Marseille Immunology Biocluster

Where tomorrow's immunology comes to life

EDITORIAL by Eric Berton,
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Marseille Immunology Biocluster: acting for tomorrow's immunology to benefit patients.

With the birth of Marseille Immunology Biocluster (MIB), a revolution in the field of immunotherapy is now underway in France. MIB is not just a space where advancements in immunopharmacology are envisioned; it is also where they will materialize, thanks to an ambitious model that brings together science, academic excellence, clinical research, industry, and public authorities. This is the true strength of the MIB project: acting as a catalyst for innovation in partnership with businesses, while also serving as a facilitator and network coordinator to accelerate the development of new antibody-based therapies for the benefit of people living with health conditions, improving diagnostics through targeting antibodies, and pushing the boundaries of innovation in health.

Researchers, healthcare professionals, industry professionals, investors, students, and public authorities will all benefit from optimal conditions to accelerate translational and clinical research in immunology, focusing on four therapeutic areas: oncology, infectious diseases, autoimmune diseases, and inflammatory diseases. Diagnostics and medtech will also be key areas explored within the biocluster.

Our pragmatic approach, aimed at developing new diagnostic tools and innovative therapies, will solidify Marseille's position as a global reference hub for immunotherapy research and will directly enhance France's scientific influence internationally.

All founding members and partners of MIB are proud to see this unifying project come to fruition for our research ecosystem, with projects for the future set to begin on our various sites as early as 2025.

Immunotherapy, a forward-looking response to transform health.

Why is Immunotechnology considered "revolutionary" nowadays?

Immunology, the science that studies the immune system, is a science that is constantly evolving. It is a recent science, but the concepts themselves are very old (we have known for a long time, for the plague or smallpox, for example, that people who had been infected would not be infected again). Since 2010, immunotherapy, a therapy based on the immune system, has experienced considerable growth. The main innovation lies in the therapeutic possibilities (medications) and, of course, the progressive understanding of the mechanisms. The therapeutic tools, called monoclonal antibodies, are very recent. Antibodies are naturally capable of recognizing pathogen determinants. They are also able to act in us, which is why we can make medicines from them. We are now able, through molecular genetic engineering techniques, to make them diagnostic tools as well as therapeutic tools. These are the tools that are considered revolutionary but above all that bring significant hope for millions of sick people around the world.

Interview with ***Daniel Olive.*** *Scientific and Technical Manager of Marseille Immunology Biocluster, Head of the "Immunity and Cancer" team at the CRCM, Professor of Immunology and Head of the Oncology Research teaching program at Aix Marseille University.*

How do these antibodies work?

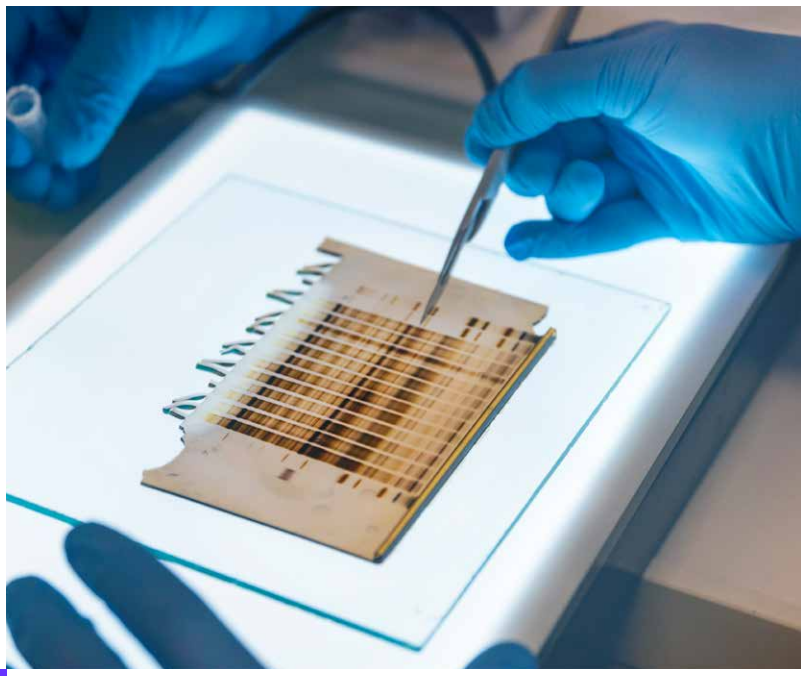
Monoclonal antibodies are antibodies that recognize a single antigen, a single target. These antibodies have the characteristics of not only being unique, but they can be produced infinitely. They absolutely are medicines but also detection tools. This technological advance has opened the way to many therapeutic elements. The other new point in cancerology is to have been able to observe that these monoclonal antibody drugs could be directed against targets. Today, we know how to use these potentialities, but not completely. We have realized that for certain lung cancers refractory to chemotherapy, surgery or radiotherapy, immunotherapy could be effective. Which gave hope and a (totally unexpected) direction: starting from one cancer, many cancers can be controlled by this immuno-modulation. Another potentially counter-intuitive feature of immunotherapy: the immune system is located everywhere in the body.

It is in contact with all tissues and all cells. This implies that potentially, it can act against almost all types of pathologies affecting a tissue. Thus, many pathologies arising from tissues can be controlled, which distinguishes immunotherapy from other treatments. The spectrum can range from leukemia to certain solid tumors, which is a bit surprising for the medical community.
This profoundly changes concepts, even therapeutic ones: I am part of the generation of doctors who started with very heavy surgical treatment plans or prolonged chemotherapy. And these dogmas are gradually changing. The key question now is how to be as minimally invasive as possible, while respecting tissues and individuals.

How will MIB help develop these therapeutic tools? and for which pathologies?

Antibodies are highly versatile tools. It can be used to prevent a pathogenic virus from entering. We can have antibodies that will target a cancer cell or immunomodulate autoimmune diseases. The idea was therefore to design a sort of hub, to create immunological drug tools around these concepts, with projects that can come from all over France, from Pitié-Salpêtrière in Paris, or from Toulouse or Brest. MIB will thus focus on oncology but also on infectious diseases, inflammatory diseases and autoimmune diseases. There is therefore a broad spectrum of pathologies on which we can imagine using these therapeutic agents and in several ways.

Marseille, land of innovation in immunology.



In 40 years, Marseille has successfully built, thanks to a public-private collaboration, an entrepreneurial biotechnological ecosystem specializing in immunology, with the creation in 1982 of "Immuno-tech", the first biotech in Marseille using monoclonal antibodies for diagnostic purposes. Since then, many other initiatives have been added, establishing Marseille a land of innovation in immunology that relies on all the living forces of the territory.
Today one of the most promising initiatives in the field of immunology in France, MIB is dedicated to the international influence of France.

Thanks to a collaboration between the academic world, hospitals, industrialists, competitiveness clusters, local authorities and public authorities, MIB benefits from a rich and diverse environment of excellence, accelerating the transition from basic research to clinical applications. This alliance between academic knowledge and entrepreneurial dynamism is at the heart of MIB's philosophy to create a one-stop shop in the field of immunology, offering an integrated platform for research, innovation and economic development.
The creation of Marseille Immunology Biocluster marks a major turning point in the strengthening of research in the fields of application of immunology in France, by concentrating expertise, innovation, resources and collaborations in Marseille. MIB positions the territory as one of the centers of excellence in the fight against infectious, autoimmune, oncological and inflammatory diseases, oriented towards sick people. It strengthens the scientific and economic attractiveness of the region and contributes to the influence of French research internationally.

The support of public authorities.

MIB is a winner of the France 2030 Call for Expressions of Interest for Bioclusters launched in 2022, to strengthen France's attractiveness as a land of innovation and research in cutting-edge fields. Within this, MIB was awarded public funding of 96 million euros over 10 years to begin its work. MIB's mission is now to structure and enrich an ecosystem of research partnerships in immunology that must contribute significantly to the development of new drugs, in accordance with the strategic objectives of the France 2030 program. This financial support demonstrates the authorities' confidence in MIB's ability to become a driver of innovation and a key player in the field of biotechnology.

A collaborative project led by core contributors to Marseille’s immunology ecosystem.

MIB is the result of 2 years of collective and collaborative work, led by Aix Marseille University, via its A*Midex foundation, the Inserm and CNRS research organizations, the Eurobiomed competitiveness cluster, the SATT Sud-Est, the Provence-Alpes-Côte-d’Azur Region, the Marseille Provence Méditerranée Metropolis, the medical center Assistance Publique - Hôpitaux de Marseille (AP-HM) and the Paoli-Calmettes Institute (IPC) as well
as many private players: pharmaceutical, biotech and CRO industries.

MIB’s strength lies in its transversality. MIB is now made up of a network of professionals and health experts, researchers and practitioners in immunology, as well as clinicians in 4 therapeutic areas: oncology, infectiology, autoimmune diseases and inflammatory diseases.

With the commitment of the industrial sector and public authorities, MIB is a powerful multidisciplinary network to accelerate the development of breakthrough innovations: new antibody-based therapies, diagnostic tools and MedTech.

The founding members of MIB.

Founding members who are both experts and complementary.

Pierre d'Epenoux
President
of ImCheck Therapeutics

Laurent Baly
President of SATT South-East

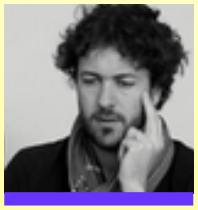
Dr. Daniel Olive
University Professor and Hospital Practitioner - Head of the "Immunity and PU-PH Hospital Practitioner Cancer" of the CRCM

Denis Bertin
Deputy Vice President A*Midex

Antoine Petit
CEO of CNRS

Hervé Brailly
Chairman of the supervisory board of Innate pharma

Pr. Bruno Quesnel
Director of the Research and Innovation - National Cancer Institute - Director of the cancer theme center of INSERM



Dr. Divi Cornec
University Professor and Hospital Practitioner
Director of the
INSERM LBAI unit

Eric Vacaresse
President of Eurobiomed

François Crémieux
Managing Director of
the AP-HM

Pr. Norbert Vey
University Professor and Hospital Practitioner
Director of the
Paoli-Calmettes Institute

MIB's public and private stakeholders.

Researchers and practitioners

Industries

Public authorities

Facilitators

A structuring dynamic of partnership.

Private and economic partners

Academic partners

Public partners

Industrial partners

An ambition: to develop innovative and unique solutions.

Addressing unmet medical needs through immunotherapy.

As both a biocluster and an innovation catalyst, MIB brings together top scientists, clinicians, and industry experts to accelerate the development of new diagnostic tools and antibody-based therapies for the benefit of patients, pushing the boundaries of healthcare innovation.

Today, immunotherapy brings hope to many patients in need of therapeutic solutions. With a pragmatic approach, the goal is to develop innovative therapies, new diagnostic tools, and MedTech advancements.

The missions of MIB can be summarized as follows:

> Position Marseille as an international hub for immunotechnology.
> Bring together top players in immunology.
> Develop innovative therapies.
> Strengthen and enhance public-private partnerships.
> Boost the attractiveness of the region.
> Contribute to France's health sovereignty strategy.

10-year objectives that reflect both the scientific and the entrepreneurial dimensions of MIB.

1 Approved Blockbuster

3 Approved niche antibodies

5 Antibodies in phase 2/3

+50% Phase 1/2 trials in immunology

30 New viable start-ups

30 Business establishments

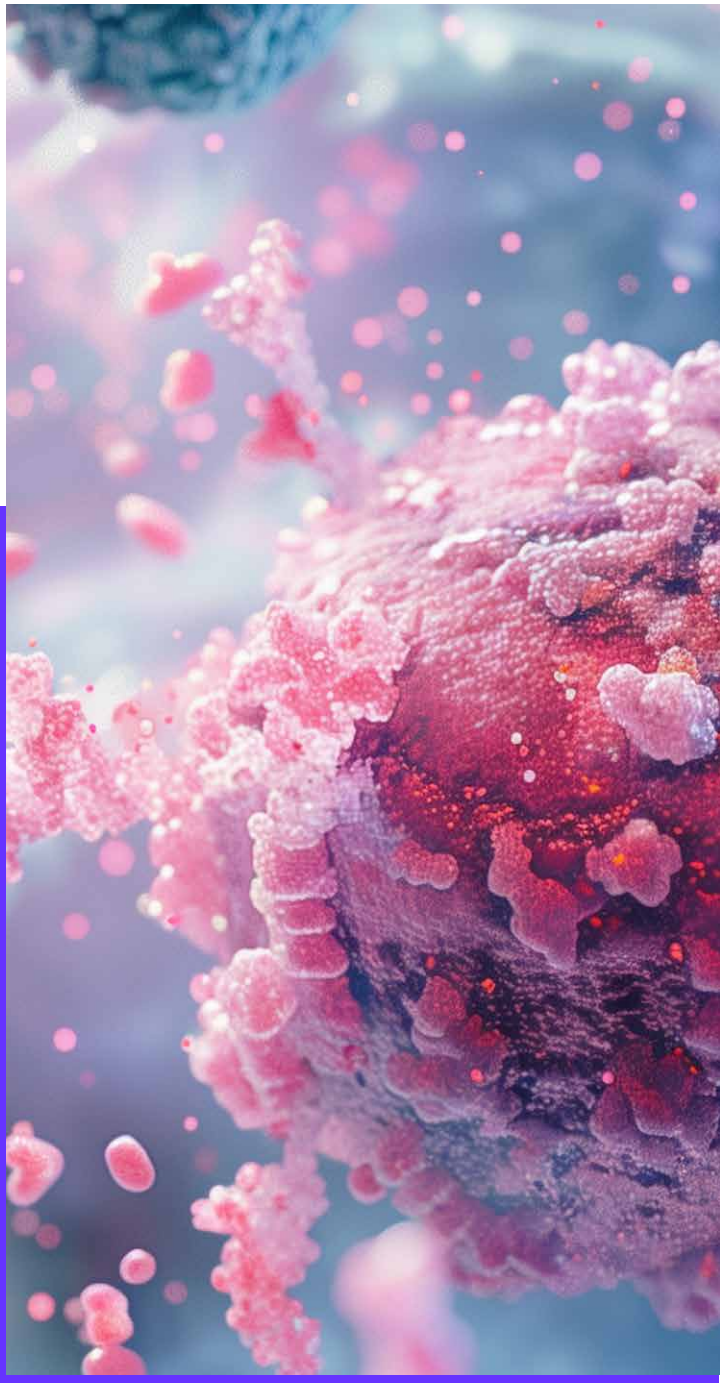
2000 Direct job creations

+€2 Billion Of capital

Three pillars supporting these objectives.

To achieve its ambitions, MIB is built on three pillars: **robust academic research, strong clinical research, and a history of over 40 years of public-private partnerships.**

The creation of new technological platforms will enhance clinical research capabilities and complement existing academic and commercial offerings, particularly in the early stages of drug discovery and engineering of therapeutic candidates.



A technological service offering: developing access to innovative platforms and promoting clinical research.

From 2025, MIB will set up its first technological platforms on different sites spread across the Aix-Marseille metropolitan area. The objective is to provide access to a world-class technological offering, from the basic research phase to the clinical proof of concept. The technological Hub will make it possible to face all the scientific challenges to develop the next generation of antibody-based drugs and diagnostic tools.

The B-SCREEN platform will be implemented in the first half of 2025. Dedicated to screening antibodies from patients' B lymphocytes, B-SCREEN is relevant in immuno-cancerology, autoimmune diseases and infectious diseases. B-SCREEN will be located on the Luminy campus in Marseille.

The Cell Scale platform, with an implementation also planned for the first half of 2025, will offer a unique research space to BioTech/MedTech and academic partners developing tumor antigens and aspiring to develop immunotherapy based on autologous cells. The Cell Scale platform will work closely with the B-SCREEN platform to harness the full potential of the candidate antibodies generated by these platforms in a cell therapy format.

From 2026, **the MabScale platform** will be the new applied research unit of MIB dedicated to the engineering and biomanufacturing of antibodies. The objective is to provide new proprietary technologies (new formats, new production technologies and associated analytical methods, predictive methods in antibody biochemistry)...

C2IT: the first clinical research center dedicated to immunology.

The result of a collaboration between AP-HM and IPC, C2IT aims to create a unique early-phase clinical research center dedicated to immunology and pooling resources. By relying on a network of teaching hospitals and specialized research organizations and benefiting from the technological support of the ImmuKnowledge platform for data management, C2IT's mission is to conduct clinical research, with a target of 1,000 patients over 5 years.

MIB's contribution to a healthier society.

Both through its ambition and its organization, MIB will have a strong societal contribution, in three dimensions.

By accelerating immunopharmacology projects.

MIB plays a crucial role in accelerating immunopharmacology projects by facilitating **international collaboration.** This **dynamic network includes strategic hospital** partnerships with cities such as Brest, Toulouse, Paris and Montpellier, thus strengthening ties between experts. At the heart of this ecosystem, MIB leverages state-of-the-art **scientific and clinical resources**, focusing particularly on the discovery and development of antibodies. These efforts will enable significant advances in the treatment of complex diseases such as cancers, autoimmune diseases, inflammatory diseases and infectious diseases.

By attracting and retaining talent.

Aware of the importance of **human capital in science**, MIB's major objective is to offer a useful platform to French talents in the development of their projects. MIB also wishes to attract international experts by positioning itself as a central economic and scientific location for research in the fields of application of immunology. By offering professional development opportunities, cutting-edge research facilities and an environment conducive to collaboration, MIB contributes to creating a **stimulating environment that fosters scientific excellence.** This strategy is essential to foster the collaboration of a dynamic and diverse scientific community around high-impact projects.

By promoting growth.

MIB is committed to supporting the growth of BioTech companies, as well as encouraging the emergence of new start-ups. This support will take the shape of dedicated funding, the creation of a start-up studio in ImmunoTechnology, innovation support for SMEs and mid-cap companies, and the creation of a network of economic opportunities based on the Eurobiomed competitiveness cluster and the SATT Sud-Est. At the same time, MIB is actively working to attract national and international investments to strengthen its ecosystem. Particular attention will be paid to the development of the in vitro diagnostics, companion diagnostics, and drug candidates sectors, opening new avenues for companies specializing in these fields and strengthening MIB's role as a catalyst for innovation in health.

MIB in brief.

19

Founding organizations

50+

Public, private and academic partners

€96M

An initiative made possible thanks to the governmental subsidy from France 2030

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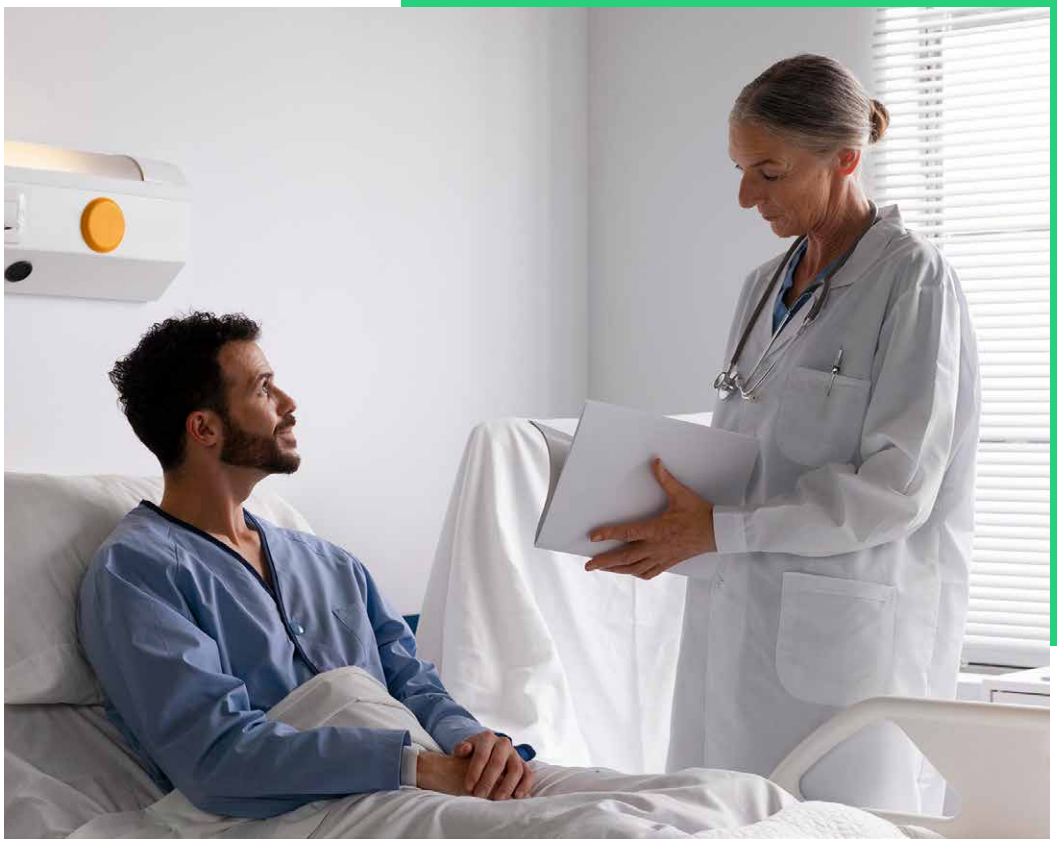
THERAPEUTIC AREAS

IMMUNO-ONCOLOGY

AUTO-IMMUNE DISORDERS

INFECTIOUS DISEASES

CHRONIC INFLAMMATION



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