



Paris, November 08, 2023

**France 2030: 11 award-winning projects funded to better understand and prepare for emerging infectious diseases for nearly 22 million euros.**

**Sébastien Lecornu, Minister of the Armed Forces, Sylvie Retailleau, Minister of Higher Education and Research, Marc Fesneaux, Minister of Agriculture and Food Sovereignty, Christophe Béchu, Minister of Ecological Transition and Territorial Cohesion, Aurélien Rousseau, Minister for Health and Prevention, together with Bruno Bonnell, Secretary General for Investment, in charge of France 2030, and Lise Alter, Director of the Agence de l'innovation en santé, announce the winners of France 2030's Emerging Infectious Diseases Research Program (PEPR MIE).**

The French government has made healthcare research and innovation one of the strategic priorities of the France 2030 plan, with its healthcare component "Innovation in health 2030", implemented by the Agence de l'innovation en santé, to make France a leading country in Europe in this field.

**France 2030: a strategy to strengthen the state's preparedness and response to the risks of a new health crisis**

**Launched over two years ago, the strategy for accelerating the response to emerging infectious diseases (EID) and NRBC (nuclear, radiological, biological and chemical) threats aims to understand, prevent and control the emergence or re-emergence of infectious diseases, as well as to deal with intentional or accidental NRBC threats.**

**This strategy aims to strengthen France's preparedness in the event of a major new health crisis, and to develop our response capacity at national level in coordination with the European level, with a "single health" approach integrating the links between human, animal and ecosystem health.**

The strategy includes a **major research component, with two complementary priority research programs and equipment (PEPR):**

- **The PEPR MIE, led by Inserm through ANRS | Emerging Infectious Diseases (ANRS | MIE),** should help to better understand how to effectively prevent and control the emergence of infectious diseases, as well as develop countermeasures to diagnose, protect and treat people. It should also enable to put in place health policies based on scientific evidence and adapted to the specific context of the crisis.
- **The PEPR PREZODE (for Preventing Zoonotic Diseases Emergence), led by IRD, CIRAD and INRAE,** will strengthen knowledge production and the development of tools to define innovative strategies for risk reduction and early detection of emergences. The first results are expected in early 2024.

## SUPPORTED

The ministers today announced the winners of the **call for projects** for the EID research program (PEPR MIE), **which aims to support interdisciplinary projects in fundamental research, research for the development of countermeasures, as well as in public health and the human and social sciences.**

The PEPR MIE has three components:

- Component 1: Accelerating the acquisition of fundamental knowledge on emerging infectious diseases
- Component 2: Promote innovation and develop new treatments, vaccines and other prevention, diagnostic and surveillance tools for emerging infectious diseases.
- Component 3: Enable public policies and society to cope with epidemic crises

**Following evaluation of the 37 eligible projects by an international panel of experts, 11 research projects were selected and funded for a total of almost 22 million euros, managed on behalf of the program by ANRS | MIE for Inserm.**

7 projects were submitted under section 1 of the call for projects, 2 projects under section 2 and 2 projects under section 3:

- The projects selected for section 1 focus on in-depth study of the mechanisms of infection of the various pathogens targeted in the strategy, understanding the dynamics of transmission and circulation of these pathogens, identifying the biological factors determining the disease, and identifying the immune pathways of interest for the development of new therapeutic strategies.
- Section 2 projects focus on aspects relating to the development of innovative diagnostic methods and multi-component antiviral treatments to detect and combat targeted pathogens more effectively.
- Finally, projects in section 3 focus on the role of public communication in preparing for and responding to epidemic risk, and on analyzing factors influencing the acceptance and accessibility of epidemic-fighting measures such as vaccines.

**The selected projects and the full list of winning teams are detailed in the appendix.**

**The winners of the PEPR PREZODE AAP will be announced during the first quarter of 2024.**

### Appendix 1: Presentation of winning projects

**Each project is led by an interdisciplinary consortium of 4 to 20 teams with complementary expertise, led by a coordinator. The complete teams are detailed in Appendix 1.**

#### SECTION 1 - Accelerating the acquisition of knowledge on emerging infectious diseases

**3D-LUNGO** - Coordinator: CHAKRABARTI Lisa (Institut Pasteur)

The 3D-LUNGO project aims to provide 3D tissue models, based on the study of the susceptibility of nasal or bronchial mucosa and pulmonary alveoli to respiratory viruses, to rapidly and collaboratively test the lesions that newly emerging respiratory pathogens could induce.

**France 2030 grant:** €1,476,112 M

**DEBS-Plague** - Coordinator: Florent SEBBANE (Institut Pasteur de Lille/Inserm)

The DEBS-Plague project aims to understand the circulation dynamics of the plague and to identify the French ecosystems that are favorable or unfavorable to its establishment, adopting an interdisciplinary approach (combining historical, archaeological, biological, mathematical and engineering sciences). The aim is to limit or even prevent the possible emergence of plague, but also to develop a model system applicable to other zoonotic infectious diseases.

**France 2030 grant:** €2,737,534 million

**SISP&EAU** - Coordinator: BOELLE Pierre-Yves (Institut Pierre Louis d'Epidemiologie et de Santé Publique, Sorbonne Université/Inserm)

The SISP&EAU project aims to build and validate a surveillance model for respiratory viruses in France, integrating clinical cases and wastewater. It will set up detection and monitoring of viral strains causing respiratory infections to characterize virus circulation dynamics in the general population. It will perpetuate the technological, mathematical and IT tools developed for epidemiological surveillance during the COVID-19 pandemic.

**France 2030 grant:** €2,170,040 M

**CAZIKANO** - Coordinator: DESPRES Philippe (Université de la Réunion)

The CAZIKANO project concerns the Zika virus, which causes serious congenital malformations. It aims to characterize the factors favoring transmission of the pathogen by mosquitoes and viral persistence in individuals. The aim is to propose innovative anti-infectious strategies based on the antiviral action of compounds extracted from ultra-marine plants.

**France 2030 grant:** €3,250,270 million

**Ft6SS-Meca** - Coordinator: HENRY Thomas (Centre International de Recherche en Infectiologie, Inserm Lyon)

The Ft6SS-Meca project will study the structure, molecular mechanisms of secretion and function of effectors of the secretion system (T6SS) of the bacterium *Francisella tularensis* (threat agent). The expected results could lead to the long-term identification of new treatments specifically targeting this secretion system, a key virulence factor.

**France 2030 grant:** €1,080,453 M

**COPAFLICT** - Coordinator: BAIZE Sylvain (Institut Pasteur)

The aim of the COPAFLICT project is to improve fundamental knowledge of viral hemorrhagic fevers and offer new perspectives for their diagnosis and treatment. To this end, it will study the immunopathogenesis associated with the Lassa fever virus (lightning hemorrhagic fever), to identify immune pathways of interest for the development of new therapeutic strategies targeting the host response.

**France 2030 grant:** €1,737,057 M

**LSDengue** - Coordinator: CABIÉ André (Martinique University Hospital)

The LSDengue project aims to identify the determining factors in severe forms of dengue fever, in order to define biomarkers that can be used clinically and adapt patient care. It involves a study on an unprecedented scale, involving the complete characterization (clinical, genetic, virological and immunological) of hundreds of patients of diverse genetic origins, recruited from a large part of the geographical area of incidence of dengue thanks to a vast network in the French overseas departments and territories. The aim is to anticipate the progression of infection to severe dengue, improve patient management and reduce the risk of dengue-related mortality. This intercontinental network could provide a solid basis for the preparation and control of emerging viruses, in particular arboviruses and dengue.

**France 2030 grant:** €2,082,853 M

## **SECTION 2 - Organizing and developing new treatments, vaccines and other means of prevention, diagnosis and surveillance for emerging infectious diseases**

**NIPAH-LISA** - Coordinator: LONGHI Sonia (Aix Marseille Université, CNRS)

The NIPAH-LISA project focuses on airborne infections by highly pathogenic viruses of the Paramyxovirinae family (including the Nipah virus), and aims to develop a multi-component antiviral treatment for these infections.

**France 2030 grant:** €1,580,557 M

**VORTEX** - Coordinator: GAYMARD Alexandre (Hospices Civils de Lyon, HCL)

The VORTEX project aims to develop a non-invasive diagnostic method based on the results of patients' exhaled air analysis. It aims to identify signatures of volatile organic compounds specific to a pathogen or to the immune response of patients, in order to improve the management and monitoring of emerging respiratory infections.

**France 2030 grant:** €2,418,646 million

### **SECTION 3 - Enabling public policy and society to cope with epidemic crises**

**TICKRISK** - Coordinator: GILES-VERNICK Tamara (Institut Pasteur)

The TICKRISK project involves an anthropological study and the co-development, with the professionals concerned (human health, veterinarians, breeders) in 4 countries (France, Spain, Romania, Turkey), of an epidemic preparedness program that includes a risk communication component. The aim is to integrate this dimension into the preparation and response to an epidemic risk and, ultimately, to improve it.

**France 2030 grant:** €1,594,059 M

**ACME** - Coordinator: MUELLER Judith (Institut Pasteur)

The ACME project will study the key factors influencing the acceptance and physical and psychological accessibility of measures to combat epidemics, foremost among which is vaccination. It aims to promote the development and implementation of effective countermeasures, notably through appropriate and inclusive communication and organization. Particular attention will be paid to building confidence in crisis situations. Ultimately, this project should help to improve the effectiveness of public health actions more widely.

**France 2030 grant:** €1,526,992 M

## **Appendix 2: Complete list of teams**

### **SECTION 1 - Accelerating the acquisition of knowledge on emerging infectious diseases**

#### **3D-LUNGO**

**Teams:** CHAKRABARTI Lisa (Institut Pasteur, Paris) ; GOUJON Caroline (Institut de Recherche en Infectiologie de Montpellier, CNRS Languedoc) ; TERRIER Olivier (Centre International de Recherche en Infectiologie, ENS Lyon et Université Claude Bernard Lyon 1) ; GOBAA Samy (Institut Pasteur, Paris) ; MENU Elisabeth (Centre de recherche immunologie de infections virales et des maladies auto-immunes, CEA) ; BOURDIN Arnaud (CHU Montpellier)

#### **DEBS-Plague**

**Teams:** SEBBANE Florent (Centre d'Infection et d'Immunité de Lille, Institut Pasteur de Lille) ; PIZARRO-CERDA Javier (Institut Pasteur) ; ATKINSON Steve (Nottingham University, UK) ; TORTOSA Pablo (Université de La Réunion) ; LATTARD Virginie (VetAgro Sup Lyon) ; DOBIGNY Gauthier (Centre de biologie pour la gestion des populations, IRD) ; RAJERISON Minoarisoa (Institut Pasteur de Madagascar) ; GIROD Romain (Institut Pasteur de Madagascar) ; BOUSHIRA Emilie (Ecole vétérinaire de Toulouse, INRAE) ; NICOUUD Marilyn (Université d'Avignon) ; SLAVIN Philip (Stirling University, UK) ; CASTEX Dominique (Université de Bordeaux) ; OUESLATI Tarek (Université de Lille) ; SPYROU Maria (Universität Tübingen, DE) ; CARIA Giovanni (Laboratoire d'Analyses des Sols, INRAE) ; MONDY Samuel (INRAE) ; MASSOL François (Centre d'Infection et d'Immunité de Lille - Institut Pasteur Lille) ; STENSETH Nils (Centre for Ecological and Evolutionary Synthesis, University of Oslo) ; MIGUET Serge (Laboratoire d'Informatique en Image et Systèmes d'information, INSA, Université Lyon 2) ; KASSI Samir (Laboratoire Interdisciplinaire de Physique, Université de Grenoble)

#### **SISP&EAU**

**Teams:** BOELLE Pierre-Yves (Institut Pierre Louis d'Epidemiologie et de Santé Publique, Sorbonne Université) ; DARMON David (Risques, Epidemiologie, Territoires, Informations, Education et Santé, Université Cote d'Azur) ; ROHR Olivier (Laboratoire de dynamique des interactions hôtepathogène, Université de Strasbourg) ; MADAY Yvon (Laboratoire Jacques-Louis Lions, Sorbonne Université) ; THIBAUT Vincent (Laboratoire de Virologie, Hôpital de la PitiéSalpêtrière) ; GUERIN Jean-Luc (Interactions hôtes agents pathogènes, INRAE) ; DELEUZE Jean-Francois (Centre National français de Recherche en Génomique Humaine, CEA) ; BARBRY Pascal (Institut

de Pharmacologie Moléculaire et Cellulaire Physiologie génomique des eucaryotes, CNRS) ; SCHVOERER Evelyne (Stress Immunité et Pathogènes, Université de Lorraine - Faculté de Médecine) ; DUBOIS Michel (Groupe d'Etude des Méthodes de l'Analyse sociologique de la Sorbonne, CNRS) ; LINA Bruno (Institut des Agents Infectieux, Hospices civil de Lyon - Hôpital de la croix rousse) ; ROUSSET Dominique (Virologie CNR-LA virus des infections respiratoire et CNR-LA Arbovirus, Institut Pasteur de la Guyane) ; SIMON-LORIERE Etienne (Institut Pasteur)

#### **CAZIKANO**

**Teams:** DESPRES Philippe (Université de la Réunion) ; LAMBRECHTS Louis (Institut Pasteur) ; JOUVENET Nolwenn (Institut Pasteur) ; MESMIN Bruno (Institut de Pharmacologie Moléculaire et Cellulaire, CNRS Côte d'Azur) ; DEJUCQ-RAINSFORD Nathalie (Institut de recherche sur la santé, l'environnement et le travail, Inserm Nantes) ; ROUSSE Fanny (Institut de Chimie des Substances Naturelles, CNRS Côte d'Azur) ; ROUILLE Yves (Institut Pasteur de Lille) ; WATTERSON Daniel (The University of Queensland, AUS)

#### **Ft6SS-Méca**

**Teams:** HENRY Thomas (Centre International de Recherche en Infectiologie, Inserm Lyon) ; TERRADOT Laurent (CNRS) ; FRONZES Remi (Institut Européen de Chimie et Biologie, Université de Bordeaux) ; BOISSET Sandrine (Centre National de Reference de la tularémie CHU Grenoble-Alpes)

#### **COPAFLICT**

**Teams:** BAIZE Sylvain (Unité de Biologie des Infections Virales Emergentes, Institut Pasteur) ; LACHUER Joël (Structure Fédérative de Recherche Santé Lyon-Est, Université Lyon 1) ; DILLIES Marie-Agnès (Hub Bioinformatique et Biostatistique, Institut Pasteur) ; BELLANGER Laurent (Laboratoire Innovations technologiques pour la Détection et le Diagnostic, CEA) ; JOLLY Nathalie (Centre de Recherche Translationnelle, Institut Pasteur)

#### **LSDengue**

**Teams:** CABIÉ André (CHU de Martinique) ; NACHER Mathieu (Centre d'investigation clinique Antilles Guyane, Centre Hospitalier de Cayenne) ; DE LAMBALLERIE Xavier (Unité des virus émergents, Faculté de Médecine de Marseille) ; ROUSSET Dominique (Institut Pasteur de Guyane) ; DUPONT-ROUZEYROL Myrielle (Institut Pasteur de NouvelleCalédonie) ; MISSÉ Dorothée (IRD Montpellier) ; QUINTANA-MURCI Lluis (Unit Human Evolutionary Genetics, Institut Pasteur) ; MAVINGUI Patrick (Université de la Réunion) ; GÉRARDIN Patrick (CHU de La Réunion) ; JAFFAR-BANDJEE Marie-Christine (CHU de La Réunion) ; CÉSAIRE Raymond (CHU de Guadeloupe) ; ABEL Laurent (IHU Institut Imagine, Inserm Paris) ; FOLLENFANT Emilie (Service de médecine interne CHT Nouméa)

### **SECTION 2 - Organizing and developing new treatments, vaccines and other means of prevention, diagnosis and surveillance for emerging infectious diseases**

#### **NIPAH-LISA**

**Teams:** LONGHI Sonia (Aix Marseille Université, CNRS) ; SI-TAHAR Mustapha (Centre d'Etude des Pathologies Respiratoires, Université de Tours, Inserm) ; LOTTEAU Vincent (Inserm Lyon) ; VIDALAIN Pierre-Olivier (Centre International de Recherche en Infectiologie, Inserm, CNRS, ENS Lyon, Université Lyon 1) ; MESSAOUDI Samir (Laboratoire de Synthèse Organique, Ecole polytechnique, Palaiseau, CNRS) ; TSAPIS Nicolas (CNRS, Université Paris Saclay) ; HA-DUONG Tâp (CNRS, Université Paris Saclay) ; SAFRA Lou (Sciences Po, CNRS)

#### **VORTEX**

**Teams:** GAYMARD Alexandre (Hospices Civils de Lyon, HCL) ; RIVA Matthieu (Institut de recherches sur la catalyse et l'environnement, Université Lyon 1) ; SAUVINET Valérie (Centre de Recherche en Nutrition Humaine Rhône-Alpes, Hospices Civils de Lyon, HCL) ; VERDON Julien (Ecologie et Biologie des Interactions, Université de Poitiers) ; BORGNAT Pierre (Laboratoire de Physique, ENS Lyon) ; TAIEB Emmanuel (Triangle. Action, discours, pensée politique et économique laboratoire de research, Sciences Po Lyon) ; JARRAUD Sophie (Hospices Civils de Lyon, HCL) ; BARDEL-DANJEAN Claire ((Hospices Civils de Lyon, HCL) ; TROUILLET-ASSAN Sophie (Hospices Civils de Lyon, HCL) ; GAYMARD Alexandre (Hospices Civils de Lyon, HCL)

### **SECTION 3 - Enabling public policy and society to cope with epidemic crises**

#### **TICKRISK**

**Teams:** GILES-VERNICK Tamara (Anthropology & Ecology of Disease Emergence, Institut Pasteur) ; MARI

SAEZ Almudena (Université de Montpellier) ; MALVY Jean-Marie Deni (Université de Bordeaux) ; FREY-KLETT Pascale (Institut National de Recherche pour l'Agriculture, l'Alimentation, et l'Environnement, INRAE) ; BOURMAUD Philippe (Institut français d'études anatoliennes) ; BONNET Sarah (Ecology and Emergence of Arthropod-borne Pathogens, Institut Pasteur)

#### **ACME**

**Teams:** MUELLER Judith (Unité de l'épidémiologie des maladies émergentes, Institut Pasteur) ; DE LAMBALLERIE Xavier (Unité des virus émergents, Faculté de Médecine de Marseille) ; ALLA François (Unité hospitalière d'innovation en prévention/service de prévention, CHU de Bordeaux) ; HEYERDAHL Léonard (Unité Anthropologie et Ecologie de l'Emergence des Maladies, Institut Pasteur) ; BOTELHO-NEVERS Elisabeth (Centre International de Recherche en Infectiologie, Université Jean Monnet) ; RAUDE Jocelyn (Recherche sur les Services et le Management en santé, EHESP) ; VERGER Pierre (Observatoire Régional de Santé PACA) ; VENTELOU Bruno (Aix-Marseille Sciences Economiques, Environnement & santé, Aix-Marseille Université)

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## **About France 2030**

The France 2030 investment plan:

- Embodies a dual ambition: to transform key sectors of our economy (healthcare, energy, automotive, aeronautics and space) through technological innovation, and to position France not just as a player, but also as a leader in the world of tomorrow. From fundamental research to the emergence of an idea, to the production of a new product or service, France 2030 supports the entire life cycle of innovation, right through to industrialization.
- Is unprecedented in its scale: €54 billion will be invested to help our companies, universities and research organizations make the transition in these strategic sectors a success. The aim is to enable them to respond competitively to the ecological and attractiveness challenges of the world to come, and to develop the future leaders of our sectors of excellence. France 2030 is defined by two cross-functional objectives: to devote 50% of its spending to decarbonizing the economy, and 50% to emerging, innovative players, without spending money that is detrimental to the environment (in line with the Do No Significant Harm principle).
- Will be implemented collectively: designed and deployed in consultation with economic, academic, local and European players to determine the strategic orientations and flagship actions. Project leaders are invited to submit their applications via open, demanding and selective procedures, in order to benefit from government support.
- Is managed by the Secrétariat Général pour l'Investissement on behalf of the Prime Minister, and implemented by the Agence de la Transition Ecologique (ADEME), the Agence Nationale de la Recherche (ANR), Bpifrance and the Banque des Territoires.

For more information: <https://www.gouvernement.fr/france-2030> | @SGPI\_avenir

## **About ANRS-MIE**

ANRS | Emerging Infectious Diseases, created on January 1, 2021, is an autonomous agency of Inserm, headed by Professor Yazdan Yazdanpanah. Its mission is to lead, evaluate, coordinate and fund research into HIV/AIDS, viral hepatitis, sexually transmitted infections, tuberculosis and emerging and re-emerging infectious diseases (notably emerging respiratory infections - including Covid-19 - viral hemorrhagic fevers, arboviroses).

Under the supervision of the Ministry of Higher Education and Research and the Ministry of Health and Prevention, ANRS | Emerging Infectious Diseases federates an inter-institutional network of national and international physicians and researchers, patient associations and representatives of civil society, fully integrated into the governance and operation of the agency. This co-construction dynamic ensures that projects are implemented in line with the expectations of the communities concerned, and aims to limit the health, economic and social impact of epidemics.

For further information: <https://www.anrs.fr>

## **About Inserm**

Founded in 1964, Inserm is a public scientific and technological establishment under the dual authority of the French Ministry of Health and the Ministry of Research. Dedicated to biological, medical and human health research, it covers the entire spectrum from the research

laboratory to the patient's bedside. On the international stage, it is the partner of the world's leading institutions committed to scientific progress and challenges in these fields.

For further information: <https://www.inserm.fr/>

### **About the French National Research Agency (ANR)**

The Agence Nationale de la Recherche (ANR) is a public agency under the authority of the French Ministry of Research. It is the funding agency for project-based research in France. Its mission is to support and promote the development of fundamental and applied research in all disciplines, at national, European and international levels. It also funds technical innovation and technology transfer, partnerships between public and private sector research teams, and reinforces the dialogue between science and society.

The ANR is also the main operator of France 2030 in the field of higher education and research, for which it selects, finances and monitors projects covering initiatives of excellence, research infrastructures and support for the advancement and valorization of research.

The ANR was awarded the "professional equality" label in 2023.

For further information: [www.anr.fr](http://www.anr.fr)