

October 2022. Sector snapshot

Life sciences and healthcare industry

in Catalonia

Life sciences and healthcare industry in Catalonia. Sector snapshot

ACCIÓ
Government of Catalonia



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Author

ACCIÓ Strategy and Competitive Intelligence Unit

Collaboration

BIOCAT

Barcelona, October 2022



1. The life sciences and healthcare industry



2. The life sciences and healthcare industry in Catalonia



3. Opportunities in the life sciences and healthcare industry

Life sciences and healthcare industry in Catalonia

1. The life sciences and healthcare industry

Life sciences and healthcare industry: definition



Pharma (fully integrated)

Fully integrated pharma companies are commercial enterprises that research, develop, produce and market drugs and other medicines. In today's economy, these enterprises are usually large companies that deal in branded and generic compounds and at least partially rely on smaller biotechnology companies for in-licensing of novel compounds for their pipelines.



Medical Technology

Medtech companies are involved in research, development, production and marketing of systems and devices for medical applications in humans and animals (i.e. to treat and diagnose diseases and medical conditions).



Digital health

Digital health and care refers to tools and services that use information and communication technologies (ICTs) for improvement, prevention, diagnosis, treatment, monitoring and management of health-related issues, and to monitor and manage lifestyle habits that impact health.



Biotechnology

Biotech companies use living organisms and biological substances to develop products and services with applications in numerous fields, such as waste management, food processing, agriculture and pharmaceuticals.

The core business of firms categorized as **Biotechnology-Therapeutics and Diagnostics companies** is the application of biotechnology in the discovery and development of novel therapeutic compounds and probe molecules for applications in medicine.

Companies that fall under the **Biotechnology - R&D Services category** provide support services in the biotech industry, such as product development services, analytical services, screening, contract manufacturing and contract R&D.

Companies in the **Biotechnology - Other category** apply biotech concepts (using living organisms and biological substances for the development of products and services) to areas other than drug development for medical use.

Source:

Pharmaceuticals, Biotechnology and Medical Technology: Catalonia Health and Life Sciences Data Platform.

Digital Health: European Commission.

The global life sciences and healthcare industry



Pharmaceuticals

- European pharmaceutical industry production rose to **€310 B** in 2020, a **5.73% increase** over the previous year and **55.21% over 2010**.
- The sector has invested **€39 B** in **R&D** in the European Union to become the leading sector in R&D expenditure.
- The European Union has a **positive trade balance of €155 B**, led by Switzerland, Ireland and Germany.
- **Spain** ranks **5th** in sales and job creation, and **8th** in pharma production in the European Union.



Digital health

- The global market in 2022 is US\$181.9 B. The global digital health market is expected to grow at a CAGR of 16.5% and reach over US\$550 M by 2027.
- Funding for startups in digital health skyrocketed in 2021 to €1.67 B, almost three times the 2020 total.
- Patent registration in digital health has increased significantly in the last five years compared to the previous five. Most of these patents are from health companies in the United States and China, and from other areas, such as Samsung.



Biotechnology

- The biotechnology industry has grown on a par with the pharmaceutical industry. After two decades, it has now reached the consolidation stage as an emerging industry.
- A number of major industry multinationals have chosen Spain as a destination for investment, not only to distribute their products, but also to establish their R&D, production and service centres.
- Almost **4,000 companies carried out biotech activities** in 2020, of which 862 were exclusively biotech companies.



Medtech

- There are more than **33,000 medical technology (medtech) companies in Europe**. The greatest number are based in Germany, followed by Italy, the UK, France and Switzerland. Small and medium-sized companies (SMEs) make up around 95% of the medtech industry, most of which employ fewer than 50 people (small and micro-sized companies).
- The European medtech market was estimated at roughly €140 B in 2020.
- Spain represents 6.3% of European medtech, and 9% of the European in vitro diagnostic industry (IVD).

Source: *Pharmaceuticals: The Pharmaceutical Industry in Figures, 2021, European Federation of Pharmaceutical Industries and Associations. Digital health: Precedence Research. Biotechnology: ASEBIO. Medtech: The European Medical Technology Industry in figures 2021.*

Main global companies in the life sciences and healthcare industry

- The top 10 countries account for 75% of global turnover, with the **United States (32%), China (15%) and Japan (6%) in the top positions.** The United States and China are the countries with the most unicorns.



Top 30 global companies

Europe



Americas



Asia



Presence in Catalonia



53% of the main companies in healthcare and life sciences have a presence in Catalonia



Source: Dealroom. ACCIÓ.

Note: Companies sorted by turnover.

Note: Based on Orbis. CNAEs:

- 21 – Manufacture of pharmaceutical products,
- 325 – Manufacture of medical and dental instruments and supplies,
- 266 – Manufacture of irradiation, electromedical and electrotherapeutic equipment.

Life sciences and healthcare industry in Catalonia

2. The life sciences and healthcare industry in Catalonia

Catalonia: an economy with strong, diverse life sciences and healthcare ecosystem

1. Catalonia: a leading life sciences ecosystem



The sector **has 91 research institutions and over 1,300 companies** (mainly biotech and pharma, but also medtech and digital health firms), which, together with healthcare services, **generate 8.7% of Catalan GDP.**

2. Globally recognized life sciences innovation hub



Catalonia offers the **best technological centres and supporting research infrastructure for the life sciences and healthcare sector.** Barcelona ranks in top positions in **active clinical trials.** Most top pharmaceutical companies choose Barcelona to run their trials. Catalonia leads Spain in the number of current patent families, making up 35% of the country's total, ahead of the Community of Madrid.

3. On the global radar for life sciences FDI



Between 2017 and 2021, **Catalonia was the top life sciences FDI destination in Spain, accounting for 31.7% of FDI projects.**

4. A major exporter in the industry



€7.78 B in exports in life sciences and healthcare products (2021).

Catalonia exports more life sciences and healthcare products than any other region of Spain.

5. A prime location for top scientific talent



Catalonia has different initiatives in the public and private sectors to **retain and encourage talent** in the life sciences sector.

Among the **12 Catalan universities** with life and health sciences degrees, 3 (UAB, UPF and UB) are among the top 200 in the world.

2. The life sciences and healthcare industry in Catalonia

1. **Catalonia: a leading life sciences ecosystem**
2. Globally recognized life sciences innovation hub
3. On the global radar for life sciences FDI
4. A major exporter in the industry
5. A prime location for top scientific talent



Catalonia has one of the leading life sciences and healthcare ecosystems in Europe, with 91 research centres and over 1,300 companies.

The Catalan life sciences and healthcare industry

1,300+ COMPANIES (2021)



- 335** biotech companies
- 200** professional services and consulting companies
- 228** medtech companies
- 180** providers and distributors
- 202** digital health companies
- 126** pharma companies
- 50** investing organizations

Compared to 2020, the number of companies increased by 8%

The company **creation rate** is about **1 new company per week**.

92% of companies are **SMEs**.

91 research institutions: research centres, university hospitals, large research infrastructure, technology centres, and science and technology parks with life sciences and healthcare and health activities.

€21.33 B TURNOVER (2021)



4.4% of Catalan GDP.

Turnover is **€31.1 B** (8.7% of Catalan GDP) when **healthcare services companies** are included.

Pharma companies represent **47% of total turnover**.

In 2020, turnover continued to grow at the same annual rate (CAGR) as in the previous 10 years (roughly 3%)

57,718 EMPLOYEES (2021)



243,718 people are employed in the sector when **healthcare services companies** are included (**8% of the working population in Catalonia**).

Source: Biocat (BioRegion Report 2021).

Four fast-growing subsectors



Pharmaceutical

126
COMPANIES (2020)
€9,99 B TURNOVER
(2020)

As a subsector, pharma has the fewest companies but their joint turnover is nearly three times that of biotech firms.



Medtech

228
COMPANIES (2020)
€3,57 B TURNOVER
(2020)

The medtech subsector stands out for a 40% increase in turnover in 2020.



Biotechnology

335
COMPANIES (2020)
€4 B TURNOVER
(2020)

The turnover generated by these biotechs can be broken down in terms of firms that work in human health / therapies (2% of turnover), scientific services (37%), and the rest of the companies that use biotechnology in their animal health, agrifood, industrial and environmental (61%) processes,



Digital Health

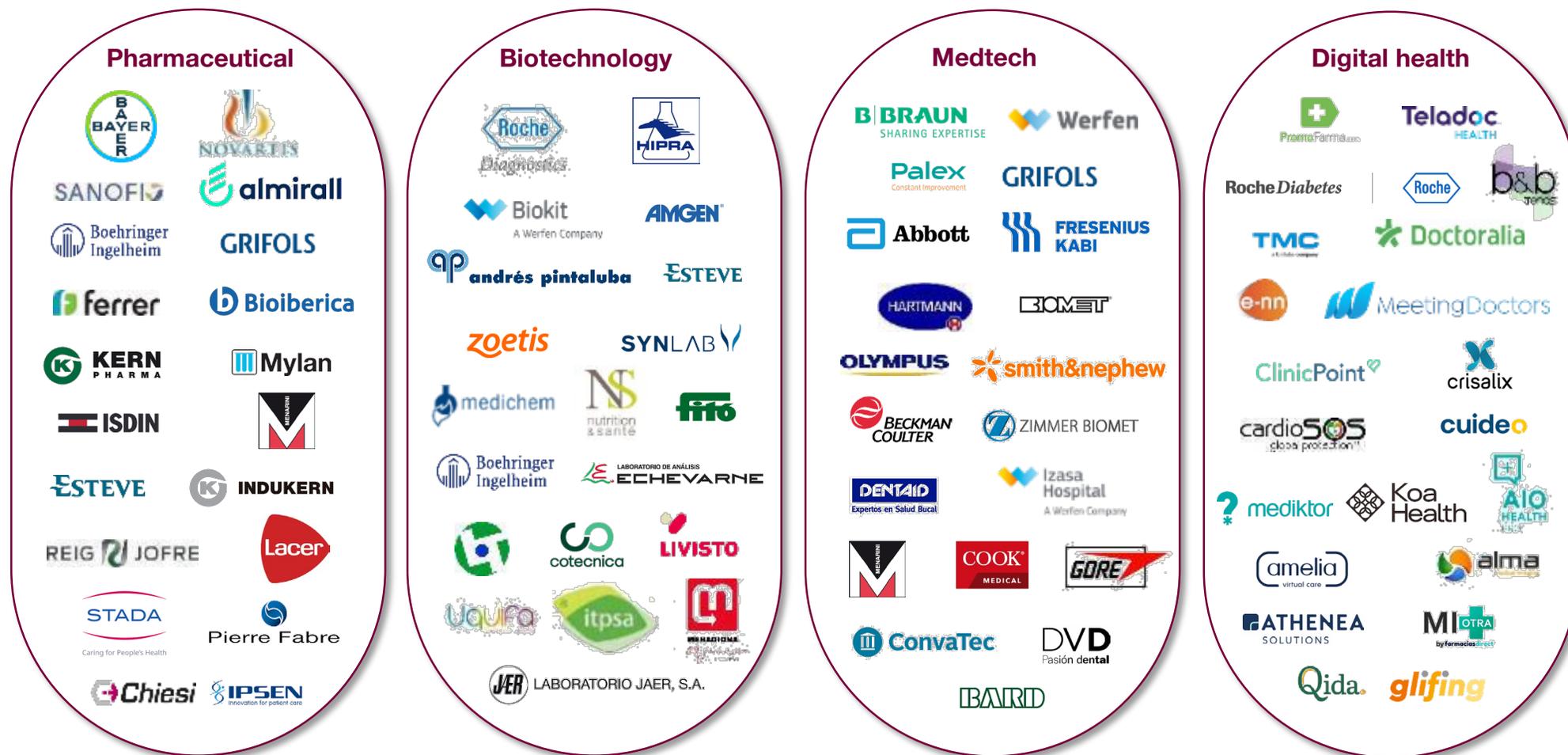
202
COMPANIES (2020)
€311 M TURNOVER
(2020)

The digital health subsector showed the second largest increase in turnover in 2020 (21%).

Source: Biocat (BioRegion Report 2021).

Main life sciences companies in Catalonia by segment

4 of the 5 main pharmaceutical enterprises in Spain have a presence in Catalonia



Note: This is a partial illustrative representation of the main companies that form part of this ecosystem

Source: Biocat (BioRegion Report 2021).

A diverse support ecosystem to support the life sciences and healthcare sector



Note: This is a partial illustrative representation of the main companies that form part of this ecosystem. Source: Source: Biocat (BioRegion Report 2021). ACCIÓ.

Catalonia has strategic life sciences clusters, associations and agencies



Fenin is a **multi-sector federation** that groups **manufacturing, import and distribution** companies and associations of **healthcare technologies** and products.



BIB is a non-profit association for the **promotion** of advanced **research, knowledge and technology transfer**, stimulating competitiveness and innovation within the industrial sector, and providing greater visibility as an international node in the field of bioinformatics.



Pier07 is a partner of Tech Barcelona's Urban Tech Campus and will be the hub of reference for entrepreneurship and innovation projects in the health and life sciences sector.



It is the **National Trade Association of the Pharmaceutical Industry** based in Spain. Its **members include most of the R&D-based pharmaceutical companies** established in Spain.



The mission of the Barcelona Health Hub association is to promote innovation in digital health and its transfer to the sector by connecting startups, health organizations, companies and investors.



Biocat is the organization that coordinates and promotes the healthcare and life sciences sector in Catalonia.



A cluster initiative that aims to contribute to the competitiveness of the value chain of the **biomedicine and health sector**. It promotes the research, development and innovation of this area so that its business community will generate new biopharmaceutical products, services, medical technologies and digital health.



Beauty Cluster Barcelona is a **private organization** made up of 200 companies that work to **boost the growth and competitiveness** of its partners in the **value chain of the beauty sector**.



The Mental Health Cluster of Catalonia is a hub for innovation and business development in healthcare, homecare and social services. The cluster has a broad knowledge of the mental health and neuroscience market through its members: private industry, public organizations, research and education institutions, mental health providers, hospitals, community services and technology centres.

Source: ACCIÓ.

Business accelerators and support programmes

Life sciences and healthcare accelerator



Other top accelerators and incubators



Crowdfunding platforms



Main specialized investors established in Catalonia



International venture capital funds and investors



Business Angels



Note: This is a partial illustrative representation of the main partners that form part of this ecosystem.

Source: ACCIÓ.

A highly efficient health system

According to Bloomberg, Spain has the **most efficient public health system in the world**. Proof of this excellence is that Spain has the highest organ transplantation rate in the world, the **highest life expectancy at birth in the European Union**, and a **patient satisfaction level of 85%**.

Catalonia has 5 of the 20 most valued Spanish hospitals.

CLÍNIC
BARCELONA

Best assessed Spanish hospital and 63rd in the world.



14th position



6th most highly rated Spanish hospital, and 81st in the world.



16th position



19th position

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Catalan hospitals also stand out as state-of-the-art research centres. In fact, the **Catalan Health Institute (ICS) is the leading health organization in Spain** in terms of the number and quality of scientific papers published, with 5,000 dedicated researchers who published 4,570 papers in high-impact journals in 2018. However, the entire Catalan health system works on research with an impact:

20 University hospitals



12 Hospital research institutes



Sources: Hospital excellence index, Newsweek, The World's Best Hospitals 2022.

2. The life sciences and healthcare industry in Catalonia (I)

1. Catalonia, a leading life sciences ecosystem
2. Globally-recognized life sciences innovation hub
3. On the global radar for life sciences FDI
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Barcelona is the 11th most innovative European city.

2thinknow, 2021

Barcelona ranks 7th in the Tech Cities of the Future ranking 2021.

Financial Times, 2021

A Digital and Innovation Hub

Digital Health Hub

- Barcelona has become one of the **top five European tech hubs** thanks to international talent attraction, a dynamic local entrepreneurial ecosystem and institutional support for innovation in the healthcare system.
- Thanks to the Mobile World Congress, **Barcelona is the meeting point for the global digital revolution.**
- Catalonia boasts a **large ICT ecosystem** with more than 1.900 startups, many of them in the life sciences sector.
- **Multinational** life sciences and healthcare companies choose Catalonia to install their digital innovation hubs.

YPSOMED
SELF-CARE SOLUTIONS

Alliance Healthcare
Bringing healthcare closer

Roche

Diagnostics

SANOFI

ACCIÓ
Catalonia
Trade & Investment

Generalitat de Catalunya
Government of Catalonia

Health Innovation Hub

- **Open innovation:** major laboratories are associating with startups to create new drugs and new services through apps to provide patient care.

ferrer

Ferrer 4 Future: Ferrer Spring Challenge 2020 is about how the pharma group can improve patient pain in several stages.

NOVARTIS

Neuroscience Lab, Neurohouse: provides healthcare professionals with spaces for creation, dialogue and collaborative work to enable improvement when dealing with and caring for people with neurodegenerative diseases.

Teladoc
HEALTH

Teladoc Health: an American telemedicine company has set up a digital hub in health technologies in Barcelona, which is why it has hired a team of 50 developers and plans to expand the workforce to a hundred experts in the coming months.

SANOFI

Sanofi Health-U: an open innovation programme that launches a series of challenges linked to Sanofi's core business with the aim of finding quick, disruptive, technology-based solutions.

Almirall

Almirall Garden: a 9-month acceleration programme providing up to €50,000 in funding per startup.

Boehringer Ingelheim

Boehringer Ingelheim: is committed to digital transformation by investing €11 million in its digital hub in Spain, established in 2018 in Sant Cugat del Vallès (Barcelona), and which provides service worldwide. Current plans involve doubling this figure in the next three years. The pharmaceutical multinational will also strengthen this centre by expanding its staff by 24% this year.

CataloniaConnects

An expanding startup ecosystem based on world-class science

More than 1,900 startups are located in Catalonia

Barcelona is the **2nd-ranked EU startup hub** with the highest percentage of international founders.

Startup Heatmap 2022

Barcelona is the **5th best ecosystem** in the EU in which to set up a startup, behind Paris, Berlin, Stockholm and Amsterdam.

StartupBlink, 2022

Barcelona is the **2nd favourite EU startup hub** for founders setting up startups.

Startup Heatmap Europe, 2022

- The **top** startup sector in Catalonia is a **healthtech startup**.
- There are currently **295 healthtech startups** in Catalonia.
- **16%** of the startups created in 2021 belong to the **healthtech** and **medtech** sectors.

Health and health services, 2021



Note: This is a partial illustrative representation of the main startups that form part of this ecosystem.

Source: ACCIÓ, Barcelona & Catalonia Startup Hub, 2021.

In five years, Barcelona attracted \$355 M in investment in life sciences and healthcare startups

Barcelona attracted \$355.5 M in investment in life sciences and healthcare startups from **2017 to 2021**
(Dealroom, 2022)

	2017	2018	2019	2020	2021
Investment (\$M)	17.6	44.2	37.2	121	135

Most representative investments of 2017-2021:

	Impress	STAT Dx Genetic Dx	ANCD	QNA	Koa Health	mdk	INTRAIN
Total investment	\$55.5 M	\$54.5 M	\$38.7 M	\$34.7 M	\$33 M	\$19.7M	\$18 M
Date last investment / acquisition	2021	2018	2019	2020	2021	2021	2021
Rounds period 2017 /2021	2 rounds	1 round	4 rounds	2 rounds	2 rounds	3 rounds	2 rounds

Source: Dealroom 2021 (consulted 14/04/2022).

Note: consultation made in Dealroom with Catalonia as a founding location.

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Barcelona ranks first in the category fDI's European Cities and Regions of the Future 2022/2023 - FDI Strategy Awards.

Financial Times, 2021.

Catalonia: a leading destination for life sciences and healthcare FDI

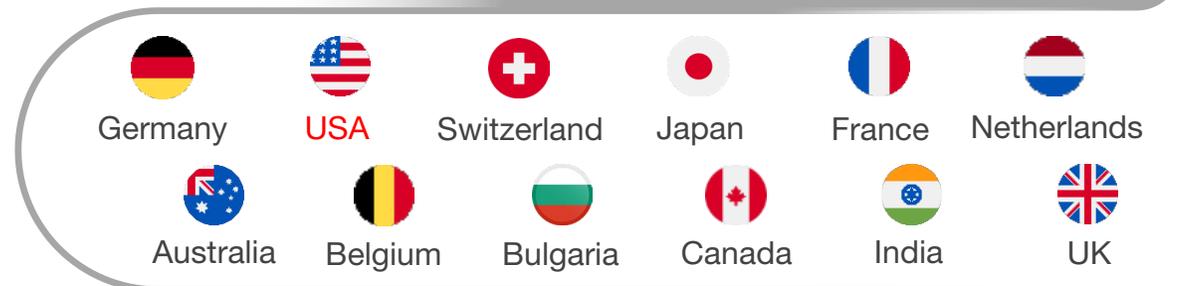


Between 2017 and 2021, **Catalonia was the top life sciences FDI destination in Spain, accounting for:**

- **31.7%** of FDI projects.
- **36.4%** of invested capital.
- **31.6%** of jobs created.

	Projects	Capital (€M)	Jobs
Pharmaceutical	16	336.3	927
Medtech	6	38.5	141
Biotechnology	4	64.2	230
Healthcare	7	238.6	1,387

Main countries by investment origin



26 companies invested in the Catalan life sciences sector from 2017 to 2021.



Source: ACCIÓ based on fDi Markets, 2017-2021.

Catalonia: leading destination for life sciences and healthcare FDI

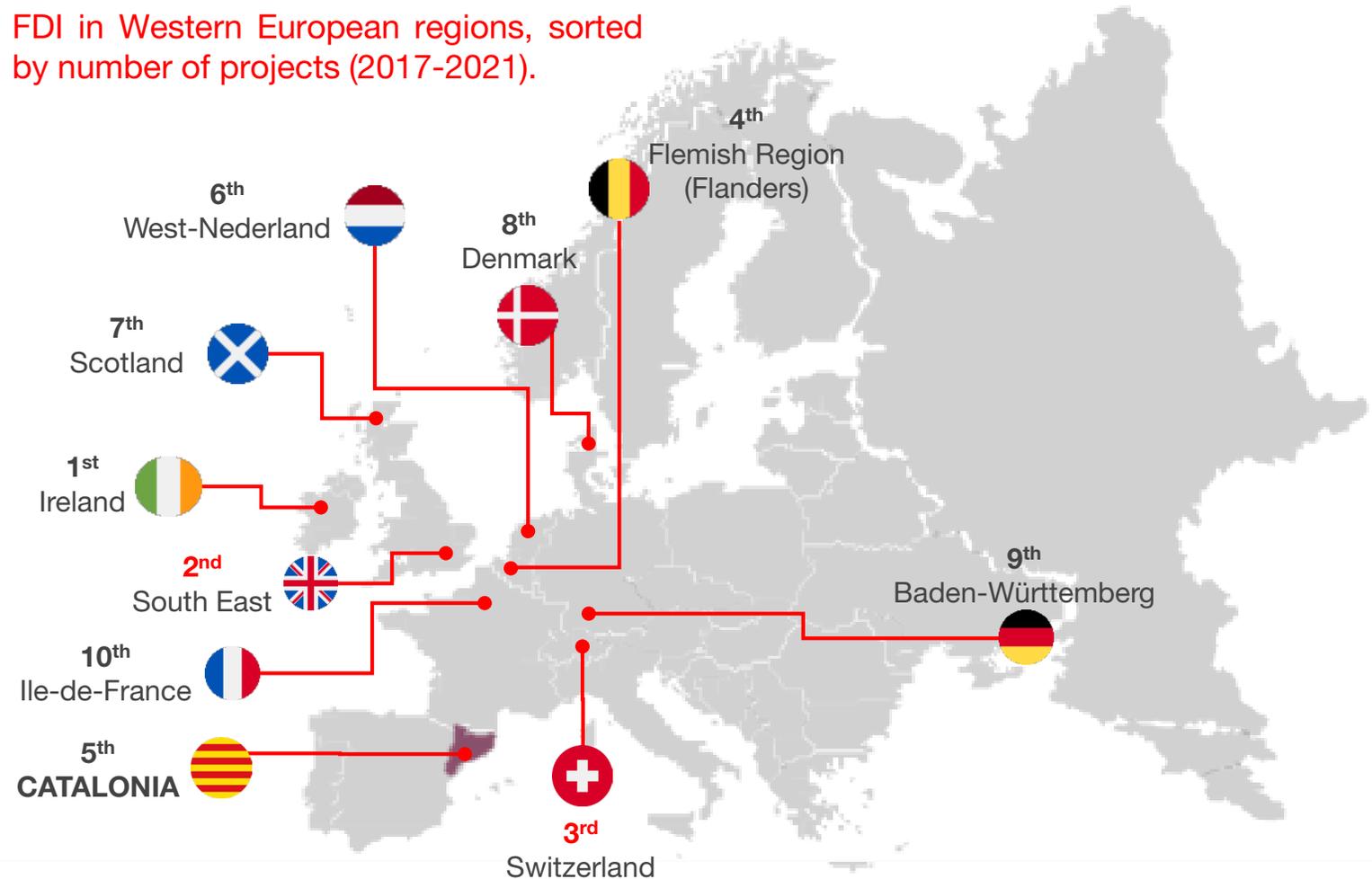
Catalonia is the **5th-ranked region in Western Europe in jobs created**, the **10th in capital investment** and the **12th region by number of projects**.

FDI in Catalonia accounts for **3.9% of the jobs created in Western Europe**, **2.5% of projects** and **1.9% of total capital investment**.



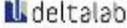
Source: fDi Markets, 2017-2021.
Note: *Ireland and South East had the same number of projects.

FDI in Western European regions, sorted by number of projects (2017-2021).



Life sciences M&A in Catalonia

26.5% of M&A deals in Spain

	Germany	Acquisition of remaining stake		Pharmaceutical manufacturer
	France	100% acquisition		Medical and beauty machinery manufacturer
	Netherlands	100% acquisition		Diagnostic equipment manufacturer
	Portugal	100% acquisition		Chemical raw material manufacturer
	United Kingdom	100% acquisition – Tarbis Pharma		Pharmaceutical manufacturer
	South Korea	Increase from 39% to 86%		Probiotics and genetic test manufacturer
	Germany	100% acquisition		Herbal extract and natural active substance manufacturer
	Japan	100% acquisition		Pharmaceutical product manufacturer
	Japan	100% acquisition - Malgrat Pharma Chemicals		Biopharmaceutical ingredient manufacturer
	Switzerland	100% acquisition of 2 plants		Oral solid medicines manufacturer
	Italy	100% acquisition		Active pharmaceutical ingredient (API) manufacturer
	Thailand	85% acquisition		Laboratory instrument manufacturer
	Switzerland	100% acquisition		Biomimetic synthetic bone graft substitute manufacturer

Source: Orbis Crossborder, 2017-2021.

Life sciences leaders choose Catalonia

AGC Pharma Chemicals announced in April 2022 that it will invest €90 million and create 100 skilled jobs with the expansion of the company's factory in Malgrat de Mar (Maresme). The aim is to increase the production capacity of active pharmaceutical ingredients by 30% with the construction of a new 7,500 sqm production plant, which will be operational in 2024.



The pharmaceutical company AstraZeneca will open a development centre in Barcelona to accelerate the development of new generation drugs in the field of rare diseases, a project that will involve the creation of up to 100 jobs specializing in R&D in the next two years. The company will open this new hub through the Alexion Group company, which specializes in rare diseases.



Source: fDi Markets and Press.

The German pharmaceutical company Bayer has strengthened its activity in Catalonia by opening the new LifeHub Barcelona, a space of more than 650 sqm for acceleration of innovative projects in the fields of health and agriculture.



Hartmann is investing €14 M in the expansion of his plants in Mollet del Vallès and Montornès del Vallès for medical devices for wound care, incontinence and disinfection, creating 15 new jobs.



US-based Teladoc Health, a multinational telemedicine company, has established a new headquarters in Barcelona, invested €120 M and created 750 jobs.



Qiagen, a major Dutch global provider of technologies for clinical trials and testing, acquired the Catalan company Stat-Dx, which specialized in the development, manufacture and marketing of "Closer to Care" diagnostic solutions. Qiagen has doubled the plant at Barcelona Science Park for production of Covid tests.



SP Scientific has made a strategic investment by building and opening a 4,000 sqm facility in Barcelona next to the company's original factory, thus doubling the site's capacity.



Japanese pharmaceutical multinational TOWA acquired Pensa Pharma from Esteve by investing €320 M and keeping 600 jobs.



Swiss medtech company Ypsomed has opened a digital hub in Barcelona to create 40 jobs in two years. The developer and manufacturer of injection and infusion systems for self-medication will develop new digital and connected devices for management of chronic diseases such as diabetes.



The company, which was established in Catalonia in 2010 in a 400 sqm space, currently has a team of 250 workers at its Cornellà de Llobregat offices. The company expects to employ 10,000 people internationally by 2025.



US-based Zoetis, a manufacturer of animal health medicines and vaccines, will invest €45 M to expand the production and technological capacity of its plant in La Vall de Bianya (Garrotxa). The investment will create 100 jobs.



CataloniaConnects

2. The life sciences and healthcare industry in Catalonia (III)

1. Catalonia: a leading life sciences ecosystem
2. Globally recognized life sciences innovation hub
3. On the global radar for life sciences FDI
4. **A major exporter in the industry**
5. A prime location for top scientific talent



The Port of Barcelona is the 2nd most attractive port location for logistics investment, behind only Rotterdam. *Savills 2020.*

Catalan life sciences and healthcare companies take on the world

€7.78 B

Exports in life sciences and healthcare products (2021)

52.9% of total for Spain

Catalonia is the main exporting region of life sciences and healthcare products in Spain

9.6%

of total Catalan exports

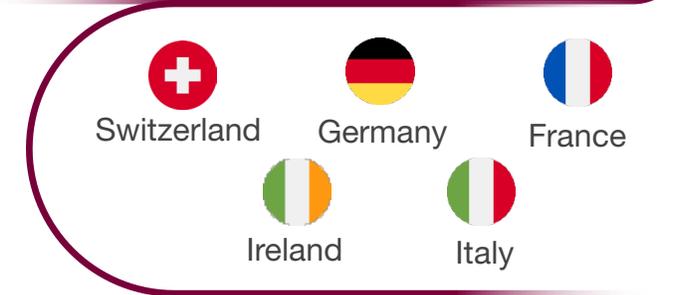
830

Regular exporting companies of life sciences and healthcare products (2021)

44%

of the total number of life sciences and healthcare exporting companies in Spain

Principal destinations of Catalan life sciences and healthcare exports



First level exported products

- 92.13% Pharmaceutical products
- 7.53% Irradiation, electromedical and electrotherapeutic equipment
- 0.33% Medical and dental supplies

First level exporters



Note: Regular exporting companies are companies that have exported for the last four consecutive years.

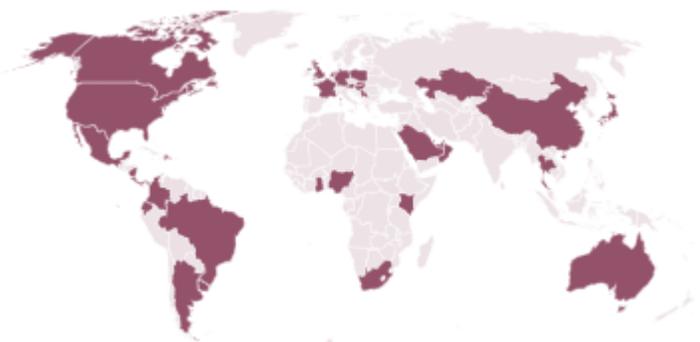
Source: DataComex, ICEX, CNAE: 21 – Manufacture of pharmaceutical products, 325 – Manufacture of medical and dental instruments and supplies, 266 – Manufacture of irradiation, electromedical and electrotherapeutic equipment.

International market opportunities, 2022

Health and health services



38



Pharmaceutical industry



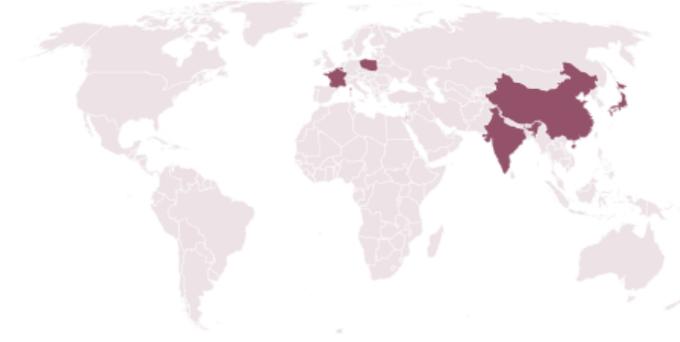
29



Biotechnology



7



Source: Global Map of International Business Opportunities, 2022.

2. The life sciences and healthcare industry in Catalonia (IV)

1. Catalonia: a leading life sciences ecosystem
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Barcelona is the world's 9th most attractive city for the global workforce.

Boston Consulting Group, 2021

Catalonia: where education leads to success

Catalonia has many research organizations in the life sciences industry. In fact, there are 91, classified as follows: research centres (41), university hospitals (19), science and technology parks (14), universities offering life sciences studies (12), technology centres (2) and (3) large-scale facilities. The information presented here is on **universities**:

Catalonia has the third best university system in Europe and offers several life sciences degrees and master's programmes. Catalan universities offer **93 degrees** and **104 master's programmes** related to the life sciences.

Of the 12 Catalan universities that teach life and health sciences, 3 (UAB, UPF and UB) are among the top 200 in the world.

The Times Higher Education, world university rankings, 2022



Some of the programs related to life sciences and healthcare in Catalonia

Degrees in...	Master's in...
Biochemistry	Applied Biotechnology
Bioinformatics	Biochemistry
Biological Systems Engineering	Bioengineering
Biomedical Engineering	Bioinformatics
Biomedical Sciences	Biomedicine
Biotechnology	Genetics
Genetics	Molecular Biotechnology
Health and Wellbeing Sciences	Neurosciences
Medicine	Pharmacology
Pharmacy	Research, Development and Medication Control

Sources: Government of Catalonia's Canal Universitats. ACCIÓ.

Vocational training

Among the 10 most requested vocational training courses in the last academic year are 4 specialities related to the life sciences.

The most requested vocational training courses in preregistration for the 2021-2022 academic year were:

Intermediate vocational training cycles

1. Care Nursing Assistants
2. Microcomputer Systems and Networks
3. Administrative Management
4. Guide in the Natural Environment and Leisure Time
5. Electromechanics of Motor Vehicles
6. Care for Dependent People
7. Health Emergencies
8. Commercial Activities
9. Pharmacy and Parapharmacy
10. Electrical and Automatic Installations

Continuing education initiatives



The 4D Health Innovation Simulation Centre is a simulation centre for training and education of professionals linked to the health sector. It offers a wide range of personalized services for each client. Innovation projects are organized on the development process of technological products, protocols and healthcare processes. The centre is located in Igualada.



Sources: Ministry of Education, Government of Catalonia. 4DHealth website.

A city with great talent for the life sciences industry

As one of the best locations in the world to live in and work, Barcelona has become a magnet for young professionals and top-level scientific talent and researchers in Europe.

Barcelona is **the second most technological** city in Southern Europe (Tech Cities of the Future 2020). There are **2,000 research groups** and more than **20,000 researchers** working in the region. **41,000 research projects have been** produced. **With only 0.1% of the world population, Catalonia produces 0.8% of word scientific production.**

Some of the state-of-the-art facilities that support and develop technology-related projects include the **ALBA Synchrotron** (the first particle accelerator in Southern Europe), **MareNostrum - BSC** (Spain's premium supercomputer and one Europe's foremost) and **the Computer Vision Centre**.



Top Science City in Southern Europe

Top 200 Science Cities, Nature Index, 2019

Barcelona is the 5th European City in creative and knowledge-based jobs
Cultural and Creative Cities Monitor, 2019.

14th largest cluster network in Europe for activity in the fields of science and technology.

The Global Innovation Index, Cornell University, INSEAD, WIPO, 2020

With 23,173 scientific publications, Barcelona is the 5th city in Europe and 20th in the world in academic production according to the *Knowledge Cities Ranking 2020 prepared by the Centre for Land Policy and Valuations of the UPC from the Science Citation Index.*

Two Catalan hospitals among the best 100 hospitals in the world. *Hospital Clínic in 63rd position and Vall d'Hebron in 81st position. World's Best Hospitals 2021, Newsweek, 2022.*

Barcelona came in 7th place in the Top 20 European cities for capital invested in technology companies.

The State of European Tech, Atomico, 2021.

The Barcelona Supercomputing Centre (BSC) will host the first quantum computer in Southern Europe.

Source: ACCIÓ based on CORA, the research portal of Catalonia, 2021.

Talent training and retention

In Catalonia, different public and private initiatives help retain and attract talent in the life sciences sector.

The *Catalunya La Pedrera Foundation*, in collaboration with *Hospital Germans Trias i Pujol*, *Hospital Universitari de Bellvitge*, *Hospital Clínic*, *Vall d'Hebron Institut d'Oncologia (VHIO)* and the *Institut d'Investigació en Ciències de la Salut Germans Trias i Pujol (IGTP)* are responsible for implementing the Talent Programme. Its aim is to promote research by health professionals and retain talent in Catalonia through post-residency grants for young medical specialists and health professionals considered excellent and relevant in their areas of specialization, and who want to carry out a research project with the aim of doing a doctoral dissertation, and at the same time remain linked to hospital care.



The number of university graduates in biotechnology now exceeds 7,200 students (2019-2020 period).

AseBio 2020 report, data on university students from the Ministry of Universities.

Biotech companies have the highest percentage of researchers compared to the total number of employees, followed by R&D service companies, with 15.45% of researchers of the total number of employees.

AseBio 2020 report, data from the 2019 Biotechnology Use Survey and R&D activity statistics. INE.

The percentage of researchers of the entire R&D staff in biotechnology companies is 55%.

AseBio 2020 Report, data from the Biotechnology Use Survey. INE.

Biotech companies maintain leadership in women's participation in R&D activities. The presence of women in biotech activities has remained above 51% since 2016 (55% in 2019).

AseBio 2020 Report, data from the Biotechnology Use Survey. INE.

Source: Catalunya La Pedrera Foundation. AseBio 2020 report.

Life sciences and healthcare industry in Catalonia

3. Opportunities in the life sciences and healthcare industry

Sector challenges

Patient response

- **Quickly and flexibly developing treatments and vaccines** against communicable diseases that pose a threat to the global population while promoting research, development and international cooperation. Seeking medical **solutions** to the increase in **chronic non-communicable diseases** in treatment and post-treatment phases.
- Providing medical solutions and **personalized treatments**, given the increase in **mental and neurological disorders**.
- Offering **diagnostics and personalized medicine** based on genetics.
- Promoting **predictive and proactive health**.
- Increasing the number of **alternative therapies**.

Changes in the population

- Ageing of the Catalan population, → the need to **expand geriatric infrastructure** and **develop medical products and services adapted** to the elderly.
- Changes in the lifestyle of the population: generating **new prevention products that provide mental and emotional well-being. A population of aware patients/consumers** → is more sensitive to health and well-being problems. And they are willing to pay for products and services that provide clear health benefits.
- Changes in the **relationship between health and the environment**: the impact of climate change on citizen health. Alignment with the Strategic Development Goals (SDGs).
- Greater social awareness towards mental illness and the pursuit of greater **personal independence** throughout the life cycle.

Digital transformation of the sector

- **Promoting telemedicine** and its devices: through applications for electronic health, online pharmacy, online doctor's visits, unifying clinical records, etc.
- **Giving a boost to emerging therapies**: bioengineering and regenerative medicine, omics and design of new biologics.
- Adapting the business model to be able to **provide precision medicine**, precision surgery and robotics.
- **Using artificial intelligence (AI)** and big data in therapeutic decision-making.
- **Preventing data breaches** and cybersecurity risks.
- Promoting **alternative care over traditional care**: home care, hospital at home, remote testing, etc.

Public spending on health

- The onset of pandemics, such as the Covid-19 health crisis, highlights the **need to expand public health** and increase the amount of public spending on health.
- It is also necessary to **boost national, European and international aid and programmes** in order to **promote R&D** in the sector.
- **One-Health**: Fostering and unifying collaboration between disciplines to achieve optimal health (human-animal-environmental). Integration and an approach to raise people's awareness.

Talent training and retention

- **Strengthening public and private initiatives** to train and retain talent in the life sciences sector.
- **Training** health professionals on the appropriate use of **new health and innovation technologies** in the sector.

Technologies applied to the sector

: hybrid technologies

Digital society

 Digitalization		IoT / Sensors
		Big data and artificial intelligence
 New digital economy		AR / VR and metaverse ^H
		Cloud / Edge
		Cybersecurity
		Connectivity
		Supercomputing
 New digital economy		Photonics / Quantum science
		Insurtech ^H

Health

 Emerging therapies		Bioengineering and regenerative medicine ^H
		Omics
		Design of new biologics ^H
 Medtech		Vaccines
		Digital health ^H
		POCT ^H
		Wearables ^H

Green transformation

 Climate resilience		Bioeconomy
		Blue economy ^H
 Food of the future		Foodtech ^H

Industrial resilience

 Advanced industry		Robotics and collaborative robotics ^H
		Additive manufacturing
		Simulation / Digital twins ^H
 Mobility of the future		Automation ^H
		Drones ^H
 Processes		Catalysis and biocatalysis
		Continuous processes
		Chemical recycling
 Materials		Micro- and nano-electronics
		Semiconductors
		Frontier materials
		Sustainable materials

Thank You!

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More information about the sector, news and opportunities

<https://catalonia.com/key-industries-technologies/health-life-sciences>

