



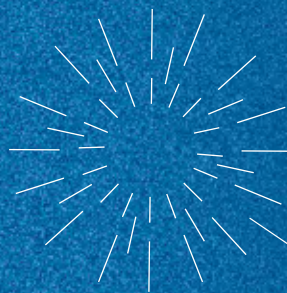
RÉPUBLIQUE
FRANÇAISE

*Liberté
Égalité
Fraternité*

anrs
EMERGING INFECTIOUS
DISEASES **Inserm**



Activity Report 2023


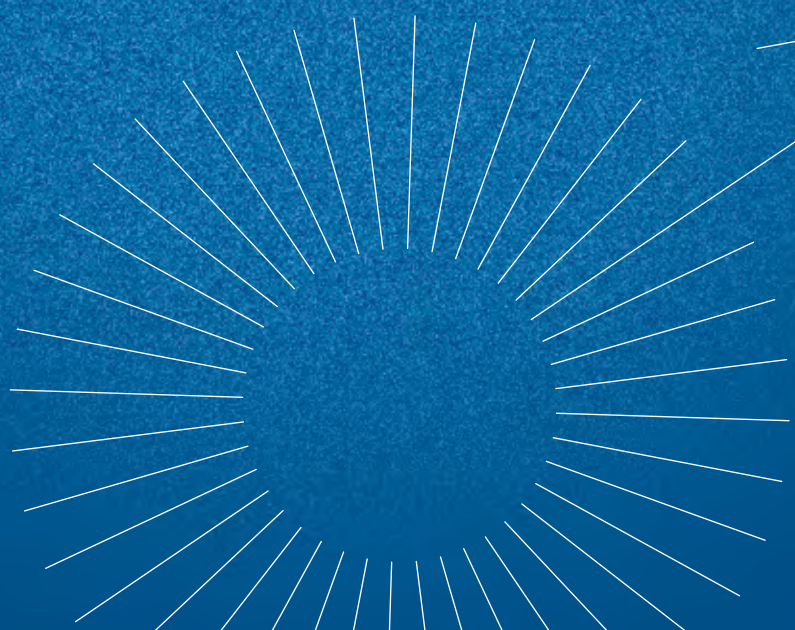




The French National Agency for AIDS Research (ANRS) was created in 1988, and became an independent agency of Inserm in early 2012.

In the beginning, it focused on HIV/AIDS in France and internationally, particularly in sub-Saharan Africa. In 1999, its mandate was extended to include research on tuberculosis and sexually transmitted infections.

A substantial transformation was carried out in 2021 in response to the COVID-19 pandemic. The agency merged with the Inserm Research and action targeting emerging infectious diseases (REACTing) consortium, and the expanded entity became ANRS Emerging infectious diseases (ANRS MIE).



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Isabelle Richard
Chair of the Advisory Board

Yazdan Yazdanpanah
Director

Since its creation, ANRS Emerging infectious diseases (ANRS MIE) has endeavoured to respond to the challenges posed by emerging infectious diseases, without compromising on its historical field of research: HIV/AIDS, viral hepatitis, tuberculosis and sexually transmitted infections. ANRS MIE centres its concerns around improving patient care, preparing the response to future pandemics and deploying this response in the event of crisis.

For the agency, 2023 was the year of reinforcing and, in the field of emerging infectious diseases, consolidating its capacities for action. Before we look at some of the significant highlights, we would like to thank our partners, which participate daily in the life of the agency and contribute directly to its successes: our ministerial supervisory bodies, the General Secretariat for Investment (SGPI), the major national research bodies in human and animal health, the hospitals, the universities and our international and association partners. ANRS MIE is a crucible. It owes its strength not just to its teams, but to the researchers, institutions and associations that animate it, support it and contribute to its actions.

In this respect, we would say that the first sign of the momentum recorded in 2023 was the record volume of submissions to our calls for proposals. An increase which reflects the high quality of our facilitation groups and committees, as well as the researchers and association representatives who collaborate with them, and the growing mobilisation of the research teams, particularly internationally, around the thematic areas of the agency.

In order to support this dynamic, we have developed, as part of the implementation of our strategic orientations, the prioritisation of our research objectives that will be reflected in the design of our calls for proposals. While we maintain our principle of openness to all research projects, and with it our essential commitment to the scientific quality of the projects, we have, with the support of a group of experts, identified five major scientific priorities within the fields of HIV/AIDS, hepatitis, tuberculosis and sexually transmitted infections:

- prevention of mother-to-child transmission for HIV, hepatitis and congenital syphilis;
- non-vaccine biomedical prevention and non-biomedical prevention for STIs and HIV;
- curing HIV and hepatitis B and D;
- new therapeutic approaches for tuberculosis;
- interventional research to implement and optimise interventions (prevention, screening, management).

With regard to emerging infectious diseases, we have chosen to focus our funding on respiratory viruses, arboviruses and haemorrhagic fevers, by promoting the accelerated acquisition of fundamental knowledge, the development and organisation of research and development (diagnostics, vaccines, treatments), and the preparation of the authorities and general public for epidemic crises.

ANRS MIE and Inserm have also, in conjunction with the principal institutions involved in French vaccinology research, led discussions to develop a national vaccine research and innovation strategy. The *France Vaccins* programme, the first programme led by the French Agency for Health Research Programmes entrusted to Inserm in close association with ANRS MIE, is the fruit of this work.

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Internationally, the agency is meeting its commitments and the development of research, in line with the 2023-2027 French Global Health Strategy. In 2023, the agency made changes to its international network, which is now organised into two types of partnerships: partner sites, for the most longstanding partnerships, and the International Research Platforms in Global Health (PRISMEs), for the most recent. Two PRISMEs were created in 2023, in Côte d'Ivoire and Democratic Republic of the Congo. We have worked to consolidate research capacities within and outside our network by creating or ensuring the sustainability of research infrastructures, in line with the efforts undertaken in France and Europe.

ANRS MIE is also working to build and support the research of tomorrow. Our strategy focuses on training and supporting young researchers. A specific, structured programme with significant funding was constructed in 2023 to support the new generation of scientists in the French research ecosystem and within the agency's international network.

Finally, ANRS MIE is first and foremost a team, made up of committed, available and expert people, to whom we are very grateful. A team that is growing as our activity develops, with the year 2023 marked by the arrival of new collaborators, with varied profiles and experiences.

This activity report describes the main highlights of the previous year, within each department of the agency, and focuses on certain significant projects. In order to fulfil its mission to combat infectious diseases, ANRS MIE remains faithful to the values for which it is the guardian and heir: scientific excellence, multidisciplinary, a partnership-based and multi-institutional approach, the systematic involvement of civil society and affected populations, a concern for public action, and lastly, the adoption of a global perspective that goes beyond national borders.

Budget

€75 M



with **85%** of the funds executed dedicated to the direct funding of research

Human resources

98



collaborators at the end of 2023

Calls for proposals

184



new research projects and grants in over **60** countries in 2023

€60.5 M

of total budget allocated to research projects and grants resulting from the 2023 calls for proposals (**52%** funding for HIV, hepatitis, tuberculosis and STIs vs. **48%** for emerging infectious diseases)

Response to emerging diseases

5

emergence unit activations of Level 1 status



1

article for the general public written and published in *The Conversation*

3

scientific watches carried out, disseminated and updated weekly

10

knowledge notes written and shared with institutions and partners

Clinical and public health studies

78

studies sponsored by the agency, including **36** in low- and middle-income countries

7

methodology and management centres in France

1

centralised library with over **2 million** samples



A network of over

300

hospital departments

International network



11

partnerships:
Brazil, Burkina Faso,
Cambodia, Cameroon,
Côte d'Ivoire, Guinea,
Mali, Democratic Republic
of the Congo, Senegal,
Vietnam, Zambia

36

institutions and authorities
for research and health
from our partner countries
and France

6

international technical
experts: Burkina Faso,
Cambodia, Cameroon,
Senegal, Vietnam, Zambia

€2.4 M

dedicated to partnerships,
excluding project funding

33

training courses supported
in all research fields

108

young researcher
projects and grants

Clinical research studies

80



studies (pathophysiological, cohort or
therapeutic trials including vaccine trials)
sponsored by the agency

Pharmacovigilance

173



studies followed by the pharmacovigilance
department, including:

→ 71 sponsored by the agency

→ 102 sponsored by Inserm

Scientific facilitation

The agency's Scientific Days
events:



351 attending
in person

453 attending remotely

30 speakers

12 moderators from France,
Senegal, USA, Burkina Faso,
Spain, Cameroon, Egypt,
Morocco and UK

1 Highlights of the agency's scientific activity

HIV/AIDS

According to UNAIDS, 39 million people were estimated to be living with HIV in 2022, with 1.3 million new infections worldwide. In the forty years that have followed the discovery of the virus, large amounts of knowledge have been accumulated, enabling the provision of effective treatments and medical prevention methods. However, the annual number of discoveries of HIV seropositivity is declining too slowly, and mobilisation must remain an ongoing concern.

➤ Research in public health and the human and social sciences

In 2003, with the **VESPA** survey, ANRS MIE funded the first national representative study of the living conditions and social needs of people living with HIV. In 2011, **VESPA 2** measured the frequency of the comorbidities that occur with age, the methods and quality of their care, as well as their impact on health, social situation and quality of life. The **VESPA 3** questionnaire with an expected 3 000 respondents, was launched in 2023, and will seek to describe:

- how social and territorial inequalities affect access to care;
- the quality of relationships with healthcare professionals;
- career paths and the impact of seropositivity on work;
- emotional and sexual quality of life;
- mental well-being;
- differences in life paths and experiences according to age at the time HIV status is discovered, and the number of years lived with HIV (including ageing);
- the consequences of the COVID-19 crisis.

New questions were added regarding follow-up and the side effects of injectable therapy, cancer-related comorbidities, anal health, problems related to menopause, breastfeeding, ability to read and understand health information, chemsex and sexual violence. The first results are expected at the end of 2025.

Furthermore, in a context in which the annual number of discoveries of HIV seropositivity is declining too slowly, ANRS MIE and the *Île-de-France* Regional Health Agency (ARS) made the commitment at the end of 2023 to eliminate HIV transmission in *Île-de-France* by 2030, based on improved knowledge of the epidemic that will be shared with all stakeholders for a better implementation of the prevention strategies.

With regard to people born outside France and living in the *Île-de-France* region, we can cite the **ANRS-Makasi** project, an innovative intervention to strengthen the empowerment of sub-Saharan African immigrants who can be exposed to sexual risks and HIV due to precarious living conditions. In 2023, a collective book was published to describe this research experience (*Vers l'empowerment en santé : recherches communautaires autour du projet Makasi*). Another project, **ANRS-Ganymede**,

focuses on men, born abroad and HIV-positive, who have sex with other men and are followed up in *Île-de-France*. The primary objective was to estimate the proportion of post-migration HIV acquisition in this population. The first results of the exploratory phase of the study conducted on a small sample of people were published in the special edition of the journal *Santé publique* in June 2023.

➤ Clinical research

Outside of France, ANRS MIE has since 2016 co-funded the **Drug-Related Infections in ViEtnam (DRIVE)** project with the Global Fund and the US National Institute on Drug Abuse (NIDA). It is a community-based programme that seeks to reduce HIV transmission among injecting drug users in Haiphong. This programme has led to the creation of a multidisciplinary research platform, with a solid partnership with the university, the local authorities and civil society. Various studies have been published concerning risk reduction, screening and access to treatment for diseases such as hepatitis C (**ANRS 12380 DRIVE-C**), tuberculosis (**ANRS 0092s DRIVE-TB**), and mental health disorders (**DRIVE-MIND**). The **DRIVE-MIND2** trial sponsored by ANRS MIE completed its recruitment in 2023. DRIVE was presented at

the 49th Board Meeting of the Global Fund to Fight AIDS, Tuberculosis and Malaria held in May 2023 in Hanoi, Vietnam.

ANRS MIE is also sponsoring the phase III trial **ANRS 0392s ELDORADO** to demonstrate the non inferiority of a doravirine-based triple therapy versus a dolutegravir-based triple therapy in terms of virologic efficacy in treatment-naïve patients living with HIV-1. This trial, conducted in partnership with MSD, will be implemented in Brazil, Cambodia, Cameroon, Côte d'Ivoire, France and Mozambique and scheduled to start in the fourth quarter of 2024.

➤ Focus on vaccine research

The Vaccine Research Institute (VRI), the laboratory of excellence established by ANRS MIE and Paris-Est Créteil University (UPEC) in 2012, and the agency are currently involved in phase I trials of HIV/AIDS vaccines. Preliminary results concerning the preventive vaccine candidate **CD40.HIVRI.Env** were presented in 2023 at the Conference on Retroviruses and Opportunistic Infections (CROI) (**ANRS VRI06** phase I trial). CD40.HIVRI.Env demonstrated both its safety and its ability to induce early, potent (from 80% to 100% from Week 6; 100% at Week 26) and lasting (up to Week 48) responses in 36 trial volunteers. The phase I trial included 72 healthy people in France and Switzerland who were instructed to continue to protect themselves against HIV. The vaccine approach is innovative: it is based on the injection of monoclonal antibodies that specifically target

dendritic cells via their CD40 receptors. A HIV envelope protein binds to these monoclonal antibodies so that the immune system learns to recognise and neutralise the virus. The VRI has been developing this novel platform for several years. While the results are looking promising, it is important to remember that the efficacy of the vaccine will only be evaluated at the phase II/III stage.

What is more, as part of the missions of the **ANRS RHIVIERA** consortium, ANRS MIE funding has been obtained for the project to develop a platform for adjuvant messenger RNA vaccines that use lipid nanoparticles (LNP) to induce effective immunity from HIV (team led by Victor Appay, Inserm U1135).

➤ Focus on remission

The objective of the **ANRS RHIVIERA** (Remission of HIV Infection ERA) consortium is to understand the mechanisms governing the establishment of the viral reservoir. Its main objective is to develop new tools and strategies in the search for sustained remission of HIV infection, including a) understanding the mechanisms underlying the control of infection without treatment, b) identifying predictive markers of viral control or relapse after treatment discontinuation, and c) developing strategies that enable the vast majority of HIV-infected patients to achieve HIV remission. The consortium conducts ambitious translational projects, through public and private partnerships. In 2023, it achieved the following objectives:

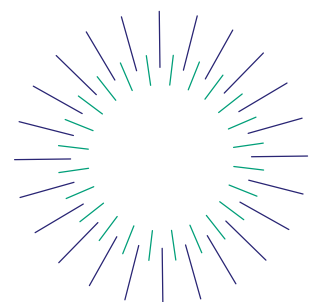
- The identification of a new family of broad-spectrum neutralising antibodies in a post treatment controller in the **ANRS VISCONTI** study (Molinos-Albert LM, *et al. Cell Host & Microbe* 2023 ; *Nat Com* 2022).

- The publication of the results of the **primate-VISCONTI** study showing the benefit of early antiretroviral therapy, initiated four weeks after SIVmac251 infection in monkeys, on the long-term control of the virus after treatment discontinuation (two-year follow-up). These results reinforce the value of early detection and the earliest possible treatment of people infected with HIV (Passaes C, *et al. Nat Commun* 2024;15(1):178).

- The start of the **ANRS 175 RHIVIERA 01** trial in March 2023. A total of 16 participants were included. The primary objective of the trial is to evaluate the likelihood of controlling HIV infection during an analytical treatment interruption (ATI) of antiretroviral therapy in **ANRS CO6 PRIMO** cohort participants who are treated early and carry the CMH B35 (53) Bw4TTC2 genotype.

- The implementation of the **ANRS 176 RHIVIERA 02** trial in collaboration with Rockefeller University. The first inclusions are planned for April 2024. The primary objective is to determine whether administration of a treatment with dual long-acting HIV-1 specific broadly neutralising antibodies in combination with antiretroviral therapy in individuals with (acute/early) primary HIV-1 infection, versus antiretroviral therapy alone, results in prolonged control of HIV infection, after scheduled discontinuation of antiretroviral therapy after its initiation.

Another study sponsored and funded by the agency, **ANRS 171 SYNACTHIV**, aims to make dormant HIV-infected cells visible to the immune system, by reactivating them to promote their elimination. An open-label, phase I clinical trial to evaluate the safety and tolerability of a novel combination of two HIV-1 inducers (decitabine and romidepsin) in patients infected with HIV-1 subtype B, treated with a combination of antiretroviral agents and with an undetectable viral load, was initiated in Belgium in 2022. The new administration procedures will be evaluated clinically and by blood sampling after each procedure. In January 2024, four patients were included. A total of 15 patients are expected.



Viral hepatitis

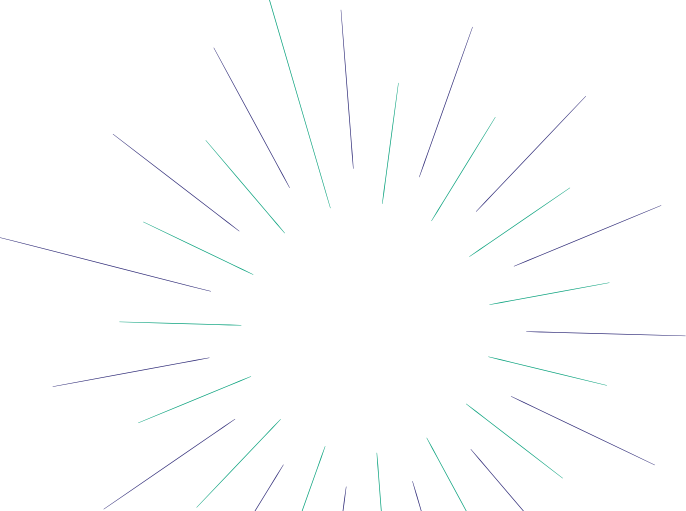
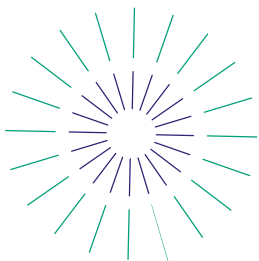
According to the WHO, 254 million people were living with chronic hepatitis B in 2022 and there are 1.2 million new infections each year. The hepatitis B virus (HBV) can be transmitted from mother to child, most often at birth during delivery. In the same year, 50 million people were affected by the hepatitis C virus (HCV), with 1 million new contaminations each year. Significant shortcomings in diagnosis and treatment remain.

➤ Clinical research

The **ANRS 12417 TOPCHIB** trial, set up in Cameroon, aims to demonstrate that preventive treatment with tenofovir disoproxil fumarate (TDF) in addition to hepatitis B vaccination can reduce mother-to-child transmission of the virus, if the child is vaccinated at birth. It is planned to include 100 pregnant women (with a positive HBeAg) – as well as their future children – in two phases, a pre-inclusion phase that includes HBV screening, and an inclusion phase related to treatment initiation. The women will be followed for a period of 13 to 16 months and the children for 48 weeks.

Changes in viral load will be measured in both mother and child, as well as the contamination rate and child protection rate. The clinical and biological safety of TDF administration in mother and child, the acceptability and costs of the intervention will also be evaluated. This project, sponsored and funded by ANRS MIE, began in the second quarter of 2023 and is expected to end in 2026.

As part of the European project **IP-CURE-B**, which aims to develop new curative concepts in chronic hepatitis B, the agency has partnered with Gilead which has developed TLR8 (GS9688), a molecule to restore both the innate intrahepatic immune response and HBV-specific T-cell responses, with an associated decrease in markers of intrahepatic and serum viral replication in patients with chronic hepatitis B. This treatment is used in **ANRS HB07 IP-CURE-B**, which is a phase II clinical trial in HBeAg negative, virologically suppressed, non-cirrhotic patients with chronic hepatitis B. It will evaluate whether stopping treatment with a nucleos(t)ide (NUC) analogue, or stopping NUC treatment following administration of selgantolimod (SLGN), can increase the rate of hepatitis B surface antigen (HBsAg) decline compared to standard of care for chronic hepatitis B. Additional exploratory analyses will help to identify whether changes in the liver immune environment are responsible for the HBsAg decline. The first patient was recruited in February 2022; 51 patients are currently included out of the 100 envisaged.

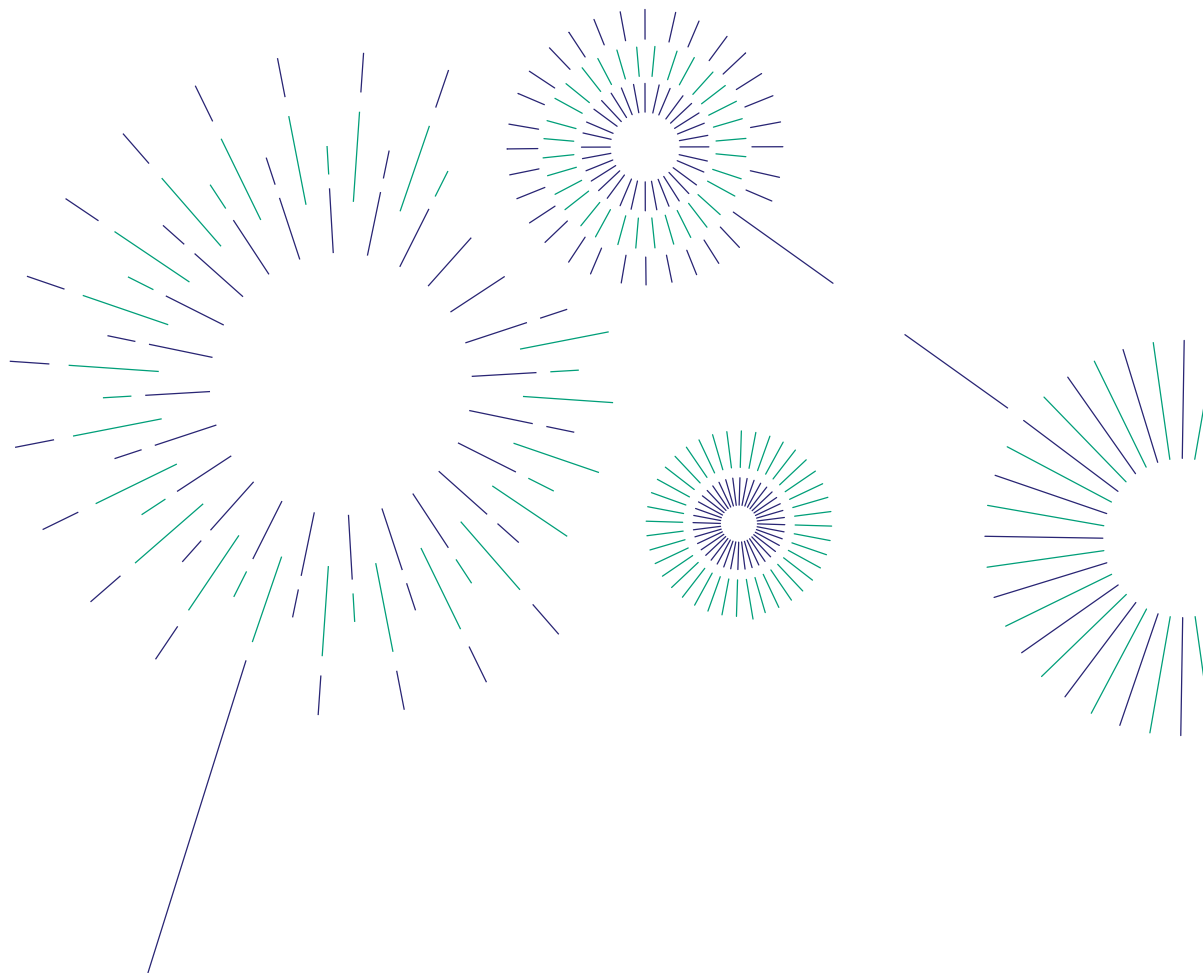


➤ Research in public health and the human and social sciences

The **ICONE** study was designed by the Inserm U1058 research team in the wake of the various DRIVE studies conducted in Vietnam. The objective was to implement a Respondent-Driven Sampling (RDS) recruitment method in Montpellier, France, to screen for and treat hepatitis C in drug users – populations that are isolated from healthcare structures. Peers were used to facilitate social procedures and promote adherence and compliance among the drug users. In 11 weeks, 554 drug users were included; 75% of whom were not being followed in an addiction medicine facility. The majority were multi-drug users living in highly precarious situations. Of the 8.8% diagnosed with chronic HCV, 76% were treated and 55% cured. The study demonstrated that the RDS recruitment method is very effective in streamlining the pathways of drug users and that it can be implemented on a larger scale in France. The **ICONE 2** project

to screen for and treat HIV and hepatitis B and C among the populations most isolated from the healthcare system was launched in autumn 2023 in Fort-de-France, Lyon, Marseille and Paris. It also includes the evaluation and initiation of follow-up of psychiatric disorders.

The objective of the **HIPOCAMP** project is to study the prevention of mother-to-child transmission of HBV by a target antiviral treatment using an innovative rapid whole-blood test. The study, to start in 2024, is sponsored by ANRS MIE and will take place in six low-income countries (Burkina Faso, Cameroon, Côte d'Ivoire, Togo, Cambodia and Vietnam).



Sexually transmitted infections: Mpox, syphilis...

Every year, 374 million people contract a bacterial or parasitic sexually transmitted infection (STI), which is possible to cure, unlike those caused by viruses. Nevertheless, all STIs present a risk to sexual and reproductive health (cancer, sterility, impact on pregnancy and newborns, increased risk of contracting HIV, etc.).

In recent years, France has seen an increase in STIs – particularly syphilis, chlamydia and gonorrhoea – which particularly affect men who have sex with men (MSM). This is the population mainly affected by the epidemic of mpox (monkey pox), which emerged in France in May 2022.

Research is focused on prevention, diagnosis, treatment and resistance to treatment, the development of vaccines and non-medical interventions. These include information on risky practices (chemsex, non-use of condoms, etc.) and facilitating access to screening and care.

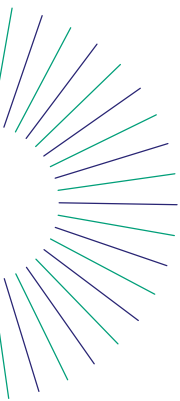
➤ Clinical research

The **ANRS DOXYVAC** trial was designed to evaluate interventions aimed at preventing STIs. It has been ongoing since January 2021 in MSM who use PrEP to prevent HIV infection, who are highly exposed to the risk of STIs and who have presented at least one STI during the year prior to their participation in the trial. In February 2023, an interim analysis of the trial results showed that using doxycycline for post-exposure prophylaxis was effective in reducing the incidence of both chlamydia and syphilis infection. It also showed the efficacy of a meningococcal B vaccine (Bexsero®) in reducing the risk of gonorrhoea infections. However, the vaccine efficacy has since been called into question. The full results of an independent audit on the conduct of this study and a re-analysis of the results are expected before a decision can be made on the possible efficacy of this vaccine strategy.

With the first case of mpox reported in the UK on 7 May 2022, ANRS MIE activated a crisis mechanism on 16 May 2022 on the research component dedicated to monkeypox.

It is in this context that the study of the vaccine impact on the incidence of mpox virus in MSM taking PrEP was added to the DOXYVAC trial. The vaccine used, MVA-BN, provided a high level of protection against the virus. The results presented at the 2023 Conference on Retroviruses and Opportunistic Infections (CROI) have shown that the incidence of mpox virus infection was 67.4 per 1 000 person-months between 9 May and 10 July. It fell to 24.4 per 1 000 person months between 11 July (date from which vaccination was possible; it should be noted that the decline in the epidemic had been initiated before vaccination, following changes in behaviour or the isolation of infected people) and 20 September 2022.

In order to help to better understand the natural history of the disease, a flagship research project was initiated in 2022 with the launch of an international cohort of people infected with the mpox virus (**ANRS MOSAIC**), in collaboration with the University of Oxford, Geneva University Hospitals, and coordinated by ANRS MIE for Europe. Its objectives are to better understand the disease and evaluate the impact of care of infected patients. The first patients were included in France on 13 July 2022.



ANRS UNITY, set up in March 2023 in three countries (Argentina, Brazil, Switzerland), is a randomised, double-blind, placebo-controlled phase III trial evaluating the efficacy and safety of antiviral treatment with tecovirimat in patients with mpox.

For the first time in France, a study aimed at evaluating the prevalence of human papillomavirus (HPV) infections and STIs in the transgender population was designed. This observational, cross-sectional, monocentre study, **ANRS 0406s PrevHPV-TG**, followed up at Bichat Hospital in Paris, is part of a global approach to sexual health.

➤ Survey

The third major national study, **Health, emotional and sexual life**, commenced in early November 2022. It is conducted by Inserm and *Santé publique France* and is sponsored and funded by ANRS MIE. Following a first edition in 1992 and a second in 2006, this new survey was completed in December 2023.

It studied the emotional and sexual lives and the preventive practices of 37 000 people in France and linked them to the societal changes and public policies of recent years. The first results of this research are expected in the final quarter of 2024.

Cross-sectional research on HIV/AIDS, viral hepatitis and STIs

The French Minister for Health and Prevention, Aurélien Rousseau, has tasked the French National AIDS Council (CNS) and ANRS MIE with conducting an update of the country's guidance for the treatment of HIV, viral hepatitis and STIs. This is conducted under the aegis of the CNS and ANRS MIE, as well as the French National Authority for Health (HAS) for the chapters relating to anti-infective, curative and preventive therapeutic aspects.

At Inserm, and in collaboration with our various institutional partners, both public and private, we continue to develop integrated approaches to promote multidisciplinary. Our ongoing programmes include research into vaccines (HIV/AIDS, tuberculosis, HCV and priority emerging pathogens), research into cures (HIV, HBV, HDV), and community-based participatory research ('triple elimination' of mother-to-child transmission of HIV, HBV and syphilis).

With the aim of promoting multidisciplinary, ANRS has extended the remit of the cohort on mother-to-child transmission of HIV in France to include viral hepatitis and emerging

infectious diseases (**ANRS 0288s VIROPREG**). It has several objectives: evaluate the impact of exposure to HIV-1/HIV-2 and antiretroviral treatments received during pregnancy and the neonatal period in children born to mothers infected with HIV-1/HIV-2; estimate mother-to-child transmission of HBV/HCV in children born to mothers infected with HBV/HCV; evaluate the impact of exposure to arboviruses (dengue) during pregnancy on the risk of adverse pregnancy outcomes and characterise the repercussions of the infection itself and/or its treatment on the health of the pregnant woman, the course of the pregnancy and the health of the newborn.

ANRS12420-HEPEDIAC is a pilot therapeutic study of direct-acting antiviral (DAA) therapy. Its primary objective is to evaluate the efficacy and safety of the sofosbuvir/daclatasvir combination in adolescents and children of at least six years of age with active HCV infection in Cambodia. Inclusions began in August 2023 at three hospitals in Phnom Penh and Siem Reap.

A new recruitment site has just been set up in Battambang province. To date, 12 children have tested positive for HCV by RNA out of the 9 752 tested (24 children tested positive following the rapid diagnostic test).

Tuberculosis

Tuberculosis (TB) is one of the leading causes of death from infectious diseases worldwide. The WHO estimated 9.9 million new cases of TB in 2020, and 1.3 million deaths, of which 214 000 concerned people living with HIV. Much remains to be done in order to better understand and effectively manage this disease.

➤ Clinical research

In 2023, **ANRS 0092s DRIVE-TB** was launched. This study is part of the Drug-Related Infections in ViEtnam (DRIVE) project, a community-based research programme, co-funded by ANRS MIE, the Global Fund and NIDA, which aims to reduce HIV transmission among injecting drug users in Haiphong. The study aims to evaluate community-based TB intervention in this population in terms of screening and access to treatment.

Two other projects funded by the agency were launched this year. **ANRS 0214 APRECIT-BIS** aims to improve screening for tuberculosis infection in at-risk populations in Madagascar and Cameroon. For this, two rapid, non-invasive and innovative respiratory tests and a saliva test will be used for screening, triage and diagnostic confirmation. The project includes a capacity building component in TB research. The other project, **ANRS 0459 TB-ALGORIT-PED**, aims to improve the diagnosis of TB in children. Underdiagnosis and consequently undertreatment of the infection in children is a major public health problem in many parts of the world. The objective of the study is to evaluate the diagnostic performance of two WHO treatment decision algorithms for pulmonary TB in children under 10 years of age in Nigeria, Niger, Guinea, Uganda and South Sudan.

Funded by The European and Developing Countries Clinical Trials Partnership (EDCTP) and sponsored by ANRS MIE, the **ANRS 12398 INTENSE-TBM** project began in 2019 and is expected to end in 2025. It aims to improve the care of people with tuberculous meningitis. This randomised, multicentre clinical trial studies the efficacy of a new therapeutic strategy: on the one hand, an intensified tuberculosis treatment versus WHO standard of care, and on the other, the addition of aspirin to the tuberculosis treatment versus no aspirin (placebo). It has been implemented in four sub-Saharan African countries (South Africa, Côte d'Ivoire, Uganda and Madagascar).



Emerging infectious diseases

An emerging or re-emerging disease is any infection whose incidence has increased over the past 20 years or is threatening to increase in the near future. The majority of these diseases result from the inter-species transmission from animal hosts to humans (zoonoses).

The twenty-first century has seen several major epidemics and pandemics, including the Ebola epidemic in West Africa in 2014-2016, and more recently the COVID-19 pandemic that began in China at the end of 2019.

Similarly, an epidemic of monkeypox (mpox) affecting several countries, mainly among MSM, took the world by surprise in 2022.

➤ Respiratory viruses

COVID-19

In 2023, ANRS MIE reviewed the progress of the 27 Long COVID research projects funded by it as part of the 2021 and 2022 Long COVID calls for proposals (9 projects in clinical research, 10 in basic research, 8 concerning the human and social sciences/public health). One of the objectives was to draw up an overview of unmet research needs and priorities, in connection with the **Long COVID Coordinated Action (CA54)**¹ set up in 2022. This work and the reflection that followed led to the proposal

of four priority areas:

- the epidemiological field with the need for regular evaluation of the epidemiological outcome of cases and of the societal impact;
- basic research with, in terms of pathophysiological hypotheses, a focus on neurological effects;
- therapeutic research;
- the field of human and social sciences.

CA54 will refine these areas in 2024.

1. Coordinated Actions are groups of people involved in the scientific facilitation of the agency (for more information, see Part II. Bringing together and facilitating communities).

➤ Treatments and vaccines

A randomised controlled trial to optimise antiviral therapy in immunocompromised patients is currently ongoing. This is the **ANRS 0176s OPTICOV** study, whose objective is to evaluate whether a combination antiviral therapy of two direct-acting antivirals (nirmatrelvir/ritonavir + remdesivir) and/or an increase in nirmatrelvir/ritonavir duration from 5 to 10 days improves antiviral efficacy by decreasing the SARS-CoV-2 positivity rate by RT-PCR in nasopharyngeal swabs at Day 10. The participants have confirmed asymptomatic SARS-CoV-2 infection or mild to moderate COVID-19. The trial is taking place in France and Switzerland.

In 2023, Inserm and ANRS MIE agreed to sponsor two first-in-human phase I vaccine trials evaluating candidate vaccines against SARS-CoV-2, with a scheduled start in 2024.

The first vaccine is a monoclonal antibody targeting dendritic cells developed by the VRI and the start up LinKinVax (**ANRS LKV. Cov40** trial) and the second is a nasally-administered protein vaccine developed by Tours University and INRAE, with an exclusive operating license for the start up Lovaltech (**DR230330 – ANRS0514s MUCOBOOST** trial). The MUCOBOOST trial, a ReCH-MIE 2023 winner, is a randomised, controlled, multi-centre phase I/II trial comparing the safety and immunogenicity of a booster dose of the intranasal COVID-19 vaccine expressing recombinant SARS-CoV-2 N/S proteins with a booster dose of COVID-19 mRNA vaccine in healthy adult volunteers. MUCOBOOST is sponsored in conjunction with Tours Regional University Hospital.

➤ Research in public health and the human and social sciences

How has the health crisis affected our attitudes towards not only COVID-19 vaccination but also other vaccines? It is important to analyse the concept of vaccine hesitancy, widely observed during the crisis, while taking into account the strong politicisation of behaviours. The purpose of the ICOVAC study is to continue to monitor and document the vaccine challenges surrounding COVID-19 in the coming years, and to evaluate the impact of this crisis on vaccination in general. Four areas of research have been envisaged:

- the first will study the current vaccination challenges in the general population (quantitative and qualitative surveys, analysis of reports of side effects related to the COVID-19 vaccine);
- the political dimension of the vaccine question will be explored in the first part, but will be the subject of a more specific study encompassing collective mobilisations and public debates (ethnographic approach, analysis of debates on Twitter (now X) and in the general news media);
- the third area will concern healthcare professionals (general practitioners, paediatricians, community and hospital nurses) and will involve qualitative interviews, secondary quantitative analyses (general practitioners) and the establishment of a barometer (nurses);
- the fourth area will bring together scientific value creation and promotion actions aimed at structuring research in the human and social sciences on vaccine questions.

➤ Respiratory syncytial virus (RSV)

In the context of the provision of a monoclonal antibody, nirsevimab, for the prevention of RSV-related lower respiratory tract infections in newborns and infants, ANRS MIE has been mandated by the French Ministry of Health and Prevention to organise an evaluation of the impact of this strategy on the 2023-2024 winter bronchiolitis epidemic. The creation of working groups in 2023 resulted in two projects that were submitted and funded by the ANRS MIE on an emergency basis:

- **The POLYRES National Observatory** tackles the molecular characterisation of RSV, which will enable exhaustive analysis of the variants of the virus in infants under one year of age in the context of the widespread use of nirsevimab. The monitoring and follow-up of RSV polymorphisms in this setting should help to detect any potential resistance that may emerge with the use of this new preventive intervention.
- **ENVIE** is a non-interventional study whose principal objective is to evaluate the real world efficacy of passive immunisation with nirsevimab on the prevention of hospitalisation of infants under one year of age for RSV bronchiolitis in France. The results of this study have already been submitted for publication following the inclusion of 1 000 infants. An 'immunology and microbiology' ancillary study derived from ENVIE, also funded by ANRS MIE, aims to conduct additional analyses in the field of immune and microbiological biosignature in children hospitalised for RSV bronchiolitis.

➤ Nipah

The WHO has ranked the Nipah virus (NiV) as one of the top eight emerging pathogens likely to cause major epidemics in the future. It was first described in 1999 following an outbreak in pigs and humans in Malaysia and Singapore. It is a zoonotic virus whose known reservoir is the fruit bat. The clinical picture can range from asymptomatic infection to acute respiratory infection and fatal encephalitis. Mortality related to this disease is estimated at between 40 and 75%.

In a context where no treatment or vaccine is available yet, a preclinical study demonstrating the immunogenicity and efficacy of the vaccine candidate **CD40.NiV**, developed by the Inserm VRI / ANRS MIE and Paris-Est Créteil University, was finalised this year. It demonstrated that

CD40.NiV conferred protection against the development of NiV, with 100% survival of immunised animals through to the end of the study, i.e. 28 days after infection. These results are an important step towards the clinical development of a vaccine against infection.

In addition, **NIPAH-LISA** is one of the successful applicants to the Emerging Infectious Diseases Priority Research Programme and Equipment (PEPR MIE) 2023 call for proposals. This project focuses on airborne infections of highly pathogenic viruses of the *Paramyxovirinae* family (including NiV), and aims to develop a multi-component antiviral treatment against these infections.

➤ Arboviruses

On 27 July 2023, an indigenous human case of West Nile virus infection was reported for the first time in Bordeaux, France. In 2023, 26 human cases and 24 equine cases were identified in the Nouvelle-Aquitaine and Charente-Maritime regions of the country. Faced with these events, the Arbo-France network met and submitted for funding from the ANRS MIE emergency fund a project entitled '*Situation exceptionnelle de circulation des arbovirus du Nil occidental et Usutu en Nouvelle-Aquitaine : poursuite des activités de surveillance*' [Exceptional situation of West Nile and Usutu arbovirus circulation in Nouvelle-Aquitaine: continuation of monitoring activities]'. The project has three components, entomological, veterinary (avian, equine) and human, with the aim of monitoring West Nile and Usutu viruses in Nouvelle-Aquitaine, including an entomological component and a genome component.

Another arbovirus, dengue, received special attention this year with the funding of **LSDengue** in the framework of the PEPR MIE call for proposals. The aim of this project is to identify the determinants of severe forms of dengue in order to define biomarkers for clinical use and adapt patient care. It envisages a study, the largest to date, of the comprehensive characterisation (clinical, genetic, virological and immunological) of hundreds of patients of diverse genetic origins, recruited over a large part of the geographical area of dengue incidence thanks to a vast network in the French overseas territories. This involves anticipating the progression of the infection to severe dengue, improving patient care and reducing the risk of infection-related mortality.



➤ Viral haemorrhagic fevers

Lassa fever

In 2023, ANRS MIE embarked on the funding, set-up and support of projects related to Lassa fever (acute haemorrhagic illness).

The **COPAFLECT** project, funded as part of the PEPR MIE 2023 call for proposals, aims to study the pathogenesis of Lassa fever and identify relevant immune pathways for the development of novel therapeutic strategies that target host response.

A new alliance was created in 2023 to fight Lassa fever, the **international consortium INTEGRATE** which, for a five-year period brings together 15 research institutes, health facilities and humanitarian organisations from 10 countries of West Africa, Europe and the USA. The objective of this research programme, coordinated by ALIMA and funded as part of EDCTP3, is to create an innovative adaptive platform for phase II/III clinical trials aimed at identifying the most effective drugs for treating Lassa fever in West Africa. ANRS MIE is a member of the consortium and its mission is to support the Irrua Specialist Teaching Hospital (ISTH) in Nigeria in its role as sponsor through the transfer of skills. The aim is to build the capacity of African institutions to become sponsors of clinical trials.

Within the INTEGRATE platform, ANRS MIE is working with the other partners to set up two clinical trials that will take place in Nigeria. The randomised, phase II-III trial **ISTH/ANRS 0409s INTEGRATE**, the first trial of the international adaptive platform, is funded by EDCTP3. It investigates the efficacy, tolerability and safety of repurposed favipiravir versus ribavirin, the current standard of care for Lassa fever in West Africa. The trial is scheduled to start in 2024. The purpose of the **ANRS 0345s Lassa Integrate** randomised phase II trial is to evaluate the safety, tolerability and pharmacokinetics of a new antiviral molecule, ARN-75039, for the treatment of Lassa fever in West Africa. It will be compared to ribavirin.

ANRS MIE also coordinates a multidisciplinary working group on viral haemorrhagic fevers, with a particular interest in filovirus and arenavirus diseases (such as Lassa fever), which brings together experts to facilitate exchanges and bring about the emergence of new research projects.

Ebola

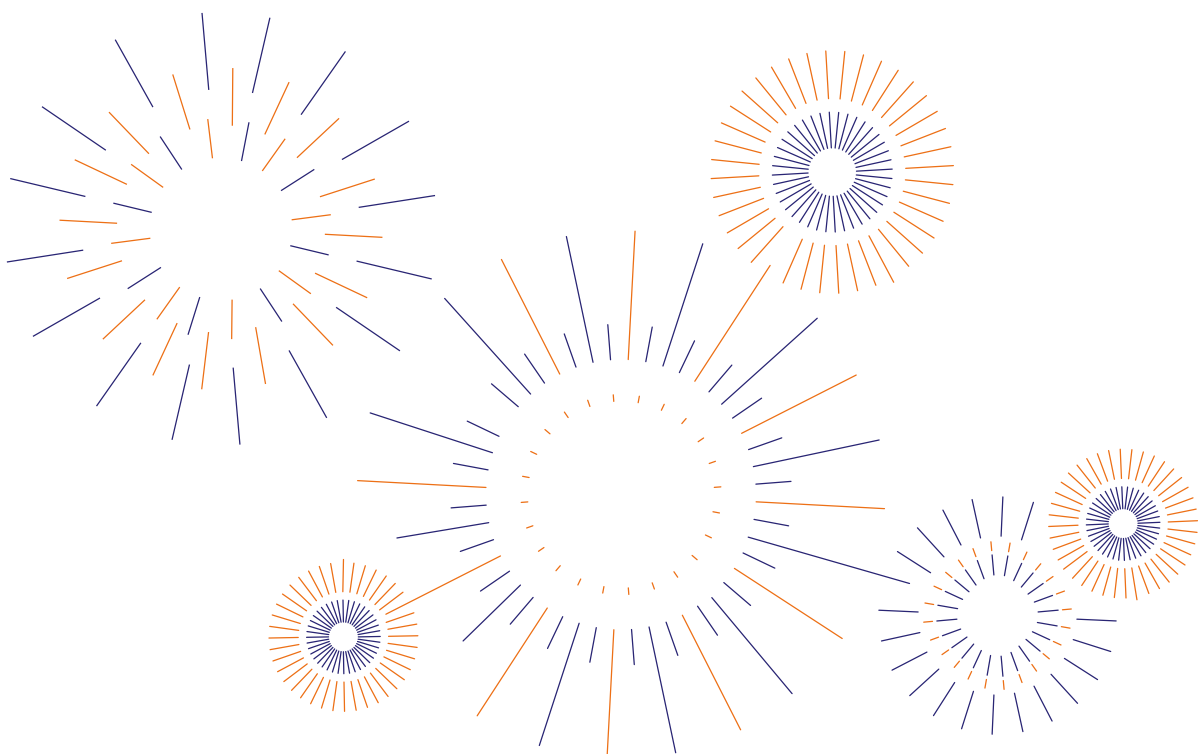
There are two types of tools to combat the spread of the disease: a vaccine (Ervebo) and monoclonal antibodies. However, they share the same viral target. It is therefore possible that the vaccine may be inhibited by the monoclonal antibodies, especially when administered concomitantly. The objective of the phase II study **ANRS 0064s IMOVA** is to evaluate the magnitude of the effect, if applicable, of administration of the monoclonal antibody inmazeb on the neutralising antibody responses induced by Ervebo. If an interaction is observed, it may help to determine the time interval necessary between the administration of the two products.

An observational study was conducted by researchers from IRD, Inserm, ANRS MIE and the French National Institute of Biomedical Research (INRB), on **Les Vainqueurs d'Ebola cohort** of survivors treated with Ebola drugs during the tenth epidemic in the Democratic Republic of the Congo. Over time, the individuals treated with monoclonal antibodies experienced a rapid decline in their levels of antibodies to the virus. The results of this study, published on 30 November 2023 in *The Lancet Infectious Diseases*, show that monoclonal antibodies could have a negative impact on the production of anti-Ebola antibodies over time and thus potentially increase the risk of reinfection or reactivation.

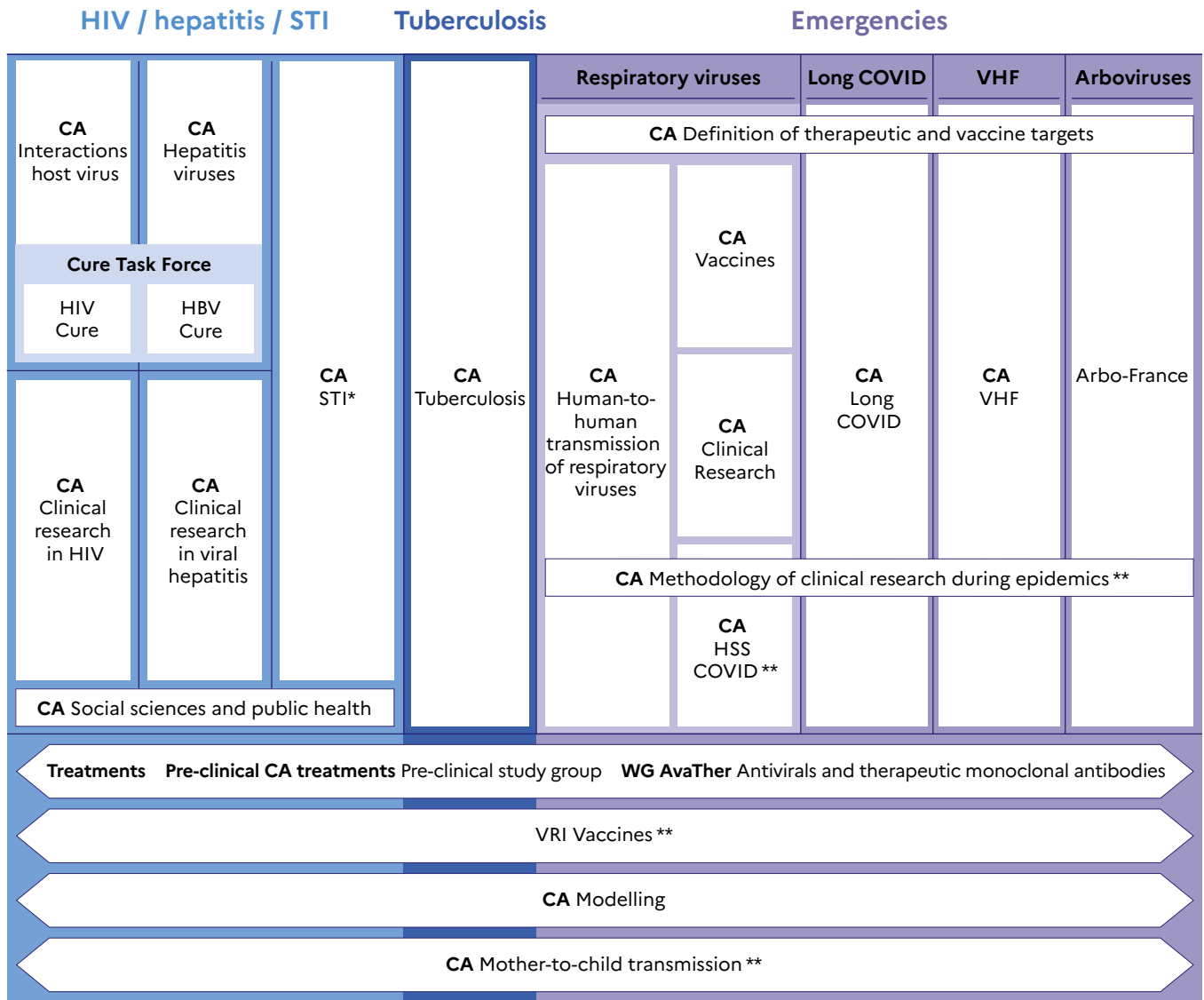
2 Bringing together and facilitating communities

Facilitation that covers the entire agency remit

The aim of scientific facilitation at ANRS MIE is to encourage exchanges between researchers from different institutions or specialities and representatives of patient associations. For this to happen, it involves different groups of people: Coordinated Actions, working groups and sub-groups and thematic networks. These facilitation meetings aid reflection on specific themes, encourage research collaborations and the design of innovative projects, highlighting priority areas for research or, on the contrary, areas that receive less attention but are necessary.



➤ Scientific facilitation at ANRS Emerging infectious diseases



*In project ** In restructuring

CA = Coordinated Action
 VHF = Viral haemorrhagic Fever
 WG = Working Group
 STI = Sexually Transmitted Infections
 VRI = Vaccine Research Institute

➤ Coordinated Actions (CA)

The review of the scientific facilitation bodies, which began in 2021, continued in 2023. As a result, several new Coordinated Actions (CAs) and thematic working groups have been created, and others remodelled. Their activities include the maturation of research projects and the support of young researchers in matters of organisation and facilitation.

CA Host-virus interactions: Basic and translational HIV research (CA41)

It facilitates research into the mechanisms regulating HIV replication and persistence, the induction of effective immune responses and the remission of infection through cohorts and animal models with the aim of developing curative therapies.

CA Viral hepatitis basic and translational research (CA42)

It studies the fundamental molecular and cellular aspects of the life cycles of hepatitis viruses, host responses and diseases induced by these viruses. It looks for new areas of interest and establishes future directions.

CA Clinical research in HIV (CA44)

It has been restructured with a strengthening of the partnership between low-to-middle-income and high-income countries and the creation of cross-cutting groups CA44/41.

CA Public health, HIV, sexual and hepatic health (CA46)

In addition to its scientific facilitation and knowledge-sharing activities, it also aims to bring about the emergence of major structuring, interdisciplinary and inter-team projects around its constituent working groups, in low-to-middle-income and high-income countries.

CA Sexually transmitted infections (CA53)

It was established in 2022 as part of the update of French guidance for the treatment of HIV infection, viral hepatitis and STIs conducted by the French National AIDS Council (CNS) and ANRS MIE. It aims to improve prevention as well as diagnostic and therapeutic management.

CA Human-to-human transmission of respiratory viruses (CA51)

It focuses on the transmission of respiratory viruses. Its objective is to coordinate research into the formation and emission of infectious respiratory particles by projection or exhalation, their transport, their inhalation, the modes of respiratory system infection, human to human transmission in the population, and the associated means of prevention. It mainly tends to bring about the emergence of new interdisciplinary projects.

CA Respiratory viruses (CA52)

As a continuity of the different REACTing and then ANRS MIE working groups on COVID-19, it identifies research priorities and supports research projects on respiratory viruses (SARS-CoV-2, influenza, RSV, metapneumovirus, human parainfluenza viruses), pathophysiology, therapeutic approach and public health.

CA Respiratory virus vaccines

Currently under construction, its mission is to structure and coordinate research on the following themes in the field of respiratory virus vaccination: RSV vaccination, routes of administration and vaccine platforms, immunisation and communication strategies.

CA Long COVID (CA54)

Established in 2022, it focuses on the field of epidemiology, basic research with studies on neurological effects, therapeutic research and the field of human and social sciences.

CA Modelling (CA49)

Present from the very beginning of ANRS MIE, derived from a pre existing working group on the modelling of the SARS-CoV-2 pandemic, it forms part of the continuity of regular interactions between the different research teams in France involved in the modelling of infectious diseases. It covers a broad thematic spectrum which includes population models, the emergence and dynamics of epidemics, quantitative epidemiology, intra-host modelling, phylodynamics, health economics and the consideration of behaviours.

In 2023, the Viral haemorrhagic fevers CA was established and the activities of the Tuberculosis CA were defined.

CA Viral haemorrhagic fevers CA

The Viral haemorrhagic fevers working group, initially established by the REACTing consortium, was integrated into ANRS MIE in 2021 and restructured as a Coordinated Action in 2023. Drawing on a community of experts from a diversity of academic institutions, non-governmental organisations and ANRS MIE partner sites, the activities of this CA aim to promote the development of research on viral haemorrhagic fevers.

CA Tuberculosis CA

Its objectives concern the facilitation of the diagnosis of the different forms of the disease in certain sensitive populations (children, immunocompromised individuals, pregnant women), the fight against resistance to tuberculosis drugs with the development of new

therapeutic strategies targeting tuberculosis or the host, and the development of innovative prevention strategies (candidate vaccines, protective correlates, immune protection mechanisms, etc.).

It should be noted that some CAs work closely together. For example, the 'Respiratory virus vaccines', 'Transmission' and 'Human-to-human transmission of respiratory viruses' CAs or the **CURE cross-sectional group** consisting of CA41 and CA42. Since 2023, the CAs and the sector scientific committees (CSS), whose role is the scientific evaluation of research projects, have met three times a year. A new **Mother-child CA** was being developed in 2023. It will be cross cutting, multidisciplinary and include representatives of the various 'Mother child' groups of the thematic CAs and external experts who will make up the Scientific Advisory Board.

Thematic Networks

Like the Coordinated Actions, the Thematic Networks are groups involved in scientific facilitation at ANRS MIE.

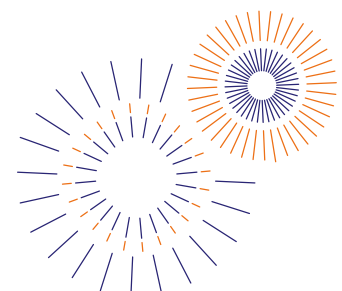
Arbo-France, placed under the aegis of ANRS MIE, is a multidisciplinary and multi institutional French network for human and animal arbovirus monitoring, surveillance and research. The aim is to facilitate preparedness and response to human and animal arbovirus epidemics, in mainland France and the overseas territories. The main activities of the network are:

- presentation and analysis of epidemiological situations,
- scientific facilitation,
- help with setting up research projects,
- expert appraisal,
- scientific watch.

Arbo-France published its human and animal arbovirus research strategy in early 2023, and in November 2023 held a Scientific Day devoted to the monitoring of the West Nile virus in France and Europe. This event enabled the creation of a **Research and Innovation Working Group** for the monitoring of zoonotic arboviruses.

The objective of the **ANRS HBV Cure Working Group** is to contribute to the identification of new therapeutic targets and new antiviral molecules to fight HBV. Its principal missions are as follows:

- promote ambitious and innovative research on the theme of HBV Cure in France and abroad;
- facilitate scientific discussions within the consortium in order to incubate and promote cutting-edge research programmes combining basic, translational, clinical, social sciences and public health research;
- communicate on the programme and achievements of the Working Group and disseminate knowledge on the theme of HBC Cure to serve the global perspective of the global elimination of the hepatitis B virus.



Working Groups

Initially designed for the evaluation of COVID-19 antiviral drugs, **AvATher** (antivirals and therapeutic monoclonal antibodies) extends its remit to other respiratory viruses (coronavirus, influenza, RSV, other viruses considered priority). This is an advisory expert group which provides opinions on antiviral molecules and monoclonal antibodies targeting respiratory viruses, in the final phase of preclinical development or in the clinical phase. Its work is coordinated with the agency's other facilitation bodies, in particular the **Respiratory viruses CA and the Preclinical Studies Group** (GEPC).

In the event of an epidemic crisis caused by other pathogens (viral haemorrhagic fever, arbovirus, etc.), the group could exceptionally be called upon to issue opinions and/or recommendations, or to conduct an expert appraisal of a clinical study project concerning

new antiviral candidates potentially active against the pathogen in question.

In particular, the group is tasked with:

- issuing advisory opinions to health authorities and/or clinicians;
- maintaining an active watch of the literature concerning antivirals;
- evaluating the therapeutic potential of and prioritising antiviral candidates in order to promote or facilitate their clinical evaluation within one of the national or European clinical research platforms;
- advising the decision-making bodies on the relevance of considering the clinical evaluation or inclusion in the French therapeutic arsenal of a specific antiviral in a given indication.

Supporting and facilitating the ANRS MIE international network

A growing international network

The international network, which brings together French and international players through two types of key partnerships, the most long-standing being with the **partner sites** and the more recent with the **International Research Platforms in Global Health (PRISMEs)**, was officially launched in June 2023 at the annual meeting of the partner sites and the PRISMEs. On this occasion, and in accordance with its international roadmap, ANRS MIE wished to strengthen its support for its international partners, heighten the visibility of the international network and intensify synergies and collaborations between partners within the network.

This network grew in 2023 with the creation of two new PRISMEs, one in Côte d'Ivoire and the other in the Democratic Republic of the Congo.

In Côte d'Ivoire, the ANRS partner site became a PRISME in January 2023. The Côte d'Ivoire PRISME brings together four Ivorian partners and five French partners. The platform is primarily built around actions carried out by the PAC-CI association and the GHIGS team (Inserm / IRD / Bordeaux University). The PRISME platform was launched in the Democratic Republic of the Congo (DRC) in March 2023 in the presence of the French President. It is the result of a long-standing scientific relationship between France and the DRC in the fight against various epidemics. The platform brings together the INRB, Kinshasa University, the Ministry of Public Health, Hygiene and Prevention of the DRC, ANRS MIE, IRD, Inserm, Montpellier University and the French Embassy in the DRC.

Five **international technical experts** (ITEs) are assigned to partners in the international network and are genuine focal points for facilitating the activities carried out within the

framework of the partnerships. Since 2023, one ITE has also been based in Zambia at the University Teaching Hospital of Lusaka to assist

with research projects supported by ANRS MIE in Zambia and to develop new collaborations in southern Africa in the medium term.

➤ Bringing together the international scientific community and supporting research training

Thanks to ANRS MIE support, and as envisaged in the missions entrusted to the partner sites and the PRISMEs, the international network partners have the possibility to hold Scientific Days. These meetings are an opportunity to present the results of the research activities carried out over the past two to three years and to discuss research perspectives and priorities with researchers, doctors, students, authorities and representatives of associations and civil society.

The **Scientific Days of the Côte d'Ivoire PRISME** took place on 23 and 24 January 2023 in Abidjan. They were an opportunity to present the projects led by the PAC-CI and GHIGS teams, particularly through the Mereva scientific engineering platform, and to exchange with a vast network of partners on numerous research themes: HIV/AIDS, emerging infectious diseases, tuberculosis, epidemic response, non-communicable diseases, global health, interdisciplinarity.

On 16 and 17 May 2023, the 14th edition of the **Scientific Days of our partner site in Senegal** was held in Dakar, marking the 30th anniversary of the partnership. The theme of the event was 'Facing epidemics, from research to health policies' and the two days were devoted to Senegalese research priorities: supporting innovations and emerging epidemics with a One Health approach.

The 8th edition of the **Scientific Days of our partner site in Brazil** took place from 9 to 11 October 2023 in Brasilia as part of the 29th technical and scientific seminar of the Franco Brazilian cooperation, the theme of which was the elimination of HIV, STIs, tuberculosis and other neglected diseases.

The 2023 edition of the **Scientific Days of our partner site Vietnam** (15-16 November) took place in the context of the 40 years of HIV discovery and the fiftieth anniversary of the Franco Vietnamese cooperation, with the guiding theme 'Towards the eradication

of epidemics in Vietnam'. Several research avenues were highlighted, such as preventing HIV in men who have sex with men, reducing the mortality rate of the hepatitis B virus, understanding and controlling dengue and mpox epidemics, and preparing for the arrival of other emerging infectious diseases unknown in Vietnam.

Finally, despite the geopolitical context, **our partner site in Burkina Faso** was able to hold the 9th Investigator Meeting on 19 December 2023 in hybrid form (with some attending in person and others remotely), thereby demonstrating the long-standing nature of the partnership and the dynamism of research in the country. Representatives from other partner countries of the international network were also invited.

Every year, the dynamics of the training developed and offered by the international network partners are intensifying in different research fields. These training sessions are aimed at students, young researchers, more senior researchers, health professionals, community players, etc. In total, apart from the continuous support of research teams and thesis students, 33 training courses were created in 2023 in the partner countries of the international network, particularly with the support of ANRS MIE.

In 2023 in Senegal, the Fann Regional Centre for Research and Training in Clinical Management (CRCF) and ANRS MIE, in partnership with the Network for the Anthropology of Emerging Epidemics (RAEE), held a training workshop in anthropology applied to emerging epidemics. The awareness of the participants was raised regarding the social and health issues related to epidemic risk, and emphasis was placed on the operational dimension of epidemic preparedness and response. From 6 to 14 November 2023, the CRCF and ANRS MIE, in partnership with *Institut Pasteur* in Paris, the new Pharmaceutical Regulatory Agency (ARP) and the IRD, held the 6th edition of the course on clinical trial methodology and training of clinical study technicians to meet the growing

need for qualified human resources in clinical research in Senegal. In Guinea, CERFIG, a key player in the country's PRISME, provided support for the qualifying training courses offered by Gamal Abdel Nacer University in Conakry (Masters in Public Health, Masters in Microbiology and Immunology). In addition, through the support obtained within the framework of an FSPI project, the Guinean partners offered health research ethics training for the staff of 20 research institutions and 15

Guinean NGO partners. In Cameroon, research ethics awareness workshops were offered to university students, as this type of training is not provided in the local university curricula. In Cambodia, researchers from the University of Health Sciences and the local *Institut Pasteur*, key structures of our partner site in the country, contributed to the development of epidemiology classes for the second-year Masters in Infectious Diseases offered in collaboration with Paris-Saclay University.

➤ Continuing collaboration with the major global health players

Strengthening cooperation with the WHO in tuberculosis

In June 2022, ANRS MIE and the WHO initiated a cooperation in order to set up a cross-cutting strategic reflection on HIV/AIDS, viral hepatitis and STIs. The aim is to improve their scientific and technical cooperation in low- and middle-income countries (LMICs) in West and Central Africa. This cooperation was extended to include tuberculosis in November 2023.

These two memoranda of understanding are part of the general framework of the cooperation between France and the WHO signed on 31 December 2019 on the establishment of a strengthened partnership for the 2020-2025 period.

Participating in the development of the French Global Health Strategy 2023-2027

ANRS MIE is strongly committed to the collective work within the 'French Team' to define the new **French Global Health Strategy for 2023-2027**. French research and expertise are integrated as veritable levers of action and influence to support the strategy. This initiative was officially launched in October 2023.

GloPID-R

The **Global Health Security Initiative and Global Research Collaboration for Infectious Disease Preparedness (GloPID-R)** alliance is a network of research funding bodies tasked with facilitating the coordination of investments to improve the preparedness and rapidity of research response to epidemics and pandemics. Founded in 2013, the project is funded by the

Horizon 2020 research and innovation programme. So far, the network has 33 members and nine observers worldwide (with the Pasteur Network and ANRS MIE being the two French representatives of the network). ANRS MIE is involved in the governance and facilitation of the network. In particular, it contributed to the preparation of a roadmap for the coordination of effective and equitable global clinical trials in the event of epidemics and pandemics.

EDCTP

This public-public partnership between 15 European countries and 27 developing African countries on clinical trials is funded by the European Union. France is one of the founding countries and one of the first contributors to this partnership launched in 2003. The objective of EDCTP is to accelerate the clinical development of new or improved health technologies with the aim of identifying, treating and preventing infectious diseases (including re emergences) related to poverty and which are generally excluded.

ANRS MIE is strongly involved in defining the orientations of the partnership, as well as in its operationalisation. It plays a role in which it liaises with all French research institutions.

After hosting the 3rd EDCTP programme in May 2022, ANRS MIE renewed its involvement in this partnership by being the official co-host of the 11th edition of the Forum with the Ministry of Higher Education and Research. Held by the EDCTP programme at the *Palais des Congrès* in Paris from 7 to 10 November 2023, it was attended by over 1 000 participants from 64 countries.

Strengthening our partnership with Brazil

On the occasion of an institutional visit to France by the President of the São Paulo Research Foundation (FAPESP), ANRS MIE and Inserm signed a memorandum of understanding with FAPESP aimed at strengthening cooperation and links between scientific communities in the field of research on HIV/AIDS, viral hepatitis, STIs, tuberculosis, emerging and re-emerging

infectious diseases, immunology, neuroscience, genetics, chronic diseases and cancer. This memorandum envisages the creation of a multi-stakeholder steering committee, giving rise to the design and implementation of research projects conducted in partnership, the organisation of scientific meetings and the launch of a joint call for proposals on infectious diseases by the end of 2024.

Centralised pharmacovigilance and transfer of skills

Since 2018, the ANRS MIE clinical research Vigilance Department has coordinated the creation and structuring of a centralised pharmacovigilance system within the framework of the European paediatric consortium **connect4children (C4C)**. The principle is to create key procedures, harmonise complex safety processes, create a network of local safety managers and centralise all safety-related activities.

ANRS MIE, in collaboration with the C4C teams, has developed a questionnaire for the various users and stakeholders of this pharmacovigilance system (clinical trial sponsors and project teams, national activity centres, local pharmacovigilance representatives and clinical trial sites) in order to evaluate its performance. Overall, feedback is very positive: more than 90% of respondents expressed positive feedback on the different pharmacovigilance support activities provided by ANRS MIE and around 70% gave a positive evaluation of the training offered. One of the strengths of the centralised pharmacovigilance system is the establishment of a network of local pharmacovigilance specialists, which proved to be beneficial for 76% of respondents. This experience enabled ANRS MIE to promote its pharmacovigilance expertise at the European level, and to establish a network of European pharmacovigilance experts dedicated to clinical trials, both during a pandemic and outside of any health crisis. The ANRS MIE clinical

research Vigilance Department is an expert department for conducting paediatric clinical trials in several countries at the same time.

Centralised pharmacovigilance was set up in the C4C consortium and the **EU-Response consortium** was created to accelerate the development of COVID-19 treatments in the European Union.

This approach proved to be effective and responsive in four clinical trials derived from these consortia. This suggests that centralised pharmacovigilance can be used by multiple academic sponsors. The results were published in February 2023 in the *British Journal of Clinical Pharmacology*. The year 2023 marked the end of the pilot phase relating to the conduct of paediatric clinical trials for the C4C consortium.

The transfer of skills in the area of sponsorship is one of the central points in the projects and infrastructures for epidemic crisis preparedness. As such, in 2023 the Vigilance Department strengthened local sponsorship and pharmacovigilance capacities within the framework of the **INTEGRATE consortium**.

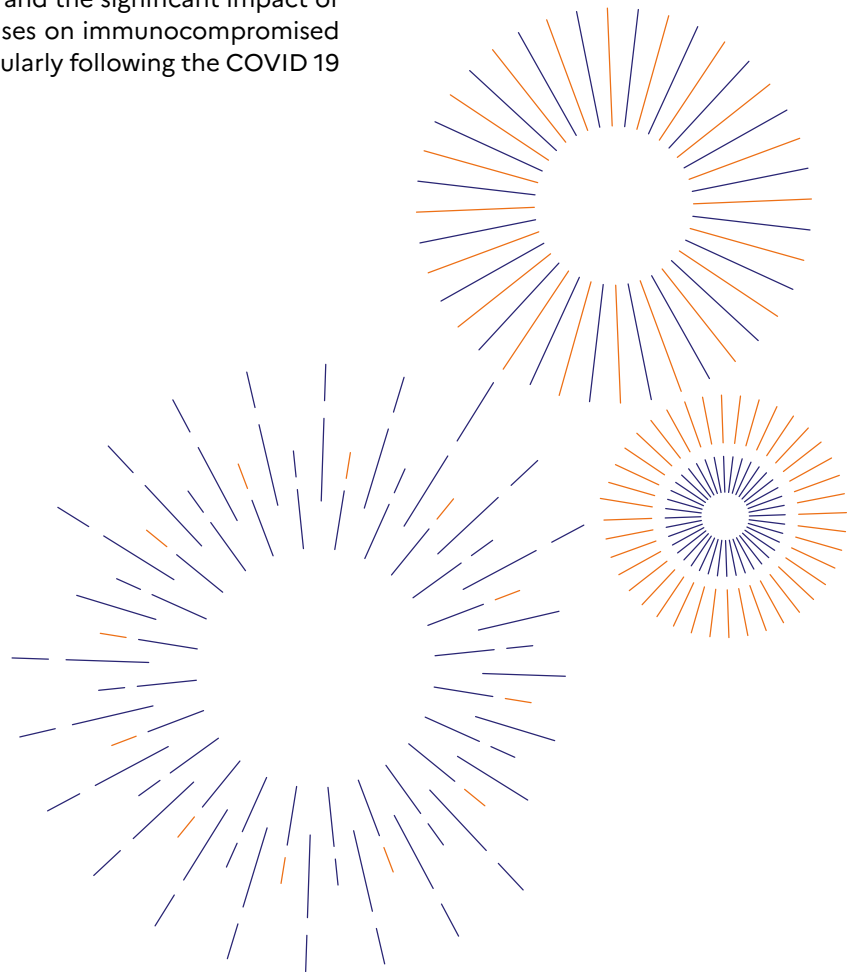
Work with civil society and patient associations

Patient associations play a fundamental role in the construction of research projects supported by the agency, particularly community-based research. They can be found in the facilitation bodies and the **Emergence programme**. They provide the link between communities and research teams. They relay medical information to patients. Together with the agency, they also carry out advocacy actions with the public authorities to ensure the interests of the communities.

For the first time this year, ANRS MIE and the associations concerned by research on immunocompromised patients had the opportunity to meet in order to forge better links. This meeting takes place in the context of the agency's changing remit and the significant impact of respiratory viruses on immunocompromised patients, particularly following the COVID 19 pandemic.

Members of the #aprèsJ20-Covid long France association participate as user representatives in two ANRS MIE Working Groups (**Long COVID and Long COVID HSS**). The association has been a member of the Long COVID CA since the end of 2022.

As is the case every year, the agency also holds regular meetings with TRT-5 CHV, the inter associative collective working to combat HIV/AIDS and hepatitis.



Scientific events and meetings supported by the agency



Presented here are only some of the many events supported by the agency or some of those to which it was invited in 2023.

MARCH

ADELF-EPITER congress

on public health in the face of emerging and re-emerging diseases

Held in Lomé (Togo), this congress brought together hundreds of epidemiology and public health scientists and players from every continent. Taking a multidisciplinary approach, it took stock of the current situation of emerging and re-emerging diseases worldwide, particularly in Africa, and discussed avenues for strengthening the health system. The congress was preceded by a training workshop for young clinical researchers and public health scientists in epidemic response.

JUNE

Workshop

on One Health research in the context of international epidemics

Montpellier University and ANRS MIE on 22 and 23 June 2023, it brought together some sixty French and international players, the vast majority involved in research in LMICs. Its aim was to take stock of existing One Health research projects and networks, identify priority unmet research topics, and construct a new international research agenda.

SEPTEMBER

'Healthy Mayotte' conference on disadvantaged territories

The second edition of this event took place in Coconi. The programme focused on three themes: addictions, emerging and re-emerging infectious diseases, and sexual health.

NOVEMBER

CA41 international symposium

Targeting the HIV reservoir: From HIV detection to immunotherapies

This symposium brought together leading researchers in the field of HIV and focused on immunotherapy strategies to cure HIV, including the molecular mechanisms of HIV detection and various immune strategies targeting the reservoir. The symposium, held at *Institut Pasteur* in Paris, included four sessions: HIV detection and cell defences, gene therapy and adoptive cell transfer strategies, immune system modulation, and antibody-based immune therapies.

International Conference

on Public Health in Africa (CPHIA)

organised by the Africa CDC held its third edition in Lusaka (Zambia) from 27 to 30 November 2023. This conference offers a unique platform to reflect on the lessons learned in health and science and to agree on the way forward to create more resilient health systems in Africa. ANRS MIE was invited to speak on the impact of innovative financial approaches to pandemic preparedness as a lever for strengthening health systems.

The 11th EDCTP Forum

was held for the first time in France, at the *Palais des Congrès* in Paris from 7 to 10 November 2023.

DECEMBER

International scientific symposium on '40 years of HIV science', in collaboration with *Institut Pasteur*

To mark the 40th anniversary of the discovery of HIV, this symposium, which brought together specialists from across the world, took stock of the major advances and scientific discoveries having marked the field these past decades.

3 Funding, structuring and coordinating

Research funding: diversifying calls for proposals

ANRS MIE offers funding for preparedness and response actions, such as **Priority Research Programmes and Equipment (PEPRs)**, **Programmes for Hospital Clinical Research (PHRCs)**, and various calls for proposals. A committee has defined the five pillars for fighting emerging infectious diseases effectively. These are prevention, the containing of epidemics, health services, equity and innovation and its dissemination.

➤ PEPR MIE: Emerging Infectious Diseases Priority Research Programme and Equipment

The objectives of the **call for proposals of PEPR MIE**, Measure 2 of the National acceleration strategy for emerging infectious diseases and nuclear, radiological, biological and chemical (NRBC) threats supported by the France 2030 plan, are to effectively prevent and control emerging and re-emerging infectious diseases at individual and collective level.

The first PEPR-MIE call for proposals was open from 7 February to 24 April 2023. Following evaluation of the 37 eligible research projects by an international panel of experts, 11 projects were selected to receive a total of EUR 22 million in funding. Each project is led by an interdisciplinary consortium of 4 to 20 teams with complementary areas of expertise, and fulfils at least one of the priority themes defined in the three scientific parts of PEPR MIE.

Seven projects were selected for Part 1 of the call for proposals, two projects for Part 2 and two for Part 3:

– The seven projects selected for Part 1 concern the in-depth study of the mechanisms of infection of different pathogens targeted in the strategy, the understanding of the dynamics of transmission and circulation of these pathogens, the identification of the determinant biological factors of the disease, and the identification of immune pathways of interest for the development of new therapeutic strategies.

– The two Part 2 projects focus on aspects related to the development of innovative diagnostic methods and multicomponent antiviral treatments to more effectively detect and control the targeted pathogens.

– Finally, the two Part 3 projects concern the communication to populations of the preparedness and response to an epidemic risk, and the analysis of the factors influencing the acceptance and accessibility of measures to combat epidemics (vaccines, etc.).

▸ Programmes for Hospital Clinical Research (PHRCs)

In 2023, the call for hospital clinical research proposals dedicated to emerging and re-emerging infectious diseases (**ReCH-MIE**) 2023-2 was launched by the Ministry of Health and Prevention's Directorate General for Healthcare Services (DGOS). ANRS MIE is responsible for its scientific steering. The total amount available is EUR 10 million.

This call for proposals aims to develop hospital clinical research in the field of emerging infectious diseases, the objectives of which are to:

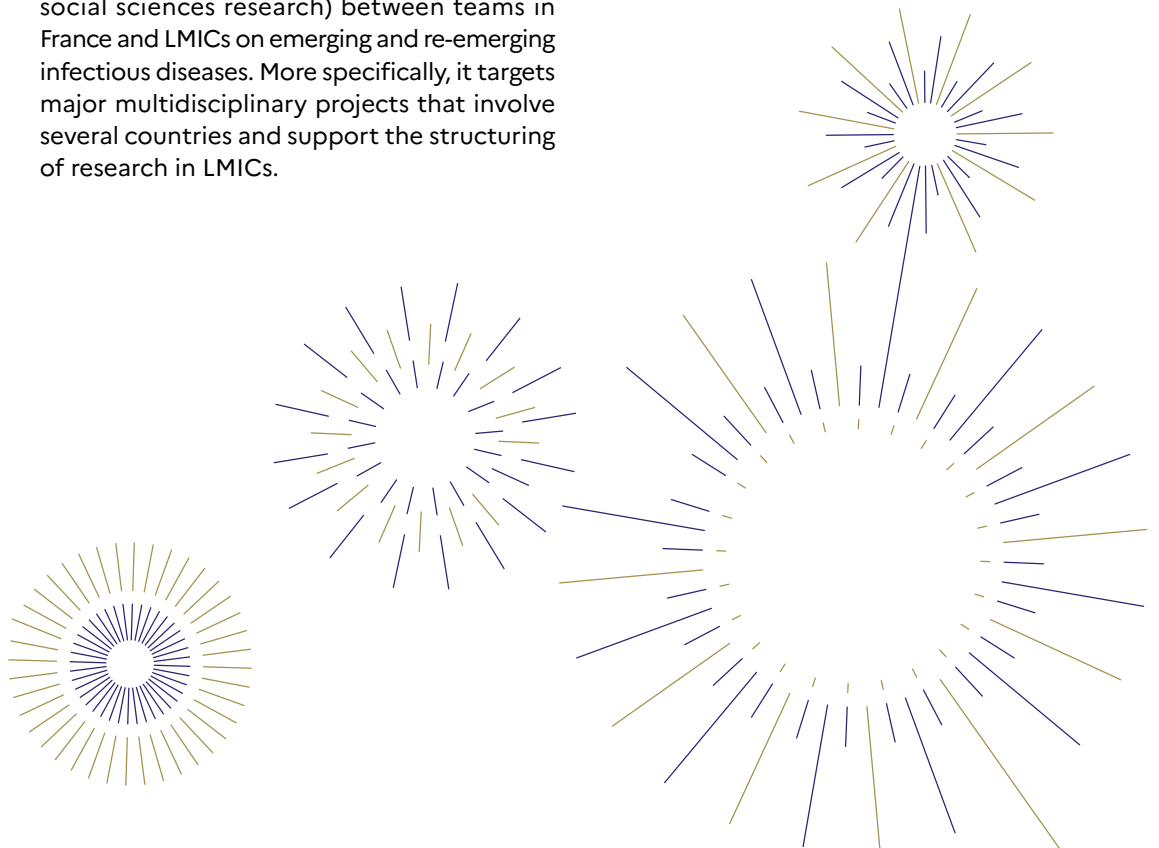
- measure the effectiveness of health technologies. For this, the research receiving priority funding will contribute to obtaining high-grade recommendations, i.e. based on a high level of scientific evidence;
- evaluate the safety, tolerability or feasibility of the use of health technologies in humans (e.g. all phase I to phase IV studies on medicinal products).

▸ Other calls for proposals

ANRS MIE is the funding body for collaborative projects that bring together teams in France and in low- and middle-income countries.

The Emergence PRFI call for proposals is an annual call for proposals for the funding of collaborative research projects (basic, translational, clinical, public health or human and social sciences research) between teams in France and LMICs on emerging and re-emerging infectious diseases. More specifically, it targets major multidisciplinary projects that involve several countries and support the structuring of research in LMICs.

The second campaign of the call for proposals was opened on 16 October 2023. The results will be known in February 2024.



▾ Calls for proposals in 2023

€31.7 M

(51% of total funding) for all pathogens combined within the agency's historical remit.

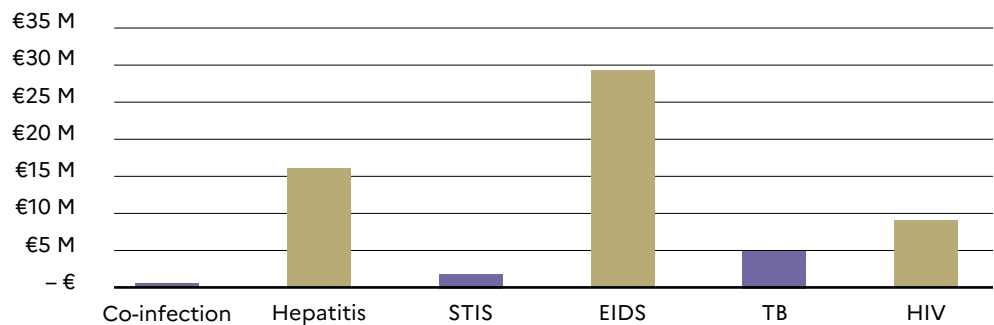
€28.9 M (49% of total funding) for all emerging infectious diseases combined.

The increased allocation of funds for research on emerging infectious diseases is due to the opening of the first PEPR MIE call for proposals in 2023 in which **€22 M** was allocated in financial support for **11** selected projects.

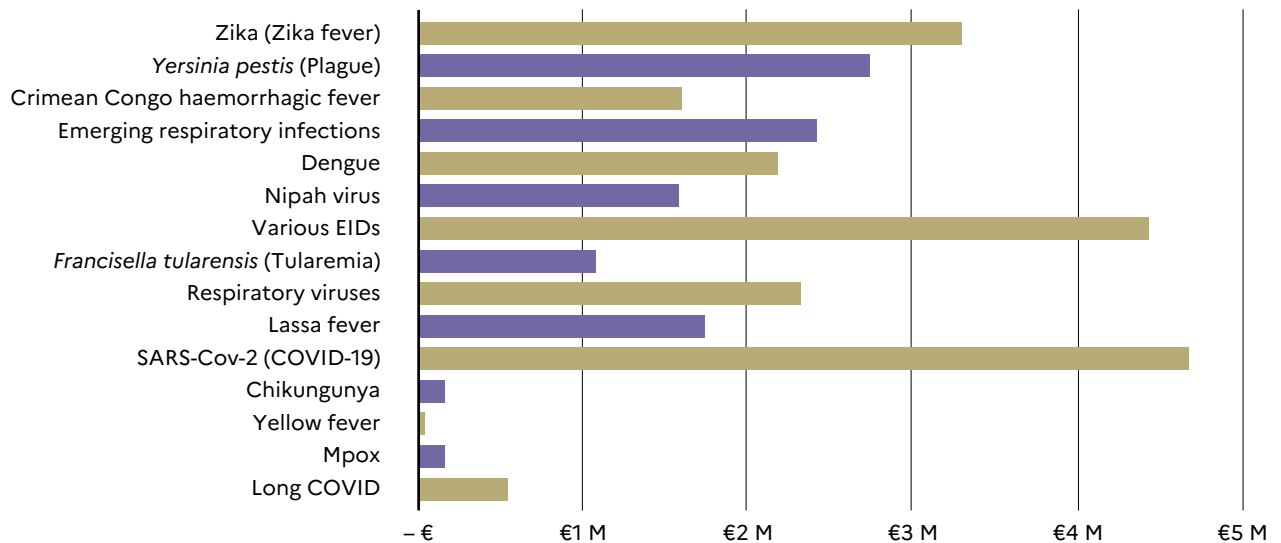
26%

of total funding allocated to calls for proposals for hepatitis research.

Distribution of funding by disease



Distribution of funding by pathogen / emerging infectious diseases (EIDs)



15.5%

of total funding allocated to calls for proposals for HIV research

8.3%

of total funding allocated to calls for proposals for COVID-19 research

7.8%

of total funding allocated to calls for proposals for tuberculosis research

3%

of total funding allocated to calls for proposals for STIs research

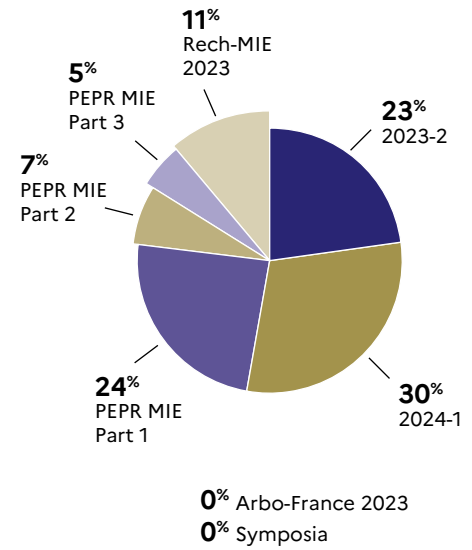
Apart from COVID-19, projects on emerging infectious diseases accounted for **40%** of the total funding allocated by the agency in 2023, with strong support for arboviruses, respiratory viruses, viral haemorrhagic fevers and re-emerging bacterial diseases such as plague.

184 research projects and symposia

within the framework of **5 calls for proposals**, particularly:

- the two generic calls for proposals on research targeting HIV, viral hepatitis, STIs and tuberculosis,
- the 2023 call for proposals of the PEPR MIE for interdisciplinary research projects on emerging infectious diseases in the fields of basic research, innovation and the human and social sciences,
- the ReCH-MIE call for proposals, which funds clinical research on emerging infectious diseases,
- the ANRS MIE-Arbofrance call for proposals, which awards **3 thesis grants** in arbovirology,
- the calls for proposals aimed at supporting the implementation of symposia and publications.

Distribution of funding by calls for proposals



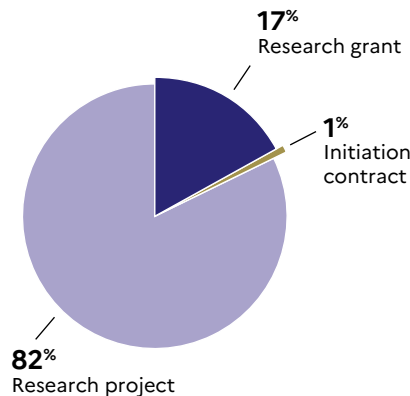
84 research grants

research grants

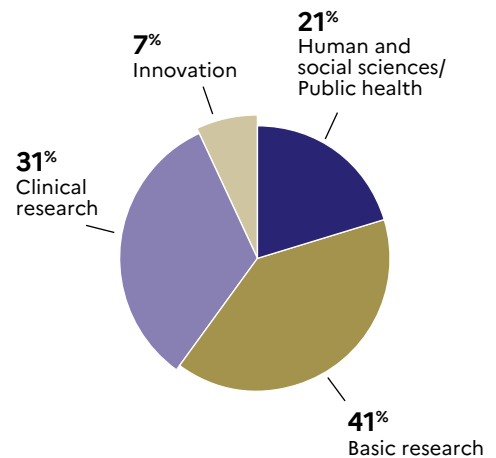
for doctoral and post-doctoral students within the framework of its calls for proposals:

- **€50 M** for projects,
- **€10 M** for research grants.

Distribution of funding by project type



Distribution by funding by research type



€12 M

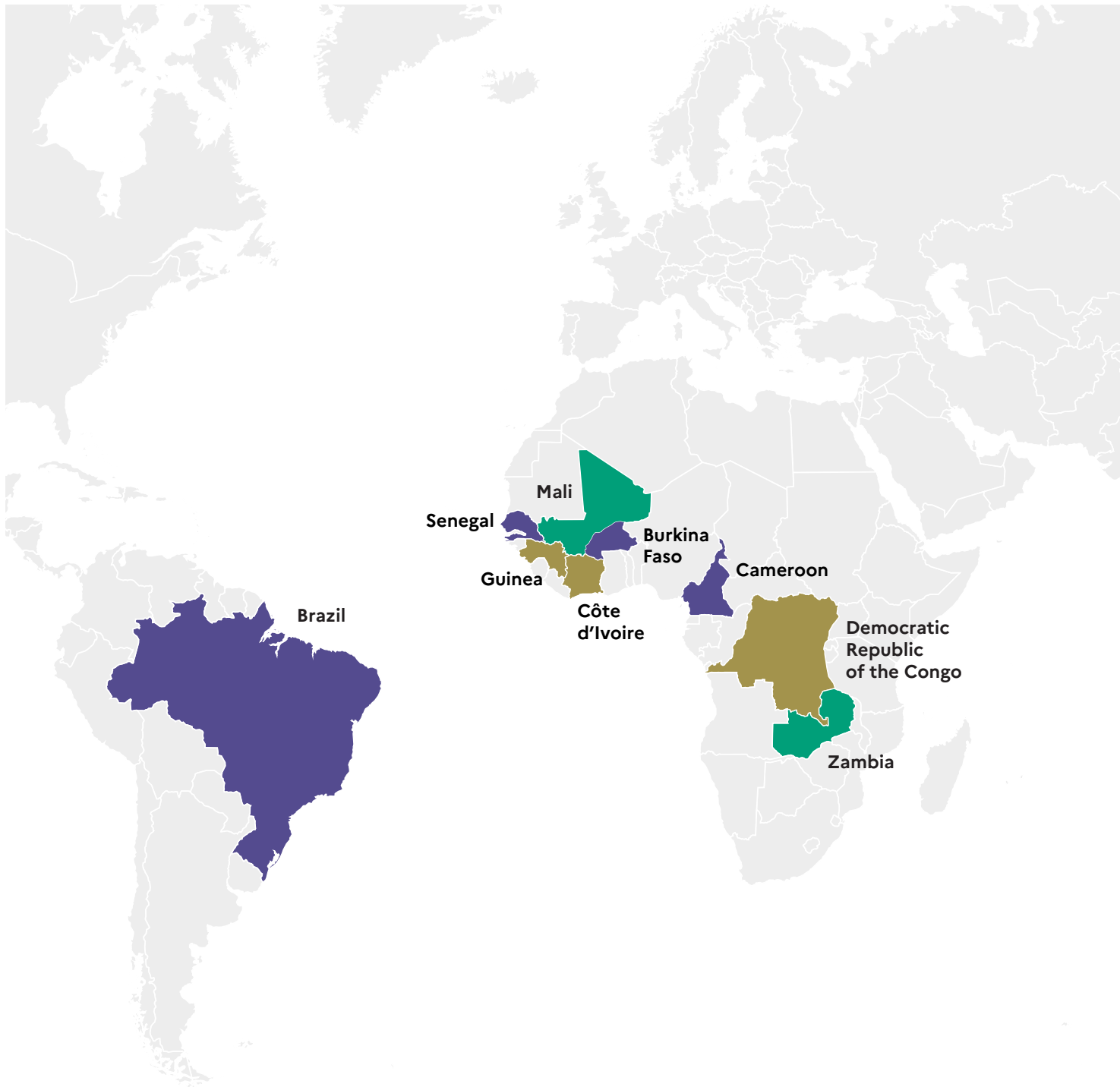
allocated for research in low- and middle-income countries.

36 projects funded

in low- and middle-income countries:

- **28** collaborative projects in Africa in 15 different countries,
- **7** projects in Asia (Vietnam, Cambodia),
- **1** project in Latin America (Brazil).

↘ The international network



- Partner site
- International Research Platform in Global Health - PRISME
- Ad hoc partnership



THE PARTNERSHIPS

Côte d'Ivoire



PAC-CI / MEREVA (binational Franco-Ivorian MMC)

MH, MHER, MF
Bordeaux University, Inserm, IRD, French Embassy

Guinea



Centre for Research and Training in Infectious Diseases in Guinea Conakry (CERFIG)

MH, MHER
Gamal Abdel Nasser University of Conakry, Inserm, IRD

Democratic Republic of the Congo



Institut National de Recherche Biomédicale (INRB)

MH, MHER
Kinshasa University, Montpellier University, Inserm, IRD, French Embassy

Brazil



MH

Burkina Faso



Muraz Centre (National Institute of Public Health (INSP), Bobo Dioulasso) / International Research Centre for Health (Joseph Ki-Zerbo University, Ouagadougou)

MH

Cambodia



University of Health Sciences / Institut Pasteur Cambodia

MH
French Embassy

Cameroon



Coordination and Research Center based at Yaoundé Central Hospital / Centre for Research on Emerging and Re-emerging Diseases (CREMER)

French Embassy

Senegal



Regional Centre for Research and Training in Clinical Care (Fann University Hospital, Dakar)

Vietnam



National HIV Programme of the Ministry of Health (VAAC) / Hai Phong Medical University Hanoi Medical University, IRD

Mali



Bamako Integrated Centre for Research, Care and Community Action - ARCAD Santé PLUS Association

Zambia



University Teaching Hospital, Lusaka

MH : Ministry of Health
MHER : Ministry of Higher Education and Research
MF : Ministry of Finance

Structuring: research networks and infrastructure

ANRS MIE supports the strengthening of national and global research capacities by setting up or supporting **infrastructure and networks**.

The mobilisation of this infrastructure and these networks was decisive when it came to facing the COVID-19 crisis, enabling the agency to set up research projects from the very start of the epidemic. The gradual opening of its remit to include emerging infectious diseases and the creation or perpetuation of infrastructure dedicated to them were one of the priorities of the agency in 2023 and will continue to be so over the years to come.

➤ ANRS MIE network of hospital clinical research sites

This network of over 300 **clinical sites** setting up clinical studies in France is supported by the agency, particularly through the funding of dedicated staff: 97 **clinical trial monitors** and 33 **biological trial monitors** were funded in 2023 on the French territory (including the overseas territories). These sites support the research activities of the clinical departments

and hospital laboratories within the framework of the agency's projects. Initially dedicated to the field of HIV, sexually transmitted infections and chronic hepatitis, the network is now expanding to include emerging infectious diseases. It also includes sites in LMICs and contributes to international clinical research studies and cohorts.

➤ International network of virology and clinical pharmacology

This extremely active network is renowned in France and internationally. It federates around one hundred laboratories across France (including the overseas territories) and partner laboratories in LMICs. Since 2023, the network has been officially part of the agency's research infrastructure and has been equipped as such. Its missions are at the interface between scientific facilitation, surveillance and project building.

The network is organised into thematic sub groups: **HIV resistance; viral hepatitis; respiratory viruses; clinical pharmacology and the technological sub-group**. It contributed to national, European and global recommendations, with in 2023 the update of the algorithms used to interpret HIV-1 antiviral resistance mutations (<https://hivfrenchresistance.org/>), as well as the development of an algorithm to interpret antiviral resistance mutations for the influenza viruses and RSV. The annual plenary meeting of the entire network was held in June 2023..

➤ Network of Methodology and Management Centres in France and the LMICs

These structures perform for the agency some of the missions of clinical study sponsor, particularly technical and regulatory management, methodological development of protocols, statistical analyses and data management. The **Methodology and Management Centres (MMCs)** receive a multiannual allocation (or project-related funding) enabling them to promptly mobilise experienced professionals in the studies supported by the agency. They also have access to tools (e.g. an electronic case report form - e-CRF) and regulatory information. To date, seven MMCs in France are receiving support from ANRS MIE.

Through the support provided by ANRS MIE within the international network, nine research structures based in the partner countries also received support dedicated to MMC activities. The MMCs constitute the heart of the network around which gravitate other structures that collaborate with the agency within the framework of specific projects.

In 2023, a new collaborative process was established: the first joint accreditation of an MMC with the Paris hospitals group (AP-HP), making it possible to pool the skills of the teams to ensure the rapid and coordinated launch of studies on infectious diseases, in France and internationally.

➤ Clinical research platforms

With the COVID-19 crisis, Inserm and ANRS MIE have actively mobilised to support the establishment of clinical trial platforms and facilitate the initiation of studies in France, Europe and Africa. These include the COVID-19 vaccine trials platform **COVIREIVAC**, for academic or industrial studies in France and Africa; the European therapeutic trials platforms **DisCoVery/SolidAct** within the framework of **EU-RESPONSE** for COVID-19 or **MPX-RESPONSE** for mpox infection, with support for an international trial coordinated by the agency; the **INTEGRATE** platform for research on Lassa fever in Nigeria; and **ANTICOV** for the identification of treatments for moderate forms of COVID-19, which brings together 14 countries in Africa and South America.

As part of the 'Emerging Infectious Diseases' acceleration strategy, projects were submitted in 2023 in order to make some of the platforms sustainable and expand their remit to include emergencies: the **I-REIVAC Emergence** platform will succeed COVIREIVAC and the **OPEN-ReMIE** platform will succeed DisCoVery.

The **I-REIVAC-Emergence** project is a clinical research network in the field of vaccinology, capable of rapidly implementing academic or industrial clinical trials to evaluate vaccines.

It is jointly managed by Inserm/ANRS MIE and AP-HP. I-REIVAC is linked to the European project **VACCELERATE**, which created a clinical trial platform for the evaluation of vaccines in Europe.

The objective of the **OPEN-ReMIE** network is to evaluate strategies for treating emerging infectious diseases in hospitals with academic or industrial support, in conjunction with European and international research networks. In the absence of an epidemic crisis, this network will focus on respiratory viral diseases. It will be jointly managed by ANRS MIE and *Hospices Civils de Lyon* within the framework of a management delegation.

As an **international coordination centre**, ANRS MIE also joined the **STRIVE** (Strategies & Treatments for Respiratory Infections & Viral Emergencies) network in 2023. Funded by the US National Institutes of Health (NIH), the objective of this international network is to evaluate therapeutic strategies for COVID-19, and subsequently treatments for other respiratory infections.

▸ Cohorts

In 2023, the agency continued to support **structuring cohorts**, with eight ongoing cohorts in the fields of HIV and viral hepatitis. A number of organisational changes were implemented this year following the latest evaluation of the ANRS MIE cohorts, meaning that new cohorts have emerged within the agency's priority thematic areas.

ANRS has historically funded a cohort in France on the **mother-to-child transmission of HIV**. The remit of this national prospective cohort has been extended to include viral hepatitis and emerging infectious diseases (**VIROPREG**) and has been assigned four objectives:

- evaluation of the impact of exposure to HIV-1/HIV-2 and antiretroviral treatments received during pregnancy and the neonatal period in children born to mothers infected with HIV-1/HIV-2;
- estimation of the mother-to-child transmission of HBV/HCV in children born to HBV/HCV-infected mothers;
- evaluation of the impact of exposure to arboviruses (dengue, Zika and chikungunya) during pregnancy on the risk of adverse pregnancy outcomes;
- characterisation of the repercussions of the infection itself and/or its treatment on the health of the pregnant woman, the course of the pregnancy and the health of the newborn.

New cohorts were funded in 2023, namely the **national TB cohort** through the generic call for proposals, and the **LSDengue cohort** through the PEPR MIE call for proposals. The objective of the national TB cohort is to describe the sociodemographic, clinical, radiological and bacteriological characteristics of tuberculosis patients treated in France, as well as the associated comorbidities and their impact on treatment outcomes. The LSDengue cohort seeks to collect and analyse clinical, genetic, virological and immunological data from cases of dengue in Guadeloupe, Martinique, French Guiana, Reunion Island, New Caledonia and French Polynesia. This project is expected to identify new factors predictive of severe dengue fever. The creation of a **biobank** is envisaged for these two cohorts.

A cohort whose inclusions started in 2020 is currently undergoing changes. This is the national multicentre **ANRS HD EP 01-Buledelta** cohort. Initially, its objective was to evaluate the efficacy of bulevirtide treatment in patients co-infected with HBV/HDV. So far, 290 out of the envisaged 400 patients have been included. In 2023, the Scientific Committee decided to extend the cohort to include all treatments for Delta hepatitis as well as untreated individuals. An amendment is being prepared to change the name of the cohort and increase the number of inclusions to 800 patients.

In addition, two new cohort projects on chronic hepatitis emerged in 2023.

ANRS HEPAT-B, accepted for funding and sponsorship in 2023 (call for proposals 2024-1), is a French national prospective cohort of patients with chronic HBV infection. This cohort will extend by four years the follow-up of patients included in the **ANRS CO22 HEPATHER** cohort, which comes to an end in 2024. The objectives of the cohort are to evaluate the changing risk according to patient virological profile, identify the factors associated with the development of hepatocellular carcinoma, evaluate the impact of new treatments and monitor the evolution over time of psychosocial factors and socioeconomic conditions, in relation to the severity of chronic hepatitis B and its comorbidities, and their impact on therapeutic adherence and hepatic disease progression.

The second chronic hepatitis cohort, **ANRS HEPAT-DELTA**, is a French national prospective cohort of patients with chronic hepatitis B and hepatitis D (delta) virus infection, with or without treatment received. It will be combined with **ANRS HD EP01 BULEDELTA**, a cohort evaluating a treatment for hepatitis delta. Its objectives are to understand the natural history of hepatitis delta and analyse the benefits and risks of treatment provision, including through large-scale access. Patients with chronic hepatitis B and delta infection, previously included in **ANRS CO22 HEPATHER**, will be included in the new **DELTA-COHORT project**.

The next evaluation of the cohorts by an international committee will take place in 2024.

The importance of cohorts

The data and samples collected in the cohorts are valuable because they can be used in new research projects. Cohorts are also structures that enable the implementation of ancillary studies targeting specific scientific questions or responding to an urgent need for knowledge during epidemic periods. One of the priorities of ANRS MIE is to develop scientific facilitation centred around these cohorts, improve their visibility, and simplify the reuse of these data and these biological collections by the scientific community.

➤ Genome surveillance and research networks

In response to the COVID-19 crisis, two structuring projects were set up in 2021: **EMERGEN**, coordinated by ANRS MIE and *Santé publique France* in France and its overseas territories, and **AFROSCREEN**, funded by the French Development Agency (AFD) as part of the *Santé en commun* initiative (Health in common initiative), coordinated and implemented by ANRS MIE, IRD and *Institut Pasteur* in cooperation with 25 partners from 13 African countries.

EMERGEN has enabled significant capacity-building for sequencing in France. At the end of 2023, an Inserm joint services unit was created to host the EMERGEN database in a secure HDH (Health Data Host certification) environment necessary for access to personal data. This unit will also use the tools initially developed by the French Institute of Bioinformatics (IFB) in order to collect, manage and analyse the data and metadata produced.

In terms of public health, regular analyses of SARS-CoV-2 sequences by *Santé publique France* and the National Reference Centres (CNRS) for Respiratory Viruses have led to the rapid detection of new variants of concern since 2021, and have contributed to better management of the pandemic by the Ministry of Health. The results are disseminated on a weekly basis to national and regional health authorities, microbiologists, infectious disease specialists and other scientists, as well as the media, using various channels.

At the European level, EMERGEN participates in the European project **ISIDORe**, which provides free transnational access to a comprehensive portfolio of high-quality services for studying infectious diseases in Europe, with expertise ranging from structural biology to clinical trials.

In 2023, the research projects related to EMERGEN led to numerous high-impact scientific communications in the following research areas:

- anticipation and analysis of the importance of variants based on an 'experimental research and models' component;
- identification, characterisation and analysis of the evolution of new variants in cohorts;
- modelling of the changes and impact of these variants;
- evaluation of the use of wastewater as a tool for monitoring variants.

As part of the national emerging infectious diseases acceleration strategy, the EMERGEN 2.0 project was created in 2023 to ensure the sustainability of this infrastructure in inter crisis situations and open it to the field of emerging or re-emerging infectious pathogens, such as the other respiratory syncytial viruses and the influenza virus.

The objective of its activities is crisis preparedness to enable rapid escalation in the event of a health crisis. Given the frequent zoonotic dimension of emerging infectious diseases, the One Health dimension of the project will be particularly strengthened. Problems of a regulatory (personal data) and open science (access and value creation charter) nature may be anticipated in order to avoid the pitfalls of emergency implementation.

The **AFROSCREEN** project was launched in July 2021 as a response programme to the COVID-19 epidemic and was subsequently extended to include other emerging pathogens. Funded by the French Development Agency (AFD), it is coordinated by a consortium of three French institutes (ANRS MIE, *Institut Pasteur* and IRD) and has 25 national public health institution partners in 13 African countries (Benin, Burkina Faso, Cameroon, Central African Republic, Democratic Republic of the Congo, Ghana, Madagascar, Mali, Niger, Republic of Côte d'Ivoire, Republic of Guinea, Senegal and Togo).

AFROSCREEN was designed as a network to improve preparedness and response at national and regional levels, support decision-makers in

defining public health priorities, and produce data to supply the international public health effort. The project is structured around five major activities:

- provision of sequencing equipment and/or inputs to the 21 laboratories in the network;
- training of the technical personnel responsible for data sequencing, analysis and sharing;
- creation and coordination of the network of partner laboratories;
- establishment of sentinel sites for epidemiological surveys and sample collections;
- promotion of data-sharing both nationally (with alerts, if necessary) and internationally (GISAID database).

AFROSCREEN in figures

Since 2022, 8 300 PCR screening tests have been performed and 9 524 SARS-CoV-2 sequences shared on the GISAID open access platform. The project has also adapted to epidemiological developments by providing reagents for the diagnosis and characterisation of priority viruses in the different countries (Ebola, mpox, measles, dengue, etc.). AFROSCREEN has also contributed to the creation and reinforcement of 77 SARS-CoV-2 sentinel monitoring sites in 11 countries. Six webinars were also held in 2023 as part of the project and can be viewed on the project website www.afroscreen.org.

➤ Biobank

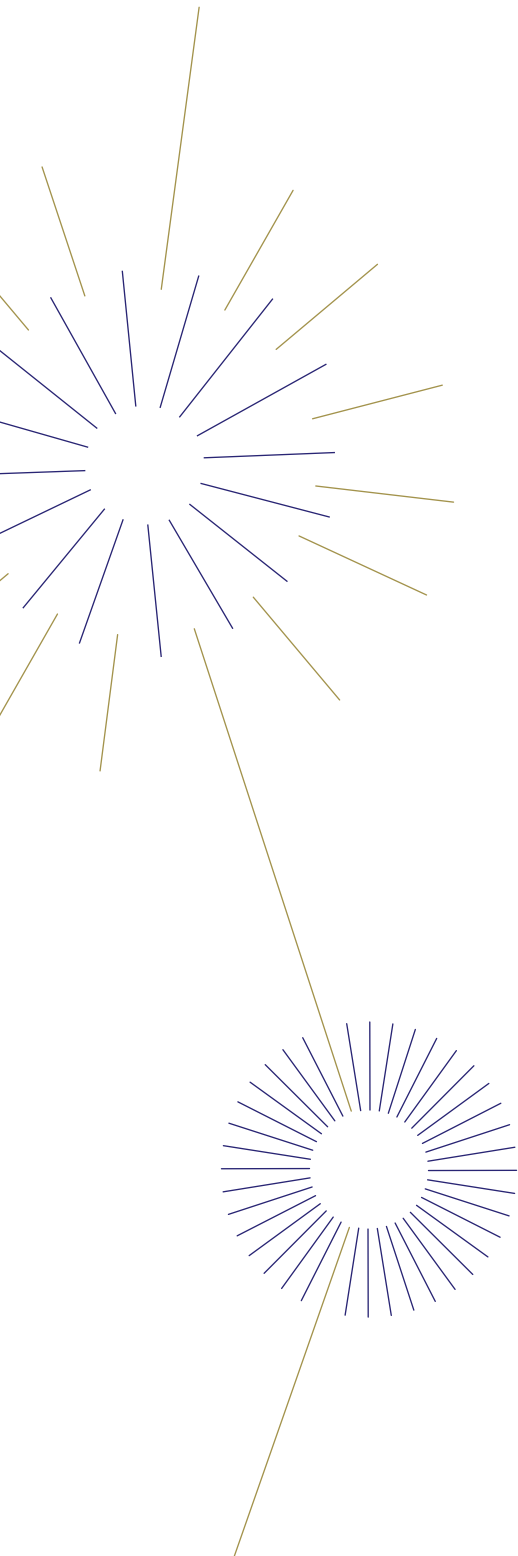
The ANRS MIE **biobank** is a national infrastructure that manages and stores the majority of samples derived from studies supported by the agency. With over 2 million samples, it is one of the most comprehensive biological collections on HIV and viral hepatitis (HBV and HCV) pathologies. The biobank ensures that these samples are available for the research teams, while ensuring regulatory and ethical compliance. It has proven its robustness through its ability to absorb the increase in activity created by the addition of emerging diseases to the agency's remit, particularly during the COVID-19 epidemic. In 2023, its volume of activities continued unabated.

A number of workstreams linked to other national and international initiatives have been identified for the coming period:

- increase the visibility of existing collections and data, and facilitate their reuse;
- define a strategy for the development of future collections;
- reinforce the biobank, particularly its emergency response capacity;
- maintain and strengthen the agency's support for the constitution and management of biological collections in LMICs, taking into account local regulations, constraints, and ethical concerns.

Agency commitments

The 10 strategic objectives of ANRS Emerging infectious diseases



- 1 **Define, promote, coordinate and fund** a multidisciplinary research agenda to improve knowledge and support the elimination of HIV/AIDS, STIs, viral hepatitis and tuberculosis.
- 2 **Define, promote, coordinate and fund** a multidisciplinary research agenda to improve knowledge and support the prevention, rapid detection, treatment and control of emerging and re-emerging infectious diseases, with the adoption of a One Health approach.
- 3 **Promote** the transfer of research findings to public health policies and good clinical practices, and towards the development of innovative tools such as diagnostics, vaccines, therapies and non pharmaceutical interventions.
- 4 **Develop and strengthen** national, European and international networks and partnerships with the stakeholders concerned, including civil society and the affected populations, for the promotion and effective implementation of the entire ANRS MIE research agenda.
- 5 **Establish** flexible administrative and scientific organisation for the rapid implementation of research to address infectious disease emergencies.
- 6 **Ensure** that the research supported is ethical, ensures the well-being of research participants and affected communities, and reinforces local training, capacities and infrastructure.
- 7 **Support and promote** the involvement of young researchers and their professional development.
- 8 **Implement** a strategy of communication on research and its findings to all stakeholders, including for health diplomacy and the formulation of public health policy.
- 9 **Advocate** for research and for increased and sustainable funding of national and international research on HIV/AIDS, viral hepatitis, STIs, tuberculosis and emerging and re-emerging infectious diseases.
- 10 **Ensure** that ANRS MIE adapts to changing social and political realities, particularly in regard to gender balance, equity, inclusion, diversity and the countries' voices.

➤ Strategic guidance document 2023-2027

In the face of the many scientific challenges linked to the emergence and re-emergence of infectious diseases, it was necessary to adapt our strategy and report on the vision, missions, objectives, priorities and collaborative methods of the agency. This process, initiated at the beginning of 2022, was conducted in collaboration with Kevin De Cock, a high-level international expert.

The **strategic guidance document** was drawn up on the basis of numerous interviews with researchers, agency governing bodies and civil

society, and designed in close collaboration with the Scientific Advisory Board. It was published in 2023.

The strategic orientations defined for 2023-2027 remain firmly rooted in the values that have always guided the agency: scientific excellence, multidisciplinary, support for political and clinical decision-making, the systematic involvement of civil society and affected populations, the adoption of a global perspective, and international partnerships based on reciprocity and mutual benefit.

➤ Open science

The communication, dissemination and openness of research data and findings is one of the priority strategic objectives of the agency. The year 2022 was a pivotal one, marked by the active participation of the ANRS in several national and international working groups, the signing of new agreements and the introduction of new open science requirements in the rules of the calls for proposals. The previous year has made it possible to develop the actions undertaken and launch new projects.

Within the context of the work carried out with the network of French research funding agencies (ANR, Anses, INCa, Ademe and ANRS MIE), ANRS MIE implemented new actions extending those undertaken in 2022:

- deposit in the national open archive HAL² of the full text of scientific publications resulting from projects funded by ANRS MIE, no later than their time of publication;
- provision, under the Creative Commons Attribution (CC-BY) licence or equivalent, of peer reviewed scientific publications derived from projects funded by the agency, using one of the three following channels: a) publication in a natively open-access journal, b) publication in a subscription journal that is part of a transformative agreement or transformative journal, c) publication in a subscription journal with submission of the publisher's version or the manuscript accepted for publication (post-print) in the open archive HAL under a CC-BY licence implementing the rights retention strategy;

- display of the eligibility for funding of the Article Processing Charges (APC) with the exception of those concerning hybrid journals (subscription journals with no transformative agreement in progress);
- encouragement to submit initial versions, pre-prints, in open platforms or archives and the use of permanent or unique identifiers (e.g. DOI, HAL Id or ORCID);
- recommendation to use the 'structured' data management plan template on the OPIDoR DMP portal.

These decisions, which were approved in 2023 by the ANRS MIE senior management team, were incorporated into an updated version of the agency's rules for calls for proposals, which are scheduled to enter into force in early 2024.

The following decisions are in addition to the previous ones:

- entry of information on the open public data platform data.gouv.fr for all research funded under ANRS MIE calls for proposals. This decision will take effect in 2024;
- support for the action plan in favour of Diamant open access. This plan promotes a publication model that enables researchers to disseminate their work under open access conditions with no publication fees and to read articles free of charge. The economic model is based on academic subsidies.

2. HAL ('hyperarticle en ligne') is an open multidisciplinary archive. It is intended for the submission and dissemination of scientific research papers, whether published or not, produced by French or foreign teaching and research institutions, public or private laboratories.

As part of its membership of the Coalition on Advancing Research Assessment (CoARA), the agency participated in 2023 in the creation of a working group on 'Improving research project assessment practices'. The overall objective of the working group is to improve research proposal assessment practices, in order to support higher quality and more impactful projects. Alongside the opening up of publications, data and source codes, the research

assessment reform is a major challenge for open science.

Finally, at the end of 2023, the agency initiated a preliminary internal review regarding the access to, management and sharing of research data. One of the objectives could be the preparation of an institutional policy on the subject in 2024.

➤ Simplification measure: the single portal

Falling within the scope of the French research programming law, the appelsprojetsrecherche.fr single portal consolidated in 2023 its central role as a one-stop shop for all information on calls for proposals and applications held by the portal's partner agencies, including ANRS MIE.

The year 2023 was marked by significant advances in the improvement and harmonisation of the portal's functionalities, facilitating greater visibility of funding opportunities and simplifying procedures for researchers (submission of proposals and simplification of the application process).

The six founding partners (Ademe, ANR, Inserm, ANRS MIE, Anses and Inca) and other newly integrated partners participated in making the changes to the portal. Strategic meetings between ANRS MIE senior management and the portal strategic committee made it possible to take into account and address the particularities of ANRS MIE in greater depth. Thanks to this progress, the provider responsible for developing the portal set up a test instance in November 2023. This represents a major step in consolidating the objectives of the portal, which will enable the first submission of proposals for the final quarter of 2024.

➤ Initiatives for young researchers

Since its creation, ANRS MIE has supported young researchers through the provision of **research grants** to doctoral and post-doctoral students as part of its calls for proposals.

Today, the agency wishes to go further by making support for young researchers a strategic priority. In 2023, a dedicated team worked to define and establish a specific, structured programme to support the new generation of scientists in the French research ecosystem and within the agency's international network.

The programme is structured around three key dimensions:

– 'attract and connect'
continuing and developing actions aimed at attracting young people to the agency's research themes;

– 'train'
providing high quality training for young researchers interested in the agency's research fields;

– 'support and retain'
offering appropriate support to young researchers to encourage them to continue their work on the agency's themes.

The creation of partnerships between institutions and the expansion of support opportunities are envisaged. The launch of the first concrete actions is planned for 2024.

In 2023, in parallel with the implementation of the dedicated programme, several new and existing initiatives made it possible to continue to specifically support young researchers:

84 research grants

for doctoral and post-doctoral students were allocated as part of calls for proposals funded by the agency:

- **the generic call for proposals** on research targeting HIV, viral hepatitis, STIs and tuberculosis;
- **the 2023 PEPR MIE call for proposals** on interdisciplinary research projects targeting emerging infectious diseases;
- **the ANRS MIE-Arbo-France call for proposals**, which awards three arbovirology thesis grants to young researchers with innovative projects in the field of anti vector strategy.

In 2023, two themes were identified:

- the animal component of arboviral infections: study of the animal compartment of a zoonosis/ study of a strictly animal arbovirus that can serve as an emergence model;
- population health interventional research on human arboviruses, in mainland France and/or the overseas territories: vector control/control of the progression of arboviral risk and the use of vaccines.

5 Masters grants

were awarded to young people from the **agency's international network** in 2023:

– 1 **Françoise Barré-Sinoussi grant for excellence** was awarded to **Hervé Matondo Phuna**, a doctor from the Democratic Republic of the Congo who wishes to pursue his commitment to fighting infectious and emerging diseases and be able to implement research and intervention projects in a low-income country context. He intends to register for a PhD at the end of his Masters. The EUR 15 000 Françoise Barré-Sinoussi grant enables a candidate from sub-Saharan Africa or South-East Asia to study for a Masters in Global health in the Global South at ISPED (Bordeaux University) in person.

– 4 **international network Masters grants**, aimed at contributing to the emergence of researchers in the agency's international network were awarded:

Achille Luwau Sadila, a doctor from the Democratic Republic of the Congo, received a grant to study for a one-year Masters in ecology epidemiology;

Aicha Betty Sow, a doctor from Senegal, applied for a grant to study for a Masters in public health at *École Pasteur-Cnam*;

Harold Djifack Kouanfack, a doctor from Togo, received a grant to study for the Global health in the Global South public health Masters at ISPED / Bordeaux University, and to work on an internship project relating to both Togo and Côte d'Ivoire;

Kolveasna Kim, a doctor from Cambodia applied for a grant to study for a Masters in 'Infectiology: Biology of Infectious Disease'.



8 ANRS MIE/French Society of Virology thesis prizes

were awarded to young scientists whose research in the field of basic sciences had stood out for its innovation, originality and quality. Each winner received EUR 1 000 and had the opportunity to present their thesis work at an event attended by experts from each field. Their profile was also posted on the agency website.

– On emerging viruses:

Oriane Constant, for her thesis 'Infection of the blood brain barrier by various emerging viruses, neuroinflammation and context of circulation';

Ludivine Grzelak, for her thesis 'Study of the mode of action of antibodies in two different contexts: SARS-CoV-2 infection and treatment with anti-CD20 antibodies';

Antoine Nkuba Ndaye, for his thesis 'Emerging viruses in the Democratic Republic of the Congo: characterization of the humoral immune response against Ebola virus and SARS-CoV-2'.

– On viral hepatitis:

Cyrine Bentaleb, for her thesis 'Hepatitis E virus, characterization of its viral factories and its replicase';

Mathilde Briday, for her thesis 'Homologous and heterologous interactions of the HBV capsid-forming core protein'.

– On HIV (Dominique Dormont Prize):

Priscila Binta El Kazzi, for her thesis 'The Interplay of RNA N7- and 2'O methylation in viral replication';

Rémi Mascarau, for his thesis 'Study of the intercellular transmission of HIV-1 to macrophages by cell-to-cell fusion';

Elenia Toccafondi, for her thesis 'Identification of specific phylogenetic properties of HIV-1 M and O integrases'.

Research facilitation

AMYB, the network of young researchers within the Host virus interactions Coordinated Action (CA41) launched in 2022, continues to run a LinkedIn page, which is related to that of ANRS MIE. By 2023, the page had 260 subscribers (versus 91 in 2022) and is used to post information of interest to the network members and beyond. In parallel, the network office has been actively working on the 2024 launch of several actions as part of the young researchers programme.

Crisis preparedness and response, and research coordination during epidemic periods

In the French and international landscape, ANRS Emerging infectious diseases acts as a **leading player, interinstitutional pilot and research accelerator**. As such, a comprehensive and integrated response can be implemented to limit the effects of infections with epidemic risk.

➤ Crisis preparedness

PEPR MIE / PEPR PREZODE

The French State has made health research and innovation one of the strategic areas of the France 2030 Plan with its 'Health Innovation 2030' health component. Launched over two years ago, the objective of the emerging infectious diseases acceleration strategy is to understand, prevent and control the phenomena of the emergence or re-emergence of infectious diseases. This strategy aims to strengthen France's preparedness for the risks of a new major health crisis and to develop our response capacity at national level, in conjunction with the European level, with a One Health approach that integrates the links between human health, animal health and the ecosystems.

The strategy has a large research component with two complementary **Priority Research Programmes and Equipment (PEPRs)**:

– **PEPR MIE**, led by Inserm through ANRS MIE, is intended to provide a better understanding of how to effectively prevent and control the phenomena of infectious disease emergence, but also to develop counter-measures to diagnose, protect and treat people and enable the implementation of scientific evidence-based health policies appropriate to the specific context of the crisis.

– **PEPR PREZODE** (Preventing Zoonotic Diseases Emergence), led by IRD, Cirad and INRAE, focuses on environmental and zoonotic issues. The joint ANRS MIE and IRD Board of Directors could be extended to include the creation of a Coordinated Action dedicated to One Health and tasked with identifying needs and with structuring the research programme.

ANRS MIE also relies on the component of the **ReCH-MIE** hospital programme for which it is responsible for the scientific steering.

At European level: The BE READY consortium, preparation of the future European partnership for pandemic preparedness

BE READY is a collaborative project funded by the European Union that was launched in 2022 for a period of three years. It aims to create a unified European research and innovation space that will serve as the basis for the European partnership for pandemic preparedness. It draws on the expertise of 26 public health organisations, ministries and research bodies from 16 countries, to ensure a cross-cutting and interdisciplinary One Health and Global Health approach. ANRS MIE is specifically responsible for the overall coordination of the consortium and for defining the strategic research and innovation agenda. A webinar entitled Introducing the Strategic Research and Innovation Agenda (SRIA) of the Future European Partnership on Pandemic Preparedness was held in July 2023. So far, it has been viewed by 119 participants representing 70 organisations from 22 countries, as well as representatives of the European Commission and WHO. In November 2023, the Steering Committee of the BE READY network met at the Luxembourg National Health Laboratory. The same year saw the creation of the consortium's website (<https://beready4pandemics.eu/>).

Coordination Mechanism for Cohorts and Trials (COMECT)

ANRS MIE, along with six other partners (Ecraid, ECRIN, NIPH, PENTA, UNIVR and Cologne University), is involved in the Coordination and Support Action (CSA)³ **COMECT**. Set up in December 2023 for a three-year period, it responds to the Horizon Europe call for pro-

posals concerning the coordination of clinical research for pandemic preparedness and response. Its objective is to improve the preparedness and response capacity of European clinical research in the event of a pandemic, through the sustained strategic and scientific coordination of adaptive platform trials and cohort studies at the European level.

➤ Crisis response and research coordination during epidemic periods

Emergence programme

With regard to crisis response, ANRS MIE has drawn on the experience of its commitment in the face of recent epidemics, some of which occurred in 2023 (COVID-19, mpox, hepatitis of unknown aetiology, Ebola (Sudan strain), vaccine-derived polio, bronchiolitis, etc.), to build a suitable mechanism as part of its **Emergence programme**, in synergy with the 'Emerging Infectious Diseases and Nuclear, Radiological, Biological and Chemical Threats (NRBC) acceleration strategy' which is part of

the 2030 Health Innovation component of the France 2030 plan.

In the event of emerging or re-emerging epidemics in France and worldwide, ANRS MIE can trigger a multi-level facilitation and watch procedure to respond to health crises quickly and proportionately. The decision-support algorithm was used several times during emergences and re-emergences (H5N1, West Nile virus, mycoplasma, etc.), some of which triggered the opening of an Emergence Unit within ANRS MIE (Guillain-Barré syndrome, Marburg, mpox).

A decision-support algorithm for use in a health crisis

In order to evaluate the epidemiological signal, ANRS MIE has developed a decision-support algorithm whose composite score determines the level of alert, from 0 to 3, and the actions associated with it (<https://anrs.fr/en/who-are-we/emergence-program/>). This composite score is based on four weighted parameters related to the pathogen and the associated disease: the existence of effective and available medical and non-medical countermeasures; the potential for transmission and evolution; and the clinical, societal and national impact. The evaluation of these parameters is refined by sub-criteria.

Two outbreaks of Marburg virus disease occurred in Equatorial Guinea and Tanzania in 2023, triggering a Level 1 **Marburg Virus Disease Emergence Unit**. This activation enabled the emergency funding of **MARCAM**, a project that takes a One Health approach to the integrated surveillance of Marburg virus disease in areas at risk of the southern region of Cameroon. The project was successfully initiated in September 2023.

As part of the clade 2 mpox epidemic having struck several countries, ANRS MIE set up a flash call for proposals in 2022. Among other things, this made it possible to fund **PANAFPOX**. This multidisciplinary project with a One Health approach aimed to shed new light on mpox in

four African countries that are either endemic (Democratic Republic of the Congo, Cameroon) or at high risk of emergence (Benin, Guinea). In addition, following a significant resurgence in cases of clade 1 mpox in the country, ANRS MIE activated at the end of 2023 a Level 1 **Mpox Emergence Unit for the Democratic Republic of the Congo** (scientific watch, definition of research priorities, dissemination of scientific information, implementation of seed funds).

The epidemiology of this clade is changing. There has been an expansion of the virus in urban areas, among female sex workers and MSM, as well as a new established route of infection through sexual transmission.

3. A type of project consisting mainly of support measures such as standardisation, dissemination, awareness and communication, networking, coordination and support services, policy dialogues, mutual learning exercises and studies.

4 Organisation and governance

| The budget and its use

➤ Income

€64 M
budget 2023

The income actually included in the agency’s 2023 budget was EUR 64 million, which included EUR 49 million in subsidies for public service costs (recurring State resources) and EUR 15 million of its own resources. In the end, this came to EUR 53 million, i.e. an overall capital loss of EUR 11 million due mainly to the shift to 2024 of the resources expected from the ANR to fund the Inserm teams selected as part of the PEPR MIE. However, the EUR 49 million recurrent state budget was received as envisaged.

Other resources, not included in the budget figures, were nevertheless placed under the direct management of ANRS MIE: particularly the annual EUR 10 million allocated by the Ministry of Health to ReCH-MIE, as well as the PEPR MIE resources allocated to bodies other than Inserm. Therefore, it is a total budget of around EUR 100 million which the agency is responsible for managing each year in order to support the research programmes that fall within its remit.

➤ Expenditure

€53 M
dedicated to research

In the 2023 budget, EUR 75 million was allocated to expenditure. A total of 83% of these resources was consumed, i.e. EUR 62 million, almost all of which (98%) for the sole part funded by recurrent State resources.

In France, these resources allocated for the research programmes were distributed mainly between Inserm (35%), public hospitals (21%), universities (6%), CNRS (4%), *Institut Pasteur* (2%) and IRD (1%). At the same time, 12% of the resources were directed towards organisations located abroad as part of calls for proposals specifically funding partnership research with the South, and for the major structuring projects on emergencies, namely AFROSCREEN and CoviCompare Africa.

This budget made it possible to fund EUR 53 million of research expenditure and the resources necessary for the operation of the agency totalling EUR 9 million.

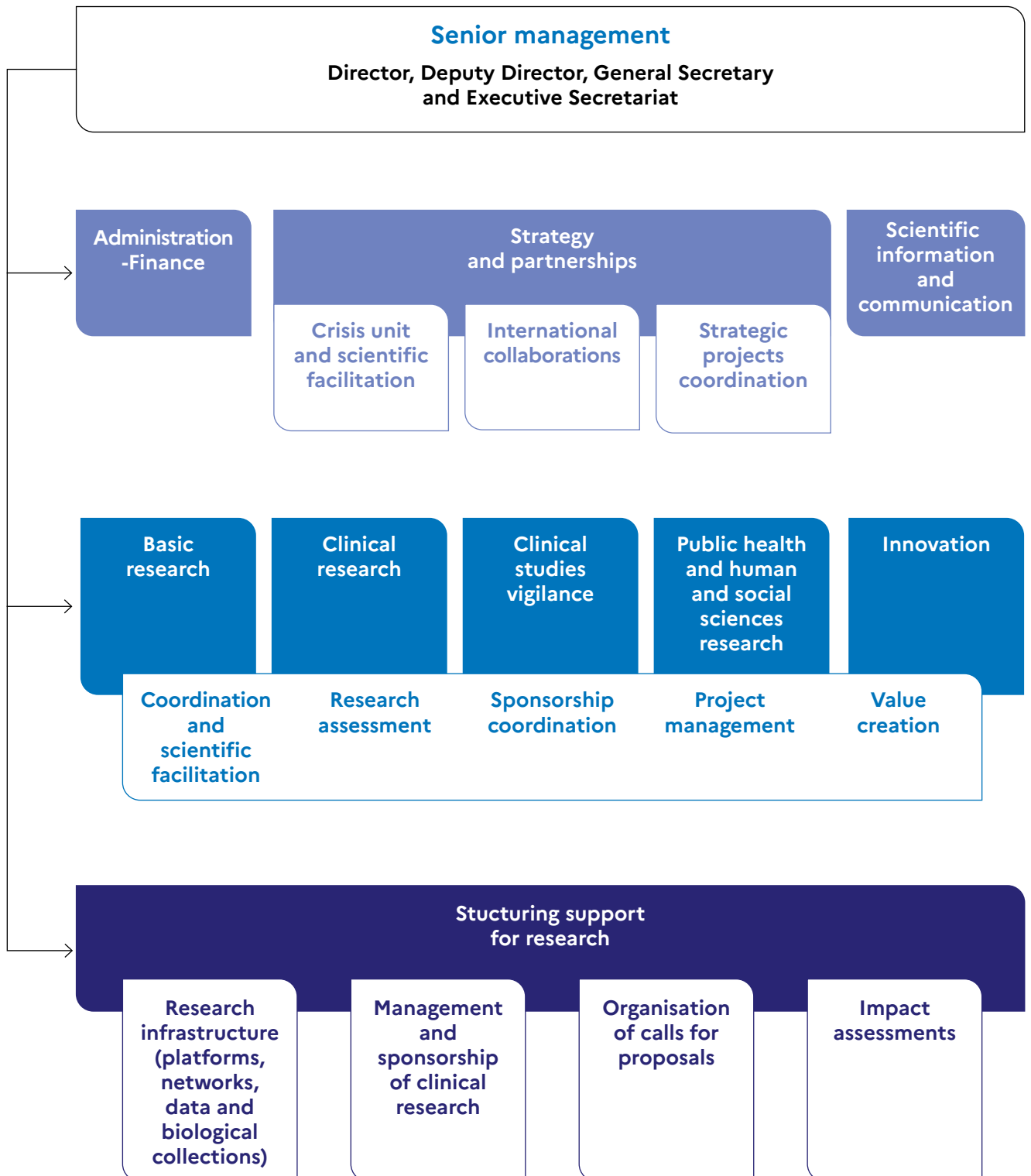
It should be noted that these figures do not include, due to the accounting principles applicable to them, the resources allocated by the agency to third-party organisations under the PEPR MIE. In any case, these remained negligible in 2023, given that the PEPR MIE 2023 call for proposals gave rise to disbursements from 2024 only. Expenditure under ReCH-MIE, an initiative led by the agency but whose support is managed by the Directorate General for Healthcare Provision (DGOS) with the beneficiary organisations directly, is also not included in these figures.

These mainly consisted of personnel expenditure (EUR 7.3 million for 101 full-time equivalents at the agency’s head office), expenditure related to the agency’s premises and its operation (EUR 1 million), expert appraisal expenditure (EUR 0.6 million) and communication expenditure (EUR 0.5 million).

Out of the EUR 53 million directly dedicated to research in 2023, 49% funded projects falling within the agency’s ‘historical’ remit (HIV, hepatitis, sexually transmitted infections, tuberculosis), 33% funded projects in the field of emergencies, and 18% funded cross-cutting support for research infrastructure and networks (which benefit both the historical remit and emerging infectious diseases).

Human resources

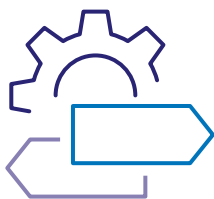
At the end of 2023, the agency had **98** employees.



The different agency bodies

➤ Advisory Board

It is tasked with making proposals and deliberating on the agency's major strategic orientations.



CHAIR

Isabelle Richard, First Vice-President of Angers University

MEMBERS

Benoît Lavallart, French Ministry of Higher Education, Research and Innovation

Bertrand Schwartz, French Ministry of Higher Education, Research and Innovation

Gregory Emery, Director General of Health, French Ministry of Health

Laurent Toulouse, Deputy Director of Higher Education and Research, French Ministry for Europe and Foreign Affairs

Didier Samuel, CEO of Inserm

Nathalie Arhel, Staff Scientist, Team Leader, Montpellier Institute of Infectious Diseases Research, JRU 9004 - CNRS / JU Viral trafficking, restriction and innate immunity team

Éric Delaporte, Director of the IRD JRU / IJU 233 TransVIHMI, Occitania Regional Delegation

Christophe d'Enfert, *Institut Pasteur* of Paris

Roger Le Grand, Director of IDMIT, CEA

Muriel Vayssier-Taussat, Head of the Scientific Division for Animal Health, INRAE

Frédéric Fleury, President of Claude Bernard Lyon 1 University

Florence Favrel Feuillede, Managing Director of Brest Regional University Hospital

Frédéric Chaffraix, Vice-President tasked with questions on the healthcare pathway and networks, hepatitis associations

Vincent Leclercq, TRT-5 CHV

Didier Pittet, Director, Infection Control Programme, Geneva University Hospitals

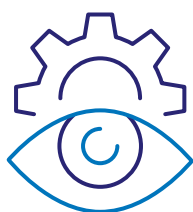
Awa Marie Coll-Seck, Minister of State (Senegal), President of CN-ITIE

Stéphanie Nguengang Wakap, Head of Research, Doctors of the World

Olivier Caillou, Budget Controller General

➤ Scientific Advisory Board

It gives an opinion on the agency's main scientific strategic orientations and on its activities. It also conducts forward-looking discussions and prepares reports on the work undertaken.



CHAIR

Sharon Lewin, University of Melbourne, The Doherty Institute, Australia

MEMBERS

Fareed Abdullah, South African Medical Research Council, Steve Biko Academic Hospital, South African TB Think Tank, South Africa

Dominique Costagliola, member of the Academy of Sciences, Emeritus Research Director, Inserm, Pierre Louis Institute of Epidemiology and Public Health, France

Meg Doherty, World Health Organization, Switzerland

Daniel Douek, Vaccine Research Center, NIAID/NIH, USA

Diana Finzi, Division of AIDS NIAID/NIH, USA

Peter Horby, Pandemic Sciences Centre, ISARIC, UK

Marion Koopmans, Erasmus MC, Netherlands

Gabriel Leung, Hong Kong University, Hong Kong

Seng Gee Lim, National University Health System, Singapore

Anna Lok, University of Michigan Medical School, USA

Ester Sabino, São Paulo University, Brazil

Rodolphe Thiebaut, Bordeaux Population Health - Inserm Unit 1219, Bordeaux University Hospital, Bordeaux University, France

Robert Thimme, Medical Center - Freiburg University, Germany

Sylvie van der Werf, Institut Pasteur, Paris University, France

Scott C. Weaver, University of Texas Medical Branch, Galveston National Laboratory, USA

Fabien Zoulim, Hospices Civils de Lyon, Inserm Unit 1052, Lyon Cancer Research Centre, France

Véronique Deret, SOS Hépatites, France

Hugues Fischer, TRT5-Act-up, France

Lucas Vallet, TRT5-CHV, France

▸ Partners Board

A place for sharing information on the agency's activities, but also current events and research challenges within its thematic field.



- French Conference of Medical Faculty Deans
- French National College of Teaching General Practitioners (CNGE)
- French Conference of University Hospital Managing Directors
- French Federation of Health Industries (FEFIS)
- French Health Industry Alliance for Research and Innovation (ARIIS)
- French National Agency for Medicines and Health Products Safety (ANSM)
- French Agency for Food, Environmental and Occupational Health & Safety (ANSES)
- French High Council for Public Health (HCSP)
- French Infectious Diseases Society (SPILF)
- French Society of Anaesthesia and Intensive Care Medicine (SFAR)
- French Society of Radiology (SFR)
- French Society of Microbiology (SFM)
- French Society of Virology (SFV)
- French Society of Public Health (SFSP)
- French Society of Hepatology (AFEF)
- French National Joint Union of Residents (ISNI)
- French Physician and Pharmacist Scientists Association (AMPS)
- *France doctorat*
- French Network of Young Infectious Diseases Specialists (RÉJIF)
- #AfterD20 (French Long COVID association)
- *Médecins Sans Frontières/Doctors Without Borders (MSF)*
- Alliance for International Medical Action (ALIMA)
- French National Health Conference (CNS)
- French Blood Establishment (EFS)
- Expertise France
- Public Health Agency
- *Épicentre*
- French Hospitals Federation (FHP)

▸ Sector Scientific Committees

They perform the scientific evaluation of funding applications.



- CSS11 – Basic research in HIV/AIDS, tuberculosis and STIs: From virus to host.

CHAIR

Nicolas Chomont, University of Montreal, Canada

- CSS12 – Basic research in viral hepatitis.

CHAIR

Massimo Levrero, Massimo Levrero, Lyon Cancer Research Centre (CRCL), Lyon, France

- CSS13 – Clinical research.

CHAIRS

Alexandra Calmy, University Hospitals of Geneva, Switzerland, and **Marc Bourlière**, Saint-Joseph Hospital, Marseille, France

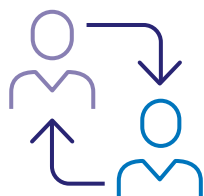
- CSS14 – Research in public health and the human and social sciences.

CHAIRS

Marie Préau, Inserm and Lyon 2 University, and **Joseph Larmarange**, Population and Development Centre (CEPED), IRD, Paris, France

➤ Scientific facilitation groups

These include the Coordinated Actions and Working Groups whose objective is to promote interactions between researchers and patient associations.



- CA41 – Host-virus interactions. **Michaela Müller-Truwin** (*Institut Pasteur*)
- CA42 – Hepatitis viruses. **François-Loïc Cosset** (CIRI)
- CA43 – Medical virology. **Vincent Calvez** (AP-HP), **Stéphane Chevaliez** (AH-HP) and **Avelin Aghokeng** (IRD)
- CA44 – Clinical research in HIV. **Olivier Lambotte** (AP-HP) and **Serge Eholié** (Treichville University Hospital, Abidjan)
- CA45 – Clinical research in hepatitis. **Victor de Ledinghen** (Bordeaux University Hospital) and **Nathalie Ganne-Carrié** (Paris Seine Saint-Denis University Hospitals, APHP; Sorbonne Paris Nord University; Inserm)
- CA46 – Research in public health and human sciences. **Didier Ekouevi** (Inserm/CARESP) and **Bruno Spire** (Inserm)
- CA47 – Dynamics and control of HIV and viral hepatitis. **Dominique Costagliola** (Inserm)
- CA Tuberculosis. **Olivier Neyrolles** (IPBS, CNRS, Toulouse) and **François-Xavier Blanc** (Nantes University Hospital)
- CA Human-to-human transmission of respiratory viruses. **Arnaud Fontanet** (*Institut Pasteur*)
- CA Respiratory viruses. **Karine Lacombe** (AP-HP, Sorbonne University) and **Édouard Lhomme** (Bordeaux University Hospital, Bordeaux University)
- CA Long COVID. **Olivier Robineau** (Lille University Hospital), **Marc Bardou** (Dijon University Hospital) and **Henri Partouche** (Paris Cité University)
- CA Modelling. **Vittoria Colizza** (Inserm) and **Simon Cauchemez** (*Institut Pasteur*)
- CA HPV. **Joseph Monsonego** (Eurogyn) and **Christine Katlama** (AP-HP)
- RHIVIERA Task Force. **Asier Sáez-Cirión** (*Institut Pasteur*) and **Christine Rouzioux** (Paris Cité University)
- HBV Cure Task Force. **Fabien Zoulim** (*Hospices civils de Lyon*, Lyon University, Inserm)
- Arbo-France. **Xavier de Lamballerie** (Aix Marseille University) and **Anne-Bella Failloux** (*Institut Pasteur*)
- Viral haemorrhagic fevers Working Group. **Sylvain Baize** (*Institut Pasteur*) and **Marie Jaspard** (ALIMA)
- AvAther Working Group. **Lionel Piroth** (Dijon University Hospital) and **Laurence Weiss** (AP-HP)
- Respiratory virus vaccines Working Group. **Brigitte Autran** (Sorbonne university, Covars) and **Odile Launay** (AP-HP)
- Interventional vaccines research Working Group. **Élisabeth Botelho-Nevers** (Saint-Etienne University Hospital) and **Pierre Verger** (ORS PACA)
- Mother-child inter CA41-44 Working Group. **Albert Faye** (AP-HP), **Pierre Frange** (AP-HP) and **Valériane Leroy** (Inserm)

5 Selective bibliography

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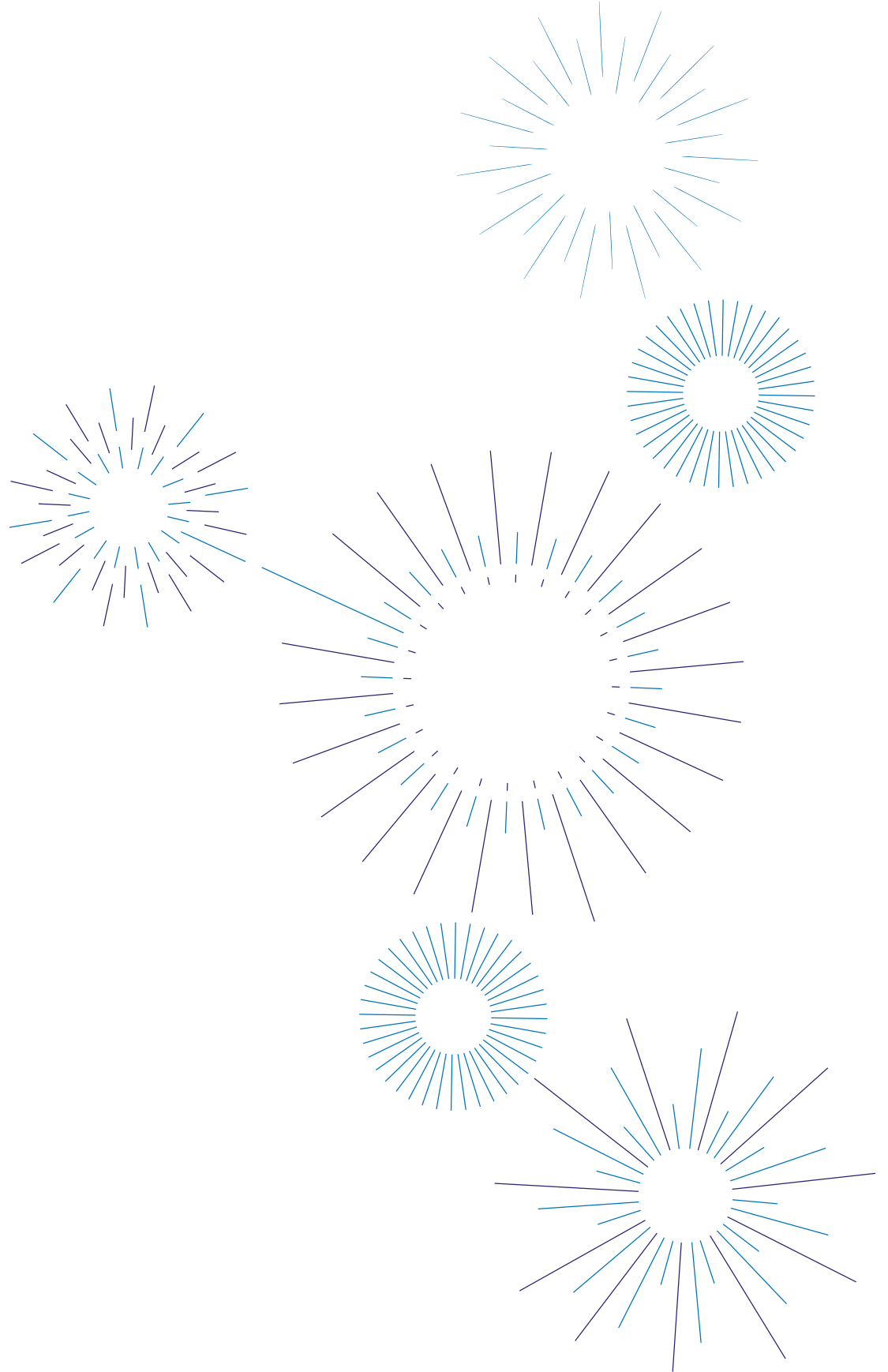
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DAA: direct-acting antiviral	e-CRF: electronic Case Report Form	NUC: nucleo(s)tide analogue
CFP: call for proposals	ECRIN: European Clinical Research Infrastructure Network	WHO: World Health Organization
CA: Coordinated Action	EDCTP: European and Developing Countries Clinical Trials Partnership	NGO: non-governmental organisation
ADEME: French Agency for Ecological Transition	ITE: international technical expert	ORCID: open researcher and contributor ID
AFD: French Development Agency	FAPESP: São Paulo Research Foundation	PCR: polymerase chain reaction
Africa CDC: Africa Centres for Disease Control and Prevention	FSPI: Solidarity Fund for Innovative Projects	PENTA: Paediatric European Network for Treatment of AIDS
ALIMA: Alliance for International Medical Action	GISAID: Global Initiative on Sharing Avian Influenza Data	PEPR: Priority Research Programme and Equipment
ANRS: French Agency for Research on AIDS and Viral Hepatitis	GloPID-R: Global Health Security Initiative and Global Research Collaboration for Infectious Disease Preparedness	PHRC: Programme for Hospital Clinical Research
ANRS MIE: ANRS Emerging infectious diseases	HAS: French National Authority for Health	PrEP: pre-exposure prophylaxis
ANSES: French Agency for Food, Environmental and Occupational Health & Safety	HBV: hepatitis B virus	PRFI: low and middle-income country
AP-HP: Paris Public Hospitals Group	HPV: human papillomavirus	PRISME: International Research Platform in Global Health
RNA: ribonucleic acid	MSM: men who have sex with men	REACTing: Research and action targeting emerging infectious diseases
mRNA: messenger RNA	INCa: French National Cancer Institute	ReCH-MIE: clinical research devoted to emerging and re-emerging infectious diseases
ARP: Senegalese Pharmaceutical Regulatory Agency	INRAE: French National Research Institute for Agriculture, Food and Environment	RT-PCR: reverse transcriptase-PCR
ARS: French Regional Health Agency	INRB: French National Institute of Biomedical Research	SLGN: selgantolimod
C4C: conect4children	Inserm: French National Institute of Health and Medical Research	SARS-CoV: severe acute respiratory syndrome coronavirus
CERFIG: Centre for Research and Training in Infectious Diseases in Guinea	IRD: French National Research Institute for Sustainable Development	TB: tuberculosis
CIRAD: French Agricultural Research and International Cooperation Organisation	STI: sexually transmitted infection	TDF: tenofovir disoproxil fumarate
MMC: Methodology and Management Centre	ISTH: Irrua Specialist Teaching Hospital	TRT-5 CHV: French inter-association collective in the field of HIV/AIDS, hepatitis and STIs
CPHIA: International Conference on Public Health in Africa	MESRI: French Ministry of Higher Education, Research and Innovation	UNIVR: Verona University
CHRU: French regional university hospital	EID: emerging infectious disease	UPEC: Paris-Est Créteil University
CNR: French National Reference Centre	MSD: Merck Sharp & Dohme	HBV: hepatitis B virus
CNS: French National AIDS Council	NIDA: US National Institute on Drug Abuse	HCV: hepatitis C virus
CRCF: Fann Regional Centre for Research and Training in Clinical Care	NIH: US National Institutes of Health	HDV: hepatitis D or delta virus
CSS: Sector Scientific Committee	NIPH: Norwegian Institute of Public Health	HIV: human immunodeficiency virus
DGOS: French Directorate General for Healthcare Provision	NiV: Nipah virus	VRI: Vaccine Research Institute
Ecraid: European Clinical Research Alliance on Infectious Diseases		RSV: respiratory syncytial virus



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