Medi'Scope

Paris Region's
health innovation radar

2024 edition.

In partnership with

L'INSTITUT PARIS REGION

CHOOSE PARIS REGION

Editorial.

Valérie PÉCRESSE
President of Paris Region

Paris Region, a driving force for excellence in healthcare innovation

The year 2024 will be remembered as a time when Paris Region shone in the eyes of the world, affirming its position as an economic, industrial and, above all, innovative leader. Paris Region has established itself as a key stakeholder in healthcare innovation, a region where know-how, boldness and excellence come together to serve a shared ambition: to build the healthcare of tomorrow, here and now.

The momentum we have generated through ambitious public policies, such as Impact 2028 and the Higher Education, Research and Innovation Plan (SRESRI), bears witness to our commitment to propelling Paris Region to the forefront of healthcare innovation. These initiatives have allowed us to unite all the stakeholders in this ecosystem, making our region a benchmark for innovation, investment and education, as attested by the recent Shanghai ranking.

This commitment applies to every stage of development, from the training of our researchers, through technology transfer and research, to production. Regional support for "Grands Lieux d'innovation", such as the Malic project at Marie-Lannelongue Hospital, is an emblematic example in the field of surgical innovation.

Acting as a driver of growth and innovation also means being able to anticipate what will shape our health in the future. We have continued to work closely with stakeholders on the ground to better understand our region's expectations, strengths and challenges. The latest edition of our "Smart Santé 2023-2026" strategy reflects this commitment to leadership, at both national and European levels, in strategic areas such as biomanufacturing and oncology, which remain priorities, while investing in emerging trends such as surgical innovation, neurology and femtech.

But beyond technologies and scientific advances, innovation must above all benefit our fellow citizens and patients. In this regard, the partnership we have forged with the AP-HP and the Hôtel-Dieu hospital in particular aims to facilitate the testing of innovations in a hospital environment, with the support and expertise of clinicians.

This is why we will continue to support the Paris Region ecosystem with determination, so that the fruits of these innovations benefit everyone. In partnership with our Medicen cluster, we will continue to support projects that will shape the healthcare of the future.

Christian DELEUZE
Chairman, MEDICEN
Paris Région

For almost 20 years, we have been working to make Paris Region a national and European center of excellence in healthcare innovation. And everything indicates that we're on the right track!

Today, we are proud to present the 3rd edition of our barometer on trends in healthcare innovation in Paris Region.

This collective "work" reflects the meticulous efforts of Medicen's teams, who work in close collaboration with our experts and partners. This project is concrete proof that our ecosystem is moving towards its full potential.

This edition was made possible thanks to a close collaboration with Ayming, as well as with key regional institutions such as the Institut Paris Region and Choose Paris Region.

Together, we are showing our ambition and ability to shape the healthcare of the future. Innovation, investment, education, real estate: these are just some of the new indicators we have included this year to illustrate how Paris Region is becoming a beacon of excellence.

Over and above our funding programs, it is through our support for the entire value chain that we will consolidate our strengths and transform our potential into engines of industrial and economic growth, which will generate technological progress and create jobs.

In this new edition, we also wished to highlight a fast-growing sector: FemTech. Paris Region has the skills and resources to become a leader in this emerging sector, with innovative solutions and booming research, which now enjoys institutional support.

There's still a long way to go, and we need to support this sector, both economically and socially, to build a fairer, more inclusive healthcare system.

As a competitiveness cluster, Medicen strives to federate all stakeholders, so that we can move forward together towards a shared success, because it is by joining forces, with boldness and determination, that we will be able to build the healthcare of the future.

Along with the entire Medicen team, I'm proud to present this latest edition, which reflects the excellence of healthcare innovation in Paris Region, as well as the central role that our cluster plays in energizing and promoting this unique ecosystem.

Fabien MATHIEU
Ayming - Partner and Managing Director Finance and Innovation

The healthcare innovation ecosystem is in a state of perpetual flux, as a result of technological developments linked to digital technology, the gradual but clear transformation of patient pathways and ever-expanding collaborative networks. We are delighted to present the third edition of our study on innovation trends in the Paris Region healthcare industry. This annual study, the result of close collaboration between Medicen and Ayming, is intended to serve as a compass in this changing environment for those who are shaping the future of healthcare in our region.

As in previous editions, we offer an economic analysis of the sectors, with a focus on markers such as employment, the impact and use of public funding, and collaboration between market and innovation stakeholders. New indicators have been added to Medi'Scope this year to further develop these analyses. These selected indicators are strategic and complementary in fostering high-performance, sustainable innovation: (i) available and future real estate supply, which is essential for setting up and developing healthcare companies, a quarter of which are currently struggling to find available premises; (ii) the use of intellectual property in the healthcare sector to protect and promote studies and know-how; (iii) the dynamics of financing, both in terms of foreign investment and fundraising to promote new projects; and finally (iv) French and Paris Region scientific excellence as a foundation for innovation. All of them are further proof of Paris Region's attractiveness as a location for healthcare innovation in France and Europe.

This year we're focusing in particular on Digital Health and related developing technologies such as Artificial Intelligence. In the healthcare sector, as in other industries, we are witnessing a real technological acceleration fueled by AI, which is redefining the contours of modern medicine. France also needs to position itself as a leader in these technologies, both in healthcare and in other sectors.

In the light of this study, I'm convinced that this revolution must now be accompanied by a change in our analysis of the healthcare sector: AI and the digitization of practices are breaking down notions of the sector and extending to Medtech as well as to stakeholders in the pharmaceutical industry: our traditional codes in healthcare as in other sectors must adapt to this change in order to take it into account. By better understanding and mapping the e-health sector, we can gain a better understanding of the stakeholders and their needs, and provide appropriate funding. Thus, supporting the digital transformation through cooperation between public funds and private financiers from the seed phase onwards would undoubtedly provide more sustainable support for projects, with a longer-term strategic vision, and would align the strong profitability objectives of private financiers with the public interests of reindustrialization and the creation of national champions.

By understanding and targeting AI projects and innovation, we can better leverage national expertise through publications and the promotion of attractive centers of excellence. Already very active in protecting the value created through innovation, France needs to make further progress in this area to strengthen its competitiveness on the international stage.

I invite you to take a close look at this 3rd study, and am convinced that it will help you guide your strategies, invest in the most promising projects and, together, build the future of our Healthcare.

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The essentials.

Our objectives 3rd edition

To shed light on the healthcare sector in Paris Region:

1. Map the employment dynamics within the healthcare sector

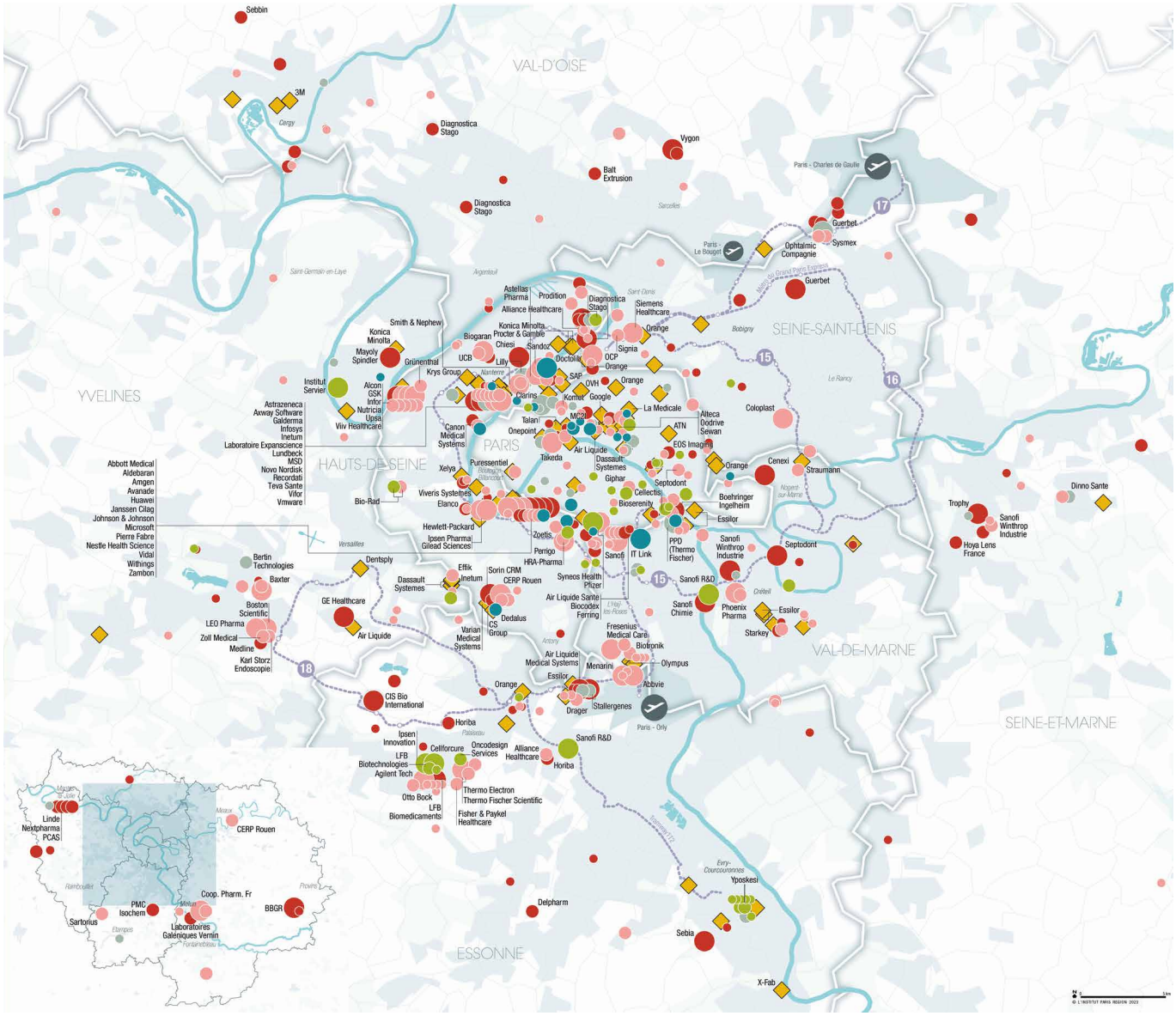
2. Illustrate Paris Region's strengths within the European Union

3. Highlight financing practices and innovation trends within the healthcare sector

Paris Region: a major force in the French healthcare sector

Key data for the region in 2023

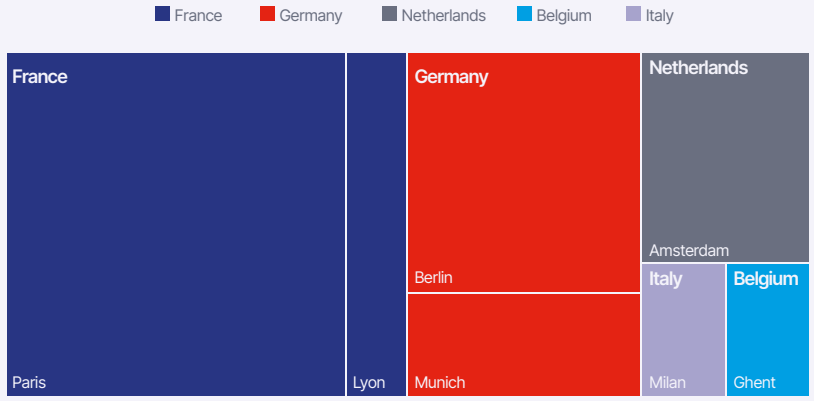
- → A thriving ecosystem with over 100,000 industrial jobs in the region, spread across 1,443 companies (1,097 V/SMEs).
- → Paris Region accounts for over 30% of industrial jobs in the national healthcare sector.
- → The healthcare industry accounts for 7% of all industrial jobs in Paris Region.
- → 8% growth in industrial healthcare jobs compared to 2018.



Paris Region has established its leadership within the European Union

- In the Financial Times Top 5 worldwide for foreign direct investment in pharmaceuticals, medical devices and biotechnology.
- No: 1 region in the European Union in terms of private funding: +2,728 M€.
- Over the last three years, the region has accounted for 1 in 3 private investments nationwide, which represents 60% of the total amount invested.
- In 2023, the total amount of fundraising fell by 60% from €2 billion to €800 million due to the economic climate, while the number of projects remained stable.

BREAKDOWN OF FUNDRAISING IN THE EUROPEAN UNION'S MAIN HEALTHCARE REGIONS.
Source: Pitchbook



A boom in corporate real estate in the healthcare sector, with a concentration in southern Paris Region

- Space dedicated to biotech companies will more than double by 2026, from 1,076,391 sq. ft. to over 2,690,978 sq. ft.
- A greater supply of rental spaces, especially in southern Paris Region in Essonne (91), Paris (75) and Val de Marne (94), which should account for 90% of the total supply by 2030.
- The development of "residential pathways" capable of supporting the growth of companies in the same areas.

The scientific excellence of Paris Region universities in the core fields of the healthcare sector

→ **With 12 universities ranked in the TOP 50** in core healthcare fields, France ranks 3rd among European countries within the zone studied*.

→ **The 7 core fields of the healthcare sector are represented** in France, while a concentration on a reduced number of themes is observed in other countries.

→ Paris Region is the **number one region in the zone studied* in terms of the number of universities ranked in the TOP 50 for each theme: 11 out of 12 universities** (cf. figure 17, p40).

PODIUM OF REGIONS WITH A CONCENTRATION OF UNIVERSITIES IN THE TOP 50 CORE HEALTHCARE FIELDS.
Source: Shanghai 2023 ranking

*The following EU countries: Germany, Netherlands, Belgium, Spain, Italy. Results from Switzerland and Great Britain are included for the sake of ecosystem perspective, but are not included in the results presented.

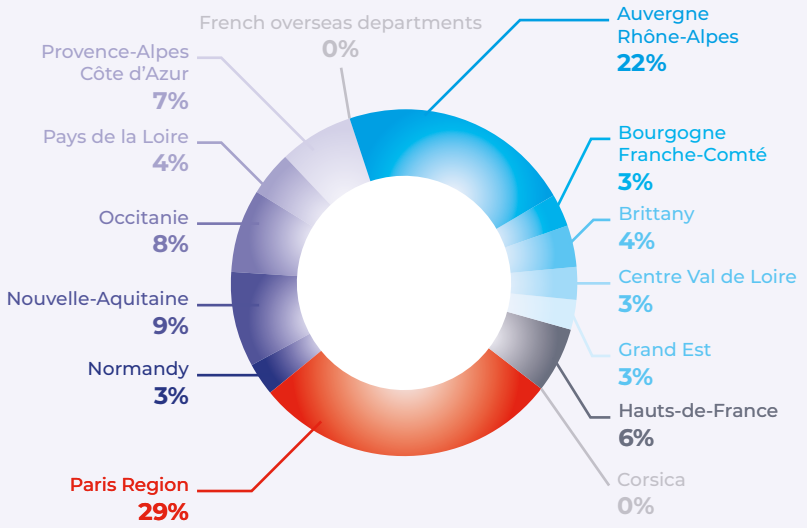
Paris Region: France's leading region for patent filings in core healthcare fields

→ France is a major stakeholder in patent filings in the European Union's core healthcare fields: **in second place behind Germany.**

→ Paris Region represented **29% of patent applications in 2022** in core healthcare fields, ahead of Auvergne-Rhône-Alpes (22% of applications).

→ The breakdown of the technological fields of the patents is similar in Paris Region to the national distribution: **nearly 70% concern medical technologies.**

BREAKDOWN OF PATENT APPLICATIONS IN FRANCE IN 2022 FOR THE 4 CORE TECHNOLOGY FIELDS OF THE HEALTHCARE SECTOR.
Source: INPI



Paris Region is present in the major strategic sectors for healthcare innovation, despite a decline in the number of projects and still unevenly distributed sectors.

Biotech/ pharma :

→ **No. 1** in terms of the number of projects financed.

→ A visible "Advanced Therapy Medicinal Product (ATMP)" effect: **+68%** chances for funding gene and cell therapy projects.

Medtech :

→ Funding portions **on the rise.**

→ Strong momentum on attractive financing rates (**52%** for biomaterials and implants).

Digital health:

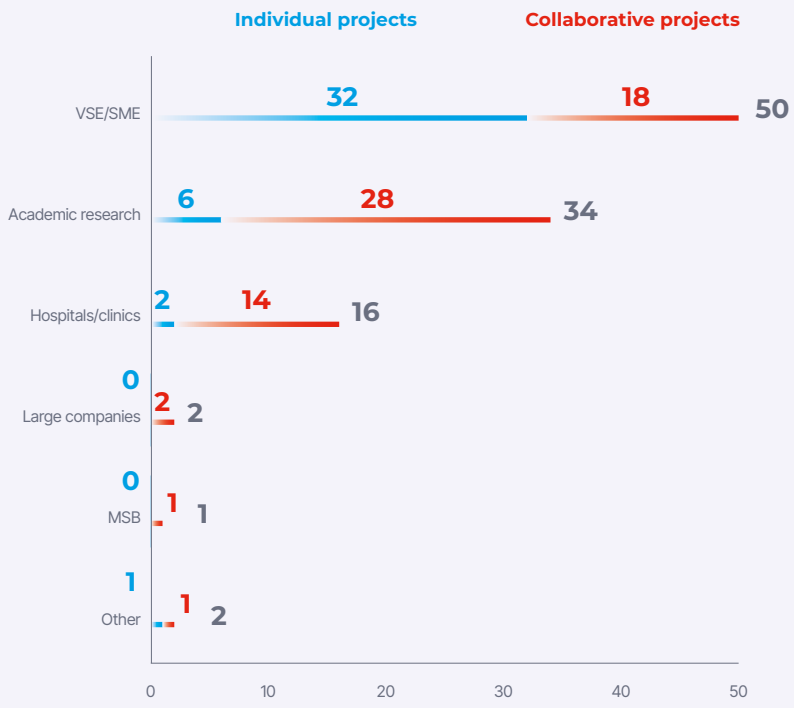
→ Sector **only slightly represented** and **on the decrease** in terms of the number of projects.

→ **Among the lowest financing rates** (38% for healthcare software, 37% for healthcare organization).

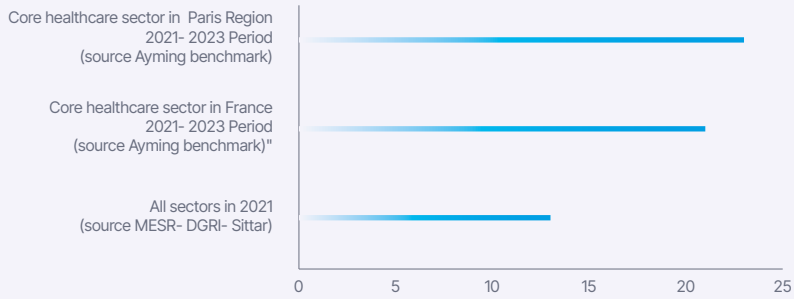
A highly collaborative R&D dynamic in Paris Region

- Project funding is a powerful lever for collaboration, particularly through projects led by academic research: **61% of projects are collaborative.**
- Companies in Paris Region show great interest in the **the use of young PhDs as a gateway** between academic and private research.
- The Paris Region healthcare industry is a value chain characterized by the use of outsourced research services.

BREAKDOWN OF APPROVED AND FUNDED PROJECTS IN 2021 - 2023.
Source: Medicen #105 projects



EXPENDITURE ON OUTSOURCED RESEARCH SERVICES INCLUDED IN THE RESEARCH TAX CREDIT.
Source: Ayming benchmark and MESR- DGRI- Sittar



Paris Region to specialize in therapeutic areas and step up its focus on AI

Paris Region: specializing in oncology, cardiology and immuno-inflammation

Oncology/hematology:

→ **76 projects** filed are in oncology, with a **41% financing rate.**

→ **Paris Region trends** in line with national trends.

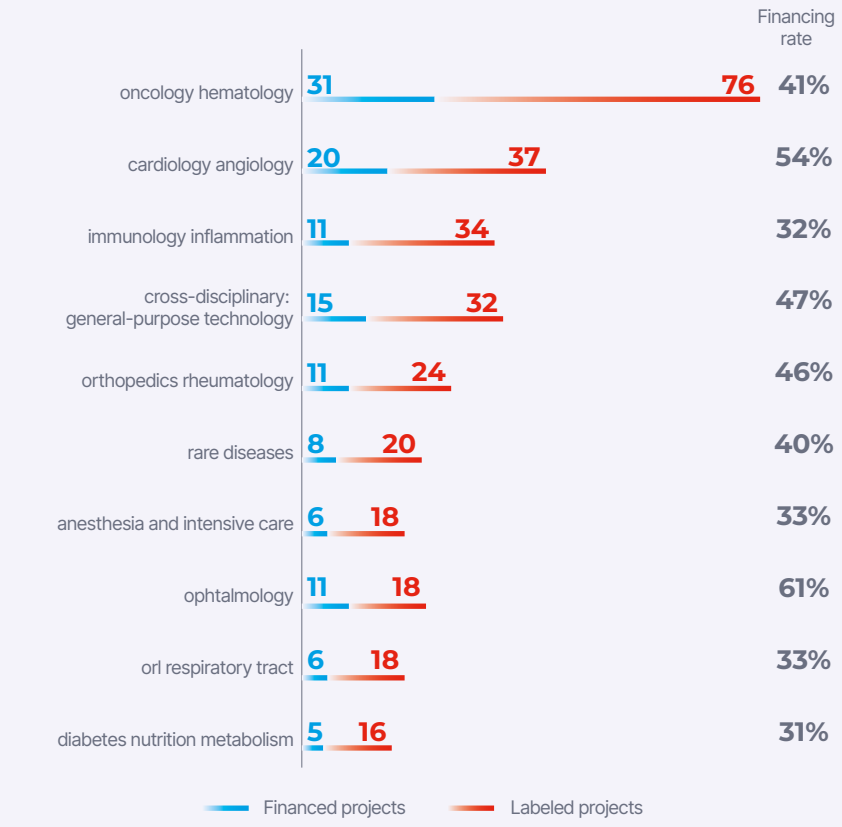
Cardiology / angiology:

→ **Paris Region specificity and high financing rate of 54%** for the Medtech sector.

Immuno-inflammation:

→ **In third place** in terms of the number of projects, but **a lower financing rate.**

TOP 10 THERAPEUTIC AREAS ADDRESSED BY PROJECTS / PRESENT AMONG FUNDED PROJECTS (2021-2023 PERIOD).
Source: Medicen



Data from the analysis of public funding is backed up by analysis of data on other funding sources, highlighting a Paris Region focus on oncology and cardiology.

AI through R&D funding:

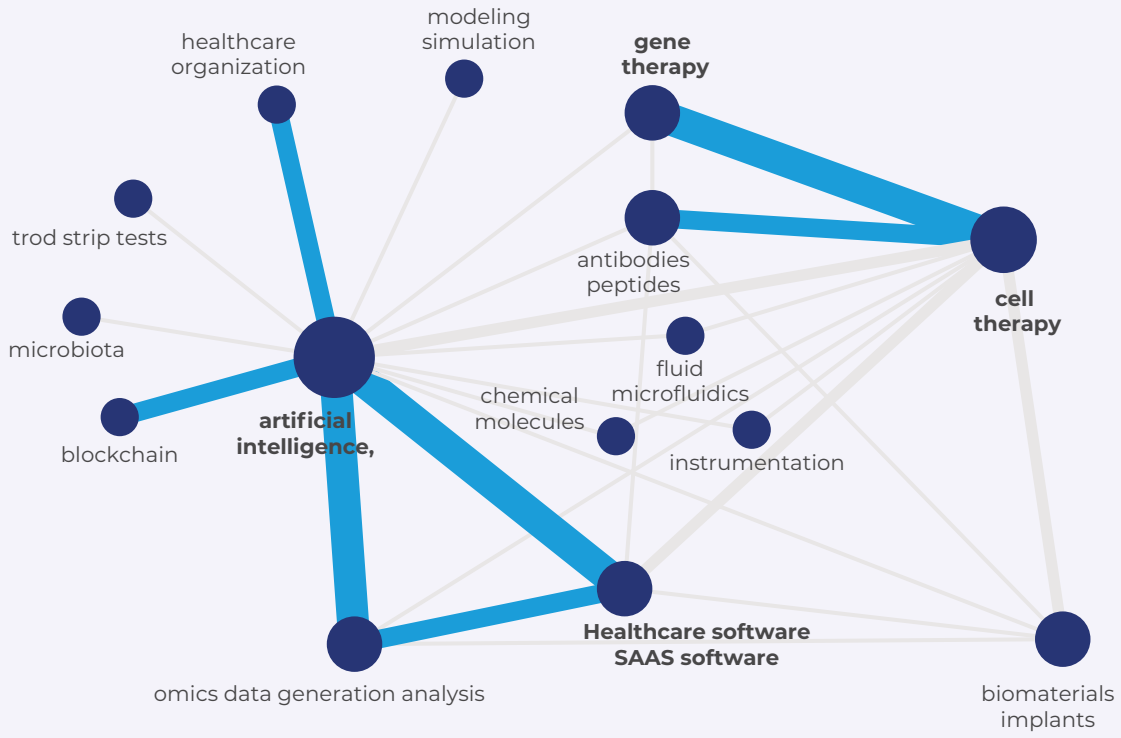
The AI revolution: 1 in 2 companies that raised capital embraced AI in 2023, compared with 30% in 2020.

→ A project that includes AI has a 42% chance of obtaining public funding.

→ AI is polarizing the axes of development and is (partially) transcending the concepts of sectors by interconnecting with both Medtech and digital health topics..

CONNECTION AND CO-OCCURRENCE BETWEEN THE PROJECTS' TECHNOLOGICAL ORIENTATIONS
(statistically significant difference) #276 certified projects.

2021- 2023

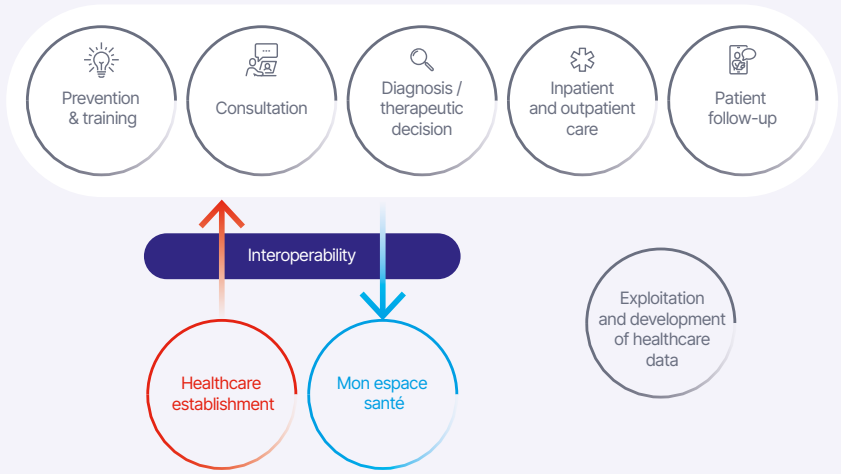


Thematic focus: Digital health in hospitals / women's health

→ Digital health: a profound revolution in the management of women's pathologies:

- More than just improved processes, **digital transformation is redefining the patient-healthcare system relationship**
- Digital health and Femtech: two synergistic sectors

HEALTHCARE PATHWAY MAPPING AND DIGITAL SOLUTIONS.
Source: Medicen



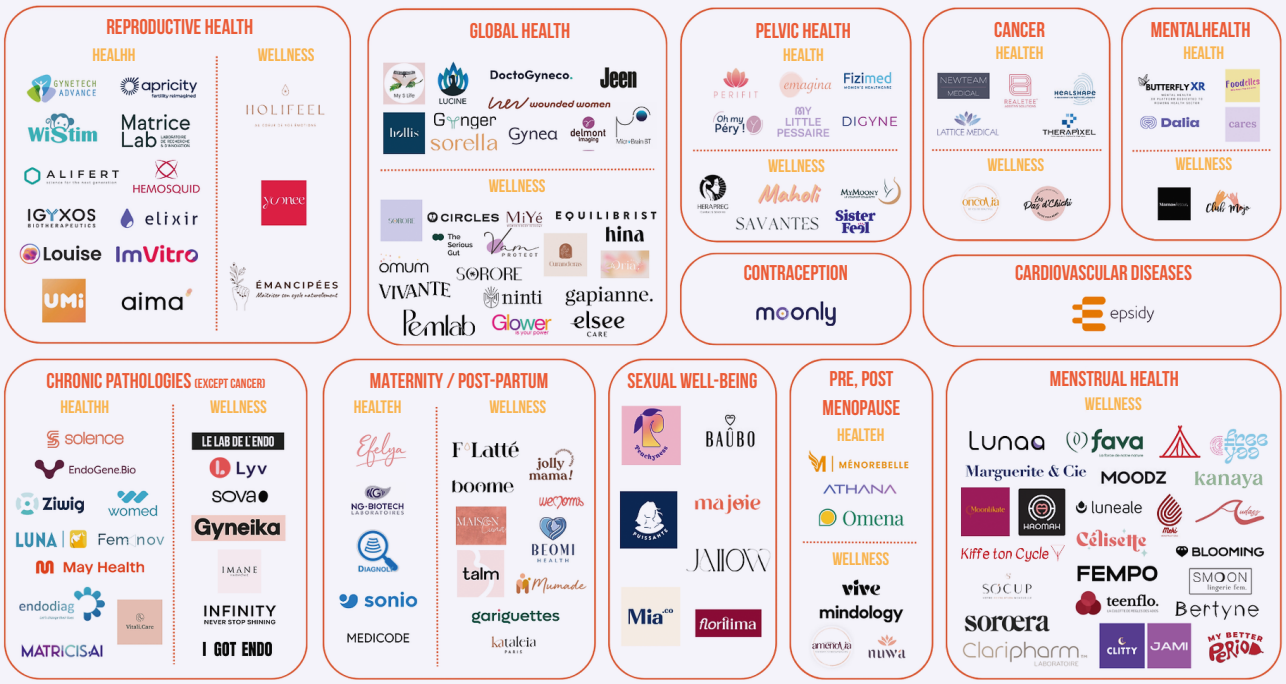
→ Femtech is developing around highly digitized public and private stakeholders that cover the entire patient pathway:

- The Femtech sector: a booming "market"
- The French Femtech ecosystem: **a theme that encompasses the entire patient pathway**

→ Diagnostic wandering and pathologies

- Women's pathologies **a multi-causal diagnostic complexity**
- **An area of expertise in Paris Region**
- Endometriosis: a transformation in patient care

MAPPING OF FRENCH FEMTECH STARTUPS IN 2024.
Source: Femtech France



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01.

Paris Region: Europe's most attractive region

01. Paris Region: Europe's most attractive region

Paris Region: a major impact on the French healthcare industry

THE PARIS REGION HEALTHCARE INDUSTRY ECOSYSTEM: A 100,000-JOB SECTOR

Work carried out in 2023 in partnership with the Institut Paris Region has helped to map the number of companies and jobs in the Paris Region healthcare industry (see mapping of jobs in Paris Region, pages 24-25).
This mapping was based on a dual analysis method using i- NAF codes dedicated to healthcare ii- and a referencing of companies based on consultations with local unions, incubators and accelerators.

We were able to highlight the fact that the Paris Region healthcare industry had 1,320 companies with more than 1 employee, including 40 large companies, 190 medium-sized companies and 1,090 start-ups and V/SMEs (see job map for Paris Region, pages 24-25).

Using this approach, we were able to estimate that the healthcare industry accounted for 100,000 jobs. In addition, our method shows that **this sector is particularly difficult to map,** as the NAF code analysis conventionally used is not suitable for a large number of companies (companies in the Digital Health sector, etc.). Thus, for the first time, we were able to show that **30% of jobs (27,000) were not mapped** using conventional analysis methods.

PARIS REGION ACCOUNTS FOR OVER 30% OF INDUSTRIAL JOBS IN THE FRENCH HEALTHCARE SECTOR

Data from URSSAF databases for 2023 show that **Paris Region accounts for 30% of private sector jobs in the French core healthcare sector[1].** There are three main points to note about the healthcare industry ecosystem in Paris Region (Figure 1).

This ecosystem:

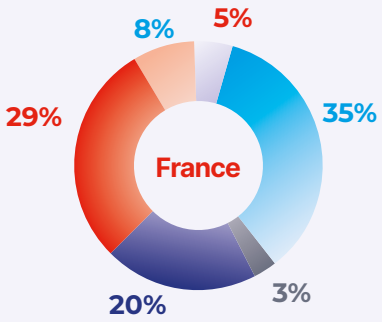
- → Accounts for over 1/3 of French R&D jobs in biotechnology (5,934 jobs)
- → Employs 1 in 2 French people in wholesale trade (30,652 jobs) and electronics manufacturing (2,660 jobs).
- → But only accounts for 15% of French jobs in the manufacture of pharmaceutical products and preparations (16,338 jobs) or medical and surgical equipment (4,973 jobs).

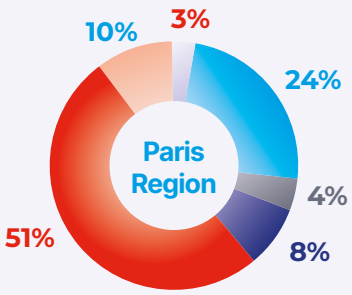
HEALTHCARE INDUSTRIES IN PARIS REGION: +7% OF PARIS REGION INDUSTRIAL JOBS

In addition, the healthcare sector accounts for 1% of jobs in Paris Region, the same figure as in France as a whole. On the other hand, the healthcare sector accounts for 7% of all industrial jobs in Paris Region, i.e. 2 points higher than the national figure (source URSSAF).

1 The healthcare sector is defined in this paragraph by the 6 NAF codes that can be affiliated to the sector. See Methodology appendix.

FIGURE 1: BREAKDOWN OF JOBS IN THE CORE HEALTHCARE SECTOR IN FRANCE AND PARIS REGION.
Source: URSSAF, IPR analysis





	Paris Region	Rest of France
2110Z	15%	85%
2120Z	20%	80%
2660Z	48%	52%
3250A	12%	88%
4646Z	50%	50%
7211Z	38%	64%

- 2110Z: manufacture of basic pharmaceutical products
- 2120Z: Manufacture of pharmaceutical preparations
- 2660Z: Manufacture of medical irradiation equipment, electromedical and electrotherapeutic equipment
- 3250A: Manufacture of medical, surgical and dental equipment
- 4646Z: Wholesale of pharmaceutical products
- 7211Z biotechnology research and development

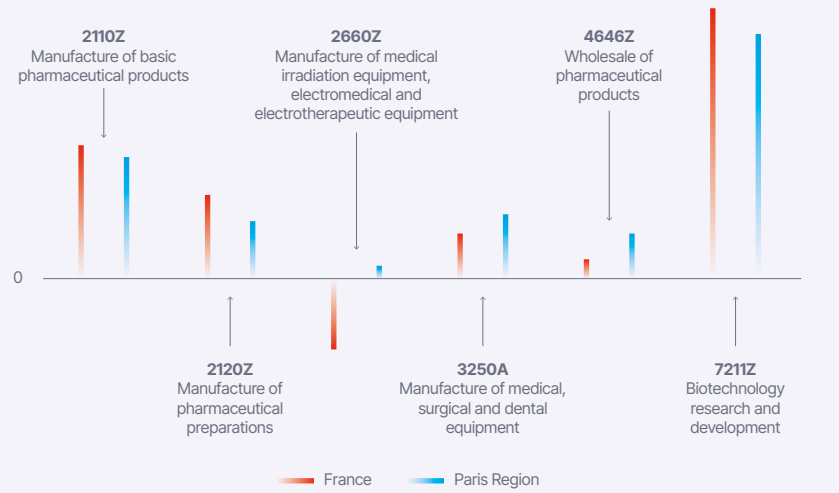
01. Paris Region: Europe's most attractive region

A POSITIVE JOB CREATION DYNAMIC, WITH A STRENGTHENING OF THE PHARMACEUTICAL AND BIOTECHNOLOGY R&D SECTORS

The healthcare industry is a dynamic sector, with the overall number of jobs in the core sector growing in Paris Region (**+8%**),slightly slower than nationwide (**+11%**).

An analysis of the breakdown of jobs in the healthcare industries by field of activity reveals a highly heterogeneous trend compared to national trends, with 3 main categories (Figure 2).

FIGURE 2: CHANGE IN THE NUMBER OF JOBS IN THE HEALTHCARE INDUSTRIES BETWEEN 2018 AND 2023 IN BLUE: PARIS REGION; IN RED: FRANCE; DETAIL ON BASE 100.
Source: URSSAF, IPR analysis



Stronger growth in Paris Region than in France for certain activities...

→ Over the past 5 years, we have seen more favorable growth in Paris Region than in the rest of France in the manufacture of basic pharmaceutical products (+275 jobs); **+21%**) and pharmaceutical preparations (+1649 jobs ; **+13%**) (NAF codes 2110Z and 2120Z).

→ As well as biotechnology R&D jobs, with an increase in the number of jobs since 2018 (+1753 jobs; **+42%**) (7211Z).

... but slower growth in Paris Region than in France in other areas:

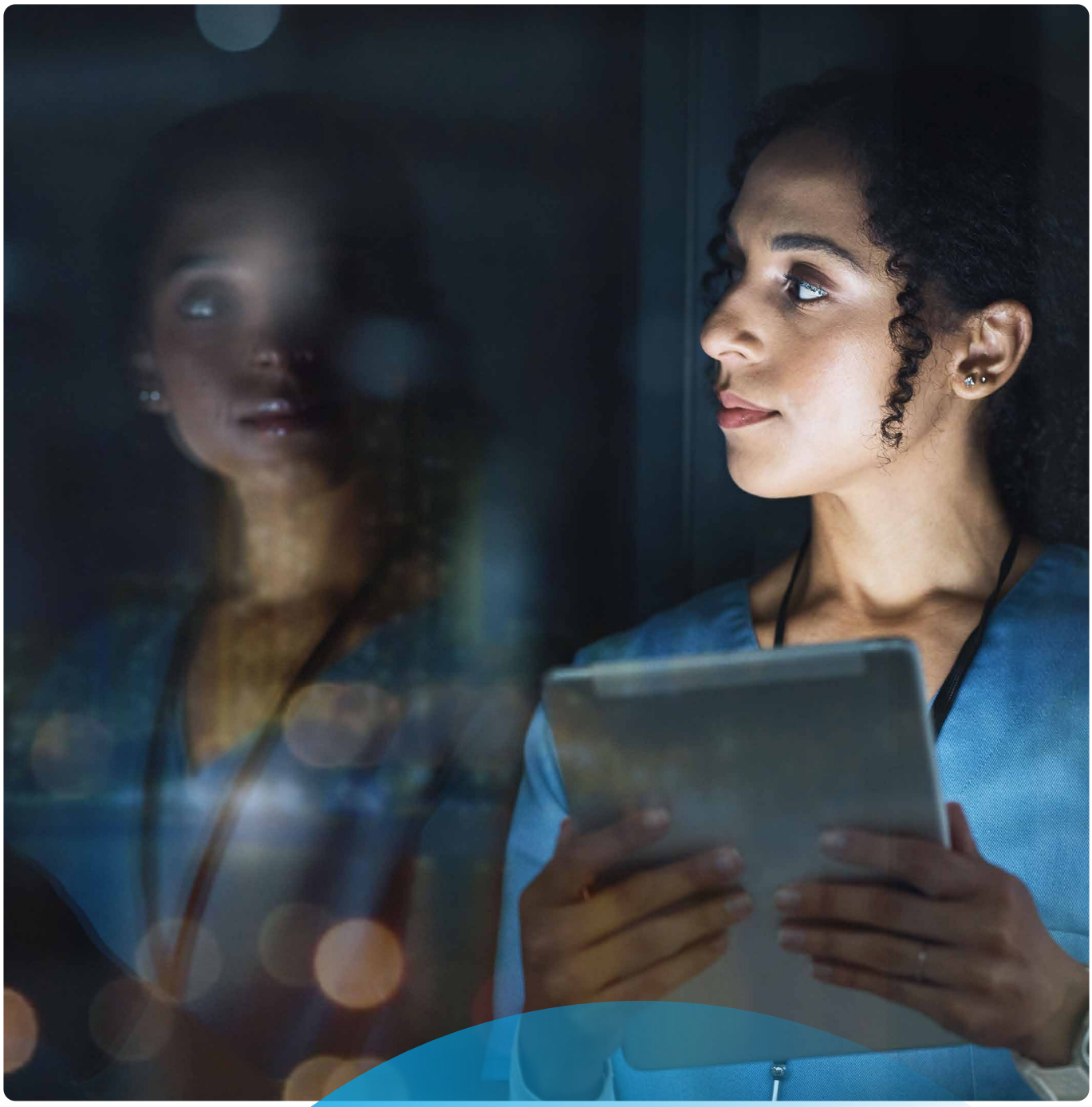
→ We are also seeing a slowdown in job creation in the Paris Region wholesale sector (+922 jobs), **+ 3%**) (4646Z), Paris Region's leading healthcare sector in terms of employment.

→ Similarly, job creation in the manufacture of medical, surgical and dental equipment is at a standstill (+338 jobs), **+7%**) (3250A).

... And in a sector that's growing in France, job losses in Paris Region

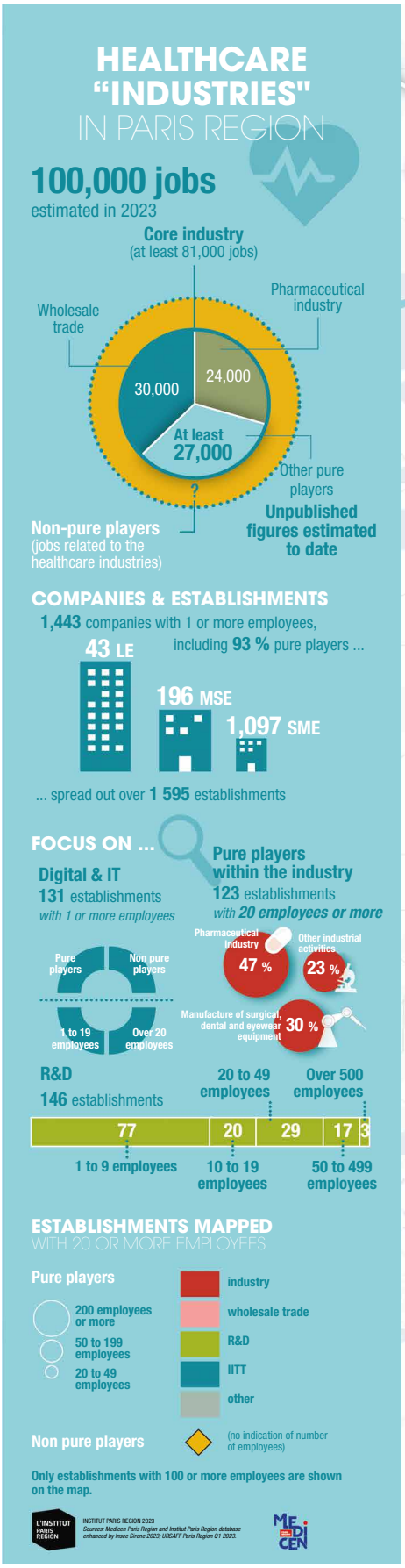
→ Since 2018, the number of jobs in electronics manufacturing has fallen sharply, with a very sharp acceleration over the past 2 years (-322 jobs, **-11%**) (2660Z).

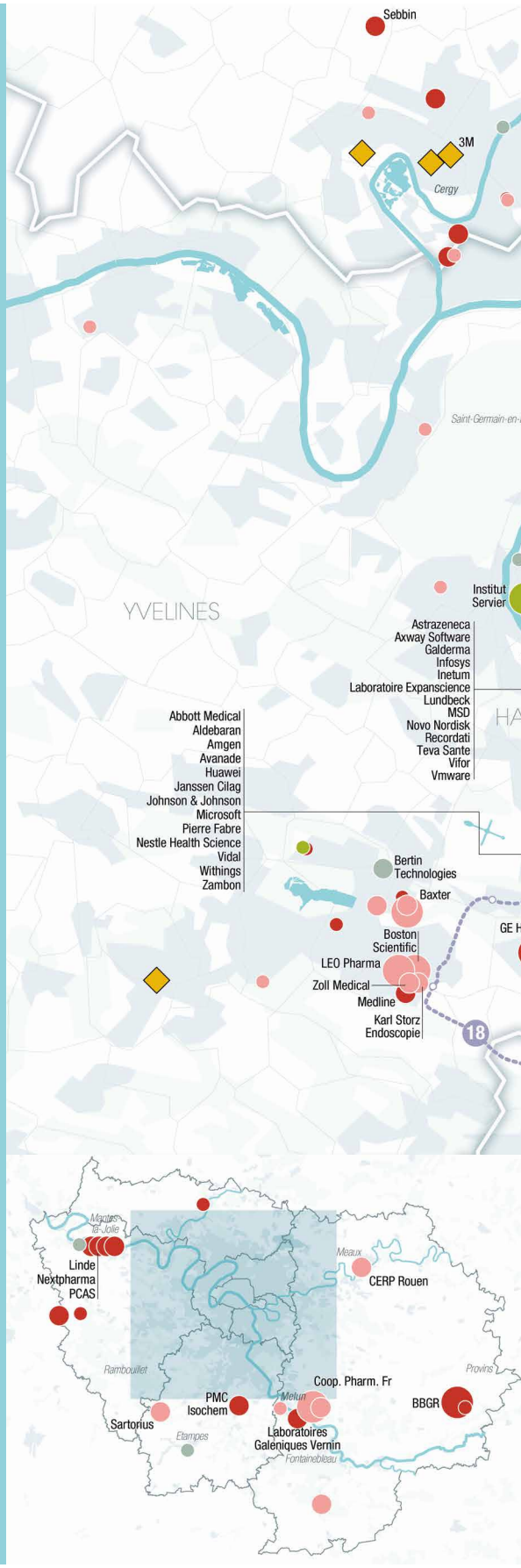
It should be noted that the job creations observed over this period in the manufacture of basic pharmaceutical products and pharmaceutical preparations (2110Z and 2120Z) are surprising. Indeed, since 2007, we have observed an erosion of jobs in this sector. *(Institut Paris Region survey 2018).* This data will need to be monitored over the next few years to see whether this is a real change in trends or just a short-term effect.

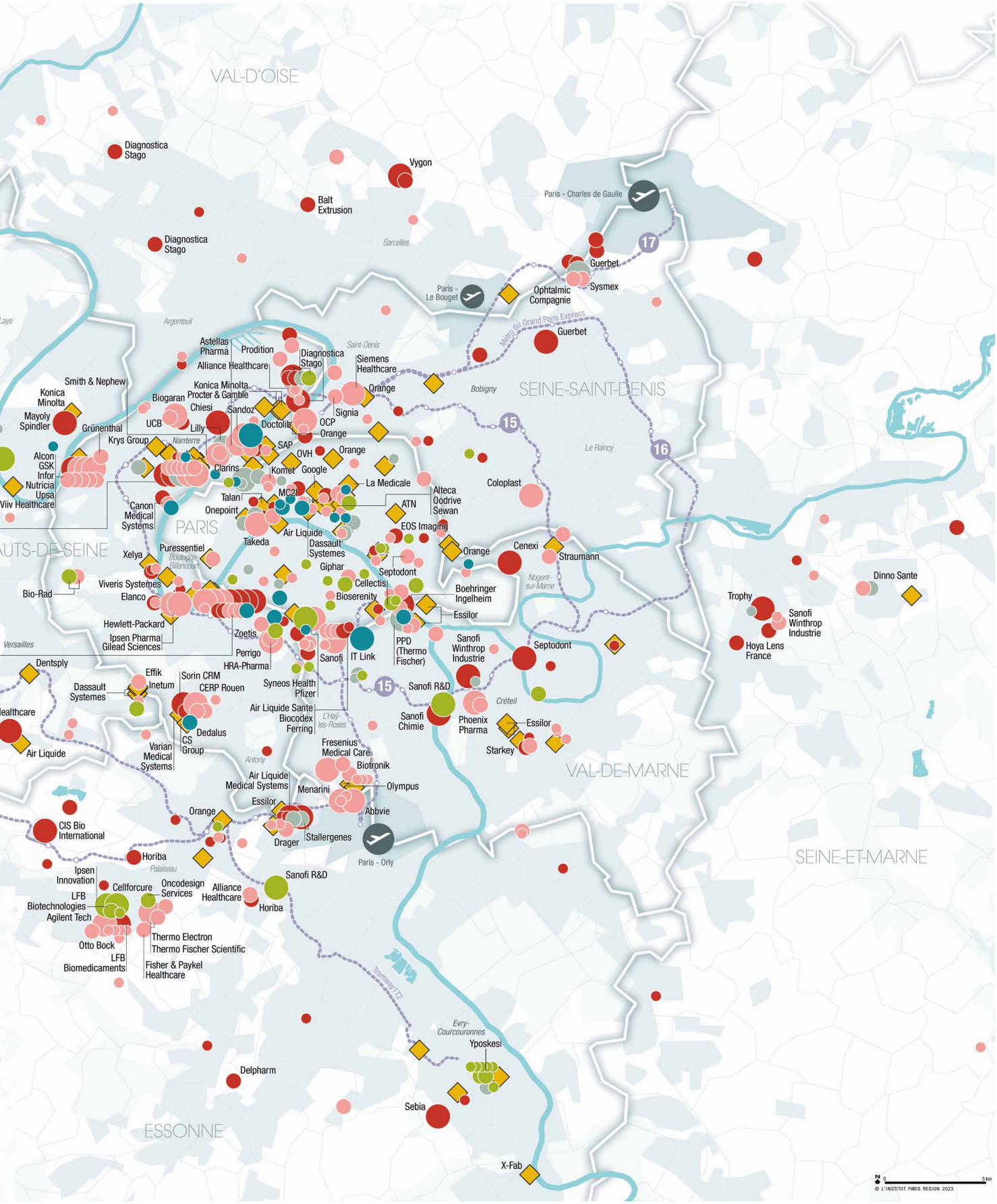


01. Paris Region: Europe's most attractive region

HEALTHCARE "INDUSTRY" JOBS: MAPPING JOBS IN PARIS REGION






VAL-D'OISE
SEINE-SAINT-DENIS
PARIS
VAL-DE-MARNE
SEINE-ET-MARNE
ESSONNE
Diagnostica Stago
Vygon
Balt Extrusion
Paris - Charles de Gaulle
Sarcelles
Guerbet
Sysmex
Ophtalmic Compagnie
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Drager
Stallergenes
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01. Paris Region: Europe's most attractive region

Paris Region: a boom in corporate real estate to enhance attractiveness

Faced with a real shortage of laboratory space for healthcare companies, as well as a lack of clarity in the current offer, companies are forced to find solutions on their own, which can lead to high development costs, or even force them to leave Paris Region.

Nevertheless, a real dynamic has been underway for several years now to overcome these difficulties and facilitate the development of healthcare companies in Paris Region.

To gauge this burgeoning trend, we conducted 26 interviews from March to June 2024 with a wide variety of profiles (developers, space managers, end users, public territorial stakeholders, etc.) (see mapping on pages 32-33).

A CORPORATE REAL ESTATE MARKET THAT WILL DOUBLE BY 2026, AND COULD TRIPLE BY 2030

Paris Region to strengthen its Life Science (LS) real estate offering. The existing marketable surface area (including laboratories, associated offices and common areas) currently stands at almost 1,162,502 sq. ft and will double by the end of 2026 to reach 2,690,978 sq. ft. Then, subject to the successful marketing of these new sites, it could triple by 2030. This corresponds to a **155% increase in marketable space** for 'L1/L2' **laboratories** by the end of 2026 (Figure 3).

FIGURE 3: INCREASE IN FLOOR SPACE (M²) - LIFE SCIENCE REAL ESTATE.
Source: Medicen and Institut Paris Region

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OFFER CONCENTRATED IN SOUTHERN PARIS REGION : ESSONNE (91), PARIS (75) AND VAL-DE-MARNE (94)

The distribution of the existing offer is concentrated in 3 departments that continue to grow and consolidate the LS residential offer in Paris Region:

→ Paris (75).

→ Essonne (91).

→ Val-de-Marne (94).

With a total of **42 LS real estate sites** by 2030 (Figure 4), they will together account for almost all the offer on the market, i.e. almost 3,121,534 sq.ft. (91% of the total).

In particular, the Essonne department is on the rise and will account for more than half (**52%**) of Paris Region's LS marketable space by 2030 (Figure 4). By 2026, Essonne will have almost quadrupled (x3.7) its existing space, while Val-de-Marne (x2.34) and Paris (x1.64) will have almost doubled theirs.

The increase in LS real estate supply in Paris Region is almost exclusively concentrated **in 4 major hubs in these regions (figure 5):**

→ **In Villejuif, near the Paris Saclay Cancer Cluster (94),** +613,543 sq. ft. of marketable healthcare space will be available by 2029.

→ **In Evry at the Genopole (91),** +333,681 sq. ft. of marketable space will be created by 2026, thus completing the residential offering at the existing site.

→ **In southern Paris (75),** a new offering of +258,334 sq. ft. will double the current 236,806 sq. ft..

→ **On the plateau de Saclay (91),** nearly 565,644 sq.ft. will be created by 2027.

FIGURE 4: NUMBER OF LIFE SCIENCE SITES IN PARIS REGION BY DEPARTMENT.
Source: Medicen and Institut Paris Region

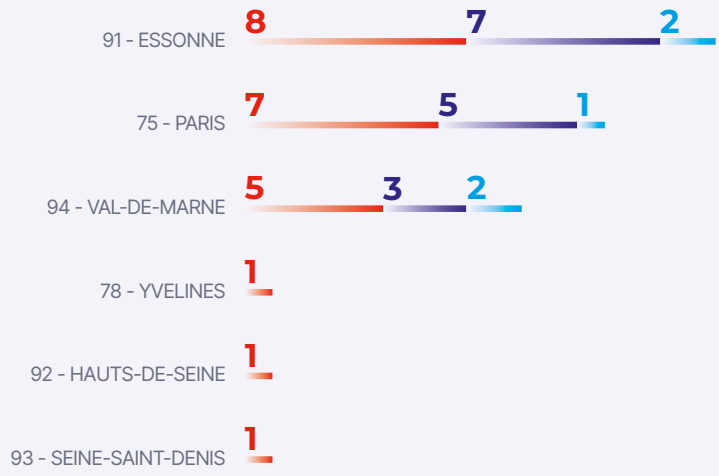
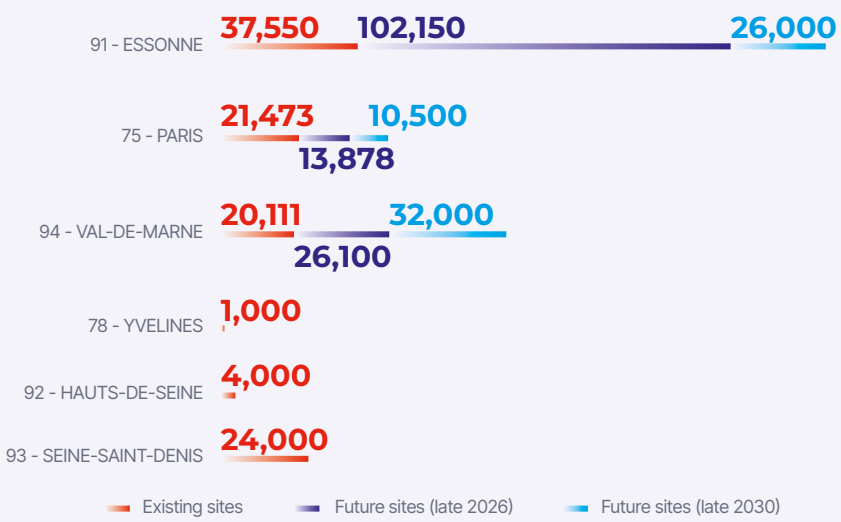


FIGURE 5: DISTRIBUTION AND EVOLUTION OF FLOOR SPACE (M²) IN PARIS REGION BY DEPARTMENT.
Source: Medicen and Institut Paris Region



"There are 3 major areas within the golden triangle formed by Villejuif, Evry and Saclay. A comprehensive offering is being built to meet strong local and international demand. These facilities are mainly geared towards early-stage companies, with flexible leases, and large companies that are setting up for the first time. This life science or health tech sector is expected to generate the most foreign company set-ups by 2026."

Jérémy HERVE, Director of Innovation and Economic Development, Établissement public d'aménagement Paris-Saclay (EPA)

The polarization of LS real estate supply in southern Paris Region is accentuated by the Yvelines department (78), while the Hauts-de-Seine (92) and Seine-Saint-Denis (93) departments remain on the sidelines of this LS real estate boom, and do not foresee any significant increase in floor space between now and 2030.

There is a strong possibility of a discrepancy between the analysis declarations and the actual situation in 2026, particularly with regard to the laboratory surface areas envisaged, which seem likely to be overestimated. In order to provide a true picture, we need to monitor the marketing of these sites and the rate at which the first wave of offers is sold out, between now and 2026.

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01. Paris Region: Europe's most attractive region

THE RESULT OF A WINNING TRIO: MAJOR HOSPITAL CENTERS, GOVERNMENT SUPPORT AND THE DEVELOPMENT OF THE GRAND PARIS EXPRESS.

01. **Innovation-focused healthcare centers:** these real estate sites benefit from their proximity to major innovation-oriented hospital centers, which allow for access to the many technical platforms in the surrounding area that are essential to companies at every stage of their development. We have mapped some forty hospitals and over 300 academic platforms that companies can access.

02. **These future sites are fully in line with public initiatives such as bioclusters France 2030 and the Paris-Saclay regional development policy.** Indeed, bioclusters such as the Paris Saclay Cancer Cluster in Villejuif, Brain & Mind in Paris and GenoTher in Évry-Courcouronnes allow complementary R&D entities to work closely together on key healthcare innovation themes, with one clear objective: **to foster public-private collaboration and translational medicine.**

03. **The first effect of the Grand Paris Express:** transportation networks are one of the determining factors when companies choose to locate outside Paris. Future LS projects will benefit directly from the new Grand Paris Express which, in addition to the already extensive network (RER, Transilien, metro), will simplify access to the Greater Paris region with the extension of line 14 to Orly and the interconnection of the various innovation hubs with the future lines 15 and 18.

THE DEVELOPMENT OF "RESIDENTIAL PATHWAYS": A STANDARD TO SUSTAINABLY SUPPORT THE MATURING OF BIOTECHS

The development of the residential offering is built around a major challenge: **the completion of a genuine residential pathway for companies.** Two types of LS hosting sites will be created to support the growing maturity of biotech companies and meet their evolving needs:

→ **Plug-and-Play" structures (17 sites by 2030),** aimed at young biotechs, offer a complete range of services, with laboratory areas of just over a hundred square feet, and very often with personalized support to accelerate the maturing of the companies that are incubated there. The sites recently operated by Biolabs at Broussais and Servier (Spartners), and the Genopole Entreprise incubator are typical examples of this approach.

→ Biotechs that are leaving their incubators are looking for new premises of a very specific type. **The "Graduate & Plateaux curés" structures (30 sites by 2030)** respond precisely to this need for expansion from a few thousand to several hundreds of thousand of square feet of laboratory and office space with highly flexible layouts. Very often unfurnished, these areas are aimed at biotechs that are able to sign longer leases. The Villejuif Bio Park, Biocitech, Silver Innov, the 13th arrondissement Biopark, Genopole Life and the Kadans and Perelis buildings all illustrate this segment.

In particular, Genopole is a pioneer for its strategic plan to offer a complete residential pathway in its area as of 2026. With almost 645,835 sq. ft. of marketable LS space spread over 5 campuses, Genopole will offer real estate adapted to the different degrees of maturity of companies, from business incubators to biomanufacturing facilities and business hotels. Genopole's strategy is to encourage companies to set up in the area over the long term, by offering them a truly local residential environment.

Interview Genopole

The synergies created between biocluster, public and private research stakeholders, combined with an environment that fosters innovation, will enhance the region's attractiveness.

David Bodet
Deputy General Manager, Genopole

How does Genopole plan to adapt its real estate offering to the different stages of biotech maturity between now and 2030?

Based in Évry-Courcouronnes, Genopole, France's leading biocluster dedicated to biotechnologies and life sciences, has anticipated changes in the sector by adapting its real estate offering to the different stages of maturity of biotech companies, from start-ups to bioindustries. By 2030, this strategy will result in the creation of new, flexible and scalable spaces, designed to meet the varied needs of startups in their development phase, growing companies and mature enterprises. GenoLife, a new 226,042 sq. ft. real estate complex dedicated to R&D for mature companies that wish to join the Genopolitan ecosystem. Added to this is the CUBE project, 129,167 sq. ft. entirely dedicated to the bioindustry. These projects are fully in line with the strategy of the 2030 National Health Innovation Plan.

The emphasis will be on modular infrastructures, which will allow companies to quickly adjust the size and specific features of their offices, laboratories and production areas as their business grows. Both projects are being developed in partnership with Bart-Patriarche and private investors.

What are the strategic advantages for a biotech company in having a local residential network?

Genopole's support services offer considerable strategic advantages for biotech companies. On the one hand, this geographical proximity allows for continuity in project development. This means that a biotech company can remain in the same environment throughout its life cycle, from R&D to industrial production, without the disruption of having to move or find new premises.

On the other hand, this approach facilitates access to local innovation networks, research laboratories, technology platforms and local universities and grandes écoles. Maintaining close proximity to other companies in the sector fosters an ecosystem that is conducive to exchange and innovation.

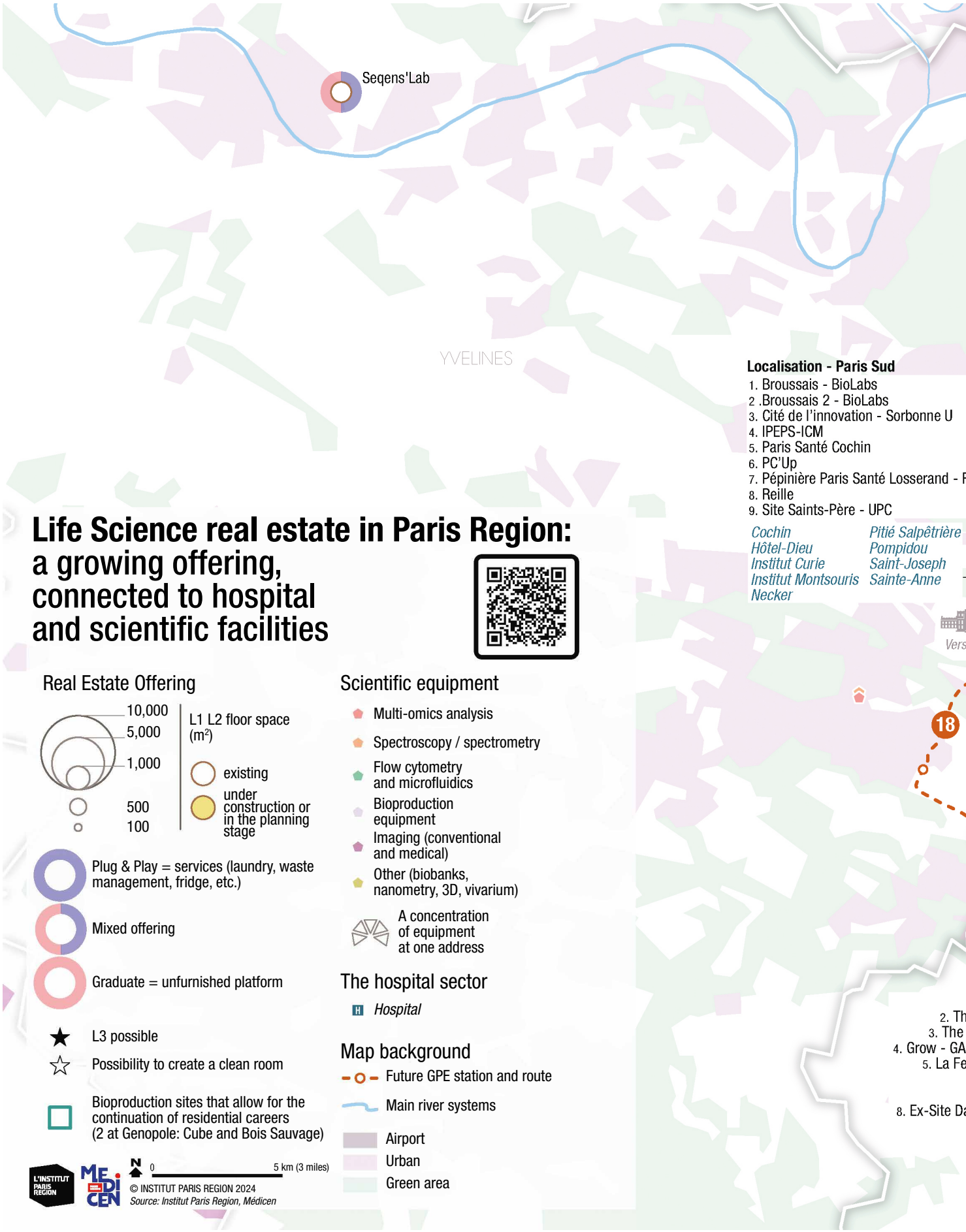
How can the development of Genopole's real estate offering make the region more attractive to biomanufacturing companies and encourage them to set up long-term operations?

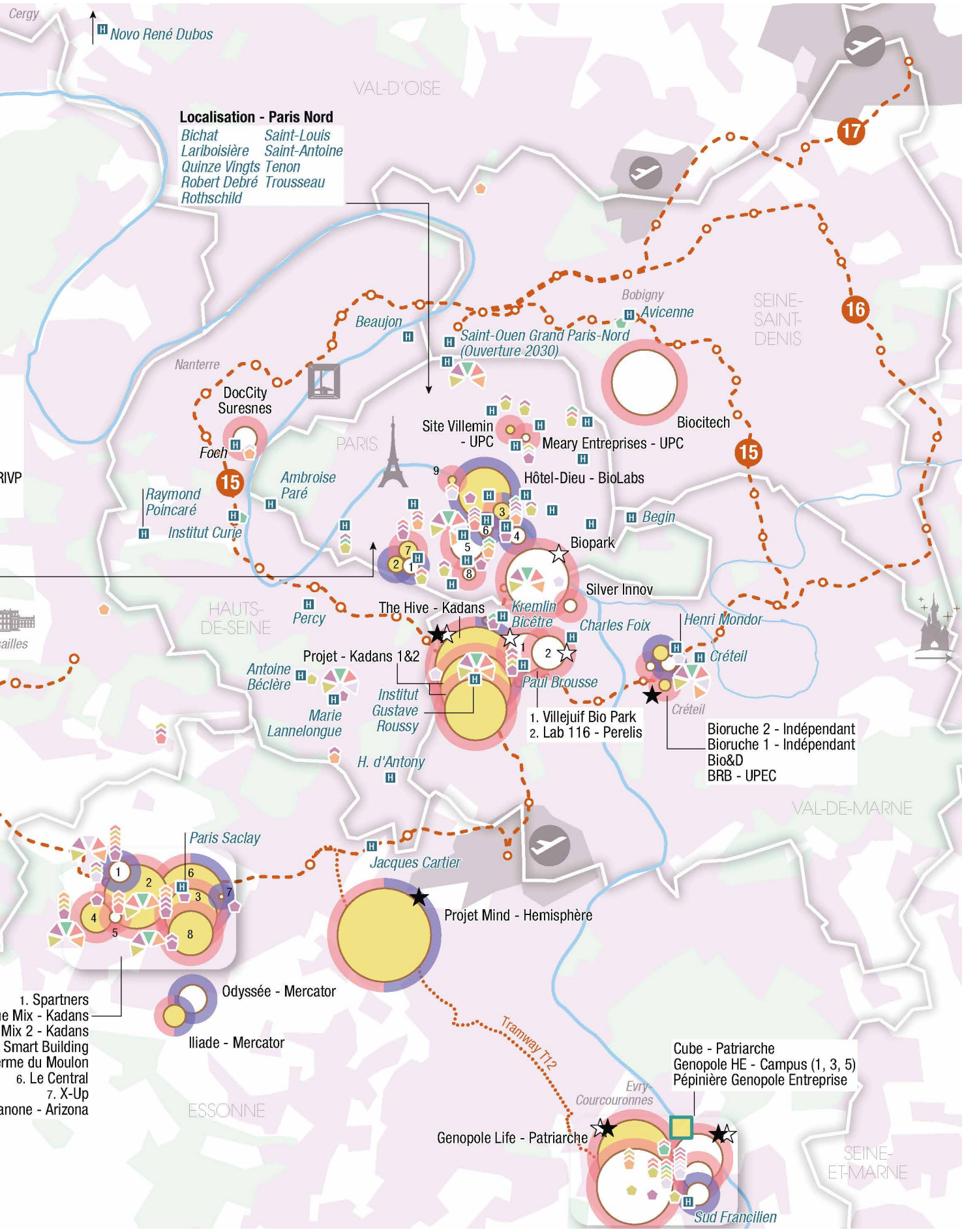
The development of Genopole's real estate offering plays an essential role in making the region an attractive location for biotech companies.

By offering modern infrastructures, such as shared platforms, that are tailored to the specific needs of this sector, our biocluster is positioning itself as an essential hub for biotech in France and in Europe.

This development effort is accompanied by a support policy for companies, which includes subsidies via national programs and customized support for each structure. The synergies created between biocluster, public and private research stakeholders, in conjunction with an innovation-friendly environment, will enhance the region's attractiveness and encourage the sustainable setting up of biotech companies.

01. Paris Region: Europe's most attractive region




Cergy
Novo René Dubos
VAL-D'OISE
Localisation - Paris Nord
Bichat
Lariboisière
Quinze Vingts
Robert Debré
Rothschild
Saint-Louis
Saint-Antoine
Tenon
Trousseau
17
16
15
Bobigny
Avicenne
SEINE-SAINT-DENIS
Beaujon
Saint-Ouen Grand Paris-Nord (Ouverture 2030)
Nanterre
DocCity Suresnes
Foch
Biocitech
Site Villemin - UPC
Meary Entreprises - UPC
PARIS
Hôtel-Dieu - BioLabs
Ambroise Paré
Raymond Poincaré
Institut Curie
Begin
Biopark
Silver Innov
HAUTS-DE-SEINE
Percy
The Hive - Kadans
Kremlin Bicêtre
Charles Foix
Henri Mondor
Créteil
Projet - Kadans 1&2
Antoine Béclère
Institut Gustave Roussy
Paul Brousse
Marie Lannelongue
1. Villejuif Bio Park
2. Lab 116 - Perelis
Bioruche 2 - Indépendant
Bioruche 1 - Indépendant
Bio&D
BRB - UPEC
H. d'Antony
VAL-DE-MARNE
Paris Saclay
Jacques Cartier
Projet Mind - Hemisphère
Odyssée - Mercator
Iliade - Mercator
1. Spartners
Mix - Kadans
Mix 2 - Kadans
Smart Building
rme du Moulon
6. Le Central
7. X-Up
anone - Arizona
Tramway T12
Cube - Patriarche
Genopole HE - Campus (1, 3, 5)
Pépinière Genopole Entreprise
Evry-Courcouronnes
Genopole Life - Patriarche
ESSONNE
SEINE-ET-MARNE
Sud Francilien

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Economic attractiveness: leadership within the European Union

FOREIGN DIRECT INVESTMENT: PARIS REGION, AN ATTRACTIVE LOCATION WORLDWIDE

FIGURE 6: TOP 5 AREAS FOR FOREIGN DIRECT INVESTMENT PROJECTS IN PHARMACEUTICALS, BIOTECHNOLOGIES AND MEDICAL DEVICES.
Source : fDi Intelligence from The Financial Times Ltd en

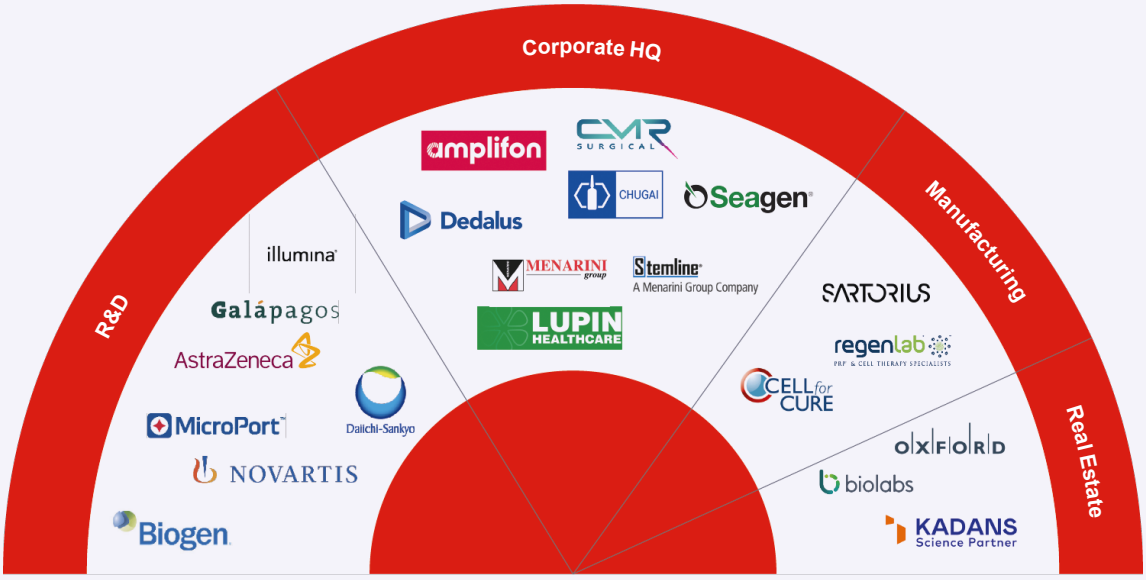
Area	Number of projects	Total capital investment (M€)	Capital investment average
PHARMACEUTICALS[2]			
Ireland (IE)	36	3,608.80	100.20
Catalonia (ES)	28	1,423.10	50.90
South East (UK)	28	351.40	12.50
Paris Region (FR)	27	142.90	5.30
Pennsylvania (US)	26	1,232.00	47.40
MEDICAL DEVICES			
Ireland (IE)	49	2,879.70	58.80
Alajuela (CR)	46	1,138.50	24.80
North Rhine-Westphalia (DE)	34	167.20	4.90
Baden-Württemberg (DE)	30	431.70	14.40
Paris Region (FR)	25	196.50	7.80
BIOTECH			
Massachusetts (US)	69	2,323.20	33.60
California (US)	43	2,496.00	58.00
Ireland (IE)	32	3,277.20	102.40
South East (UK)	27	326.30	12.10
Paris Region (FR)	23	402.10	17.50

According to analyses by fDi Intelligence from The Financial Times Ltd, Paris Region ranked among the world's Top 5 regions for foreign direct investment in pharmaceuticals, medical devices and biotech in 2023. Although its investments are more modest than in other regions of the world (€142.90 million in pharmaceuticals, €196.50 million in medical devices, €402.10 million in biotechnologies), Paris Region has a high number of projects in each segment (27, 25 and 23 respectively), thus reflecting its major role in economic development and healthcare innovation in Europe and worldwide.

2 Source : fDi Intelligence from The Financial Times Ltd

This data is corroborated by the major investment projects identified and tracked by Choose Paris Region over the period 2019 - 2023, with plans to invest in R&D centers, management centers, production sites or real estate dedicated to Healthcare innovation.

FIGURE 7: MAJOR INVESTMENT PROJECTS IN PARIS REGION.
Source: Choose Paris Region



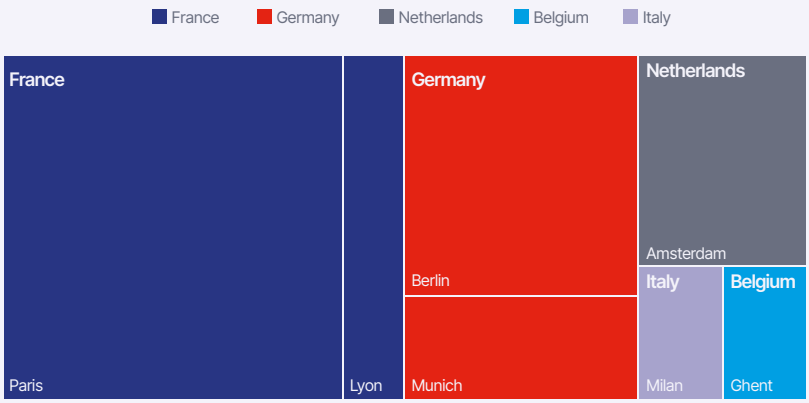
01. Paris Region: Europe's most attractive region

PARIS REGION: NUMBER ONE REGION IN THE EU IN TERMS OF PRIVATE FUNDING

An analysis of the amounts raised by healhtech companies in the main regions of the European Union shows that Paris Region is the leading region in terms of amounts invested over the 2021-2023 period(**2.728 M€**) ahead of the Berlin (**1.315 M€**), and Amsterdam regions (**816 M€**). (Figure 8).

Despite major initiatives to promote healthcare innovation in France, Paris Region still lags behind Greater London (**6.070 M€**) in Europe.

FIGURE 8: BREAKDOWN OF FUNDRAISING IN THE EUROPEAN UNION'S MAIN HEALTHCARE REGIONS).
Source: Pitchbook



PARIS REGION ACCOUNTS FOR 1 IN 3 INVESTMENTS IN FRANCE, BUT REPRESENTS +60% OF THE TOTAL AMOUNT INVESTED OVER THE LAST THREE YEARS.

Over the 2021-2023 period, Paris Region followed the national trend in venture capital activity in the healthcare innovation sector (corporate and venture capital), both in terms of the amount invested and the number of transactions (Figure 9).

Over this period, 1 in 3 investments went to companies based in Paris Region.

In 2023, in line with the global economic slowdown and the increasing difficulty for investment funds to raise funds themselves, total venture capital investment in Paris Region fell by 60% compared with 2022, from €2 billion to €0.83 billion, while the number of transactions remained relatively stable (Figure 10).

FIGURE 9: VENTURE CAPITAL TRANSACTIONS IN HEALTHTECH IN FRANCE VS PARIS REGION IN BILLIONS OF EUROS
Source : Pitchbook

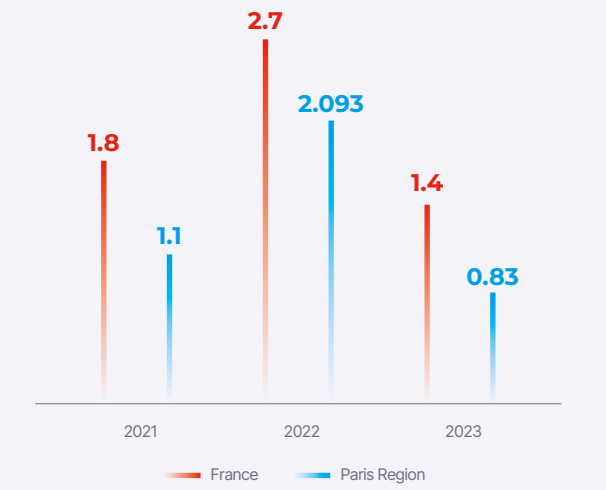
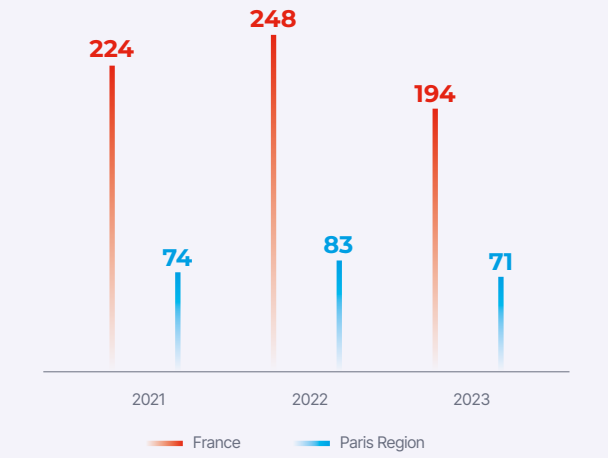
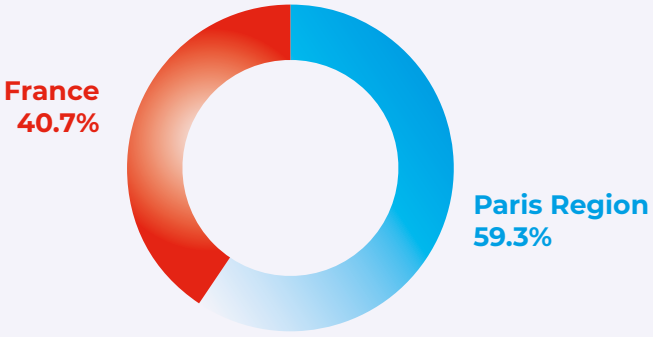


FIGURE 10: NUMBER OF VENTURE CAPITAL TRANSACTIONS IN THE HEALTHTECH SECTOR IN FRANCE VS. PARIS REGION.
Source: Pitchbook



In addition, Paris Region has concentrated most of the nationwide investments since 2021, accounting for 60% of the total amount invested nationwide (Figure 11).

FIGURE 11: PARIS REGION PERCENTAGE OF TOTAL VENTURE CAPITAL TRANSACTIONS NATIONWIDE
Source : PitchBook



01. Paris Region: Europe's most attractive region

The reduction in investments in 2023 reflects the global economic context and the significant drop in amounts invested. Surprisingly, over the 2021-2023 period, the average budget invested per transaction was stable at around €4 million in France (excluding Paris Region), whereas it varied considerably in Paris Region. In particular, the average amount was divided by 2.5, from €25 million in 2022 to €11 million in 2023.

Average budget invested per transaction (in M€)	2021	2022	2023
France (excluding Paris Region)	4.6	3.6	4.6
Paris Region	14	25	11

A MAJOR REDUCTION IN LATE-STAGE INVESTMENTS IN 2023 DUE TO THE ECONOMIC CONTEXT

A breakdown of venture capital investments by investment phase (seed, early and late stage) over the period 2021-2023 reveals a significant variation between seed and late stage, while early stage remained stable at around €250 million invested per year.

The value of seed transactions doubled between 2021 and 2022, then fell to €63 million in 2023. While the total amount varied, the number of transactions remained relatively stable (around 18/year), underlining an increase in the average amount invested per transaction over the period.

The amount of late-stage transactions in 2023 was lower than in 2021, whereas it had tripled in 2022.

This drastic reduction in Paris Region investments in 2023 was due to a sharp drop in the average amount invested per late-stage operation, from €47 million in 2022 to €18 million in 2023.

FIGURE 12: NUMBER OF TRANSACTIONS BY VENTURE CAPITAL TYPE.
Source: Pitchbook

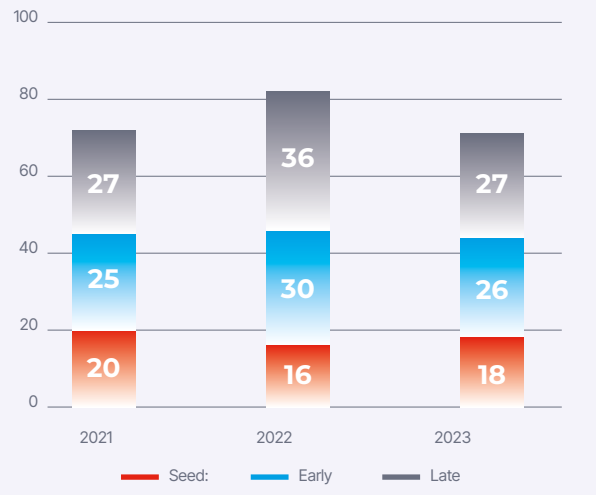
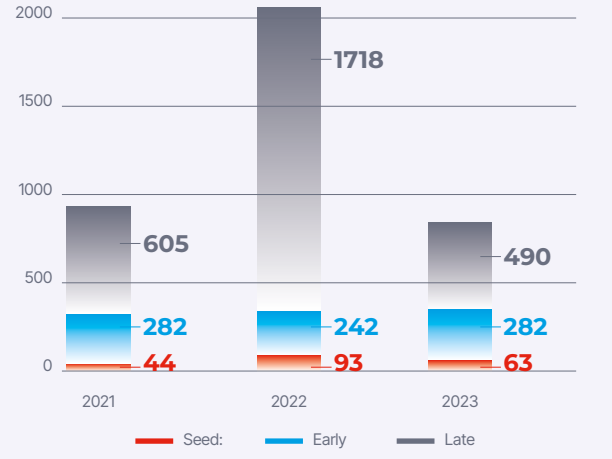


FIGURE 13: TRANSACTION AMOUNTS (€M) BY VENTURE CAPITAL TYPE.
Source: Pitchbook

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01. Paris Region: Europe's most attractive region

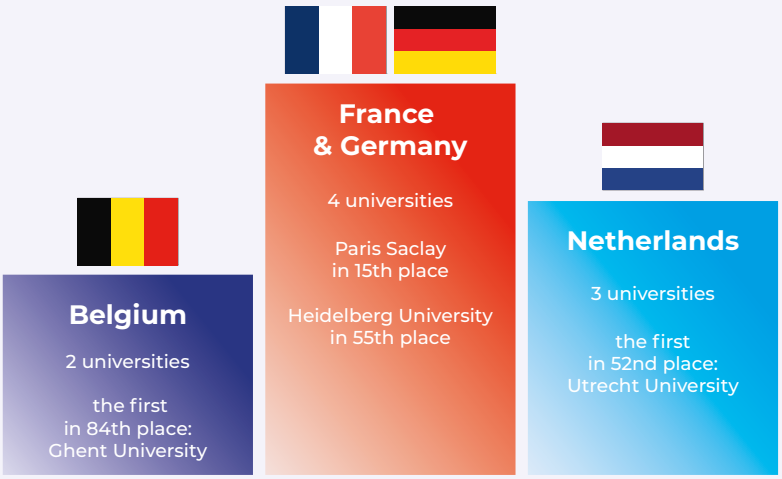
Paris Region: recognized scientific excellence

FRANCE: SCIENTIFIC EXCELLENCE WITHIN THE EUROPEAN UNION

For all technical fields combined, Université Paris Saclay is the first French university to appear in the Shanghai rankings, in 15th place in 2023. France has 3 other universities in the top 100, all from Paris Region (Université PSL in 41st place, Sorbonne University in 46th place and Université Paris Cité in 69th place). This puts France in pole position with its EU neighbors included in this analysis. France is on a par with Germany, with 4 universities in the top 100, and ahead of the Netherlands (3 universities) and Belgium (2 universities) (Figure 14).

Nevertheless, on a European scale, France ranks 3rd in terms of the number of universities in the top 100, just behind England (8 universities) and Switzerland (5 universities).

FIGURE 14: NUMBER OF UNIVERSITIES RANKED IN THE EU TOP 100, ALL FIELDS COMBINED, AND TOP UNIVERSITY BY COUNTRY.
Source: Shanghai ranking, 2023 Academic ranking of world universities

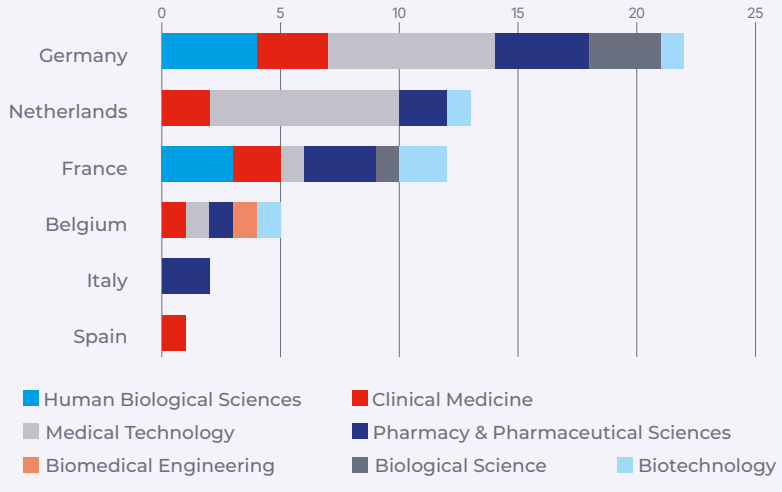


FRANCE: 3RD COUNTRY IN THE EU IN TERMS OF THE NUMBER OF UNIVERSITIES IN THE TOP 50 FOR TECHNOLOGICAL FIELDS IN THE HEALTHCARE SECTOR

We have analyzed the presence of universities in the Top50 for 7 "healthcare" themes in the Shanghai ranking. France, with 12 universities, is slightly down on the overall ranking, behind Germany (22 universities) and the Netherlands (13 universities). The profile of these rankings seems to illustrate different strategies within the countries (Figure 15).

France and Germany stand out in all core technology fields, while the Netherlands outperform in the specific field of medical technology (60% of its Top 50).

FIGURE 15: NUMBER OF UNIVERSITIES RANKED IN THE EU TOP 100, ALL FIELDS COMBINED, AND TOP UNIVERSITY BY COUNTRY.
Source: Shanghai ranking, 2023 Academic ranking of world universities



PARIS REGION: THE HIGHEST CONCENTRATION OF UNIVERSITIES DEDICATED TO HEALTHCARE INNOVATION IN THE SHANGHAI RANKING IN FRANCE AND IN EUROPE

Of the 12 French universities ranked in the Top50 in the 7 areas dedicated to healthcare, 11 are based in Paris Region, with Université Paris Cité appearing 5 times in the 7 areas specialized in healthcare innovation (Figure 16).

Among EU regions, Paris Region ranks as the region with the highest concentration of universities in the Top50 (11 universities), ahead of Berlin (10 universities) and Baden-Württemberg (around Stuttgart; 6 universities) (Figure 17).

FIGURE 16: NUMBER OF FRENCH UNIVERSITIES RANKED IN THE TOP 50 IN CORE HEALTHCARE FIELDS.
Source: Shanghai ranking, 2023 Academic ranking of world universities

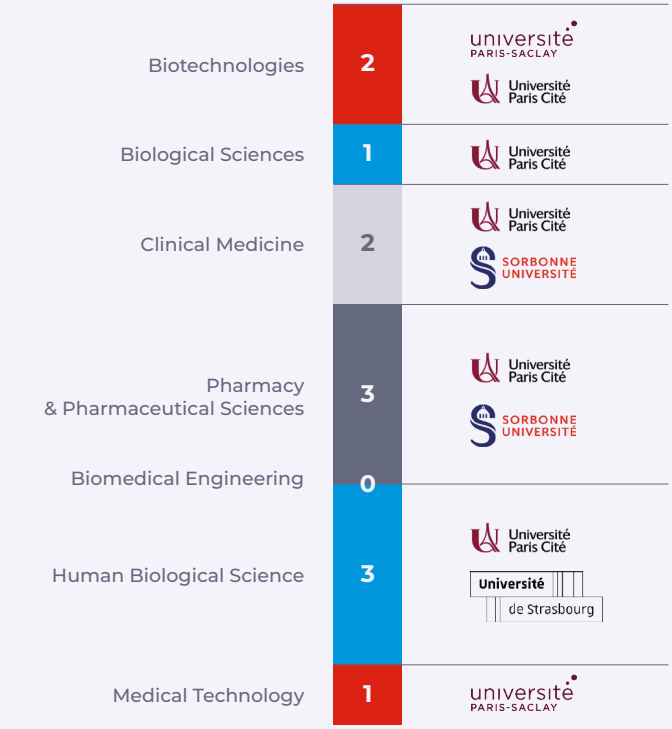


FIGURE 17: PODIUM OF REGIONS WITH A CONCENTRATION OF UNIVERSITIES IN THE TOP 50 CORE HEALTHCARE FIELDS.
Source: Shanghai ranking, 2023 Academic ranking of world universities

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Interview
Paris Region 2024 Innovators Award

Romain Vidal
Deputy Director of Innovation, Research and Higher Education, Paris Region Regional Council

Our region boasts an exceptional research ecosystem: rich in diversity, remarkable in quality.

Paris Region ranks 1st in the Patent Index barometer of the European Patent Office (EPO). What is Paris Region doing to consolidate its position as Europe's leading science and innovation region?

Our region boasts an exceptional research ecosystem: rich in diversity, remarkable in quality. We have mobilized substantial resources to ensure that scientists have access to cutting-edge equipment, so that they can compete at the highest international level, via the SESAME, SESAME filières and SESAME FEDER calls for projects; in addition, we have structured this ecosystem into nine "Major Research and Innovation Areas" (DIM), to which we have made a long-term commitment; furthermore, the Region encourages technology transfer via the funding of collaborative theses (Paris Region PhD), open platforms (SESAME Filières), AI challenges...

Since 2020, Paris Region has launched the Innovators Award. What role does this award play in technology transfer and the emergence of innovations?

In addition to the funds awarded to the winners of these 3 prizes, which recognize 3 researchers under the age of 45 whose research results have led to a remarkable innovation, we wish to shine the spotlight on these researchers who have committed themselves to innovation. The Region produces video portraits of these winning researchers, which are relayed on our social networks. Our aim is to communicate with young people and show them that you can be a researcher, while also being involved in the creation of a start-up. In addition, the award highlights these innovations to investment funds.

How does Paris Region plan to further develop its support for research and innovation in the coming years?

Our roadmap is clear, and in addition to the programs mentioned above, the Region has made a long-term commitment under the 2021-2027 French government-Region plan contract to invest more than €525m in the construction or refurbishment of buildings. Life sciences and healthcare are a priority for this CPER, and this will be reflected in the creation of new research and innovation facilities. I'm thinking in particular of the CEA's PASREL buildings, the Institut Pasteur's IMAGPATH research center, the research center of the future Saint Ouen Grand Paris Nord teaching hospital, and the Cassan building that will house Sorbonne University's biofoundry.

In addition, the ERDF gives us extra resources to support Research and Innovation. In 2025, a call for "prematurity/maturity" projects will be launched, with the support of the University Innovation Clusters, to encourage the emergence of these projects led by researchers, and give them the means to succeed in creating a start-up.

Lastly, we will be launching new "Questions of Major Interest", as we have done in the areas of mental health, lung vulnerability and disability... €1.5 million will be allocated to research teams whose findings should allow the Region to be a source of inspiration for its strategic orientations.

Innovators Awards

The Innovators' Award organized by Paris Region aims to highlight the excellence of local talent, and to encourage, support and promote research, technology transfer and the emergence of healthcare innovations with a particularly remarkable medical, societal or public health impact.

Each award consists of a personal bonus for the researcher, plus an additional budget made available to the team, via their supervising research and higher education institution or organization, to contribute to the success of their innovations.

2024 WINNERS

First prize €50,000:
Vincent LIBIS,
Aged 34, INSERM research fellow at the Learning Planet Institute, Université Paris Cité.

The first winner, Vincent Libis, is based at INSERM.

Vincent Libis and his team have developed a method for discovering microbial bioactive molecules for drug development. Microbial metabolites are the basis of over 500 drugs on the market today, but their discovery has become almost impossible with conventional approaches. The new method makes use of advances in DNA technology, and has enabled the reopening of access to this proven source for antibiotics, anti-cancer drugs and immunosuppressants.

Second prize €25,000:
Olivier THOUVENIN,
Aged 32,
lecturer at ESPCI.

The second winner, Olivier Thouvenin, is based at ESPCI.

Olivier Thouvenin and his teams have developed innovative microscopy and data analysis methods using artificial intelligence, which allow for label-free, non-destructive imaging of human samples. These methods make it possible to understand the origins of diseases, and to verify the toxicity and efficacy of new drugs in a fast, personalized way.

Third prize €25,000:
Raphaël CECCALDI,
Aged 43, INSERM research fellow at the Institut Curie.

The third winner is based at the Institut Curie.

Mortality from breast and ovarian cancer is due to chemoresistance and a lack of therapeutic options. Dr Ceccaldi and his teams have discovered a new target - uracil DNA glycosylase (UNG) - the inhibition of which induces the death of these chemoresistant tumors while preserving healthy cells. This innovation aims to develop first-in-class inhibitors for use in the treatment of these tumors.

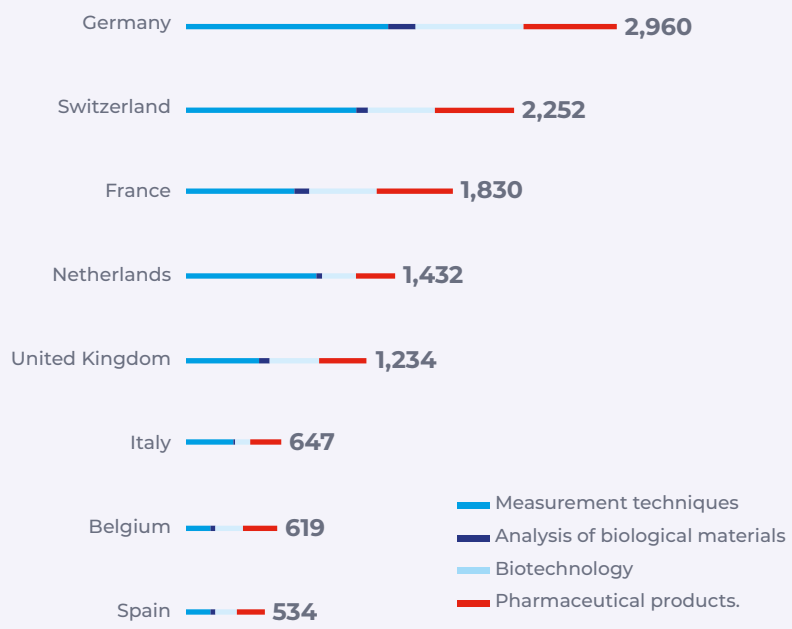
01. Paris Region: Europe's most attractive region

FRANCE: NO. 2 COUNTRY IN THE EU IN TERMS OF PATENT FILINGS IN THE HEALTHCARE INNOVATION SECTOR

Like the Shanghai ranking for universities, we analyzed the number of patent applications using EPO (European Patent Office) public data for 2022. By focusing on the 4 areas of healthcare innovation, we have observed that, at EU level, France is in second place behind Germany and ahead of the Netherlands (Figure 18).

It is interesting to note that in Europe as a whole, Switzerland comes 2nd, ahead of France in 3rd place, while the UK ranks 5th, despite having a large number of very well-placed universities in the Shanghai ranking.

FIGURE 18: EUROPEAN PATENT APPLICATIONS 2022 BY FIELD OF TECHNOLOGY.
Source: EPO



PARIS REGION: 30% OF FRENCH PATENT APPLICATIONS DEDICATED TO HEALTHCARE INNOVATION

In France as a whole, INPI (National Institute of Industrial Property) data shows that, across all scientific fields, Paris Region alone accounts for around 40% of patent applications.

In 2022, 2 regions accounted for the highest number of patent applications in the healthcare innovation sector, representing "single-handedly" +50% of cases: Paris Region and Auvergne-Rhône-Alpes, with 29% and 22% of applications respectively (Figure 19).

Patent filings in Paris Region show a profile similar to that of the rest of France in the 4 technological fields (Analysis of biological materials, Medical technology, Biotechnology and Pharmaceuticals). The region's contribution to the various technological fields is uniform (between 27 and 29% of national applications) (Figure 20).

FIGURE 19: BREAKDOWN OF PATENT APPLICATIONS IN FRANCE IN 2022 FOR THE 4 CORE TECHNOLOGY FIELDS OF THE HEALTHCARE SECTOR.
Source: INPI

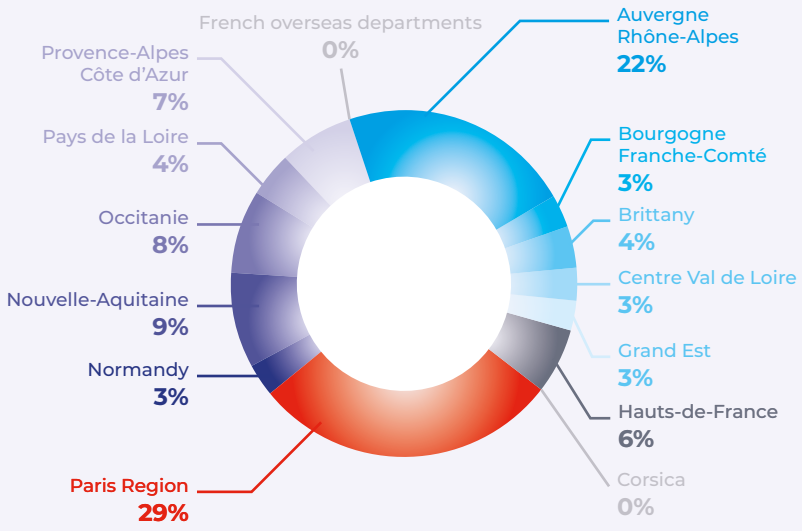
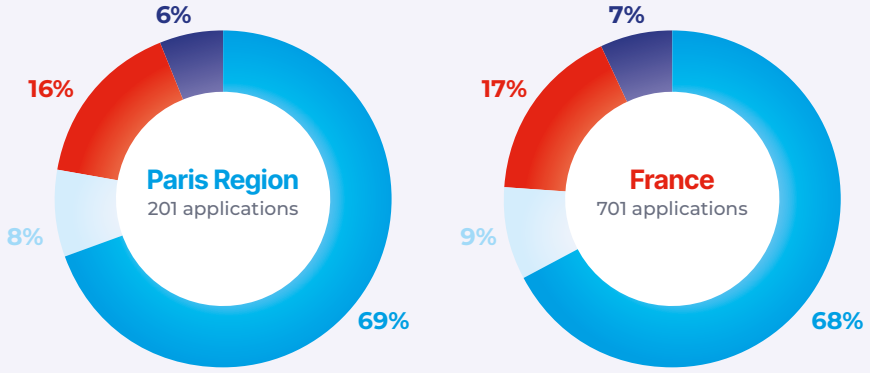


FIGURE 20: PROFILE OF PATENT APPLICATIONS BY TECHNOLOGICAL FIELD IN PARIS REGION AND IN FRANCE.
Source: INPI



02.

Healthcare innovation in Paris Region: collaborative innovation in key strategic sectors

02. Healthcare innovation in Paris Region: collaborative innovation in key strategic sectors

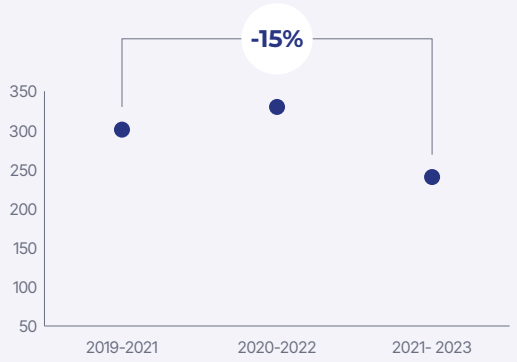
Paris Region present in major strategic healthcare innovation sectors

A 15% DROP IN THE NUMBER OF R&D PROJECTS SUBMITTED TO PUBLIC FUNDING AGENCIES

For the 2021-2023 period, our project analysis base was stable compared with the two previous periods (2019-2021 and 2020-2022), and the 37% success rate in the labeling and funding stages was also stable. Over this period, 284 projects were submitted to Medicen by its members for accreditation, and 105 projects were accredited and financed.

After an increase in the number of projects submitted over the 2020-2022 period compared with 2019-2021, this new 2021-2023 period showed a clear -15% decline in the number of projects submitted. This observation is consistent with the sharp drop in private funding analyzed above (Figure 21).

FIGURE 21: NUMBER OF PROJECTS SUBMITTED BY MEDICEN MEMBERS OVER THE LAST 3 ROLLING PERIODS.
Source: Medicen

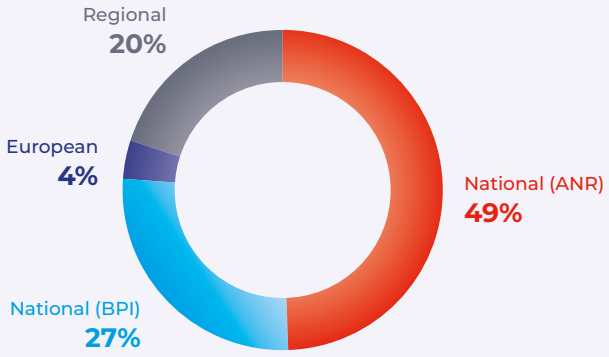


INNOVATION PROJECTS MAINLY SUPPORTED BY NATIONAL PROGRAMS, ALTHOUGH REGIONAL PROGRAMS OFFER BETTER SUCCESS RATES

With 1 in 2 projects funded over the period (1 in 3 over the 2019 - 2021 period) and 48% of funding allocated, the French National Research Agency (ANR) strengthened its major role in funding healthcare innovation, notably with a 6th wave of Hopistalo-University Health Research (RHU) projects (see 2023 results in the previous edition of Medi'Scope).

For the second time, regional funding was also the branch with the highest success rate (51%) for project leaders, while national branches varied between 31% and 36%.

FIGURE 22: BREAKDOWN OF FUNDING AGENCIES (NUMBER OF PROJECTS APPROVED AND FUNDED).
Source: Medicen #105 projects



R&D PROJECTS IN THE HEALTHTECH SECTOR THAT FOLLOW DIFFERENT DYNAMICS

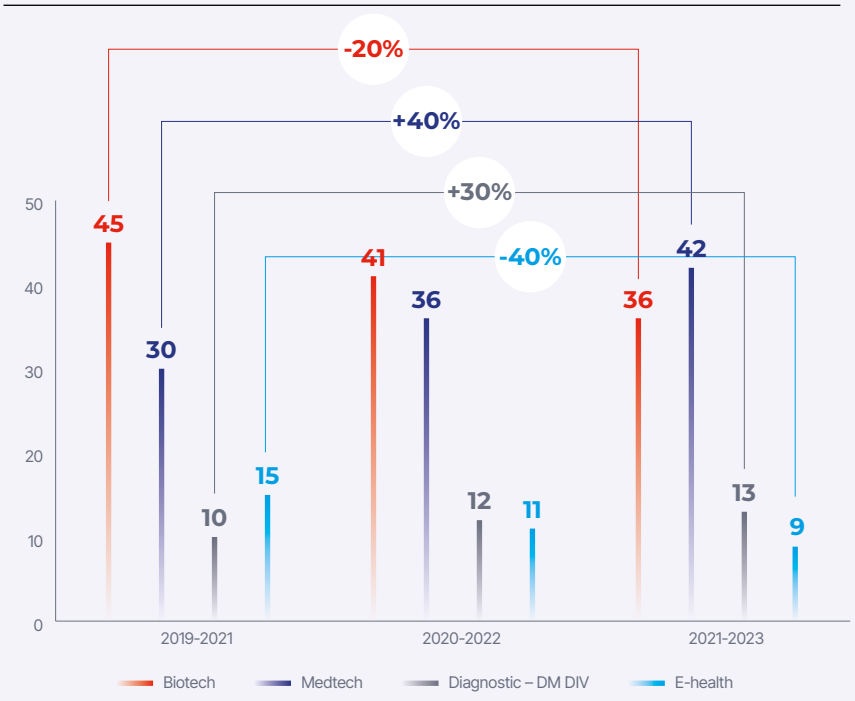
An analysis of projects funded over the last 3 rolling 5-year periods reveals the following (Figure 23):

01. The Biotech and Pharma sector continued to lead the way in terms of the number of projects funded, followed by the Medtech sector in second place, and finally the In Vitro Diagnostics and Digital Healthcare sectors..

02. Over the 3 periods, the Biotech and Pharma sector steadily lost financing revenues to the Medtech sector.

03. Despite its strategic importance, the Digital Healthcare sector was poorly represented and declined steadily over the three periods covered by our analysis.

FIGURE 23: TREND IN THE NUMBER OF PROJECTS FINANCED ACCORDING TO SECTOR - BASED ON PORTFOLIOS OF APPROVED AND FINANCED PROJECTS.
Source: Medicen



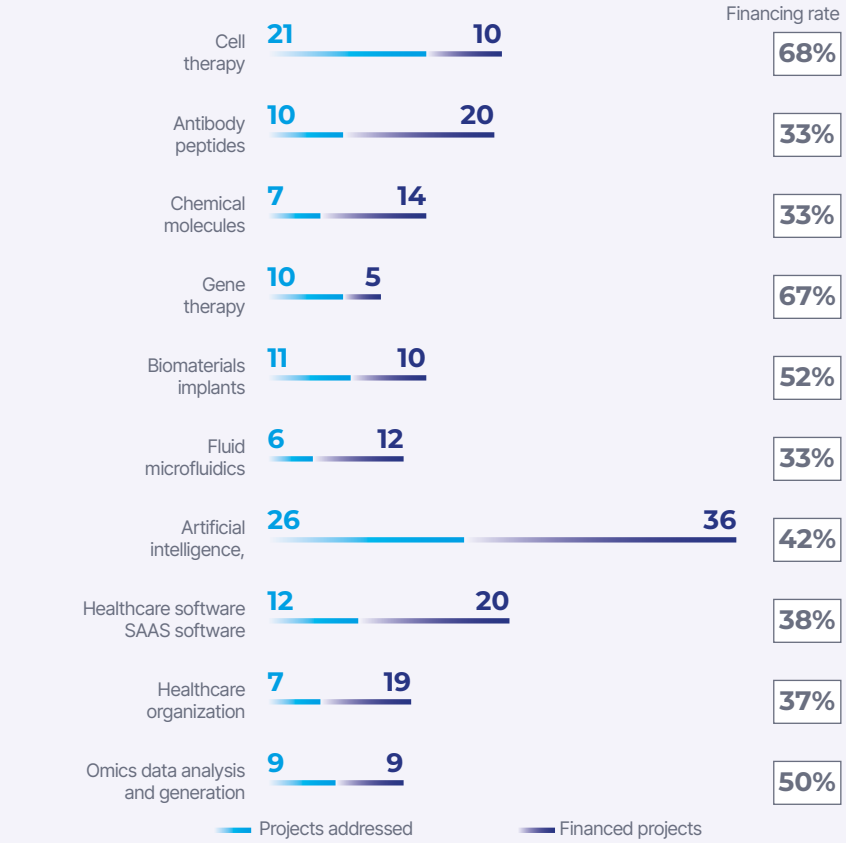
02. Healthcare innovation in Paris Region: collaborative innovation in key strategic sectors

DIFFERENCES IN R&D PROJECT FUNDING RATES ACCORDING TO TECHNOLOGICAL FIELDS

An analysis of the top 10 technology areas shows differences in funding rates (Figure 24):

- → Within the Biotech and Pharma sector: a visible 'Advanced Therapy Medicinal Product (ATMP)' effect, with increased chances of funding projects in cell and gene therapy (+66%) compared with antibodies and small molecules (33%).
- → **A highly dynamic Medtech sector** in terms of financing R&D projects, particularly in biomaterials and implants (52%).
- → **The Digital Healthcare sector still lagging behind** with an average financing rate of 37% for software and solutions aimed at improving patient care organization.

FIGURE 24: TOP 10 TECHNOLOGICAL AREAS ADDRESSED BY PROJECTS / PRESENT IN FUNDED PROJECTS. (2021 - 2023 PERIOD).
Source: Medicen #105 projects



Note that an R&D project involving artificial intelligence has a 42% chance of obtaining funding.

PRIVATE FUNDING: BIOTECH AND MEDTECH ACCOUNTED FOR 80% OF TRANSACTIONS, WHILE DIGITAL HEALTHCARE ACCOUNTED FOR 30%.

An analysis of fundraising by sector shows that the Biotech and Pharma sector accounted for 36% of total amounts raised in the region.

More surprisingly, the Digital Health sector was better represented than in innovation projects, with 20% of fundraising amounts and +30% in the total number of transactions. This data shows that, by their very nature, companies in this sector relied less on public funding for their growth, and more on private funding and industrial partnerships.

Beyond these industry-specific conclusions, there is one observation to be made with each analysis: **the difficulty of addressing a Digital Health industry whose technologies** are used in all other industries, and whose projects differ in nature from "classic" pharmaceutical or medical device development projects. Another hypothesis is the absence of a dedicated nomenclature, illustrated in this study by the lack of a dedicated NAF code or technological field in patents.

AI & BIOTECH: MOST POPULAR THEMES FOR COMPANIES THAT RAISED FUNDS IN PARIS REGION

Among the various themes addressed by companies that raised funds in Paris Region over the period, the graph opposite shows a very strong representation of the keywords "biotech" and "artificial intelligence" (Figure 25).

FIGURE 25: SIMPLIFIED REPRESENTATION OF THE THEMES ADDRESSED BY COMPANIES THAT RAISED FUNDS IN PARIS REGION IN THE HEALTHCARE SECTOR.
Source: Pitchbook

02. Healthcare innovation in Paris Region: collaborative innovation in key strategic sectors

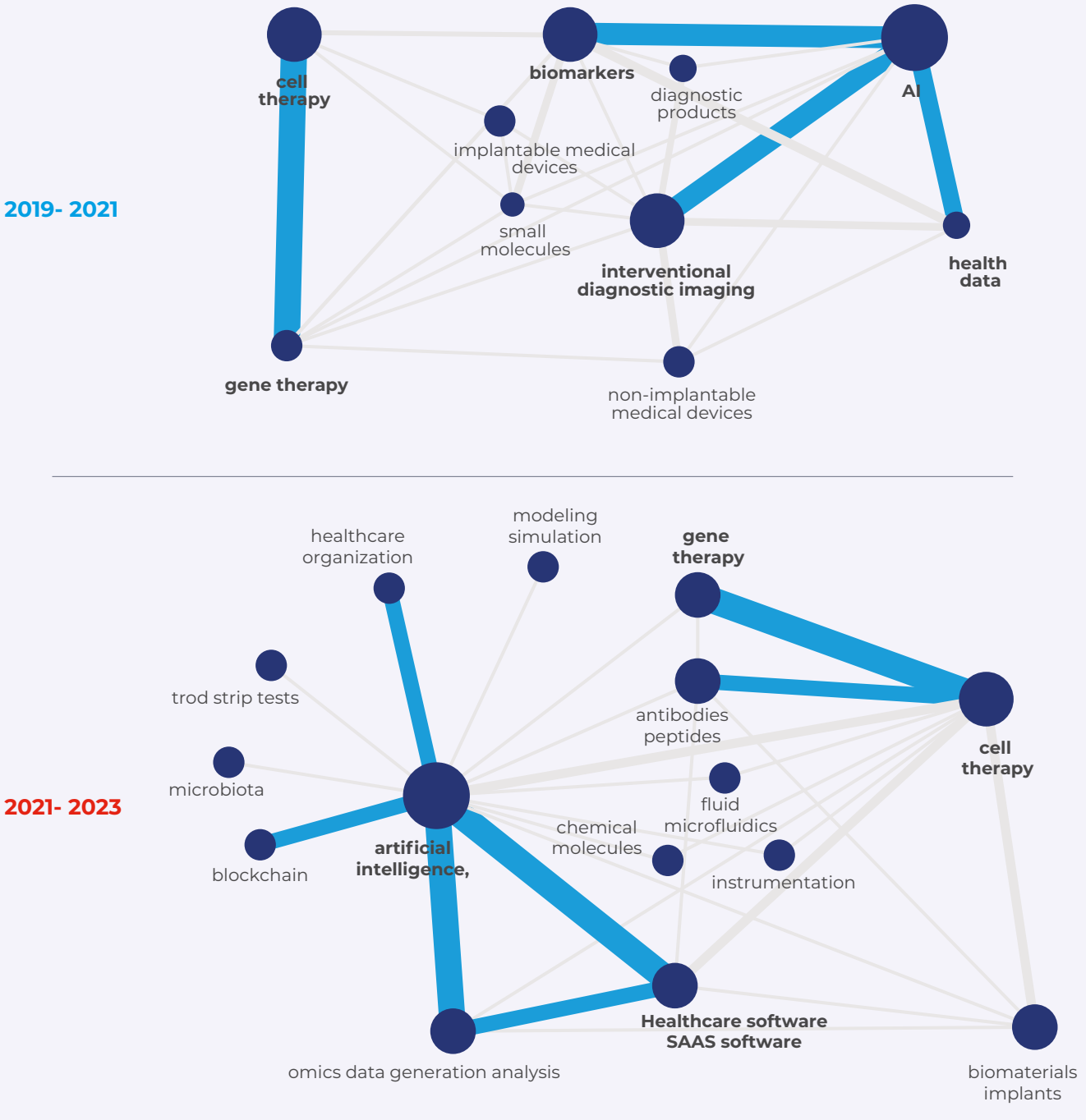
A FOCUS ON ARTIFICIAL INTELLIGENCE, WITH BIOTECH LAGGING BEHIND

Analysis of the top 15 technological themes involved in each of the projects over the 2021-2023 period shows two major changes compared with the 2019-2021 period (Figure 26):

→ Technological areas (Gene Therapy, Cell Therapy, Antibodies) belonging to the Biotech and Pharma sector were still very present, but operated in a "silo", with no connection to other technological areas in other sectors.

→ The emergence of a central technological theme: Artificial Intelligence (AI), which interconnects with many other technological themes.

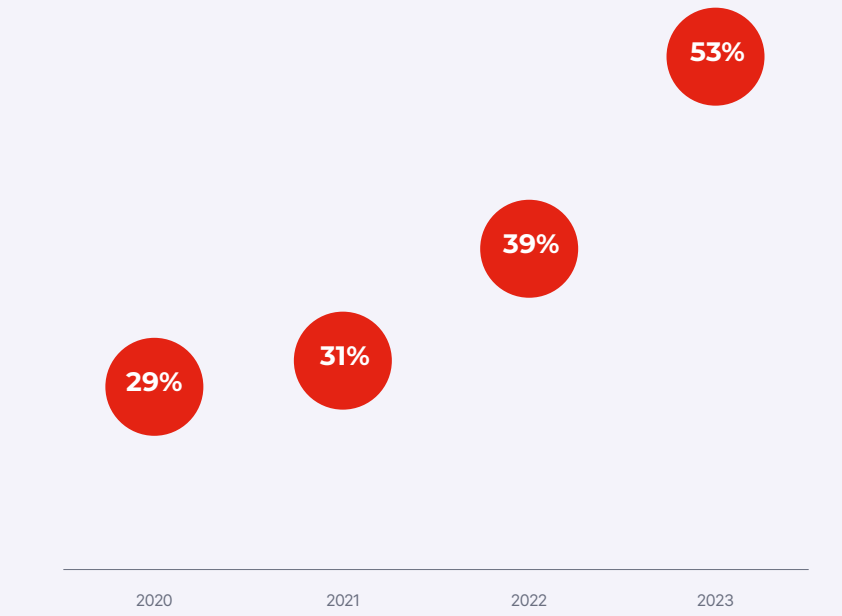
FIGURE 26: CONNECTION AND CO-OCCURRENCE BETWEEN THE PROJECTS' TECHNOLOGICAL ORIENTATIONS
(statistically significant difference) #276 certified projects.



THE ARTIFICIAL INTELLIGENCE REVOLUTION: 1 IN 2 COMPANIES THAT RAISED FUNDS USED AI IN 2023

Since 2020, we've seen a very strong shift towards AI among the companies that have raised funds within our membership. In 2023, 1 in 2 companies that raised funds incorporated artificial intelligence into their projects, compared with 1 in 3 in 2020 (Figure 27).

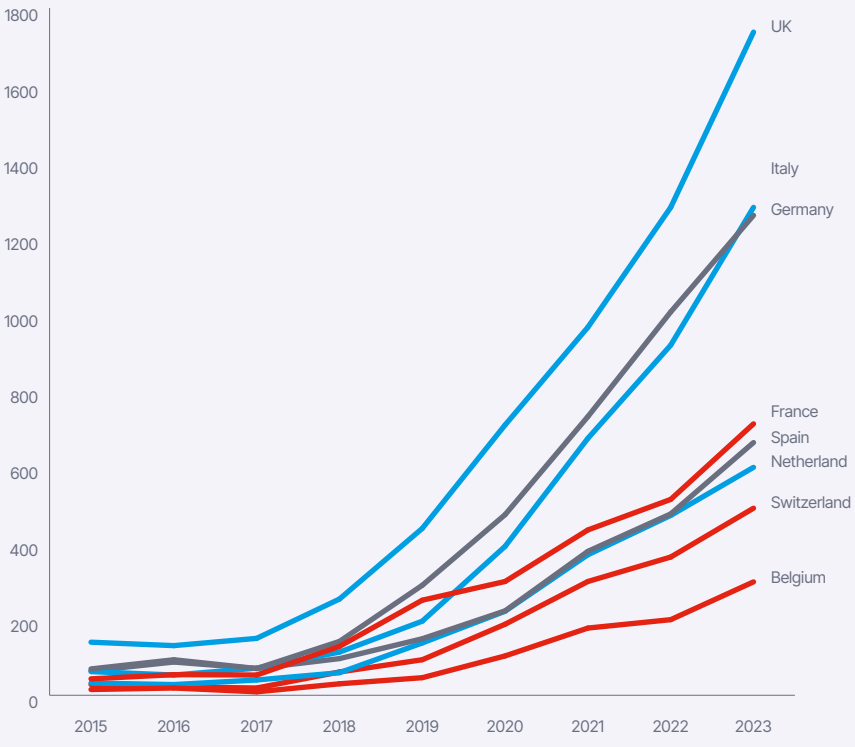
FIGURE 27: PERCENTAGE OF FUNDRAISING IN PARIS REGION INCORPORATING ARTIFICIAL INTELLIGENCE AS A TECHNOLOGICAL THEME.
Source: Medicen



FRANCE IS THE 3RD COUNTRY IN TERMS OF PUBLICATIONS ON AI APPLIED TO HEALTHCARE

Analysis of publications dealing with AI in technical areas of the healthcare sector[3] puts France in third place among EU countries for publications on the subject, behind Italy and Germany. Note that the gap between the leading pairs (Italy and Germany) and the other countries analyzed is considerable. However, 3 French stakeholders are among the top 10 contributors (INSERM and AP-HP).

FIGURE 28: PUBLICATION DYNAMICS ON AI IN HEALTHCARE IN THE STUDY AREA AND TOP 10 AFFILIATIONS OF PUBLISHERS OVER THE 2021 - 2023 PERIOD.
Publications with "Artificial Intelligence" in keywords, titles or abstracts in healthcare core areas.



3 Medicine, Health Professions. Nursing, Immunology and Microbiology, Biochemistry, Genetics, and Molecular Biology, Pharmacology, Toxicology and Pharmaceutics, Neuroscience

02. Healthcare innovation in Paris Region: collaborative innovation in key strategic sectors

PARIS REGION LEADERSHIP: ALMOST 40% OF SCIENTIFIC PUBLICATIONS ON AI APPLIED TO HEALTHCARE ARE PUBLISHED IN PARIS REGION.

Since 2015, the number of scientific publications on AI applied to healthcare has been growing rapidly, with an explosion in output since 2018. On a national level, we have observed a high concentration of publications concerning AI in healthcare in Paris Region. In 2023, 38% of French publications were affiliated with Paris Region. Moreover, the Top 10 affiliated contributors confirm this finding, with 5 purely Paris Region stakeholders in the ranking (AP-HP, Université Paris Cité, Sorbonne Université, Université Paris Saclay, Hôpital Cochin AP-HP).

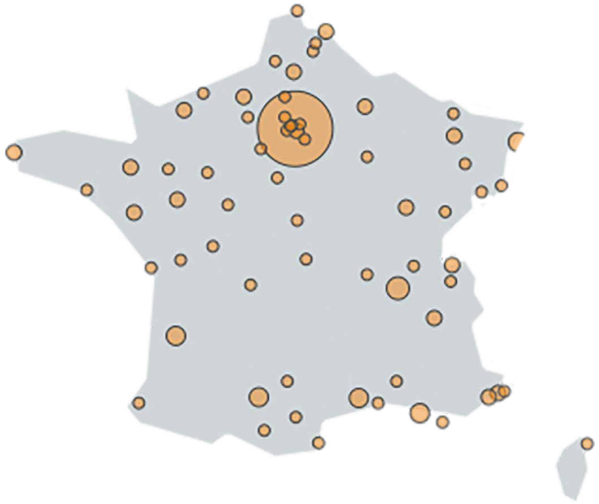
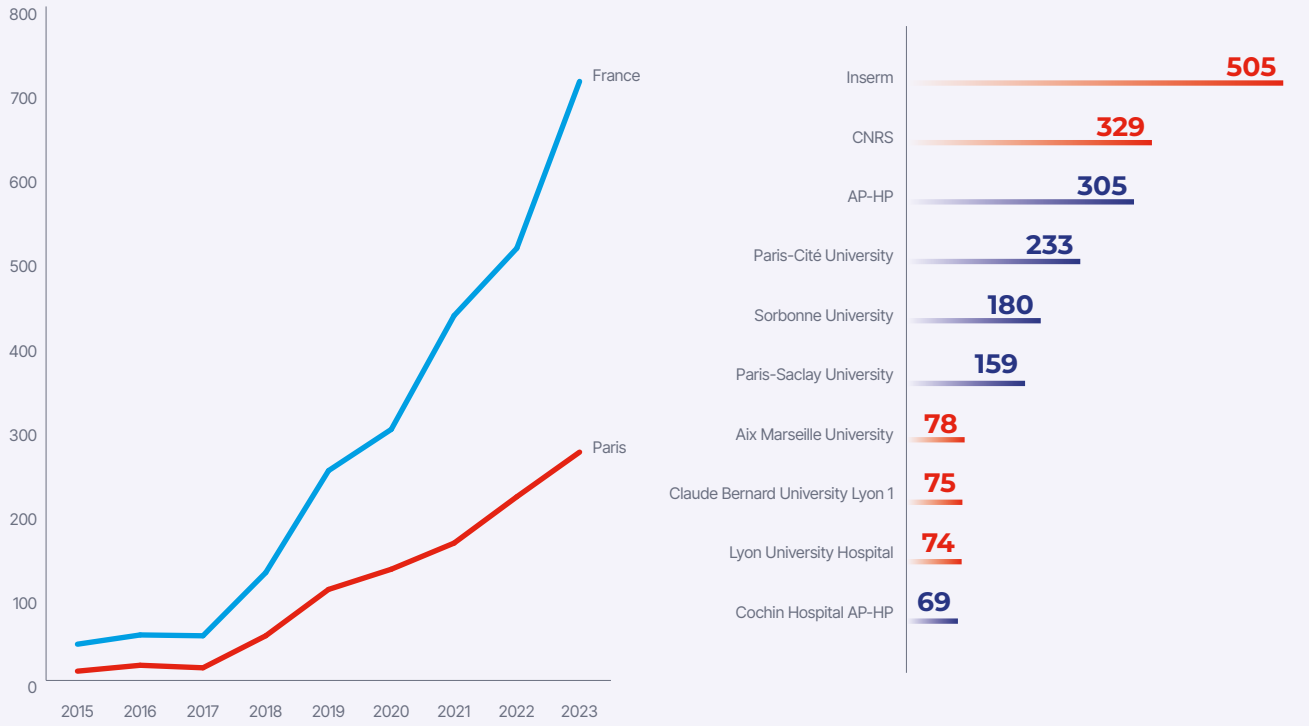


FIGURE 29: PUBLICATION DYNAMICS ON AI IN HEALTHCARE IN FRANCE AND NATIONAL TOP 10 PUBLISHER AFFILIATIONS OVER THE 2021 - 2023 PERIOD.
Publications with "Artificial Intelligence" in keywords, titles or abstracts in healthcare core areas.



Interview INRIA

Through tools such as machine learning (ML), natural language processing (NLP) and deep learning (DL), AI is increasingly being used to assist and improve the patient experience, particularly in diagnostics, treatments and their effects.

Christelle Ayache
Deputy Manager,
Digital Health Program, INRIA

What is the current state of artificial intelligence development in the healthcare sector in Paris Region?

The development of artificial intelligence (AI) in the healthcare sector in Paris Region has been on an upward trajectory for several years now, with notable initiatives to support research, innovation and the adoption of new technologies in the healthcare sector. The figures for the AI and digital sectors in Paris Region are impressive. Paris Region has 150 R&D labs dedicated to AI and 3 universities among the world's top 10 for Mathematics (source: Choose Paris Region).

Thanks to artificial intelligence and a wealth of clinical and statistical data, it is now possible to develop algorithms and models to protect, screen and cure, at both individual and population levels. The combined power of available data, algorithms (often based on learning approaches) and computing resources is opening up tremendous prospects in many fields, including healthcare. Through tools such as machine learning (ML), natural language processing (NLP) and deep learning (DL), AI is increasingly being used to assist and improve the patient experience, particularly in diagnostics, treatments and their effects.

Medi'Scope's analysis shows the emergence of artificial intelligence as a central technological theme. How does this new trend influence research and innovation policy priorities in Paris Region?

It is reflected in Paris Region's research initiatives and funding policies:

- → Institutional support: Paris Region is particularly active in supporting research in the field of AI in healthcare, notably through public funding programs such as calls for collaborative research projects with hospitals, universities and research laboratories, or the launch of challenges such as the "Challenge AI for Health".
- → Public-private partnerships: A network of public and private stakeholders is developing to experiment with and implement AI-based technologies in hospitals, notably through clinical trials or experiments using artificial intelligence-based tools to improve diagnosis and treatment.
- → Strategic orientations: AI is becoming a pillar of healthcare projects for the digital transformation of hospitals, as well as a key focus for training healthcare professionals in new technologies.

What ethical and regulatory challenges specific to the application of artificial intelligence in healthcare have you identified in Paris Region?

The deployment of AI in the healthcare sector raises several ethical and regulatory challenges:

- → Personal data protection: Patient privacy is a key concern. Compliance with the GDPR (General Data Protection Regulation) is fundamental to ensuring that healthcare data, which is often highly sensitive, is protected when processed by AI systems.
- → Access to healthcare data: The quality of healthcare data is essential to the effectiveness of AI-based tools.
- → Explicability/interpretability: It is essential to ensure that AI models are transparent and free from bias, so that the decisions made, whether they concern diagnosis or treatment, are fair and replicable.
- → Regulations and recommendations: AI used for medical purposes is considered a medical device and must therefore comply with strict regulations before being marketed (CE marking, clinical evaluations).

Despite a growing number of projects involving AI, ethical, legal and technical issues will need to be resolved to maximize its potential while ensuring patient safety and privacy. There are still a number of hurdles to overcome, and the contribution of laboratories and the support of the Paris Region AI clusters (PRAIRIE, DATA IA, SCAI) is a major asset.

https://www.inria.fr/fr/intelligence-artificielle

https://www.inria.fr/fr/sante-numerique

https://www.inria.fr/fr/sante-medecine-personnalisee-numerique-prevention-diagnostic

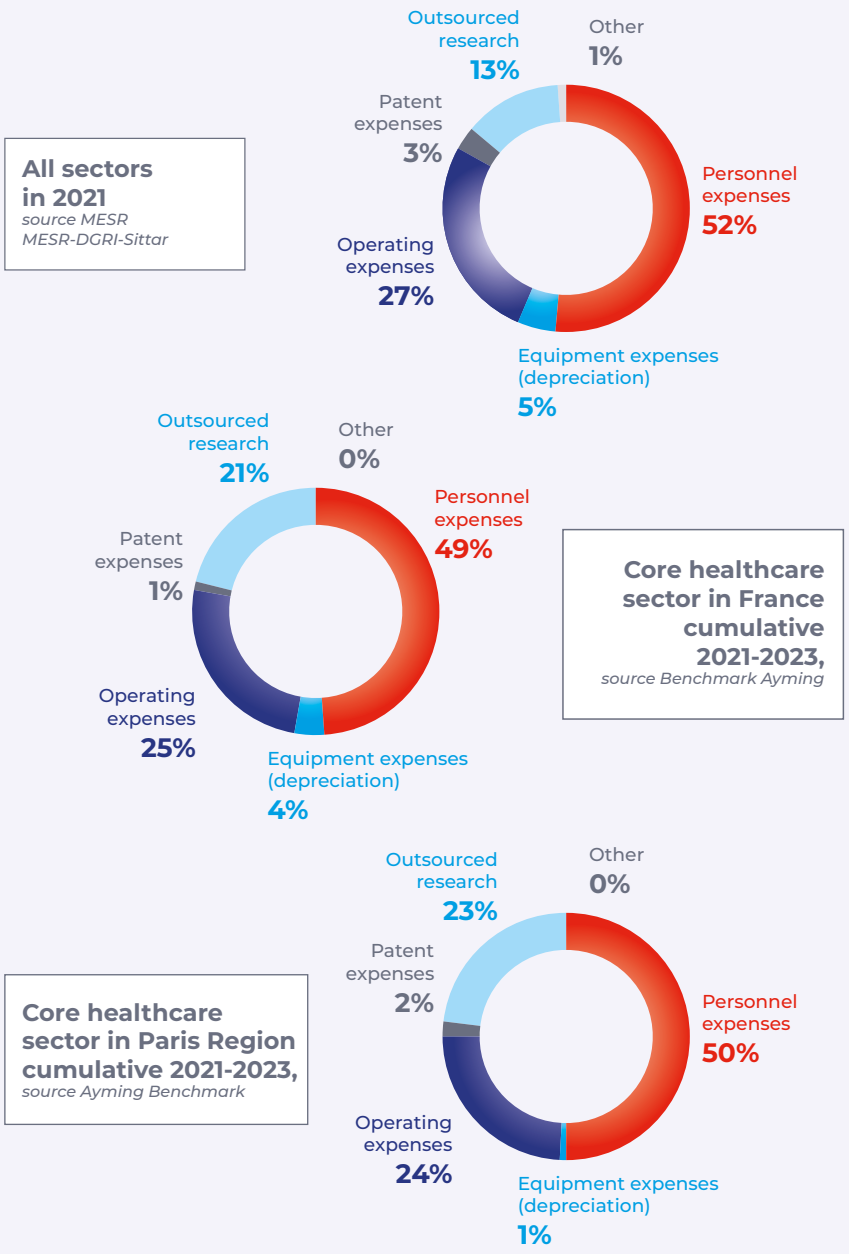
O2. Healthcare innovation in Paris Region: collaborative innovation in key strategic sectors

Paris Region cultivates open innovation: key lessons from our financing methods

THE PARIS REGION HEALTHCARE INDUSTRY: 23% OF RIC EXPENDITURE ON EXTERNAL RESEARCH SERVICES

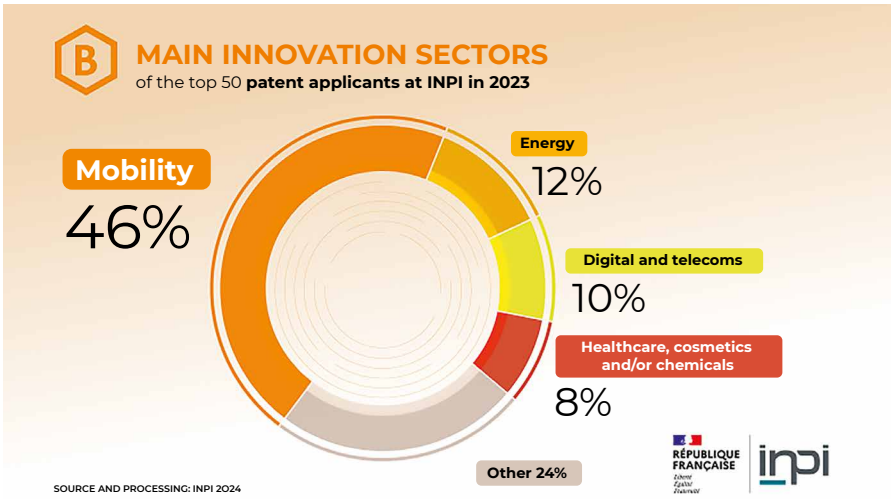
An analysis of the Research Tax Credit (RIC) expenditure base shows **a higher percentage of outsourced expenditure in the healthcare expenditure base (21%), compared with the trend across all industrial sectors (12.8%). This suggests a highly structured value chain in the healthcare industry**, with stakeholders able to provide RIC-eligible research services. This trend towards collaboration is even more pronounced in Paris Region (23% of expenditure versus 21% in France), an indication of the network's dynamism (Figure 30).

FIGURE 30: DISTRIBUTION OF RESEARCH EXPENDITURE (RESEARCH TAX CREDIT VIEW)
Source : Ayming - MESR-DGRI-Sittar



On a national scale, 3% of R&D expenditure is devoted to patents (source MESR). Aymings's study of the healthcare sector shows that the share of patent expenditure is lower in the healthcare sector (1% and 2% of R&D expenditure in France and Paris Region respectively). A finding which illustrates that the healthcare sector implements fewer IP strategies than other industrial sectors. The healthcare sector is only the 4th largest in France and accounted for 8% of patents filed in 2023[4] (Figure 31).

FIGURE 31: DISTRIBUTION OF THE TOP 50 PATENT APPLICANTS IN 2023.
Source: INPI 2024



4 https ://www.inpi.fr/decouvrez-le-palmares-2023-des-deposants-de-brevets-l-inpi

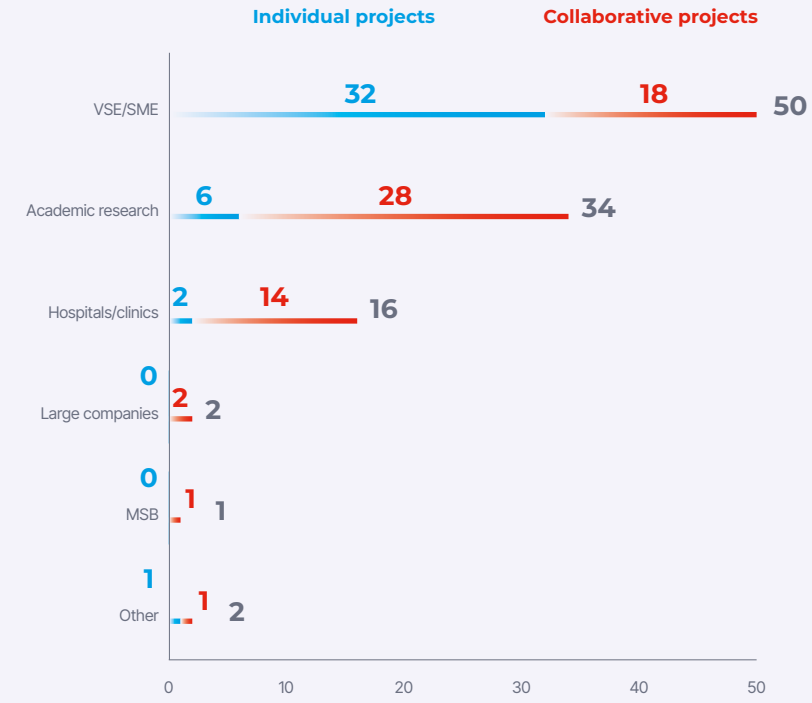
O2. Healthcare innovation in Paris Region: collaborative innovation in key strategic sectors

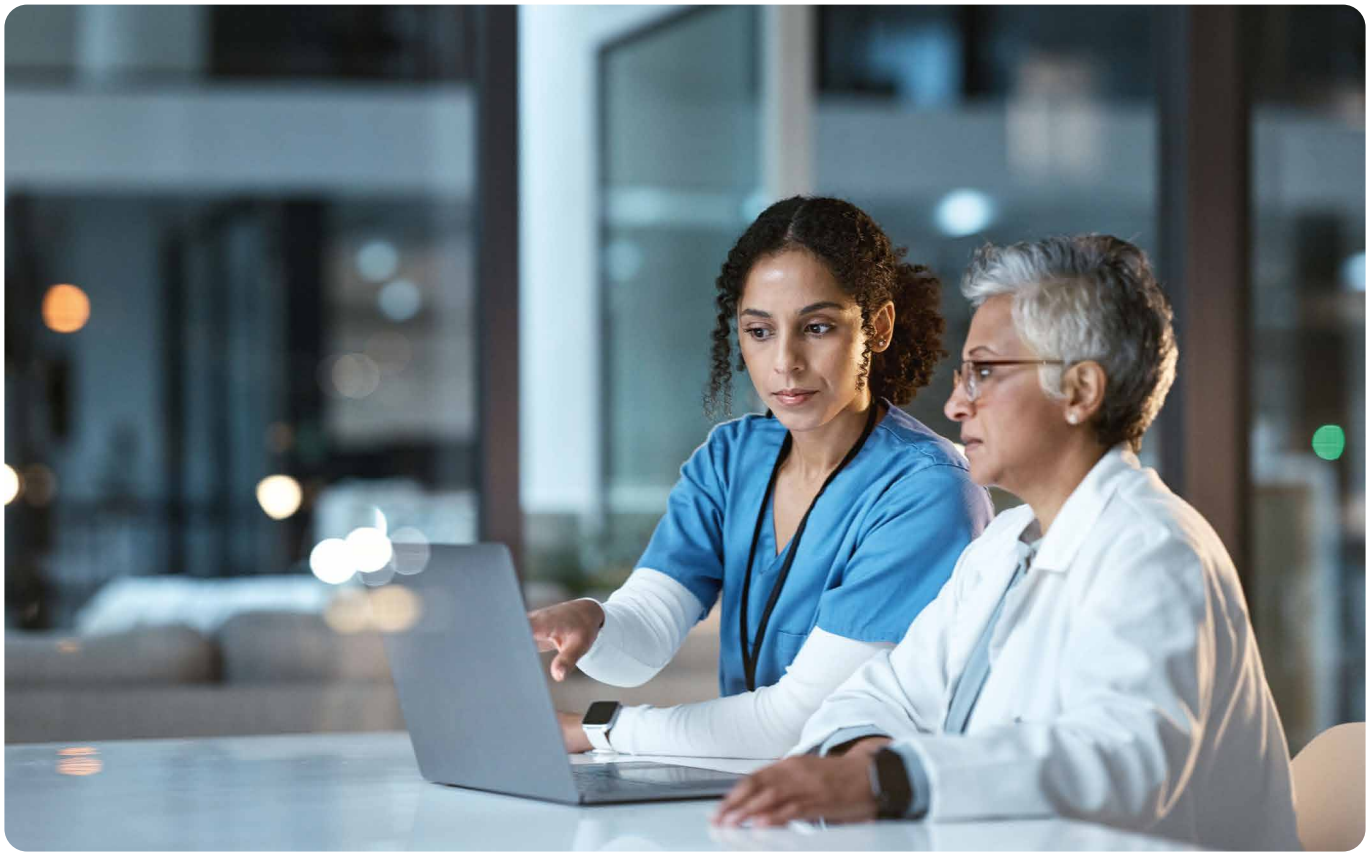
FINANCED R&D PROJECTS THAT ENCOURAGE PUBLIC-PRIVATE COLLABORATION

Over the 2021-2023 period, and as in the previous period, 61% of R&D projects funded by Medicen members were collaborative.

Over this period, almost one R&D project in 2 was funded by a public research organization (academic research or hospitals and clinics). Over 80% of these projects were collaborative and involved innovation from the industrial world through SMEs and major groups.

FIGURE 32: DISTRIBUTION OF APPROVED AND FINANCED PROJECTS IN 2021 - 2023.
Source: Medicen #105 projects

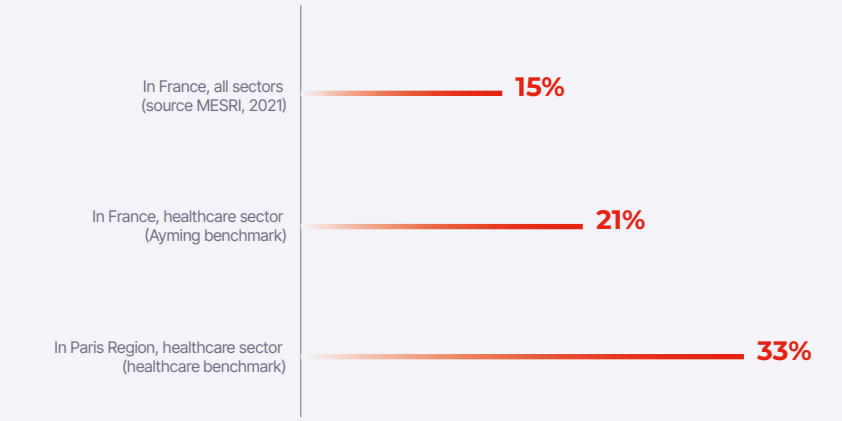




THE PHD PROGRAM: PARIS REGION'S HEALTHCARE INDUSTRY IN FULL MOBILIZATION

Independently of the projects financed, the use of the young PhD program is another indicator of the bridges that exist between public and private research. It reveals the hiring dynamics of newly graduated doctoral students[5] within company innovation units. As with the use of external research services, the number of registrants with a young PhD in their innovation workforce is higher in the healthcare sector (21%) than in other industrial sectors (15%). And with 33% of Paris Region's healthcare sector declarants having recruited young PhDs, Paris Region leads the way when it comes to integrating PhDs into core healthcare sector companies (Figure 33).

FIGURE 33: PERCENTAGE OF COMPANIES THAT USED THE PHD PROGRAM (AS DEFINED BY THE RIC) OVER THE 2021-2023 PERIOD.
Source: MESR, Ayming



5 As defined by the Research Tax Credit

02. Healthcare innovation in Paris Region: collaborative innovation in key strategic sectors

Paris Region: specialized in Oncology, Cardiology and Immuno-Inflammation

THE THERAPEUTIC FIELD HAS NO INFLUENCE ON THE CHANCES OF R&D PROJECTS BEING FINANCED.

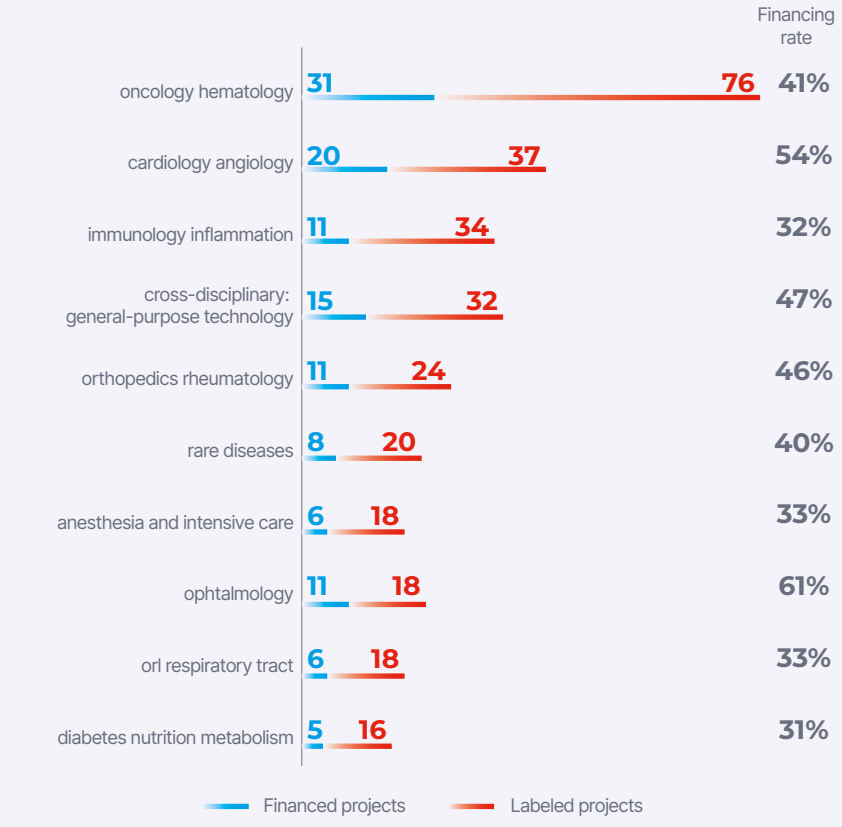
Analysis of the therapeutic area of R&D projects evaluated by Medicen over the period 2021-2023 shows consistency with national trends, with **Oncology and Hematology coming out on top by a wide margin**, with 76 projects submitted and a 41% funding rate.

In second place, **Cardiology and Angiology stand out** nationally, with a total of 37 projects submitted and a 54% funding rate, most of them in the Medtech sector.

In third place came Immunology - Inflammation, just after cardiology, with 34 projects submitted but one of the lowest funding rates at 32%.

This data on public funding is backed up by our analyses of private funding for companies in Paris Region, which also give priority to oncology and cardiology.

FIGURE 34: TOP 10 THERAPEUTIC AREAS ADDRESSED BY PROJECTS / PRESENT IN FINANCED PROJECTS (2021-2023 PERIOD).
Source: Medicen Paris Region



Interview Institut Curie

Dr Cécile Campagne
Director of Development and Industrial Partnerships

Dr Amaury Martin
Executive Vice President, Headquarters

There's no doubt that France 2030 will have been the biggest accelerator for innovation in cancer research in a long time, and a major contributor to structuring this ecosystem!

Over the past two years, 1 biocluster, 3 University Hospital Institutes and a Third-Party Experimentation Center dedicated to cancer have been accredited as part of France 2030. How does the Institut Curie fit into the structuring and acceleration of this ecosystem?

Together with PSL University and INSERM, the Institut Curie coordinates one of the 3 IHUs funded, the Institut des Cancers des Femmes. This label will allow for the development of ground-breaking interdisciplinary research projects and support the Institut Curie's position as European leader in breast and gynecological cancers. We are also involved in the Paris Saclay Cancer Cluster (PSCC), through our support for the cluster's immuno-oncology cell therapy platform, CellAction, and our collaboration on the PSCC's Data project. Each time, it's an opportunity to strengthen partnerships with companies focused on key issues in cancer research. We also hold a Chair of Excellence in Biology/Healthcare and are heavily involved in two research programs and facilities (PEPR), on organs and organoids on chips and on cellular identity and destinies, which will fuel future innovations. Another project funded by France 2030 aims to build the world's first whole-body clinical facility using FLASH electron radiotherapy. Combined with the RHU projects, France 2030 will undoubtedly have been the biggest accelerator for innovation in cancer research in a long time, and a major contributor to structuring this ecosystem!

How is the Institute helping to speed up the transition from research to practical applications for patients?

To accelerate the transformation of research findings into innovative patient care, we are developing two major strategic areas:

- → the creation of companies supported by an original, integrated incubation program. Our 360° approach offers personalized support based on close teamwork and project adaptability. This includes intellectual property management, internal support for maturation, project and team structuring, and access to a wide network of partners: mentors and experts, business angels, investment funds, potential CEOs.
- → industrial partnerships, R&D collaborations and licenses, facilitated by our Carnot "Curie Cancer" label of excellence, which we obtained in 2011 and have maintained ever since. The Institut Curie's strengths lie in the interdisciplinarity and research-care continuum that are its very essence. We offer manufacturers the opportunity to benefit from our teams' expertise in developing innovative solutions all the way through to clinical validation.

03.

Thematic focus: Digital health in hospitals / women's health

03. Thematic focus: Digital health in hospitals / women's health

Digital health: a profound revolution in the management of women's pathologies

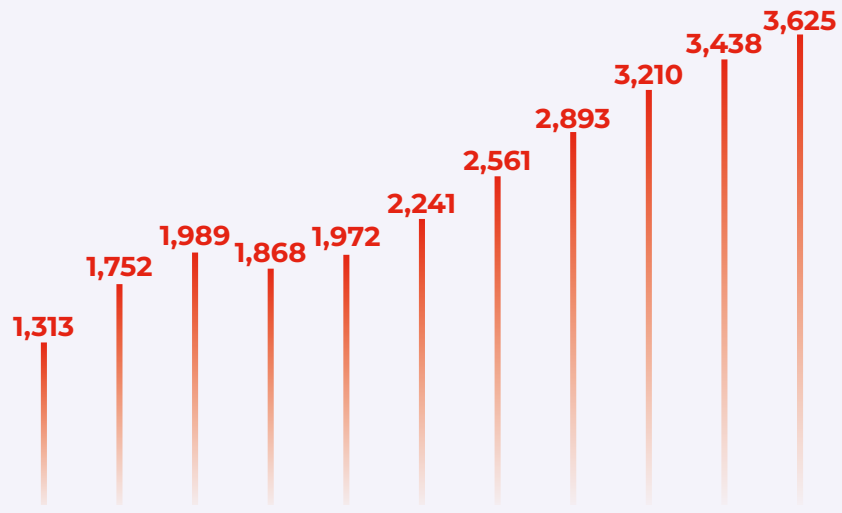
MORE THAN JUST AN IMPROVEMENT IN PROCESSES, DIGITAL TRANSFORMATION REDEFINES THE PATIENT-HEALTHCARE SYSTEM RELATIONSHIP

The digital health market is growing steadily in these segments (Figures 35 and 36). Indeed, digital technological tools offer innovative solutions and a response to the growing challenges of the healthcare sector, such as the aging of the population and the increase in chronic diseases. Their diversity (electronic medical records, platforms, connected medical devices, software and mobile applications) gives them many advantages:

- → Smoother treatment pathways.
- → Outsourcing and treatment coordination.
- → Personalized treatments.
- → Real-time information sharing for both caregivers and patients.
- → Informed decision-making and improved diagnosis.
- → More effective prevention through early identification of risks.
- → Power research with "intelligent" data.

FIGURE 35: GLOBAL DIGITAL HEALTH MARKET REVENUE 2019 TO 2029 (DIGITAL HEALTH MARKET REVENUE 2019 TO 2029 (IN BILLIONS OF US DOLLARS)).
Source : statista

FIGURE 36: FRENCH DIGITAL HEALTHCARE MARKET REVENUES THE DIGITAL TREATMENT AND CARE SEGMENT FROM 2019 TO 2029 (IN MILLIONS OF US DOLLARS).
Source : statista



Digital transformation in the healthcare sector is not limited to the introduction of new technologies; it is profoundly redefining the patient pathway, with the optimization of every stage, from diagnosis to treatment and follow-up. This pathway, which was often fragmented and complex in the past, is now becoming increasingly fluid and integrated (Figure 37).

Patients, who are becoming more autonomous and more involved in their own health thanks to monitoring applications, connected objects and telemedicine, are embracing and encouraging these developments. So, to the question ***"Do you think the development of digital tools for the healthcare sector will allow for an improved patient experience in hospitals?",*** **26% of respondents answered yes definitely and 59% yes probably as early as 2017.[6].** However, data, including health data, remains one of the critical points, both from a technical point of view and for patients (Figure 38).

FIGURE 37: TREATMENT PATHWAY AND DIGITAL SOLUTIONS DIAGRAM.
Source: Medicen

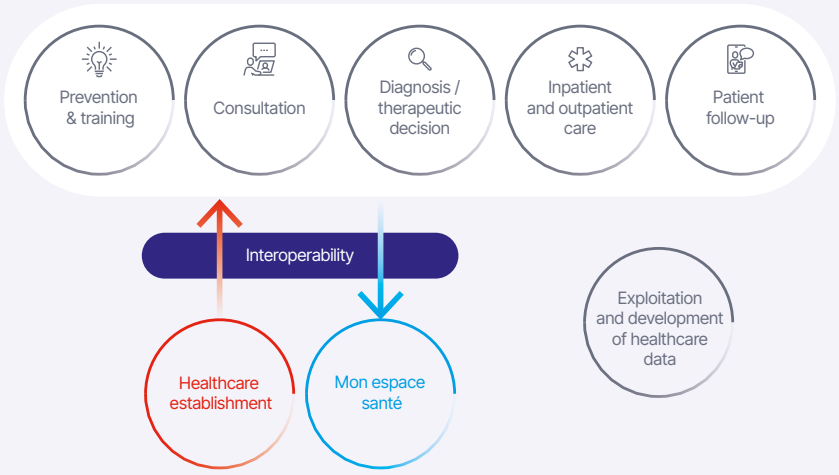
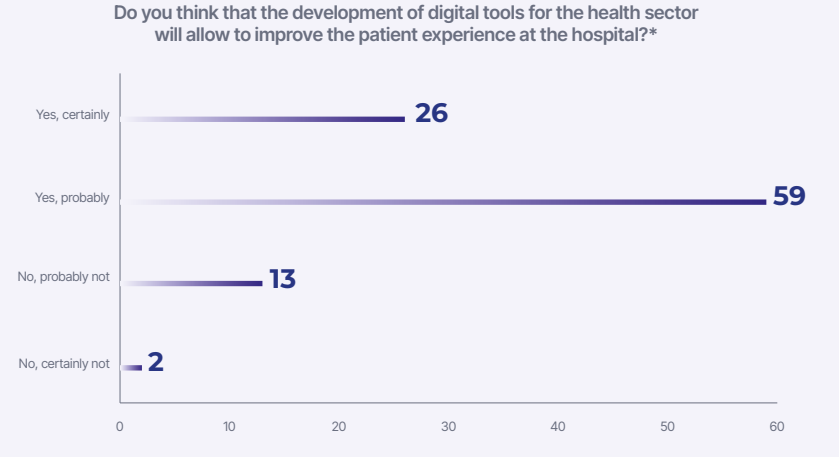


FIGURE 38: PATIENT PERCEPTIONS OF DIGITAL HEALTH - DO YOU THINK THE DEVELOPMENT OF DIGITAL TOOLS FOR THE HEALTHCARE SECTOR WILL ALLOW FOR AN IMPROVED PATIENT EXPERIENCE IN HOSPITALS?
Source: Odoxa, & Sciences Po (Health Chair). (October 16, 2017).



6 Odoxa, & Sciences Po (Health Chair).(October 16, 2017)

03. Thematic focus: Digital health in hospitals / women's health

DIGITAL HEALTH AND FEMTECH: TWO SYNERGISTIC SECTORS

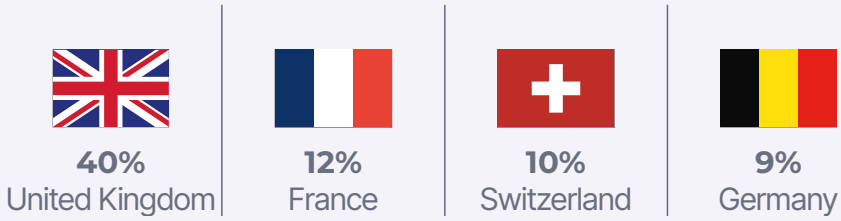
Femtech (a contraction of "Female Technology") is developing in response to the gender innovation gap in healthcare, and to women's often poor experience with healthcare.[7], and is emerging as a key sector, as well as mobilizing digital technological innovations. The femtech market encompasses software, products and services (drugs, medical devices, mobile applications and consumer products) designed to help women better understand and manage their health and well-being, particularly in areas that were once taboo. It shares with digital health a number of possible sub-sectors, as well as a wide variety of products, particularly digital ones (Figure 39).

The term Femtech itself has rapidly gained popularity since it was coined in 2016, but it only first appeared in France in early 2020, and mainly in Paris Region (source: Google Trends). The region is now a key stakeholder in this sector, in terms of both the number of companies and research facilities involved (Figure 40).

FIGURE 39: FEMTECH CHARACTERIZATION.
Source: Femtech analytics

*There is an overlap between the subsectors but FemTech ensures more holistic healthcare for women; therefore subsectors work in alignment to support the overall health of women.

FIGURE 40: LEADING EUROPEAN COUNTRIES IN TERMS OF THE NUMBER OF FEMTECH COMPANIES.
Source: Femtech analytics

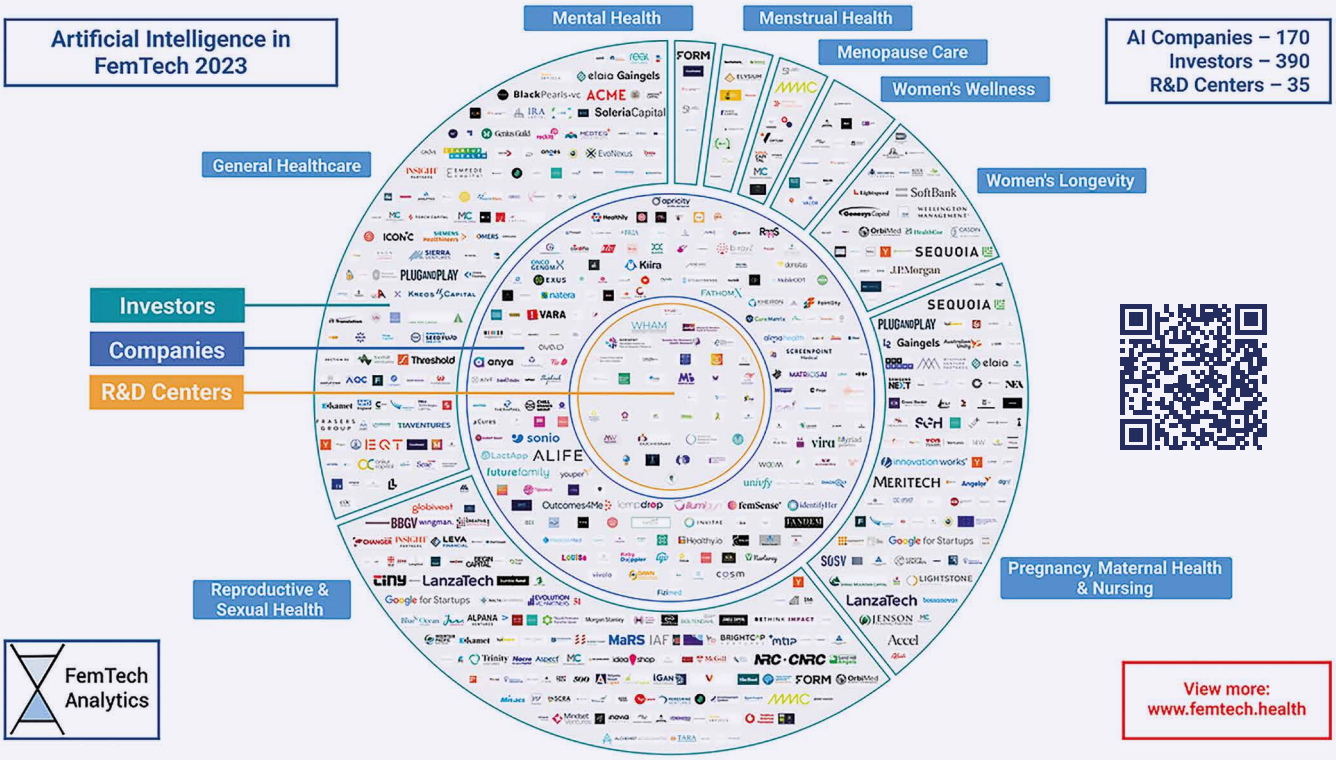


7 Long, M., Frederiksen, B., Ranji, U., Diep, K., & Published, A. S. (2023, February 22). Women's Experiences with Provider Communication and Interactions in Health Care Settings : Findings from the 2022 KFF Women's Health Survey. KFF. https://www.kff.org/womens-health-policy/issue-brief/womens-experiences-with-provider-communication-interactions-health-care-settings-findings-from-2022-kff-womens-health-survey/

Whether it's improving the management of specific pathologies such as endometriosis or polycystic ovary syndrome (PCOS), or offering innovative solutions in reproductive health (fertility), **FemTech is establishing itself as an essential lever for a more inclusive medicine tailored to women's specific needs.** By harnessing digital innovations such as artificial intelligence, blockchain and digital objects, it is developing more inclusive and personalized healthcare solutions. The market for connected objects (IOTs) and digital platforms is being driven in particular by major investments in Big Data and new-generation sensors, paving the way for promising innovations through the acquisition of data in real time and on a very large scale.

In 2023, AI, like in many other sectors, became a central lever of the Femtech ecosystem, with +170 companies, 390 investors, and 35 R&D centers. Start-ups integrating AI in FemTech stand out for significant fundraising, some exceeding $100 million, which illustrates a growing interest in technologies that are transforming the healthcare offering.

FIGURE 41: MINDMAP OF AI STAKEHOLDERS IN FEMTECH WORLDWIDE.
Source: Femtech Analytics



03. Thematic focus: Digital health in hospitals / women's health

Interview AP-HP

Even more so than in other fields, start-ups are very often created by committed patients, who have the energy, the will and sometimes very personal experience, but who also regularly need to find clinical points of support to bring their project to fruition.

Nicolas Castoldi
Deputy Chief Operating Officer, AP-HP

How can collaboration between academic stakeholders and innovative companies make it possible to address women's health issues that are little or poorly addressed?

We've made women's health one of the three main themes of the @Hôtel-Dieu experimental third-place. In particular, the aim was to provide a forum for clinicians and start-ups to identify each other and initiate dialogue, followed by partnerships and the launch of trials and experiments.

This is particularly useful in the area of women's health, where many needs are emerging that were previously not very visible. Even more so than in other fields, start-ups are very often created by committed patients, who have the energy, the will and sometimes very personal experience and who also regularly need to find clinical points of support to bring their project to fruition. And with emerging themes comes the challenge of finding the right people to talk to.

By entering into a structuring partnership with Femtech France in 2023, we wanted to send out a signal that there are many clinicians who are ready to get involved in these issues, including by supporting the development or testing stages of new tools to serve patients.

How does digital health improve the prevention, early detection and management of pathologies that are specific to women?

Digital tools are at the heart of innovation in women's health. But we're still only at the very beginning of the process: numerous applications have been created to allow women to access precise, clear and appropriate information on a number of pathologies which, until now, were rarely mentioned in public life.

That's already a lot, but the challenge now is to support the start-ups that are working to develop tools that will improve patient care. The obstacles are well known. I'll mention just two: first, evaluation, to demonstrate clinical benefit. Hospitals, with their strong commitment to clinical research, can play an obvious role in this area. Then there's the question of financing: apart from remote monitoring, this issue has yet to be resolved. Business models have yet to be developed.

To what extent do artificial intelligence tools influence the accuracy of diagnosis and treatment in the management of women's pathologies?

This is one of today's major challenges. We are starting to see the arrival of the very first algorithms that will allow for the improved diagnosis of a number of female pathologies. Many have been developed in close collaboration with university hospitals. We're working to provide even better support for these fine projects - I'm thinking, for example, of Matricis AI, a start-up developed by Inria and AP-HP that is working on the diagnosis of endometriosis. The challenge is simple: to give a large number of patients access, through these tools, to the level of expertise in interpretation and diagnosis found in a small number of expert centers.

Femtech is developing around highly digitized public and private stakeholders that cover the entire patient pathway

THE FEMTECH SECTOR: A BOOMING "MARKET"

Highly innovative and dynamic, the Femtech market is growing fast and is expected to reach over 90 billion euros by 2030. Once limited to fertility and maternity, the FemTech solutions market now covers a wider range of pathologies and issues relating to women's health. For example, it has been extended to menopause, PCOS, chronic diseases, cardiovascular diseases, cancers that affect women (breast cancer or colorectal cancer) and even mental health and post-partum depression. This dynamic is accelerating, particularly for "consumer"-focused products: 48% of products marketed are innovative medical devices, most of which are dedicated to reproductive health, contraception, pregnancy and breastfeeding. However, women's health has also become an important issue for employers, and some committed mutuals are developing B2C and B2B2C solutions.[8].

Bridging the gender gap in innovation, interest in femtech is continuing to grow, ignoring once-taboo subjects. North America accounts for the majority of investments, the majority of companies today (51%) and the largest number of R&D centers. Europe comes second, with just over a fourth of the companies. The market is still in its infancy, and most FemTech companies are at an early stage of their development[9]. Although significant (Figure 44), investment is one of the stumbling blocks for market stakeholders.

Indeed, there are still many challenges to the wider and more effective adoption of FemTech technologies. Today's market is facing the following limitations in particular[10] :

- → Lack of investment in the theme, despite very good momentum (+35% over one year). In the face of startups mainly created and run by women, the world of investment is predominantly male.[11]. The result of this imbalance is a lack of understanding of the specific needs of women's health and of the market, often defined as a "niche".[12].
- → Regulations (linked in particular to current digital issues and the management of private data collected).
- → The low adoption rate of innovative digital solutions, whether by the general public or by hospital stakeholders and healthcare professionals. The latter are reluctant to change their established methods and tools, particularly in a context of budget constraints.
- → Persistent societal taboos that impact different market segments to a greater or lesser degree (maternity and fertility are subject to a very moderate form of censorship compared to the sexual well-being or menstrual cycle segments).
- → Lack of health data and clinical studies, one of the main barriers to innovation in femtech, with a lack of data and a lag in gendered medicine.

8 https://www.femtechfrance.org/
9 https://analytics.dkv.global/FemTech/Report-Q2-2022.pdf
10 Soha Tohidi. Overview of FemTech and its financing issues in France. Pharmaceutical sciences. 2023. dumas-04589162
11 SiSed [Internet]. 2022 [cite 8 oct 2023]. Only 15% of VC general partners in Europe are women. Available on: hlps://siSed.eu/ar<cles/vc-general-partners-europe/
12 BPI France. Big Media - Big 2023 - YouTube [Internet]. [cited Oct 8, 2023]. Available at: hlps://www.youtube.com/live/G9ChTR1HXhs?si=TicS8ellpKITHVU3&t=25173

03. Thematic focus: Digital health in hospitals / women's health

THE FRENCH FEMTECH ECOSYSTEM: A THEME THAT INTEGRATES THE ENTIRE PATIENT PATHWAY

Despite these limitations, France remains an important market for FemTech, with sales of 30.6 million euros in 2022 (Femtech France 2022), and this ecosystem is gradually establishing itself as a promising sector in France. In recent years, France has seen the emergence of numerous FemTech startups, mainly founded by women with a medical profile who want to take control of their health: from just 80 companies in 2022, Femtech has grown to 115 startups in 2023 and 140 in 2024[13] half of which (52%) are based in Paris Region (Figure 42).

Mobilizing digital health developments across the entire treatment pathway, these startups typically develop mobile apps, wearable devices and digital platforms aimed at addressing issues such as fertility monitoring, menstrual health, pregnancy monitoring and general wellbeing (Figure 43). FemTech France has been listing French Femtech startups since 2024.

FemTech is an emerging market in France, and presents promising opportunities due to the evolution of the entrepreneurial ecosystem and societal needs. This sector benefits from private investment and a number of government initiatives (such as the Priority Equipment Plan for Research into Women's Health and Couples' Health).[14]). However, investor mobilization remains slower than on the international stage, thus accentuating the gap with Anglo-Saxon countries in terms of innovation, demand and economic potential. Although the WHAM report states that investing in women's health research generates benefits that go beyond investment in general research[15], France lacks the economic models to assess the financial impact of innovations in women's health, which may limit the commitment of governments and private investors. Moreover, unlike other healthcare sectors, FemTech in France today is dominated by B2C companies (23%), which leads to complications over the monetization of services due to our healthcare system influencing consumer habits. Access to innovations, with private offerings potentially inaccessible to a large part of the population, also risks accentuating inequalities.[16].

FIGURE 42: GEOGRAPHICAL DISTRIBUTION OF FRENCH FEMTECH STARTUPS.
Source: Femtech France 2024

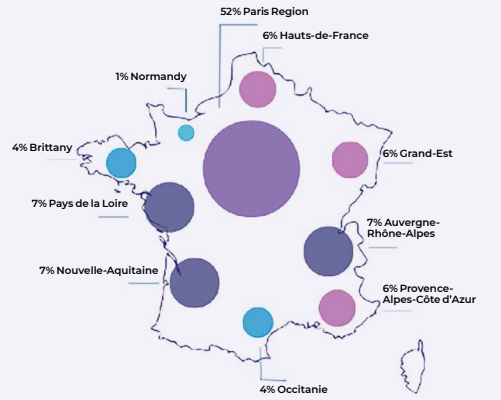


FIGURE 43: MAPPING OF FRENCH FEMTECH STARTUPS IN 2024.
Source: Femtech France

13 Source Femtech France 2024 Barometer.
14 https://anr.fr/fr/france-2030/programmes-et-equipements-prioritaires-de-recherche-pepr/sante-des-femmes-sante-des-couples
15 The Wham Report, The Case to Fund Women's Health Research AN ECONOMIC AND SOCIETAL IMPACT ANALYSIS (2020)
16 Soha Tohidi. Overview of FemTech and its financing issues in France. Pharmaceutical sciences. 2023. dumas-04589162

Interview
Femtech France

Paris Region's commitment, through its Smart Santé strategy in partnership with Medicen, is a positive signal for development and innovation in this sector.

Juliette Mauro
Chairman & Co-founder,
FemTech France

How has the FemTech ecosystem in Paris Region evolved in recent years? How has this structuring influenced regional public policy?

The FemTech ecosystem in Paris Region has experienced strong growth in recent years, in line with the dynamics of the technology sector as a whole. In 2021, 50% of French femtech startups were based in Paris, reflecting the concentration of women's health innovation in the region.

This ecosystem is also expanding rapidly in Paris Region and nationally. In 2023, there were 140 FemTech startups, with milestones such as Samsung's acquisition of Sonio, one Series B and three Series A funding rounds.

This structuring has led Paris Region to make women's health a priority in its Smart Santé 2024-2027 strategy, and has thus become the first French region to actively support the development of FemTech.

What are the specific challenges faced by FemTech start-ups in Paris Region?

FemTech start-ups in Paris Region face a major challenge: access to public funding. The region attracts many start-ups in the healthcare sector, which creates strong competition for public funding. However, projects related to women's health are not always given priority by funders and HealthTech support structures.

This is why Paris Region's commitment, through its Smart Santé strategy, in partnership with Medicen, represents a positive signal for development and innovation in this sector.

We also note that healthcare facilities in Paris Region are particularly open to partnerships with FemTech companies, as demonstrated by the three-year agreement between FemTech France and APHP.

What percentage of femtech start-ups offer digital solutions? How do you assess the impact of these solutions on the quality of treatments and the management of these pathologies?

French FemTech startups focus mainly on menstrual health (18%), global health (16%), chronic pathologies excluding cancer (14%) and pelvic health (14%). However, certain segments, such as menopause and cardiovascular disease, although highly relevant to women's health, are still underdeveloped.

In menstrual health, mass-market products prevail, while health spaces are more present in overall health. For chronic pathologies, diagnostic tests are the most widespread, and in pelvic health, connected objects stand out. Overall, a quarter of innovations come from consumer products, followed by healthcare software (10%), mobile applications, food supplements and medical devices (9%).

Although growing, femtech digital solutions face challenges in terms of recognition and certification, such as the "Mon Espace Santé" attestation or CE certification. The lack of both public and private funding adds further complexity to the validation process.

These digital solutions represent a paradigm shift in the healthcare relationship, promoting patient empowerment and the co-management of pathologies, which requires an overhaul of treatment pathways. This approach is totally in line with the femtech industry's focus on patient empowerment.

To leverage the impact of these solutions, it is crucial to provide financial support to caregivers and healthcare structures in order to redefine these pathways by fully integrating the contributions of digital solutions. Startups like Jeen, Sorella and Gynea in Paris Region illustrate this trend by including digital support in their women's healthcare offerings right from the start.

03. Thematic focus: Digital health in hospitals / women's health

Diagnostic wandering and pathologies

WOMEN'S PATHOLOGIES: MULTI-CAUSAL DIAGNOSTIC COMPLEXITY

Today, a large number of startups are appearing worldwide, seeking to cover the sector's "white zones", notably oncology (with a focus on breast cancer), but also chronic diseases and cardiovascular diseases, which are the leading cause of death in women.

In addition, initially focused on digital health (implants, software, etc.) or wellness (dietary supplements, alternative medicine, etc.), new sectors have emerged such as post-reproduction health, post-partum, global health (treatment pathways and prevention) and self-tests (hormonal and HPV). These two findings illustrate the diversity of targets and the need for new medical solutions for patients.

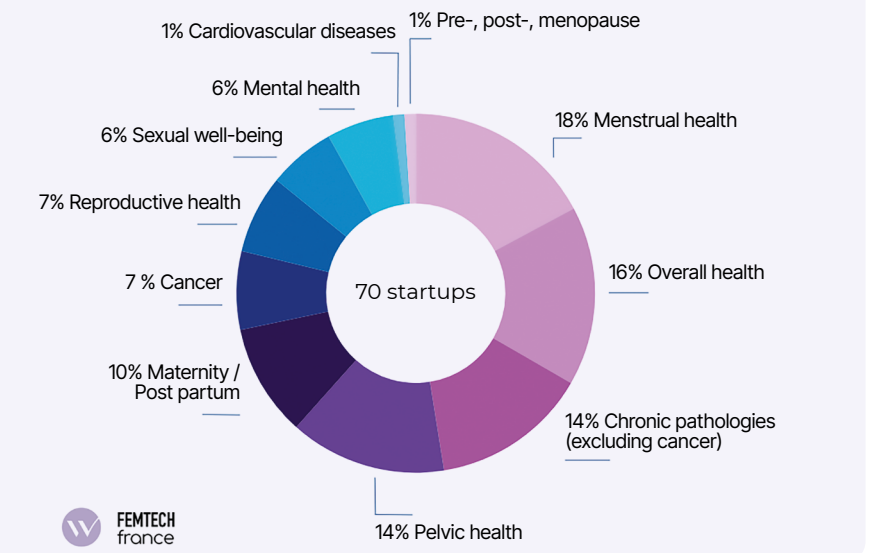
Today, the lack of data and dedicated solutions increases diagnostic difficulties and leads to therapeutic wandering. This is the case for many very different pathologies that present diagnostic difficulties:

→ **Breast cancer** (60,000 new cases and 12,000 deaths per year[17]) : although it is the most widely studied female pathology, it is not immune to this challenge. Early detection has greatly improved survival rates, but rarer and/or more aggressive forms of cancer can still escape early detection. The situation is exacerbated by disparities in access to advanced diagnostic technologies, such as 3D mammography and genetic testing.

→ **Cardiovascular diseases** in women whose symptoms differ from those observed in men, leading to misdiagnosis or underdiagnosis. Therapeutic wandering is amplified by tests and treatments that have historically been designed around male criteria, failing to take female particularities into account. While research has been prolific, it has only recently begun to fill these gaps, and the integration of new technologies is still inadequate.

→ **Endometriosis** (1 in 10 women): this pathology is often under-diagnosed due to a lack of knowledge and awareness. The time taken to diagnose the disease is estimated at 7 years on average, during which time women can suffer chronic pain and inadequate treatment. The lack of specific diagnostic tests and the lack of integration of digital technologies in this field further slow down the process. In this context a National Strategy to combat endometriosis was announced in 2022 by the government.

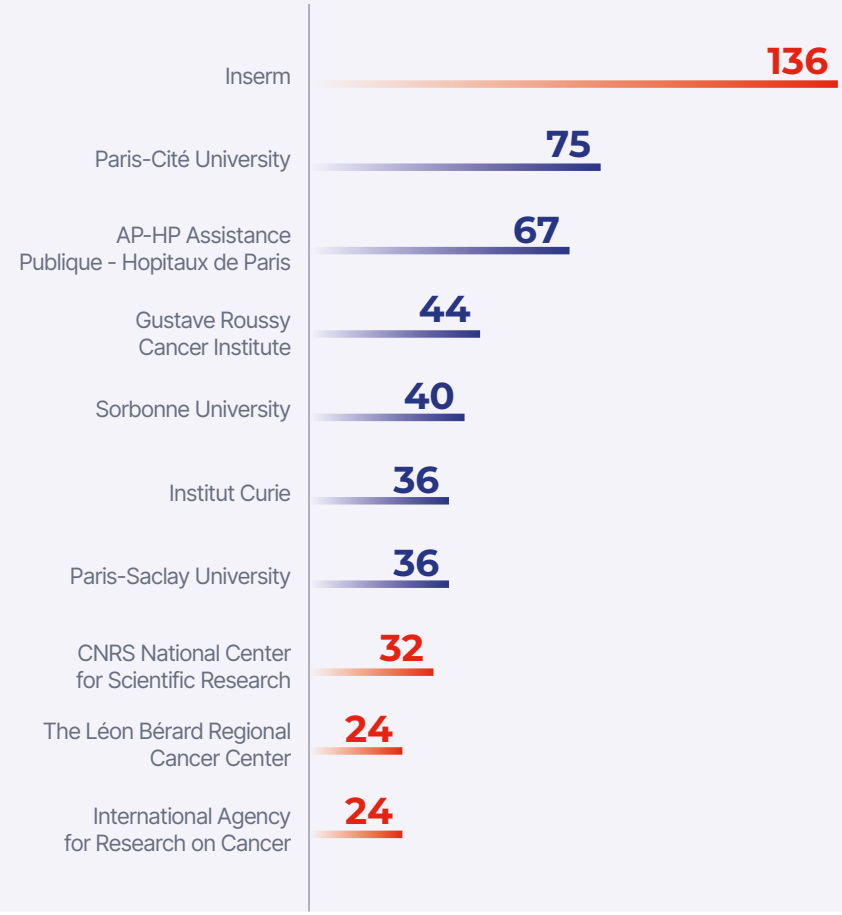
FIGURE 43: SEGMENTATION OF FRENCH FEMTECH STARTUPS.
Source: Femtech France.



17 Source: Santé publique france

The bibliometric analysis carried out on these 3 themes (research into breast cancer, cardiovascular disease and endometriosis combined with fertility) has shown an increase since the early 2000s and technical advances in digital technology.
The vast majority of publications mentioning new technologies come from the **Paris Region ecosystem** (with numerous international collaborations). These include AP-HP, Gustave Roussy, Institut Curie and the universities of Paris Cité, Paris Sorbonne and Paris Saclay.

FIGURE 44: LIST OF SCIENTIFIC PUBLICATIONS ON THE VARIOUS THEMES OF BREAST CANCER, CARDIOVASCULAR DISEASE, ENDOMETRIOSIS AND FERTILITY IN FRANCE.
Source: Scopus



ENDOMETRIOSIS: A TRANSFORMATION IN PATIENT CARE

A striking example of this transformation is the treatment of endometriosis, which has long been neglected and misunderstood, but is now an area where digital health is making a tangible difference. The use of artificial intelligence for diagnosis, the use of electronic medical records for coordinated care, and the implementation of connected devices for personalized monitoring are perfect examples of how digital health is transforming women's treatment pathways. These technologies not only allow for shorter diagnosis times, but also for treatments that are better adapted to patients' specific needs, creating a smoother, more efficient and more individualized treatment pathway.

The integration of digital technologies in the management of endometriosis offers new prospects for meeting these challenges. Whether in the form of mobile applications that allow symptoms to be tracked in real time, digital platforms that facilitate communication between patients and healthcare professionals, or artificial intelligence tools capable of analyzing complex medical data, these innovations represent a promising step forward. They not only allow for better early detection of the disease, but also a better understanding of individual variations in symptom manifestation, thus contributing to more targeted treatments.

03. Thematic focus: Digital health in hospitals / women's health

Interview Matricis.ai

Because these diseases have such a strong impact on pain management and fertility, it's essential to be informed in order to manage them better.

Raphaelle Taub
Co-founder and CEO, Matricis.ai

Can you tell us about Matricis?

Matricis.ai is a company specialized in AI for the diagnosis of pelvic pathologies, in particular endometriosis. We are developing software to help interpret MRI scans, with the aim of improving diagnostic accuracy in gynecology.

What is the origin of Matricis.ai and what problem are you addressing?

Matricis.ai was created in response to a significant delay in the diagnosis of pelvic pathologies, particularly endometriosis. Our co-founder, Elise Mekkaoui, has herself experienced years of medical wandering, a situation shared by millions of patients. Indeed, in France, a third of women see their doctor six times or more before obtaining a diagnosis, and 75% receive a wrong diagnosis along the way. Because these diseases have such a strong impact on pain management and fertility, it's essential to be informed in order to manage them better.

Inspired by similar technologies in other medical fields, we have decided to apply AI to improve the interpretation of pelvic MRIs in order to help radiologists better identify endometriosis and other female pelvic pathologies. Our team was then formed, made up of Raphaelle Taub (PhD, MBA), with extensive entrepreneurial experience, and Arnaud Fanthomme (PhD), a specialist in computer vision, which is the technology behind our product.

You are the first joint spin-off of two institutions, INRIA and AP-HP. What are their respective roles?

Matricis.ai benefits from a unique partnership between AP-HP and INRIA, which combines INRIA's computing resources and funding with AP-HP's medical expertise, thanks to the Bernoulli laboratory shared by the two institutes. In particular, we are working with the radiology team at Hôtel-Dieu, headed by Professor Elisabeth Dion, to develop our software.

What are the next steps in your development?

Currently in the pre-clinical phase, we are working on improving our AI models, based on feedback from physicians following an annotation campaign on 2,000 patients. We have filed our first patent and are aiming for CE and FDA certification of our medical device before it can be marketed. Next step: the start of our clinical study focusing on endometriosis.

04.

Appendices

04. Appendices

Methodology

GEOGRAPHIC SCOPE OF THE ANALYSES

The entire analysis is based on two frames of reference:

- On the one hand, France's positioning in its geopolitical ecosystem: for this, French data and dynamics have been compared as far as possible with data from the following EU countries: **Germany, Netherlands, Belgium, Spain, Italy.** The **UK** and **Switzerland**, both non-EU countries but important stakeholders in healthcare innovation, have been added.
- On the other hand, **Paris Region is part of the national dynamic with regard to other regions.**

ATTRACTIVENESS DATA: HEALTHCARE EMPLOYMENT

The healthcare innovation ecosystem is particularly complex to map, as it is both fragmented and heterogeneous in the fields it covers. Consequently, in the previous edition we focused on developing an exploratory approach to job search, based both on the identification of companies linked to Paris Region's host structures, and on identification by NAF code. It was agreed not to renew this approach for the 2021-2023 period, given that the dynamics will probably have changed little between the two sliding periods.

Nevertheless, in order to gain an insight into the evolution of employment dynamics, not covered in the previous edition, employment data from statistics made available in opendata by URSSAF were analyzed by the Institut Paris Region. Queries covered the following fields: private-sector employer establishments, general scheme.

The 2018-2023 study period was selected following discussions with Urssaf. Indeed, using data from before 2017, the date of the switch to the Nominative Social Declaration (DSN, 2015-2017 ramp-up), and moreover limiting the study to 5 NAF codes and one region, would expose us to commenting on noise, despite the work done to homogenize the past. It should also be noted that apprentices have been included in the headcount since the publication covering the first quarter of 2023, published in June 2023. They used to be excluded. The analysis focuses on the following NAF codes, the first 5 core healthcare sectors, the last (7211Z) being broader and containing other biotechnology fields:

- **2110Z:** manufacture of basic pharmaceutical products.
- **2120Z:** Manufacture of pharmaceutical preparations.
- **2660Z:** Manufacture of medical irradiation equipment, electromedical and electrotherapeutic equipment.
- **3250A:** Manufacture of medical, surgical and dental equipment.
- **4646Z:** Wholesale of pharmaceutical products.

ATTRACTIVENESS DATA: INVESTMENT PROJECTS IN PARIS REGION AND NATIONAL TRENDS

The analysis of foreign direct investment projects in Paris Region and other international regions was carried out using data and documents from Financial Time's fdi Intelligence for the years 2019 to 2023, in collaboration with the Paris Region's attractiveness agency: Choose Paris Region. The data used for this analysis was obtained from the Financial Times' fDi Markets database. This platform is recognized worldwide for its exhaustive tracking of foreign direct investment (FDI), covering all countries and sectors. For this study, we used FDI data including the overall and average amount of these investments, as well as the number of projects in the pharmaceutical, medical devices and biotechnology sectors for different regions. The information was extracted from the fDi Markets platform, which tracks the investment activity of over 140,000 organizations worldwide.

ATTRACTIVENESS DATA: FUNDRAISING

Regional and national fundraising

To obtain a complete picture of the evolution of venture capital investments between 2021-2023 in the healthcare innovation sector, the data was extracted from the Pitchbook database, a source recognized worldwide for its accurate collection and classification of financing rounds. The criteria used include the classification of companies in several key healthtech sub-sectors:

- → **HealthCare Devices and Supplies:** Diagnostic, Medical Supplies, Monitoring Equipment, Surgical Devices, Therapeutic Devices, and others
- → **HealthCare Services:** Clinics, Distributors, Elderly Care, Hospitals, Laboratory Services, Care Management, Practice Management, and more.
- → **Healthcare Technology Systems:** Decision/risk analysis, Company systems, Medical records, Results management, and more.
- → **Pharmaceuticals and Biotechnology:** Biotechnology, Discovery Tools, Drug Delivery, Drug Discovery, Pharmaceuticals, and others.
- → **Other HealthCare:** Other healthcare companies not included in the above categories.

The financing stages of companies are also defined according to the following criteria:

- → **Pre-seed:** Initial financing for startups that have not yet received backing from institutional investors.
- → **Seed:** Financing for companies without previous VC financing rounds, typically between 1 million and 10 million USD or EUR.
- → **Early Stage:** Investments for companies founded less than five years ago, often in Series A or B.
- → **Late Stage:** Financing for companies founded five or more years ago, or in Series C or later.

The data analyzed comes exclusively from traditional venture capital investments, in line with Pitchbook classifications. The types of investors included are traditional VCs, including corporate venture companies, but excluding non-traditional investments such as accelerators, incubators, calls for projects, grants.

04. Appendices

ATTRACTIVENESS DATA: FOCUS ON REAL ESTATE

The study's panorama of healthcare / Life Science (LS) corporate real estate was based on a broad consultation of Life Science real estate stakeholders who manage and plan to market hosting venues. An interview guide was produced to address the following themes:

01. Company profile and role in the sector.

02. Characteristics of marketed spaces (location, name of entities, surface area, type of premises, equipment, site capacity, etc.).

03. Viewpoint on current and future demand for Life Science spaces in Paris Region.

04. Challenges and opportunities in the regional, national and international Life Science market.

Interviews were conducted between March 2024 and June 2024 by videoconference and face-to-face with site visits. A total of 26 interviews were conducted, with stakeholders including developers, science park managers, public territorial stakeholders, and representatives of biotech and healthcare companies. The following is a complete list of the people who were consulted to carry out this work in conjunction with the Institut Paris Region:

Elise COLLA,
Commercial Manager - Kadans Science Partner

Sarah BESIREVIC,
Real Estate Relations Manager - Perelis

Paul SARRET,
Life Science Partnership Manager - DocCity

Léa MEKIES NAHON,
Project manager - Agoranov

Jérémy HERVE,
Economic Development Director - EPA

Bernard LLEDOS,
Vice-President, Accelair - Air Liquide

Benoît LAVET,
Marketing Manager, Office Division - Gecina

Claire BAUDOIN,
Head of Economic Development - GPSEA

Laurène JUBAN,
Health & Higher Education Project Manager - GPSEA

Justine GRASSET,
Entrepreneurship coordinator & IPHE network - GPSEA

Isabelle MARCHAND,
Director - Silver Innov'

Anouk SERREAU,
Deputy Director - Silver Innov'

Laurent PONCE,
Health sector manager - CCI Val de Marne

Sophie LOCHET,
Project Manager - Paris Biotech Santé

Stéphanie LEFEBVRE,
Entrepreneurial support in health innovation - Paris Biotech Santé

Béatrice SUDRE,
Laboratory setup & Health Science start-up consultant - Self-employed

Matthieu RESCHE-RIGON,
Vice-Dean of the School of Medicine - Université Paris Cité

Christine GUILLARD,
Director of Research and Innovation, School of Medicine - Université Paris Cité

Guillaume SUINOT,
Company setup consultant - Genopole

Paul CAROEN,
Business development and partnerships manager - Genopole

Mathieu NIVON,
Scientific Programs and Partnerships Manager - Patriarche

Loïc POURCHAIRE,
Senior associate - Patriarche

Christophe TALLEC,
Biolabs Hôtel-Dieu site manager - BioLabs France

Jean-Baptiste HENNEQUIN,
Project Manager, Cité de l'Innovation - Sorbonne University

Céline TRIQUEL,
Head of R&D Open Innovation - Servier

Hélène SIRE,
Spartners site manager - BioLabs

Frédéric KURT,
Chief Financial Officer - PSCC

Gauthier DECOCK,
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We also contacted several people to list the technical and scientific platforms that are available to companies from the main academic research and innovation stakeholders:

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The data collected was processed using a quantitative method based on the following rules:

- → The "Total marketable area (m2)" category only includes space for Life Science companies.. This total area includes office, laboratory and "other" space.
- → The "Other (m2)" category comprises several types of space, including meeting rooms, social and co-working spaces, prototyping areas and vivariums.
- → The "Marketable laboratory space (m2)" category includes only L1/L2 laboratory space (or even L3 when envisaged, which remains rare) for use by companies.
- → Where information was lacking, a default average ratio (50%/40%/10%) was applied to the entity's total surface area to distinguish between laboratory/ office/"other" surface areas.
- → The selection of hospitals shown on the map is based on several criteria:
  - it must be a center dedicated to research and innovation,
  - Most of them are hospitals with more than 30,000 admissions per year.
- → Criteria for selecting technical platforms: The non-exhaustive list of technical platforms identified is necessarily exploitable by external companies.

LIMITATIONS

Like all research, this study has certain limitations. We're confident about the figures we've put forward for all the space already sold. As far as future sites are concerned, the data collected is relatively reliable when it comes to real estate under construction. More reserves are needed for surfaces that will come out after 2026. In addition, rapid changes in the real estate market can affect the relevance of data over time. Nevertheless, the results provide a valuable overview for decision-makers and investors in the Paris Region life sciences sector.

04. Appendices

UNIVERSITY RANKINGS

The analysis of university positioning is based on the Shanghai 2023 ranking by technical field, available at the following link: https ://www.shanghairanking.com/rankings/gras/2023

The following technical fields, at the heart of the healthcare sector, have been selected and expanded with the "Bioetchnology" field:

- → Biological Sciences (Life Sciences section).
- → Human Biological Sciences (Life Sciences section).
- → Clinical Medicine (Medical Science section).
- → Medical Technology (Medical Science section).
- → Pharmacy & Pharmaceutical Sciences (Medical Science section).
- → Biomedical Engineering (Engineering section).
- → Biotechnology (Engineering section).

LIMITATIONS

The Shanghai ranking is based on the weighted criteria specified in the table below. It does not take into account the quality of teaching, the level of graduates, student success rates or graduate integration rates.

Criteria	Indicators	Weighting
Quality of teaching	Number of Nobel Prizes and Fields Medal winners among alumni	10%
Institutional quality	Number of Nobel Prizes and Fields Medal winners among researchers	20%
	Number of most cited researchers in their disciplines over the last ten years	20%
Publications	Number of articles in *Nature et Sciences* during the last five years	20%
Institutional size	Academic performance in relation to institution size	10%

TECHNICAL ANALYSES: SCIENTIFIC LITERATURE

The competitive and market environment in which innovation trends are taking place was characterized using Statista and Orbit Innovation tools, as well as the available gray literature.

Publications (dynamics, stakeholders, collaborations, etc.) were studied by creating a corpus of data using Scopus, then analyzed using Intellixir. Finally, following a similar approach, patents were identified and analyzed using Questel tools (Orbit Innovation and Orbit Intelligence).

Regarding publication dynamics in AI, queries were conducted on the following keywords in titles, keywords and abstracts: "Artificial intelligence". The scope of research focused on the core areas of the healthcare sector: Medicine, Health Professions. Nursing, immunology and Microbiology, Biochemistry, Genetics, and Molecular Biology, Pharmacology, Toxicology and Pharmaceutics, Neuroscience. Items are listed according to their geographical area of affiliation.

PATENTS

For a harmonized, repeatable view, patents have been analyzed in the technological fields shared by the various organizations (EPO, INPI, etc.). The following core areas of the healthcare sector were selected:

→ Measurement techniques.

→ Analysis of biological materials.

→ Biotechnology.

→ Pharmaceutical products.

Other, non-core areas may be useful for gaining perspective.

EPO data came from the following database: https ://www.epo.org/en/about-us/statistics/data-download

For the national scope, the selection of technological fields was based on INPI territorial data available in the following databases: https ://www.inpi.fr/statistiques-regionales-et-departementales-des-demandes-de-brevets-publiees-a-l-inpi

LIMITATIONS

The data available from the EPO source and the INPI source do not cover the same perimeters. The INPI database covers patent applications published at the INPI, while the EPO database covers European patent applications, including direct European applications and international (PCT) applications which entered the European phase during the reference period.

Also, the number of patents identified in France in a technological field on EPO sources differs from the INPI vision centered on the territory.

ANALYSIS OF MEDICEN ACCREDITED PROJECT PORTFOLIO

The analysis of projects appraised and then accredited by MEDICEN during the 2021-2023 period was carried out using the same methodology as for previous editions. Data for the three rolling years were studied using an agnostic data processing approach (extraction of projects registered between 01/01/2021 and 12/31/2023). After detecting and correcting duplicates/errors, a homogeneous "project" database was established, covering all funding sources and all sectors. The "niche" projects or technology platforms accredited by MEDICEN were excluded from the analysis base, such as the Institut Hospitalo-Universitaire (IHU), Sésames Filières PIA, etc. projects.

Prior to exploitation, an analysis of the consistency between the results of the periods previously studied was carried out, demonstrating the stability of the base constituted between the two periods and showing equivalent orders of magnitude between the two periods:

→ 268 projects appraised, compared with 314 and 336 over the two periods,

→ A 37% labeling rate for the first study period, versus 37 and 36% for the previous periods).

LIMITATIONS

Healthcare innovation chains can be porous. Similarly, several therapeutic areas can be addressed by a single project, or a subject can mobilize several technological areas. As a result, a single project submitted in response to a call for projects may be affiliated with several sectors, therapeutic areas or technological areas.

This overlapping allows for the analysis of subject interactions or interdependencies. However, this cross-referencing affects the calculations, and the number of projects or amounts per theme cannot be totaled.

An area for improvement for future editions is to reduce this overlapping in nomenclatures, or to assign priority or secondary themes in project descriptions.

Finally, it should be noted that the nomenclature of technological areas has been modified between the two periods to reduce the biases associated with technologies that are too cross-disciplinary and therefore over-represented (e.g. AI).

04. Appendices

RIC ANALYSIS: AYMING BENCHMARK AND NATIONAL TRENDS

The Ayming Healthcare Benchmark was built and analyzed using the following approach:

- → Identification of declarants in the healthcare sector, whatever their size and department, and categorization by Market Leader Ayming according to the sector definitions provided by MEDICEN. In this exercise, each declarant is affiliated to a single sector, unlike the other reference systems used in this study,
- → Consolidation of RIC declarations (amounts and distribution by item of the expenditure base) on this basis for the 3 financial years from 2021 to 2023,
- → Comparison with data (distribution of expenditure items) from studies published by the French Ministry of Higher Education and Research, and analysis according to location, type of company, etc. by the head of AYMING's innovation tax experts.

LIMITATIONS

The AYMING benchmark data is only a snapshot of the RIC declared in the healthcare sector and in Paris Region. In addition, AYMING is ISO 9001 and 27001 certified, and highly committed to the sensitive nature of its clients' data.

For these reasons, no absolute amounts are shared in this document and no individualized data has been shared between AYMING and MEDICEN.

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Presentation of the structures: MEDICEN & Ayming

Created in 2005, Medicen Paris Region is the Paris Region healthcare cluster. This unique network brings together over 450 healthcare innovation stakeholders, including 370 healthtech startups and SMEs, healthcare manufacturers, and the region's leading research institutes and healthcare facilities.

By uniting public and private stakeholders around the challenges of innovation to develop tomorrow's therapeutic and diagnostic solutions, Medicen acts as a trusted third party in the development and implementation of the industry's projects.

To stimulate the sector's growth, accelerate the time-to-market for innovative products and services, and promote job creation, Medicen is focusing on three main areas:

→ Unite the ecosystem and facilitate exchanges between stakeholders to stimulate innovation.

→ Support the development and growth of local companies.

→ Represent and defend its members' interests with public authorities.

Thanks to concrete actions in various fields such as healthcare innovation, company development, and European and international initiatives, Medicen offers personalized support to each member, regardless of the maturity of their project.

Ayming has been a **business performance consulting group for over 35 years** which supports its customers on a daily basis to improve their operational and financial performance.

Our levers for action:

→ Increase your financing capacity by enabling you to benefit from indirect financial aid (RIC, CII, JEI, IP BOX) and direct regional, national and European financial aid (grants and subsidies for innovation and investment).

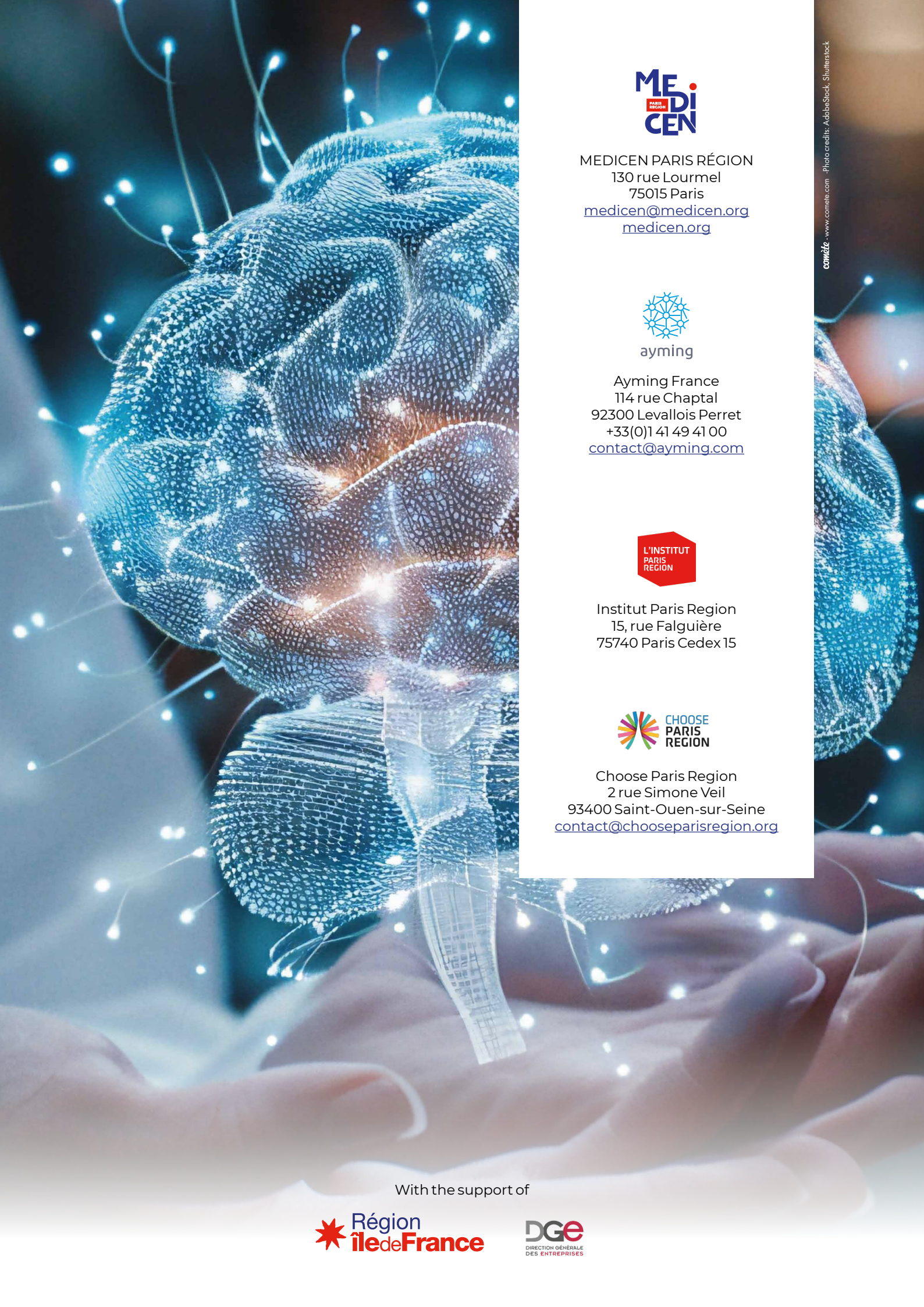
→ Efficiently manage your innovative projects by improving your processes, managing the performance of your project portfolio, and nurturing your innovation strategy through technological intelligence.

→ Key figures:

+1500 clients of all sizes

550 M€ in Innovation financing obtained every year

1300 employees in 14 countries



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