France and EMBO in numbers

218
EMBO Members[a]

39
EMBO Scientific Exchange Grants[d]

65
EMBO Young Investigators[b]

33
EMBO Courses & Workshops in France[c]
5,489 attendees
Including **3,061** French participants

28
EMBO Postdoctoral Fellows[c]

EMBC Delegates

Karen Amram-Prevot,
Nacer Boubenna,
Antoine Perrang,
Eric Aubry
Ministère de l'Enseignement Supérieur et de la Recherche

The EMBO Programmes are funded by the European Molecular Biology Conference (EMBC), an intergovernmental organization that comprises 31 members states.

France has been a founding EMBC Member State since 1969.

a Working in France
b Former and current programme members, working in France
c 2019 – 24
d Awarded to scientists based in France for training abroad 2019 to August 2024

EMBO opportunities in France

EMBO Postdoctoral Fellowships

fund internationally mobile researchers for a period of up to two years. Applications open all year around.

EMBO Scientific Exchange Grants

fund research exchanges of up to three months. The grants facilitate collaborations with research groups with expertise, techniques or infrastructure that is unavailable in the applicant's laboratory. Applications open all year around.

Maria Leptin | EMBO Science Journalism Fellowships

support science journalists and life scientists entering careers as science journalists covering life science research. Applications open all year around.

The EMBO Young Investigator Programme

supports group leaders in the early stages of setting up their independent laboratories for a period of four years. Networking is a key aspect. Application deadline: 1 April.

EMBO Courses & Workshops

stimulate exchanges of the latest scientific knowledge and provide training in experimental techniques. Application deadlines: 1 March and 1 August.

EMBO Press

publishes five journals that serve the global life science community: The EMBO Journal, EMBO Reports, EMBO Molecular Medicine, Molecular Systems Biology, and Life Science Alliance, which is published in partnership with Rockefeller University Press and Cold Spring Harbor Laboratory Press.

Find more EMBO schemes at *embo.org/funding*

embo.org
Information as of August 2024
Contact: communications@embo.org
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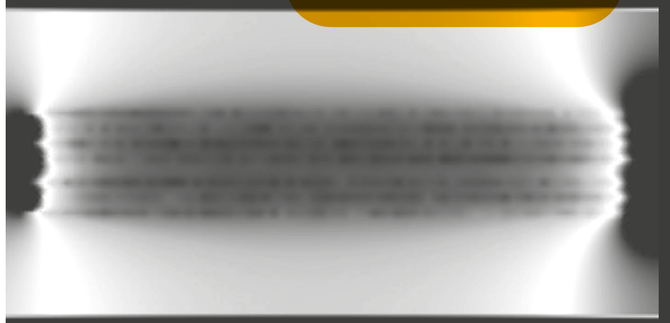

Focus on France

EMBO

Facts and figures

One of the key players in the European scientific landscape, France ranks ninth in the world in terms of scientific publications[1]. Supported by a well-structured science and innovation system, French research and development is funded through public agencies and carried out through various institutions, including the CNRS which is active in all fields of science, Inserm for medical research and Inria for data and computer science. It also operates internationally, with a network of research institutes operating in 34 countries[2]. France hosts the International Thermonuclear Experimental Reactor (ITER), the European Space Agency (ESA), UNESCO, and the OECD. These institutions play a crucial role in France's science and innovation landscape, contributing to its global research influence and fostering international collaboration.

With more than 3,500 public and private higher education institutions, France hosts nearly three million students a year[3]. The country has 72 public universities, including the University of Paris[4] founded in 1150 and now one of the world's oldest universities in continuous operation.

France spent 58,9 billion euros (2.22% of GDP)[5] on research and development in 2021, representing a 1% increase from 2011 to 2021. Businesses are the main funders of R&D activities, accounting for 60% of R&D expenditure[6]. The French private sector benefits from national public funding and resources from international organizations that accounted for 11% of the funding of total business expenditure in 2021[7]. Military funding accounted for 57% of public funding focusing on three main branches of R&D[8]: aerospace; measuring instruments, navigation instruments and watches; and fabricated metal products, except machinery and equipment.

Key figures

Population: 68.37 million[9]

R&D spending: 2.22% of GDP[10]

People employed in R&D: 496,250 full-time equivalent[11]

Patents: 66,446[12]

Higher education institutions: 3,500[13]

Higher education enrolment: 2,935,000[14]

Horizon 2020/Horizon Europe funding[15]**:**
Number of signed grants: 12,363
25,690 participating organizations
1,352 ERC principal investigators
1,005 Marie Skłodowska-Curie Actions funded researchers

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Gaëlle Legube
A human-centric approach

Principal Investigator at Centre National de Recherche Scientifique | EMBO Member | Former EMBO Young Investigator and Fellow

Gaëlle Legube emphasizes the pivotal role that EMBO has played throughout her career. Starting with an EMBO Postdoctoral Fellowship and later continuing with the EMBO Young Investigator Programme, Legube found invaluable support in the "human-centred" support system provided by EMBO.

"The organization's responsive environment fosters a conducive research atmosphere," she says. Legube sees networking, funding for lab retreats or childcare grants as examples of the essential support EMBO provides to the individual researcher. "These complement the major research funding sources like ERC grants that are more focused on the research, and less on the researcher," she says.

Legube encourages early career researchers to pursue the EMBO Programmes for support in their careers in the life sciences. "Academia offers a lot of flexibility in everyday life. For example, is it possible to combine both scientific research and family life? Probably even more so than in many other professions," Legube says.

Her research is also human-centric and aims to understand how cells detect and repair DNA double-strand break which if left unaddressed can lead to chromosomal rearrangements and oncogenesis, potentially resulting in cancer. Legube emphasizes the broader impact of her work on public health, particularly in understanding genome instability linked to cancer, aging and neurodegenerative diseases. "We work to improve public health knowledge, thus serving society," Legube says.

Meet scientists from the EMBO communities

Ilan Theurillat
Tackling aggressive cancer

Postdoctoral researcher at Max Delbrück Center, Berlin | former EMBO Fellow

"I strive to develop new ideas and understand biological mechanisms," says Ilan Theurillat, a postdoctoral researcher and a former EMBO Postdoctoral Fellow at the Max Delbrück Center for Molecular Biology in Berlin, Germany. Theurillat's research focuses on triple-negative breast cancer, the most aggressive form of breast cancer in women and one with few treatment options due to the lack of hormonal or targeted therapies. He studies tumour evolution in mice from initiation to the metastatic stage. His goal is to develop treatments targeting the entire ecosystem to prevent the tumour from thriving.

"My experience with the fellowship has been very positive," Theurillat says. "I had the opportunity to attend an EMBO event in Berlin in May 2024, where I met EMBO Director Fiona Watt and presented my research. The meeting allowed me to connect with more senior EMBO Members and grantees, which was great for networking."

Theurillat strongly encourages early career researchers to consider applying for an EMBO Postdoctoral Fellowship. "We have more experience, more freedom, and more confidence in our projects than during a PhD. We're not yet burdened with writing numerous funding applications or dealing with administrative issues. And although there are funding opportunities out there, with many projects calling for quick results and rapid medical applications, EMBO allows us to focus on more fundamental research."

Aude Bernheim
Building bridges

Institut Pasteur, Paris | EMBO Young Investigator

Aude Bernheim, leader of the Molecular Diversity of Microbes Laboratory at Institut Pasteur, Paris, was appointed in 2023 to France's Presidential Science Council, an advisory body tasked to advise the president on scientific matters. She praises EMBO for its significant role in advancing her scientific career, from attending her first international conference to her postdoctoral fellowship. "EMBO is a scientific organization that I admire, and I believe that it holds a unique position in the European research landscape. My field of research is very new, and the EMBO support has been invaluable in recognizing the importance of basic research, allowing us to take risks and supporting a blooming scientific community," she says.

Bernheim's work focuses on how bacteria defend themselves against viruses and the conservation of anti-phage systems across life domains. Her admission to the EMBO Young Investigator Programme has been crucial in this regard to support lab operations, research exchanges, and fostering a collaborative scientific community. "The EMBO Young Investigator Programme has been developed by and for researchers," she says. "It gives us access to some of the best research infrastructures in the world."

Bernheim joined the EMBO Scientific Exchange Grants Advisory Board in 2023. "I love reviewing the applications. It puts a smile on my face to learn that early career researchers value international cooperation," she says. "Young scientists are interested in building bridges among countries and disciplines. EMBO supports emerging research and, if it wasn't for EMBO, we as researchers would be forced to focus on mainstream scientific issues, without having the opportunity to delve further in little matters that aren't supported. Science would suffer in a world without EMBO."

Perspectives from Myrielle Dupont-Rouzeyrol

Unit Head at the Institut Pasteur of New Caledonia | EMBO Member

What drives you as a scientist?

My research focuses on arboviruses, and more specifically on mosquito-borne viruses such as dengue fever, Zika and chikungunya. These diseases are endemoepidemic in New Caledonia and have been the cause of regular epidemics for the past twenty years. Part of my work focuses on viruses and their interaction with and its interaction with the human host, as well as for example in connection with the World Mosquito Program which is an initiative dedicated to understanding the interactions between Wolbachia bacteria and mosquito microbiota. The Wolbachia bacterium prevents the transmission of arboviruses, and the aim of this program is to obtain, by mating wild mosquitoes and mosquitoes infected with this bacterium, a population of mosquitoes incapable of transmitting arboviruses. Another concrete example is the work we carried out when the Pacific region was the first to be affected during the last major Zika epidemic in 2014. Zika became a major issue when we realized that the virus could cause neurological damage in infants as well as other problems in pregnant women. We began by setting up diagnostic screening, but the PCR tests we were using were not proving effective in detecting the virus. We then started working on alternative sampling methods and demonstrated that urine samples gave better results than blood samples. This detection method was then adopted worldwide as the epidemic spread to other regions, and for me, as a native of New Caledonia, it's extremely gratifying to be able to work on pathogenic diseases that have a major impact on my country of residence. This is also what motivates me to pursue a career in science. Even though the projects may be technically challenging, they are rewarding and allow us to interact with the society around us.

What role does your institute play in New Caledonia and the wider Pacific?

The Institut Pasteur of New Caledonia has long been committed to supporting public health initiatives in the region. Health is one of New Caledonia Government's core competencies, and we collaborate extensively with public health authorities on various aspects, including infectious diseases, as well as with the Territorial Hospital Centre of New Caledonia (CHT). The close partnerships with the local health authorities allow the development of translational research programs. These collaborations are both local and regional: the scientific questions we raise can also be deployed in neighbouring countries. For example, we have a long-standing history of collaboration with Vanuatu, providing support to public health laboratories during the 2017 Pacific Mini Games to help diagnose and monitor diseases. We also conducted a survey in New Caledonia and Vanuatu to learn more about the pathogens to which our populations are exposed. We were delighted to learn that our work was then taken up by the Vanuatu Ministry of Health to better understand the infectious diseases' impact.

What is the current state of life sciences in New Caledonia?

Our situation in New Caledonia is relatively different from that in mainland France, since, as mentioned earlier, research is a state responsibility and health is a responsibility that depends on New Caledonia. This places us at Institut Pasteur of New Caledonia in a dual affiliation, which is why it's important to be able to answer the questions posed by our health authorities. Biological research on an island is both complicated and satisfying. Complicated because we're remote and isolated, and where one team in mainland France can get reagents in three days, it can take us up to six months to get them. You learn a lot working on an island - imagine the stock of plastic we can have in our lab to last six months of cultivation! My colleagues are also often the sole local experts in their scientific fields without a local network to rely on. However, I see this as an opportunity that pushes us to connect with other institutes and establish partnerships. We are part of the global Pasteur Network spanning 25 countries across five continents and we collaborate with the Institut de Recherche pour le Développement (IRD) and the University of New Caledonia, both of which have a global reach. Additionally, we have successful international collaborations with Australia and New Zealand despite the language barrier. We have our own specificities, and when working in the Pacific region, it's important to team up and join forces. This proximity is pleasant in the sense that we can exchange and precisely define our questions to participate in improving the health of New Caledonians and health research for New Caledonians.

What advice would you give about enjoying a successful career in the life sciences?

When aiming for a successful career in the life sciences, prioritize national or international mobility and seek training outside your home country. The EMBO Fellowships and other progammes are ideal opportunities for this. I always encourage my students to explore other scientific methods and techniques by leaving New Caledonia and gaining new experiences elsewhere. Many researchers tend to doubt their skills and competencies, and I had similar uncertainties when I was elected as an EMBO Member. However, having a mentor to support and guide you can be incredibly valuable. It's important to be open to conversations and connections without putting up barriers, and to embrace opportunities without hesitation. Training in different locations and cultures not only benefits researchers personally, but also strengthens research conducted in institutes and allows researchers to contribute their unique scientific perspectives.