID-19 and cancer:** the Target team got directly involved in the fight against COVID-19 by obtaining Flash COVID funding from ARC (leader Dr Martine Duterque-Coquillaud). The objective of the project is to assess the influence of androgens on viral infection since the expression of certain receptors of the virus is known to be androgen-dependent in certain organs such as the prostate. This project was made possible by the expertise of the team on prostate cancer and may help explain the more severe forms of COVID-19 seen in men.

• **Rare genetic diseases:** a simple edible fungus could be a game-changer in treating rare genetic diseases that affect hundreds of millions of people around the world. They often find themselves helpless in the absence of effective therapy. A research team led by Dr Fabrice Lejeune, Inserm researcher within the laboratory CANcerHeterogeneity, Plasticity and Resistance to THERapies (Inserm / CNRS / University of Lille / Institut Pasteur de Lille / Lille University Hospital), and in collaboration with a team from the National Museum of Natural History, has shown that one of the principle active ingredients contained in the Lepista inversa fungus has restorative properties that make it possible to correct certain genetic mutations, known as "nonsense" mutations.

• **Targeted therapies:** targeted therapies against the MET receptor have very recently been administered to patients with lung cancer presenting MET mutations. However, these patients present resistance limiting the effectiveness of the therapy. Starting from samples from patients treated in Lille and reconstituting resistant cell lines, one of these resistance mechanisms involving reactivation of the PI3K pathway was identified by Dr David Tulasne's team. This work opens up the possibility of co-treatment strategies to counteract resistance.

BEAR IN MIND

Cancers are the leading cause of death worldwide and in France: **over 9.6 million deaths worldwide each year.**
In the Hauts-de-France region, regional excess mortality is in the order of **25%**, all cancers combined, with premature mortality **36%** higher than the national average.

U1167 - RISK FACTORS AND MOLECULAR DETERMINANTS OF DISEASES LINKED TO AGEING

DIRECTOR: Prof Philippe Amouyel

OBJECTIVE: to analyse, explore and understand the evolutions and determinants of the main chronic diseases (cardiovascular and neurodegenerative) linked to ageing.

HIGHLIGHTS OF 2020

• **COVID-SCORE:** this unique tool (www.covid-score.fr) was created by a scientific and ethical committee made up of 9 ageing disease experts, including Professor Amouyel, on the initiative of this project. Inspired by Nutri-Score, it enables a person to directly and instantly assess their individual risk and that of their loved ones of contracting the disease, having serious complications and dying from it. 150 000 logins were recorded in the 2 days following its going live on 9 May.

• **Alzheimer's disease and immunotherapy:** Dr Isabelle Landrieu's integrative structural biology team studied how abnormal disease proteins interact at the molecular level. This study allowed them to develop therapeutic tools that will precisely target these molecules. This study was the subject of a patent filing in the context of LabEx DISTALZ.

• **Frailty and ageing:** Frailty is defined as a decrease in the physiological reserves of an ageing person, making it more difficult for us to adapt to stressful life events (psychological, accidents or illnesses) which may lead to a loss of independence. How to live as long as possible in good health? By identifying the factors of frailty as early as possible to be able to put in place measures promoting robust ageing. This is the purpose of the meta-analysis work carried out by Prof Éric Boulanger's teams on frailty. This work made it possible to identify 5 biomarkers which seem to be associated with it: C reactive protein (CRP), haemoglobin, albumen, vitamin D and free testosterone.

• **LabEx DISTALZ**: created in 2012, it brings together 8 research units of the highest international level in the field of Alzheimer's research. This structure of excellence for investments for the future, headed by Prof Amouyel, was renewed for 5 years in 2020.

BEAR IN MIND

Alzheimer's disease is the 4th leading cause of death in France.
More than 900 000 people affected.
At age 80 years old, 15% of the population is affected.
1 new case is diagnosed every 3 minutes.
Just 1 in 2 patients is diagnosed.

UMR8199 - U1283 - FUNCTIONAL METABOLIC GENOMICS AND MOLECULAR MECHANISMS INVOLVED IN TYPE 2 DIABETES AND ASSOCIATED DISEASES

DIRECTOR: Prof Philippe Froguel

OBJECTIVE: to understand the genetic and pathophysiological mechanisms behind diabetes and obesity to progress towards personalised medicine for metabolic diseases.

HIGHLIGHTS OF 2020

- **Obesity, a serious risk factor for SARS-CoV-2:** a study conducted by Prof François Pattou (UMR1190) shows a high frequency of patients suffering from obesity admitted to intensive care following contamination with SARS-CoV-2. This study was the subject of a publication, the second most cited French scientific article on COVID-19 internationally.

- **Creation of the COVID diagnostic unit:** set up in April 2020 in partnership with Synlab, this PCR test unit was a first in France and made it possible to test nearly 500 people in EPHAD in Hauts-de-France. In June, private laboratories took over.

- **Obesity and genetics:** knowing the genetic causes of obesity allows us to make a diagnosis and offer patients effective treatments. Researchers from LabEx EGID led by Dr Amélie Bonnefond have thus discovered a new form of monogenic obesity which has the unique characteristic of leading to diabetes and premature hypertension. The identification of this gene opens up diagnostic and therapeutic prospects.

- **LabEx EGID :** the French Diabetes Research Centre obtained the laboratory of excellence label in 2011. In 2020, its mission was renewed for 5 years.

BEAR IN MIND

Around the world, every 6 seconds, someone dies of diabetes.
In France, there are 5 million people with diabetes.
At least 700 000 people have diabetes without knowing it.

FOCUS ON
PRECIDIAB, FOR PERSONALISED DIABETES MEDICINE

Created in 2019 by Philippe Froguel and coordinated by i-SITE ULNE (Lille Nord Europe University), PreciDIAB has been awarded the "National Centre for Precision Medicine for Diabetes" label. This global research programme brings together multidisciplinary specialists whose objective is to develop new means of prevention, care and treatment of diabetic patients to counter the disease and its consequences and offer diabetic patients quality of life and life expectancy equal to that of non-diabetics. Their method: transpose work on diabetes to clinical applications.

- **In 2020, PreciDIAB launched a personalised medicine project on people with diabetes** monitored at the Institut Pasteur de Lille, i.e. 5000 people each year, and set up a prospective interventional study which will be launched in 2021 in schools in the Lille metropolitan area to understand childhood obesity.

Expertise

NATIONALLY RECOGNISED EXPERTISE

THE MICROBIOLOGICAL SAFETY UNIT (MSU)

MANAGER: Dr Michèle Vialette

The applied research laboratory studies **the behaviour of microorganisms (bacteria and viruses) in the environment,** and more particularly their response to environmental stresses. Cosmetic products, hospital environments, transport, establishments open to the public: there are many fields of application.

→ **COVID-19: from the start of the pandemic, the MSU was at the service of those involved in the fight against viral contamination.** The laboratory evaluated the performance of disinfection products and processes, decontamination devices for contaminated equipment or surfaces with antiviral activity (textiles, glass, metals etc). The tests were performed on HCoV-229E, a human coronavirus less pathogenic than SARS-CoV-2 and used as a model virus. In one year, around a hundred products were tested.

→ **The MSU is one of the only laboratories in France to specialise in environmental virology.** Partnerships with manufacturers such as Dyson, Saint-Gobain and Alstom aim to study air as a vehicle for microorganisms. Work that will one day contribute to controlling the risk of viral contamination.

THE GENETIC TOXICOLOGY LABORATORY

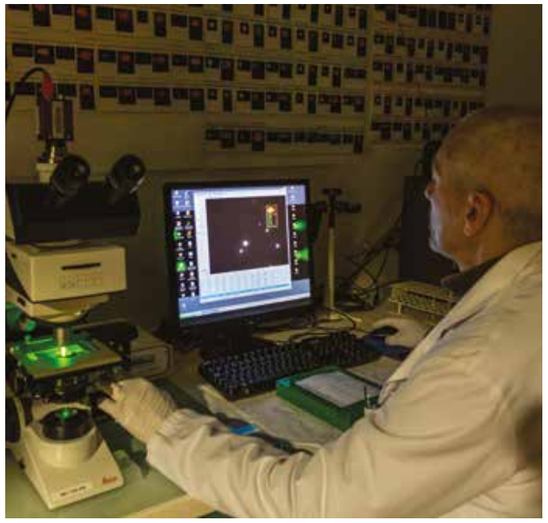
MANAGER: Dr Fabrice Nesslany

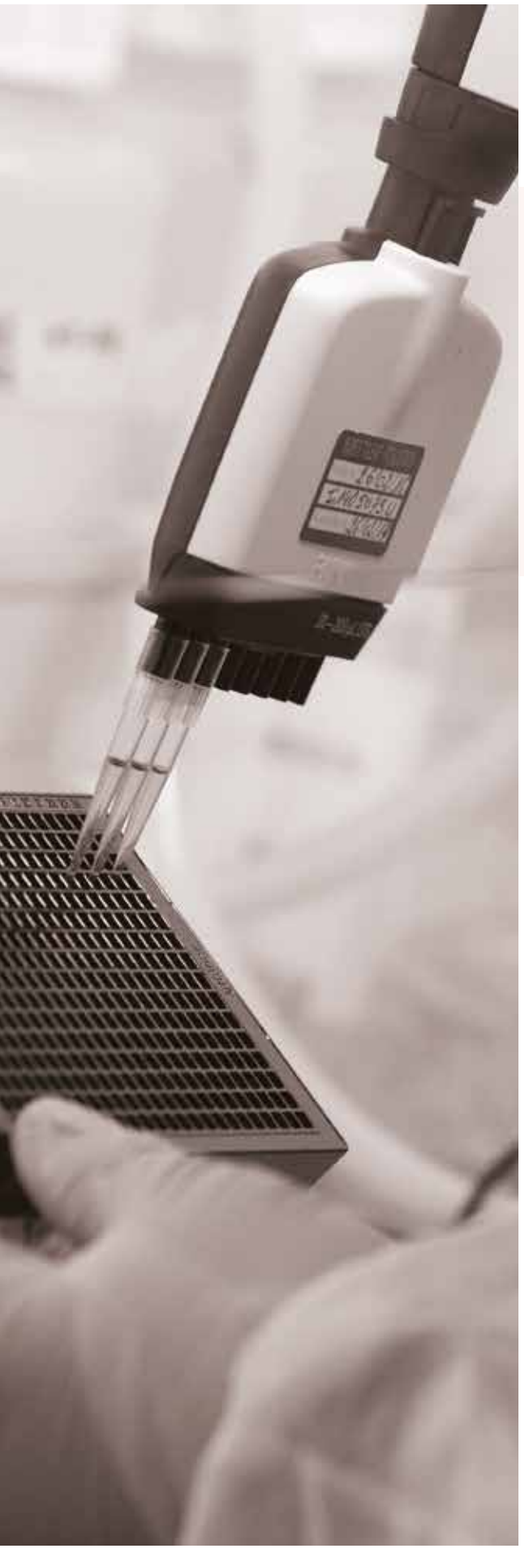
The reference laboratory is one of the largest genotoxicity centres in France. It carries out **genetic toxicology studies to assess the genotoxic and mutagenic potential of many types of substances**. Its experts work in close collaboration with drug, cosmetics, food and chemical manufacturers. The laboratory has also developed expertise unique in France in the context of nanotoxicology.

In 2020, 2 research programmes were carried out:

1 **The 3D-IVMA** project focuses on new experimental models relevant to cancer research via an *in vitro* test system to replace hepatic carcinogenesis tests using animals.

2 **The FREEDOM project** concerns the study of the effects of Endocrine Disruptors (EDs) of potentially ED substances present in food. The results will help identify potential ED substances and mixtures requiring special attention and monitoring.





Excellence

A SITE OF EXCELLENCE AND BREEDING GROUND FOR INNOVATIVE BIOTECHS

The Institut Pasteur de Lille Campus hosts biotechs and provides them with premises, equipment and skills.

OBJECTIVE: to bring together the academic research sectors and industry to accelerate the development of research and give a boost to the development of these young health innovation stars.

THE BIOTECHS PRESENT ON THE CAMPUS

Genoscreen offers analytical services in genomics on all types of genomes (human, animal, plant, microbial) and analyses and training in bioinformatics, both for academic research teams and for hospital or industrial research.

X'ProChem markets proteins synthesised using a chemical method, an innovative technology directly resulting from academic research in Oleg Melnyk's laboratory.

APTEEUS is an innovative company in the field of individualised medicine for patients with rare orphan diseases. APTEEUS contributed to the COVID-19 Task Force.

4P-Pharma developed innovative molecules at an early stage of preclinical development, and brought them through to the early stages of clinical trials.

Immune InsighT offered a novel and efficient method of validating the safety of new drug candidates before launching clinical trials.

Lifebloom developed a medical device to provide physical assistance to dependent people who can then get up and walk on their own.

Stark Labs Therapeutics was the first to develop an alternative method for removing senescent cells in age-related conditions using immunotherapy.

FOCUS ON: LIFEBLOOM

AN ALTERNATIVE SOLUTION TO WALKING LOSS FOR PEOPLE WITH REDUCED MOBILITY

Incubated at Eurasanté since 2018, the start-up has been installed since October 2019 on the Campus of the Institut Pasteur de Lille.

"*Lifebloom has created an accessible, innovative medical device that will help people with reduced mobility (disabled, injured and/or elderly) in their daily movements so that they can live on their feet and remain in control of their lives*", explains Damien Roche, engineer and co-founder of Lifebloom with Marc Bardgett, a physiotherapist-osteopath. In 2020, the Lille-based start-up was the winner of the i-Lab innovation competition organised by the Ministry of Higher Education, Research and Innovation in partnership with Bpifrance, and intended to promote public research with high potential in disruptive technologies. "*In addition to its financial endowment, this award represents real recognition of our work and the medical progress it can bring. It will allow us to accelerate the development of our technology*", adds the young director. Lifebloom is supported by Eurasanté, Bpifrance, Hauts-de-France Innovation Développement (HFID), the Norbert Ségard Foundation as well as by doctors, including Professor François Puisieux, geriatrician at the CHR in Lille who has supported the project since its inception, and field teams from hospitals, rehabilitation centres and nursing homes in Hauts-de-France. After an intense phase of R&D, Lifebloom, whose ambition is to "*push the boundaries of walking loss*", will conduct clinical studies in 2021.

BEAR IN MIND

Around the world, 132 million people cannot stand up.

Source: Wheelchair Foundation

AN INNOVATIVE, UNPRECEDENTED PROCESS OF *ill health prevention*

Unique in France, the Centre Prévention Santé Longevité (CPSL - Longevity Ill-Health Prevention Centre) brings together **all the health, vaccination and prevention activities of the Institut Pasteur de Lille.**

Open to individuals, communities and businesses, it offers **innovative courses in preventive medicine and health education**. It also leads **public health actions on the ground with populations and carries out scientific assessments** for manufacturers as well as **clinical studies** within NutrInvest.

In 2020, even though the COVID-19 pandemic impacted its "general public" activities, CPSL entered a new phase of its development **focused on an ambitious prevention approach designed to serve the population, public stakeholders and business.**

Didier Bonneau,
Deputy Director
General

"Our ambition to include ambitious ill health prevention programmes in the service of a regional project by making our protocols available to professionals and thus create a longevity network to complement existing systems."

Ageing

THE CENTRE PRÉVENTION SANTÉ LONGEVITÉ (CPSL - LONGEVITY ILL-HEALTH PREVENTION CENTRE): INNOVATION IN THE SERVICE OF HEALTHY AGEING

A multidisciplinary team made up of 90 professionals: scientific, medical and health education experts.

Medical Director: **Dr Jean-Michel Lecerf**

Administrative Director: **Cathy Brassart**

THE HEALTH EXAMINATION CENTRE

1

ILL-HEALTH PREVENTION EXAMINATIONS (IHPES)

- Carried out as part of the delegation granted by the CPAM
- For people furthest from the health system
- "Junior" IHPEs for 10-15-year-olds
- Collective activities on identified themes

IN 2020

→ **8295 IHPEs carried out**
63% of people in a vulnerable situation
373 people monitored as part of health education

→ **Participation in COVID screening with our partner Synlab**

2

HEALTH EDUCATION & THERAPEUTIC EDUCATION ACTIONS

373 people in 2020 benefited (400 in 2019) from these actions, which consist of:

- **group activities for young people aged 16 to 25**
  - Pleasure and addiction;
  - Sexual and emotional life;
  - Diet, physical activity and oral health.
- **"Tobacco" awareness stands** and individual tobacco consultations.
- **therapeutic education sessions** for type 2 diabetic patients.

3

PERSONALISED ROUTES

Personalised health assessments within or outside the company

- Tailor-made support
- Personalised health checks for employees and company managers, particularly as part of professional expatriation

IN 2020

→ **170 health checks carried out**, including 103 for Decathlon employees

The Route to Longevity

- A health check-up and follow-up with personalised coaching
- For young people, working people, early retirees, retirees and caregivers
- Objective: to help them age in good health and respond to the well-being of employees within the context of a higher retirement age

IN 2020

→ **Variation of the Route to Longevity** depending on the consultant, young people, working people, early retirees, retirees and caregivers

→ **Protocolisation of the Route to Longevity** with a view to creating a "national longevity network" which will offer an unprecedented range of preventive medicine in France.

→ **Creation of a programme** for Oney Banque

THE NUTRITION & PHYSICAL ACTIVITY DEPARTMENT

- Created 30 years ago by Dr Jean-Michel Lecerf, nutritionist and specialist in endocrinology and metabolic diseases.
- Recognised as a public health support operator by the Regional Health Agency (ARS)
- Two distinct departments: "Expertise, Health Education and Training" (EESF) and "Clinical Studies" to advance research in nutrition.
- A clinical investigation centre dedicated to nutrition: NutrInvest

IN 2020

→ **Development of an educational board game**, Nutrissimo Senior, a variation of Nutrissimo Junior.

→ **Preparation of the partnership with Sharecare**, based around an application allowing patients to manage their health on a single platform, and a second COVID-19 app as part of the management of external visits in EHPAD.

THE INTERNATIONAL VACCINATION CENTRE

- Centre approved by the World Health Organisation
- Pre-trip advice consultations
- Vaccinations against multiple diseases: yellow fever, hepatitis A and B, typhoid fever, meningitis, Japanese encephalitis, rabies, influenza, leptospirosis etc.
- METIS platform: interactive site for information and prevention on health risks specific to all destinations in the world.

IN 2020

12 000 vaccinations against 25 000 in 2019 following the health crisis

Launch of an ill-health prevention activity with the Development Unit mobilised against COVID-19: awareness raising in groups of 10 people in connection with the CPAM of Lille Douai; business advice for drafting health protocols; organisation of the 1st webinar for companies on the theme: "COVID-19 / influenza: how to manage the circulation of the virus in businesses? ».

Advice to companies during the relaxation of lockdown to change health behaviour in the context of an epidemic.

Participation in COVID screening within ARS and our partner Synlab.

TRAINING

In 2020, 1260 hours of health training were provided:

Training in tobacco science

Training in addictology

Nutrition training:

- Global management of overweight and obesity issues: medical and behavioural approaches
- Training in identifying chewing and swallowing disorders
- Dietary balance: getting the right nutrition messages across
- Care through nutrition
- Occupational health: talking about food
- Food adapted to mental handicap
- Talking about food - advising employees and companies

Training in virology

RESEARCH AND PREVENTION: NECESSARY INTERACTIONS

The CPSL is a partner of EGID in the PreciDIAB diabetes prevention project. Objective: to give a broader public health dimension to its "live better for longer" prevention activities.

Dr Jean-Michel Lecerf,
Director of CPSL

"The CPSL teams are heavily invested in the PreciDIAB project, which aims to create a future care network around and with diabetic patients to prevent diabetes complications and adverse drug effects, and offer them individualised follow-up. To do this, we must identify and monitor patients at risk of complications throughout their lives as part of more personalised medicine. In 2020, we worked on preparing the protocol that we hope to be able to implement in 2021".

Dr Jean Michel Lecerf

IN 2020

Participation in the CATOCOV study carried out by Lille University Hospital on detection of lung cancer, as an inclusion centre recruiting healthy people and former smokers.

DONATIONS, PATRONAGE, BEQUESTS: THANKS TO EVERYONE'S GENEROSITY, RESEARCH IS PROGRESSING...










A private, independent non-profit foundation, recognised as being of public utility since 1898, the Institut Pasteur de Lille is authorised to **collect funds to carry out its mission of research, ill-health prevention and public information.**

In 2020, **9.5 million euros were invested in research thanks to donations, bequests and corporate sponsorship**. The donations received are immediately transferred to the teams: they allow researchers to continue their progress, preserve their autonomy and act in an emergency, with great responsiveness and capacity for innovation, as was the case in the face of the COVID-19 pandemic.

All donations, even the smallest, are important and help support our research. Thank you!

9,5 million euros

IN 2020, 9.5 MILLION EUROS COLLECTED

- 4 million euros **from the public**
- 3,4 million euros **in bequests and life insurance**
- 2,1 million euros **in corporate sponsorship**

WHICH ALLOWED US TO FINANCE:

- **Laboratory equipment**
- **Recruitment and grants for young researchers**
- **Equipment and molecules for the search for a treatment against COVID-19**

THE INSTITUT PASTEUR DE LILLE HAS DEVOTED **19 MILLION EUROS** TO ITS MAIN MISSIONS, IN PARTICULAR:

- **Research** 16 million euros
- **Prevention** 7 million euros

The detailed accounts, validated by an auditor, are available to donors who request them.

Every donation

EVERY DONATION, EVERY GESTURE COUNTS. HOW TO SUPPORT US?

Donations, bequests and life insurance, events, solidarity runs, online collections, corporate sponsorship ... all contributions are essential to give the Foundation the means to advance research and design the treatments of tomorrow.

AS A DONOR

Whether it's one-off or regular, a donation made to the Institut Pasteur de Lille provides direct support to research teams in their fight against disease. Bequests, donations and life insurance also ensure the sustainability of our research.

AS A CORPORATE SPONSOR

Private funds constitute a major funding resource for the Foundation. The support of corporate sponsors is therefore essential to carry out the Foundation's ambitious research projects.

IN 2020, SEVERAL COMPANIES JOINED THE CIRCLE OF PATRONS OF THE INSTITUTE:

- **The LVMH group** has committed to funding a clinical trial for a treatment against COVID-19 to the tune of 5 million euros.
- **Vinted** supports the project to reposition a protease inhibitor in coronavirus research to the tune of €250 000.
- **Crédit Agricole Nord de France and Crédit Agricole Assurances** have joined forces around the operation "1 signed provident contract = €5 in donations to an association", which allowed it to donate €20 110.
- **Crédit Mutuel Nord Europe (CMNE)** allocated an exceptional endowment of €180 000 for research carried out to combat the COVID-19 epidemic.

THEY SUPPORTED US IN 2020:

- API restauration
- AG2R La Mondiale
- Assurance et Solidarité
- Auchan Retail France
- Brasserie 3 Monts
- Cofidis
- Credit Mutuel Nord Europe
- Crédit Agricole Nord de France
- Doublet
- DSD System
- Entreprises et Cités
- Lactalis
- Life Chemicals
- LVMH
- M comme Mutuelle
- Protecthoms
- RBL Plastiques
- Saverglass
- Synlab
- Verspieren
- Vinted

ROTARIANS SUPPORT THE INSTITUT PASTEUR DE LILLE

Faced with the gravity of the health crisis, **Rotarians swung into action** to support the work of our researchers and provide them **with financial support to purchase research equipment.**

AS A SUPPORTIVE FUNDRAISER

Everyone can get involved, at their own level and according to their own means, by initiating a solidarity action to raise funds to support our research work.

In 2020, nearly 20 fundraising events were organised by individuals wishing to support our research:

- **A marathon in his garden**: François, a marathon runner, completed an original race in his garden, asking his friends on Facebook for €1/lap of his garden. 4 hours 30 of running, 42 km covered and **1200 euros raised**.

- **24H4Pasteur**: Michael cycled for 24 hours in his London apartment connected to his friends by video, and thus collected **€2132**.

- **Coron[ART]virus**: Faced with the coronavirus epidemic, regional artists came together to create a unique, numbered book entitled "Coron[ART]virus", the profits from which were donated to the Institut Pasteur de Lille and Lille University Hospital. In total, nearly **800 sales** were made and more than **€10 000 collected**.

- In July 2020, more than 800 people took part in **Yoga Instants at Lille Grand Palais**. **For each ticket purchased, €1 was donated to the Foundation**.

- **The digital platforms Goodeed, Lilo and Pumpkin** also set about organising digital collections from their customers.

- To support the Institut Pasteur de Lille, **Revillon champagnes** showed their generosity by donating **€5 per bottle sold of its "cuvée solidaire"**.

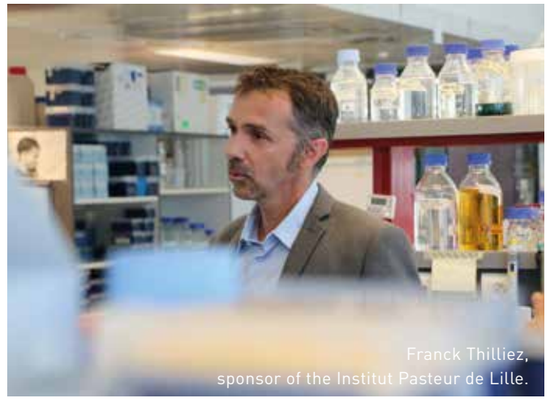
- **The Poulains du Cœur and the riders from the French team** united against COVID-19 to support the Institute's researchers in their work.

- The **Bardhal** company set up a shared product for the benefit of research. **€5000** was collected as a result.

- The hotel collective **"Les Hôtels de Lille"** set up a solidarity collection with its customers. **€7185** was donated to the Foundation.

AS A COMMITTED SPONSOR AND VOLUNTEER

Putting your popularity at the service of a good cause or giving some of your time alongside our teams is another way to support our Foundation.



Franck Thilliez, sponsor of the Institut Pasteur de Lille.

Thank you to all our donors !

Cédric Bouquet,
Communication & Patronage Director

"While the mobilisation of our researchers was remarkably responsive in the face of the pandemic, that of our donors was equally so. Whether loyal or new, many of them sprang into action and responded, from the start of the crisis, to our calls for support. This generosity allowed the Institut Pasteur de Lille to be one of the first to start the fight against COVID-19. Widely promoted and publicised, our research on SARS-CoV-2 has helped establish our notoriety as a major player in the fight against major infectious threats. However, this crisis should not eclipse other research projects (infectious diseases, neurodegenerative diseases, cardiovascular diseases, diabetes, cancers etc) carried out within our laboratories and which require continuous financial support over time. That's why all donations, of whatever nature, are invaluable in advancing our Foundation's many research projects".

Cedric Bouquet

Philanthropy

THE FACES OF **PHILANTHROPY**

OUR PATRONS

Antoine Arnault,
Chief Executive Officer of Berluti, LVMH Group

"Since the start of this unprecedented health crisis, we have mobilised our resources and those of our Houses to help wherever we could, **by manufacturing hydroalcoholic gel or masks, providing medical equipment and financial support for frontline institutions**. When we discovered that the Institut Pasteur de Lille was working on a serious and promising treatment but the researchers lacked the means to begin the last crucial phases of their research, we didn't hesitate for a second to lend our support. This gesture, like that of many other anonymous donors, reflects **our collective hope and deep confidence in this work**. That they are carried out in the Nord, the region where I was born and where our family comes from, adds a reason for pride, and **we all hope that this is where the treatment against COVID-19 will be born which will help us conquer the pandemic**, in addition to vaccination".

Antoine Arnault

Éric Charpentier,
Chief Executive Officer,
Crédit Mutuel Nord Europe

"The work carried out by the teams at the Institut Pasteur de Lille is now taking on a new dimension through the hope it gives. It is our social responsibility to support the Institute in the smooth running of its missions, to make possible and accelerate the valuable research work undertaken for several months now".

Johan Cailliez,
Administrative and Financial Director, Verspieren

"For more than 5 years, Verspieren has stood alongside the Institut Pasteur de Lille in its fight against disease. We are proud to support researchers in their projects and are convinced that it is the responsibility of companies to support such actions, in line with our humanist values and commitment to health".

OUR DONORS

1 "Supporting medical research in my region provides three good reasons for me to follow the Institut Pasteur de Lille. The current pandemic shows us that we need original ways to hope to control it, and I put my trust in its researchers". **Éric D.**

2 "I hope with all my heart that your research against this COVID is successful. Every day, remember that the French people have confidence in you! I send you a billion positive waves, so that the sky and your knowledge inspire you. Thank you in advance! " **Christiane B.**

3 "Courage to your researchers, even though my donation is just a drop in the ocean, I would have loved to give a lot more! I think about you a lot. With all my respect! " **Alain-Patrick N.**

4 "It's with real conviction that I recognise your determination and courage in research. As you know, my support is permanent, and my payment fully up to date, in proportion to my means given my age, the monthly payment being €15. Well done - you have my total respect." **F.D.**

A TESTATOR

"Health is the most precious thing you can have in my eyes. I admire the work done by researchers to enable us to live better for longer, thanks to their unwavering commitment. By making a bequest to the Institut Pasteur de Lille, I'm proud to be able to contribute to scientific progress and leave something behind". **Eugène D.**

six

THE FOUNDATION OF TOMORROW: EXCELLENCE, RESPONSIBILITY, *attractiveness*

The Institut Pasteur de Lille has been **committed for 120 years to serving the health of all**, thanks to the excellence of its **research** and its innovative activities of **public ill-health prevention**.

Located in the heart of Lille, the campus extends over **50 000m²** and hosts **800 employees of 27 different nationalities**. Together, with a real team spirit, they work for **the health of tomorrow.**

AN EXEMPLARY, SUSTAINABLE CAMPUS, FAITHFUL TO PASTEUR'S VALUES

- Putting science at the service of health
- Contributing to scientific excellence
- Acting responsibly and in solidarity
- Putting rigour and ethics at the heart of decisions
- Transmitting knowledge

RSE

RSE AT THE HEART OF OUR DNA

The activities of the Institut Pasteur de Lille are part of a **responsible, societal and environmental** (RSE) approach. Formalised in 2016, the RSE approach is supported and steered by General Management and led by a working group. This global approach allows the involvement of all employees in daily actions.

The challenge:

to bring the campus to life to promote interactions

OUR RSE COMMITMENTS

To unite teams around societal and environmental issues beyond scientific research and ill-health prevention activities.

To increase employee well-being at work.

To control the environmental impact of the campus.

Implementing an integrated management system of the QSE (Quality, Safety and Environment) type, coupled with our RSE approach, contributes to the sustainability and longevity of the Foundation.

IN 2020

While the health crisis delayed the implementation of certain projects, it also had a "positive" impact on certain aspects of QSE.

- **Safety: 0 work accidents with stoppage on site** due to the reduction in on-site working hours, particularly during the 1st lockdown.
- **Environment: reduction in energy consumption** thanks to teleworking by teams; creation of around 100 bicycle spaces; distribution of fabric masks for all campus employees.
- **Quality: performance of the annual external audit and maintenance of certifications** (health examination centre, nutrition service, biological resources centre).

As well as:
Publication of the 2020-2021 RSE Report

Charles Quentin,
QSE Manager and Covid Contact

"From the start of the health crisis, I approached my "prevention adviser" colleagues from CNRS, Inserm and the University of Lille. Together, we drafted a common health protocol framework, validated by General Management and then sent to all campus colleagues. When lockdown was lifted, a video information session was organised to remind people of the health rules and their application on the site. Throughout the year, as COVID Contact, I was approached by the various departments to deploy information and awareness actions internally".

Charles Quentin

Project for a new building at the corner of Boulevard du Maréchal Vaillant and Boulevard Louis XIV.

Eco-campus

AN ECO-CAMPUS UNDER TRANSFORMATION

Launched in 2018, the Institut Pasteur de Lille real estate project contributes to the physical metamorphosis of the campus, which today consists of numerous buildings scattered around the campus, the result of construction carried out over the years. The optimisation project provides for the construction and transformation of old buildings, offices or laboratories, some of which will eventually be rented out.

IN FIGURES

- 50 000m² of surface area to be used, of which 15 000m² are currently unoccupied.
- 65 M€ : Amount of the transformation and construction programme.
- 2025 : Delivery

OPEN TO THE WORLD

The Institut Pasteur de Lille is developing relationships with scientific structures in different countries to share knowledge and accelerate research.

- 2018 - 2021: coordination mandate for the Europe region within the Réseau International des Instituts Pasteur (RIIP - Pasteur Institutes International Network).
- Collaborations with universities, medical biology laboratories, companies and associations in more than 53 countries.
- More than half the partnerships are located beyond the borders of Europe.

Organisation chart

ORGANISATION CHART

MANAGING DIRECTOR
Prof Xavier Nassif

DEPUTY MANAGING DIRECTOR
Didier Bonneau

SCIENTIFIC

SCIENTIFIC DIRECTOR
Prof Benoît Deprez

HEAD OF INTERNATIONAL RELATIONS
Dr Nathalie Mielcarek

RESEARCH CENTRE ON LONGEVITY

- Lille Infection and Immunity Centre
  Dr Jean Dubuisson
- Risk factors and molecular determinants of diseases linked to ageing
  Prof Philippe Amouyel
- Nuclear receptors, cardiovascular disease and diabetes
  Prof Bart Staels
- Integrative genomics and modelling of metabolic diseases
  Prof Philippe Froguel
- Translational Diabetes Research
  Prof François Pattou
- Drugs and molecules to act on living systems
  Prof Benoît Déprez
- CANTHER - Heterogeneity, Plasticity and Resistance to Cancer Therapies
  Dr Isabelle Van Seuningen
- Impact of the chemical environment on human health
  Dr Fabrice Nesslany

EXPERTISE

- Genetic Toxicology
  Dr Fabrice Nesslany
- Microbiological Safety
  Dr Michèle Vialette
- Clinical Microbiology
  Prof Anne Goffard

PLATFORMS

- Mixed Services Unit
  Dr Sophie Crespin
  - PLEHTA platform
    Fabrice Infanti
  - Applied transcriptomics and genomics
    Dr David Hot
  - Cell imaging BiCeL EquipEx ImaginEx BioMed
    Dr Franck Lafont
  - Proteomics and analysis of modified peptides
    Dr Jean-Michel Saliou
  - BILILLE platform
    Dr Hélène Touzet
  - ARIADNE-Screening platform
    Dr Florence Leroux
- High-Security Laboratory
  Dr Florent Sebbane
- Genomic analysis
  Amandine Flaig
- Genomics EquipEx LIGAN
  Prof Philippe Froguel
- ARIADNE-ADME
  Dr Florence Leroux
- Nuclear magnetic resonance
  Dr Isabelle Landrieu
- Chemistry Systems Biology
  Dr Oleg Melnyk

LONGEVITY ILL-HEALTH PREVENTION CENTRE

- Medical Department
  Dr Jean-Michel Lecerf
  - Health Examination Centre - CPAM
    Dr Gwenaelle Floc'h
  - Health Examination Centre - Personalised PL
    Dr Sophie Lahousse
  - Vaccination Department
    Dr Gwenaelle Floc'h
  - Nutrition and Physical Activity Department
    Dr Jean-Michel Lecerf

ADMINISTRATIVE

ASSISTANT MANAGER
Sylvie Amoravain

ADMINISTRATION AND FINANCE

- Finance Department
  Sabine Roche
- Human Resources
  Claire Bresler
- IT
  Bertrand Poulet
- Legal and Research Promotion
  Maxime Diot
- Purchasing
  Mehdi Zaam
- Infrastructure and General Resources
  Yves Dailly
- Estates
  Virginie Drelon
- Quality Safety Environment
  Charles Quentin

COMMUNICATION AND SPONSORSHIP

- Communication and Sponsorship Department
  Cédric Bouquet
  - Communication and Media
    Delphine Fourmy
  - Fundraising
    Laure-Anne Jacob
  - Patrons
    Cédric Caravetta
  - Bequests
    Sylvie Frémaux
    Odile Billaut Mulot

LONGEVITY ILL-HEALTH PREVENTION CENTRE

- Administrative Department of the Longevity Ill-Health Prevention Centre
  Cathy Brassart
  - Administrative Unit
    Lauren Baudier
  - Development Unit
    Clément Feutry
  - Key Account Manager
    Julie Padol

RESEARCH ADMINISTRATION CONTRACT MANAGEMENT

- Research Administration and Contract Management Department
  Fabienne Jean
  - Research Administration
    Sylvia Laforce
  - Contract Management
    Ruddy Duthoit

CA MEMBERS AND IPL OFFICE

BOARD OF DIRECTORS	ESTABLISHMENTS	SURNAMES/FIRST NAMES	
X		Jacques RICHIR	
X		Claire MOUNIER VEHIER	
X	Lille Town Hall	Marie-Christine STANIEC	COLLEGE OF FOUNDERS
X		Justine RATELADE	
X		Julie NICOLAS	
X	MEL	Catherine LEFEBVRE	
X	Hauts de France Regional Council	Nicolas LEBAS	
X	Nord Department Council	Nicolas SIEGLER	
X	Institut Pasteur Paris	Stewart COLE	COLLEGES OF INSTITUTIONAL PARTNERS
X	University of Lille	Jean-christophe CAMART	
X	INSERM	Samir OULD ALI	
X	CNRS	Christophe MULLER	
X	CME of Lille University Hospital	François René PRUVOT	COLLEGE OF QUALIFIED PERSONS
X	Nord Chamber of Notaries	Patrick VACOSSIN	
X	Laboratoire ANIOS	Thierry LETARTRE	COLLEGE OF FRIENDS OF THE FOUNDATION
X	AUCHAN	Antoine PERNOD	
X	AG2R La Mondiale	Stéphane BAUW	PERMANENT GUESTS
X	SYNLAB	Thierry MATHIEU	

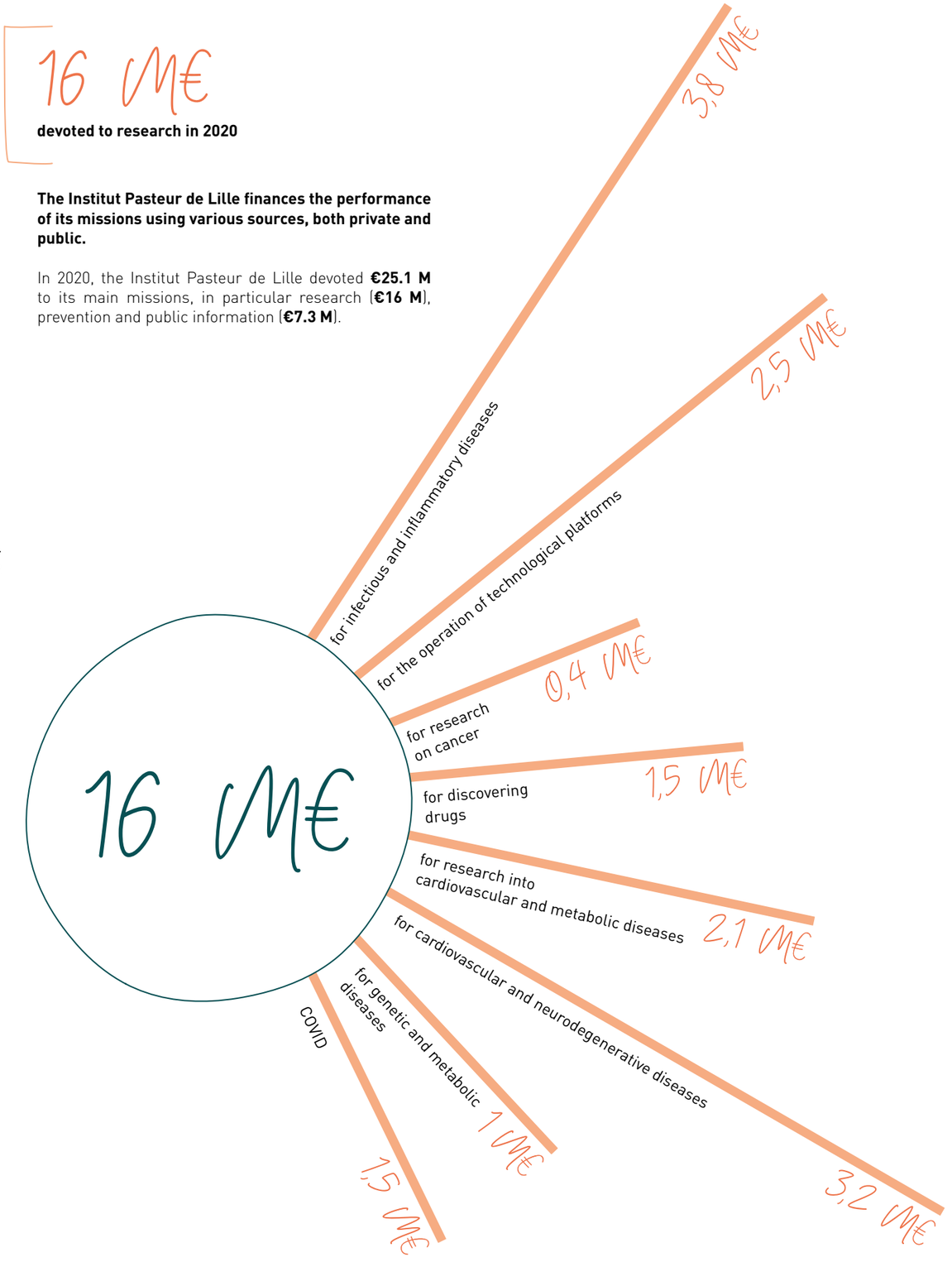
JOBS / RESOURCES

16 M€

devoted to research in 2020

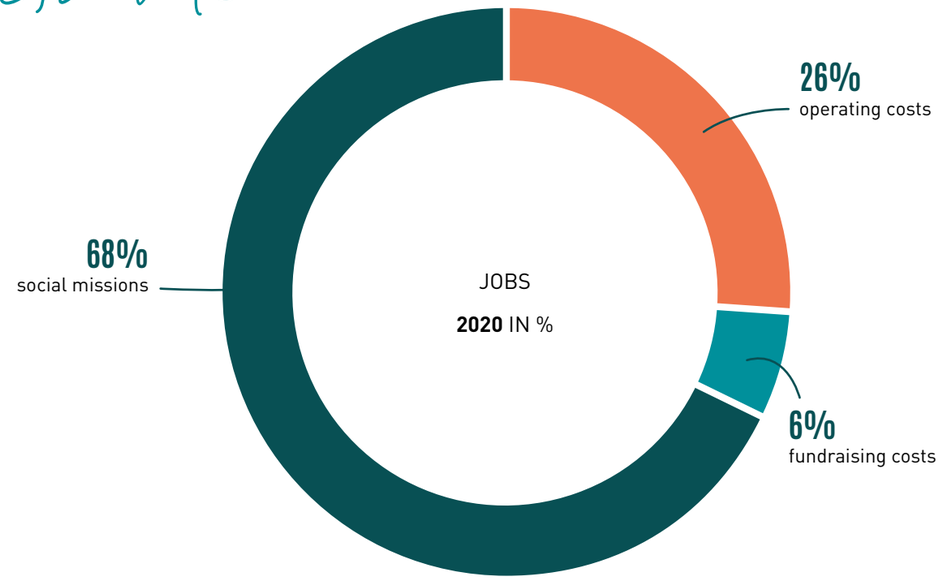
The Institut Pasteur de Lille finances the performance of its missions using various sources, both private and public.

In 2020, the Institut Pasteur de Lille devoted **€25.1 M** to its main missions, in particular research (**€16 M**), prevention and public information (**€7.3 M**).



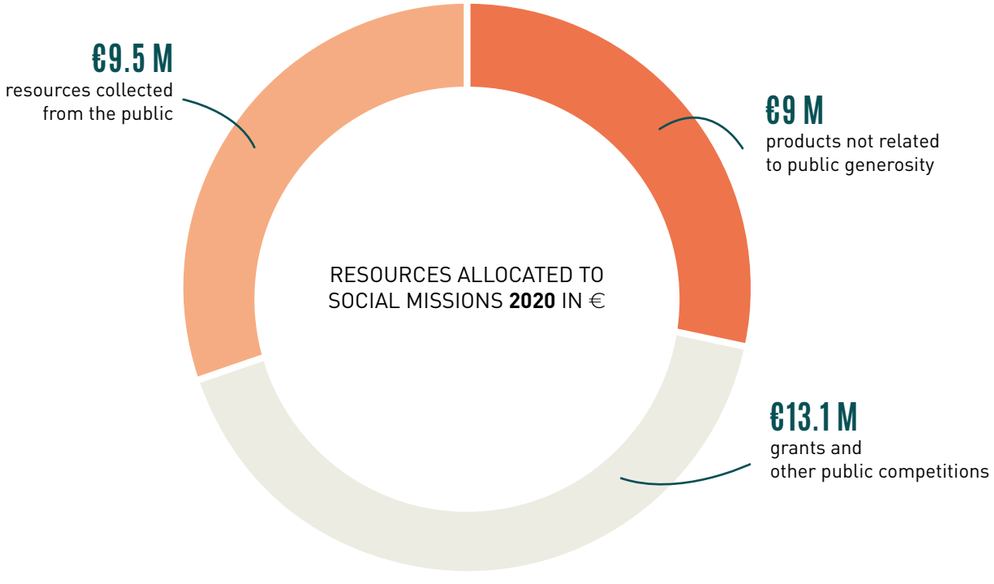
JOBS

33,5 M€



RESOURCES

31,6 M€

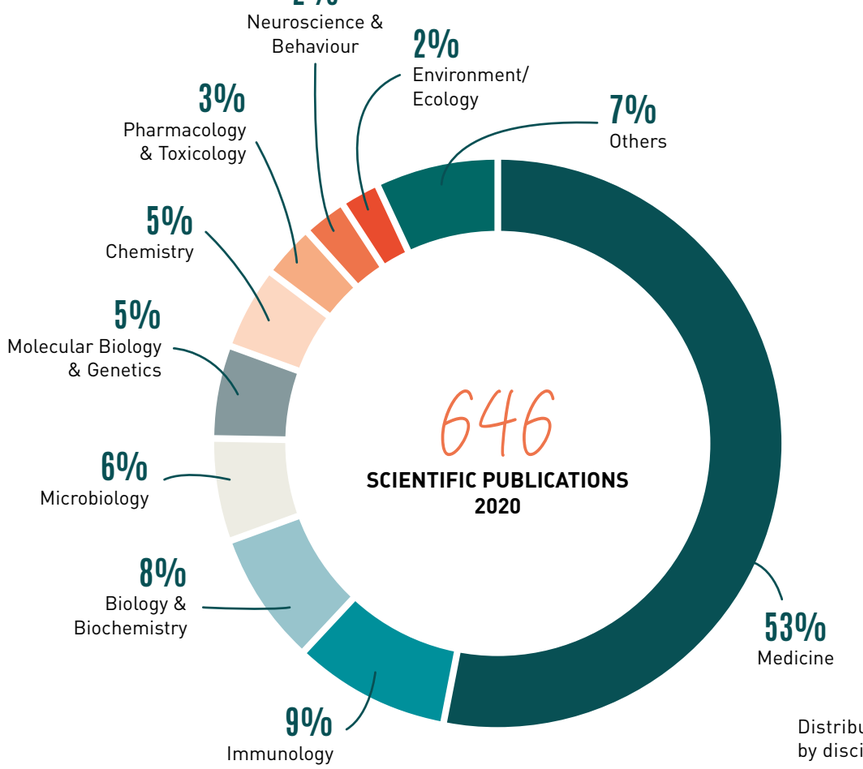


SCIENTIFIC PUBLICATIONS

The work of researchers is evaluated by the quality of their scientific publications. These publications in **international journals** such as Nature, Nature Genetics, the Lancet, PLoS One, PLoS Medicine, Gut, the New England Journal of Medicine and so on, are **a reflection of the excellence of their output**. Bibliometrics, including a quantitative assessment of impact factors in prestigious journals, reflect the interest of the scientific community in the findings which are thus taken up and cited.

Bibliometrics assess research activity by applying statistical methods to scientific publications (bibliography of articles, signatures of articles, keywords and authors, etc). It allows **the scientific output and notoriety of a researcher, a laboratory, an establishment, a country or a field of research to be measured.**

Some disciplines are represented by more researchers. **The statistics presented are therefore adjusted in relation to the overall output of each discipline.**



Distribution of publications by discipline.

YEAR	NB InCites	CNCI MEDIUM	TOP 1%	TOP 10%
2020	706	2.88	22	129

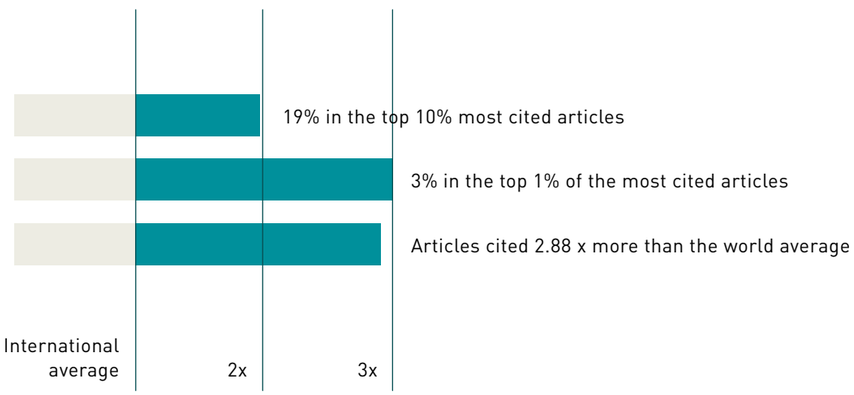
NB InCites: number of articles found in InCites, a database which contains impact indicators based on citations.

CNCI average: the CNCI Category Normalised Citation Impact - standardised citation index. It takes into account the year of publication, disciplinary field and type of documents. A CNCI of 2 indicates that publications are on average twice as cited as the world average.

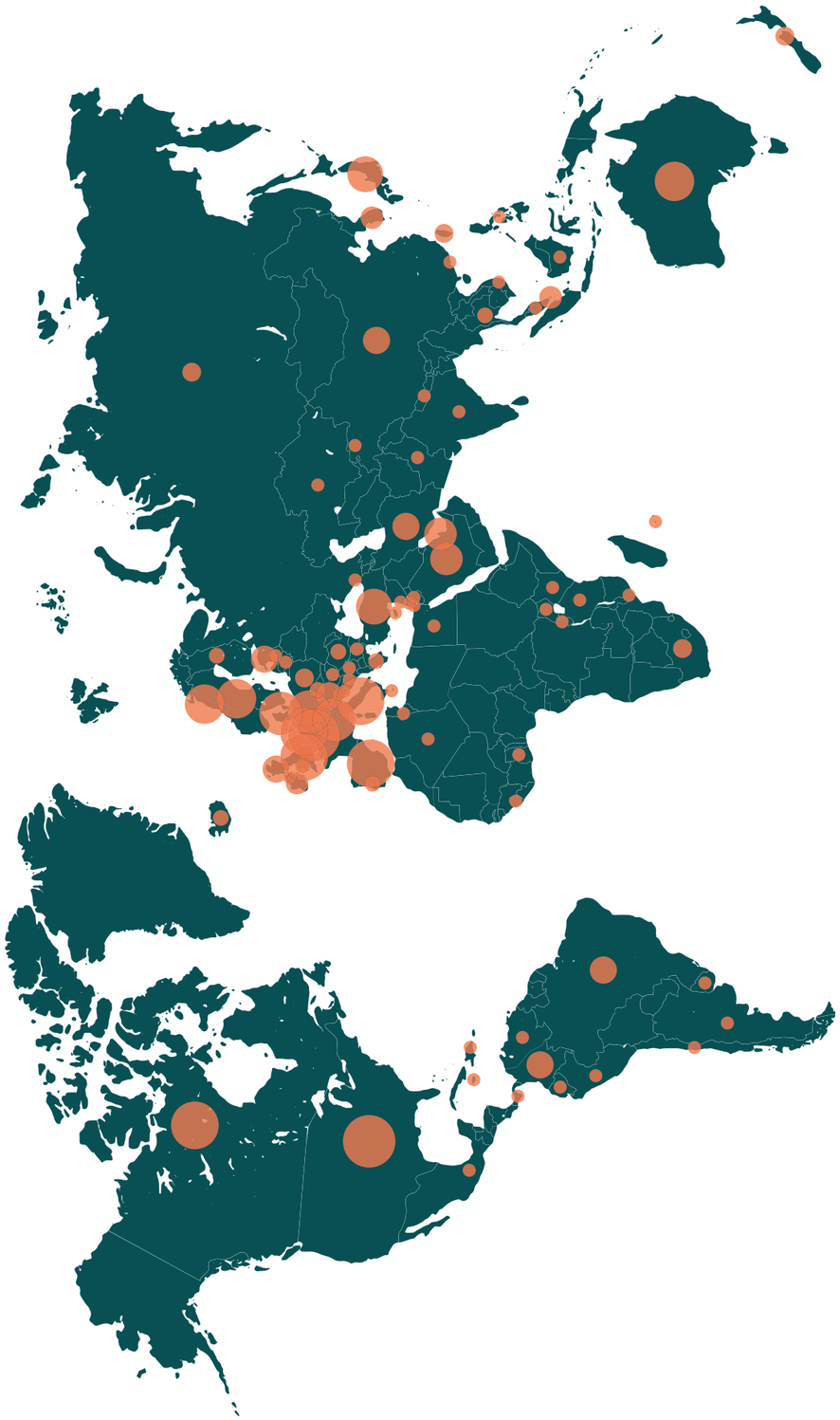
IN 2020:

51% global leadership on publications

47% leadership on publications in the most prestigious journals



GLOBAL NETWORK OF COLLEAGUES



from 900 to 1050
from 600 to 900
from 400 to 600
from 300 to 400
from 1050 to 1500
from 150 to 200
from 100 to 150
from 50 to 100
from 250 to 300
from 200 to 250
from 0 to 50

The circles have an area proportional to the number of articles published with authors from the country indicated. One in two articles corresponds to a study led by a researcher from the Institut Pasteur de Lille.

PARTNERS

Université de Lille
cnrs
Inserm — La science pour la santé — From science to health
CHU Lille
Inria
Université Catholique de Lille
Centre Oscar Lambret — unicancer Hauts-de-France

SUPPORT

Région Hauts-de-France
Ministère de l'Enseignement supérieur, de la Recherche et de l'Innovation
MEL Métropole
Union Européenne
l'Europe s'engage en Hauts-de-France avec le FEDER
Investissements d'avenir
Ville de Lille
Financé par ANR
ars Agence Régionale de Santé Nord - Pas-de-Calais
L'Assurance Maladie

PATRONS

LVMH
Crédit Mutuel Nord Europe
Crédit Agricole Nord de France
Cofidis
Vinted
DSD System
SYNLAB
Groupe Lactalis
Auchan Retail France
entreprisesetcités
RBL Plastiques
3 Monts
PROTECTHOMS Distributeur d'Excellence
LIFE CHEMICALS
SAVERGLASS
DOUBLET Créateur d'Entreprises
Santélys
api
Comme Mutuelle
AG2R La Mondiale
Colaert Essieux System
Verspieren Courtier en assurances
Assurance Solidarité

Institut Pasteur de Lille

Vivre mieux
plus longtemps

ACCELERATING RESEARCH AND TAKING ACTION FOR THE HEALTH OF TOMORROW:

all support counts

DONATIONS
BEQUESTS
BUSINESS COLLABORATIONS
SPONSORSHIP
SOLIDARITY EVENTS
VOLUNTEERING

Pasteurlille

PasteurLille

PasteurlilleTv

Institut Pasteur de Lille

INSTITUT PASTEUR DE LILLE
1, RUE DU PROFESSEUR CALMETTE
BP 245 - 59019 LILLE CEDEX

pasteur-lille.fr