

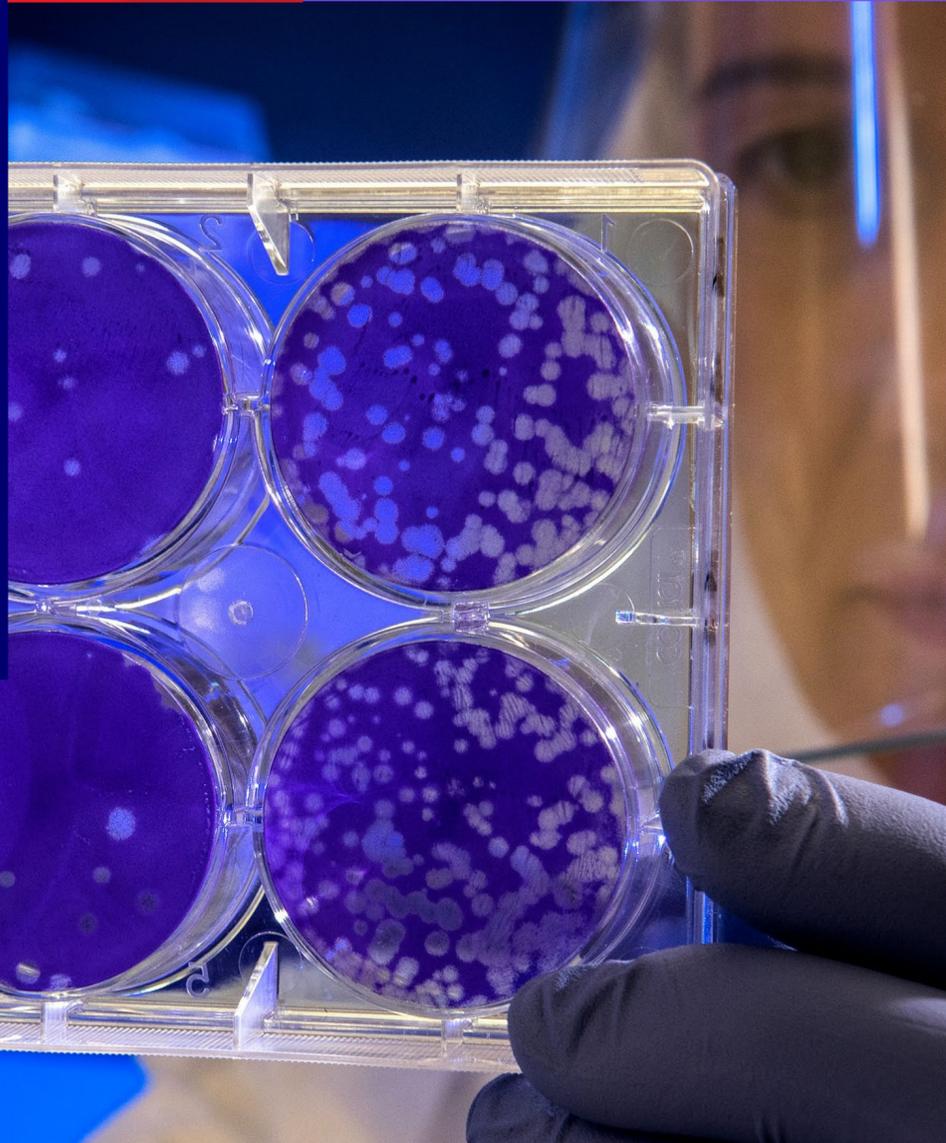
In collaboration with:

**AMGEN**



BioRegion of Catalonia  
Life Sciences and  
Healthcare Outlook  
**Challenges  
Ahead**

**biocat**



2020

#BioRegionReport

[report.biocat.cat](http://report.biocat.cat)

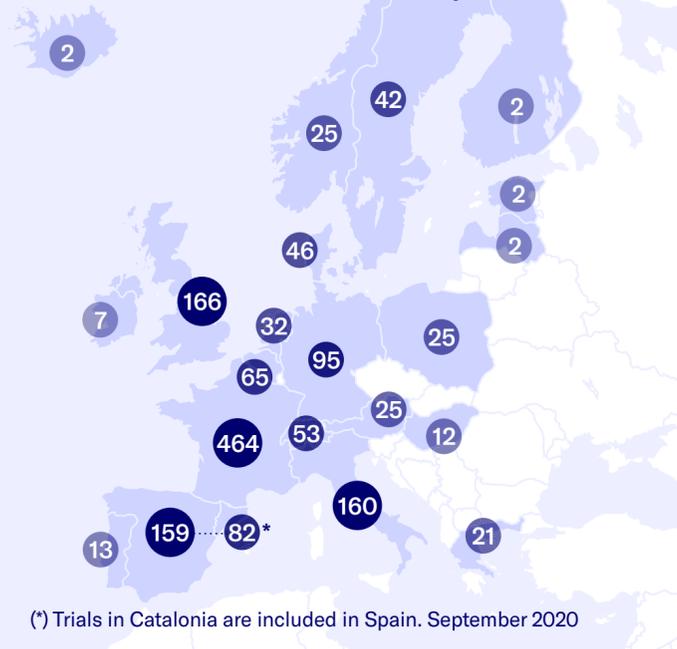
# Outlook on the Ecosystem's Assets, Capacities and Accomplishments, as well as the Challenges it is Facing to Scale Up by 2025

## 1 General Overview

The life sciences and healthcare sector is key to the country's competitiveness and general wellbeing. The foundations of the BioRegion, a leading hub in Europe, are its excellent research, quality higher education system and network of talent, institutions and companies that are doing cutting-edge research and provide the sector with innovation and services. An industry made up of over 1,200 companies, mainly biotech, pharma, medtech and digital health firms, that together with healthcare services account for 7.3% of the Catalan GDP. With indicators of success (company creation, investment attracted, employment, increase in pipeline, etc.) that have posted sustained growth since 2010. The boom of accelerators, instruments and programs to support startups, entrepreneurs and researchers is helping generate opportunities and scale up an ecosystem that is attractive to multinational corporations and international investors. In fact, according to FDI Markets, Catalonia has been the top region in Southern Europe for foreign investment since 2016.

The global crisis caused by SARS-CoV-2 has put unprecedented pressure on the healthcare system and made clear the need to strengthen the innovation system in this sector. Catalonia is a leader in the life sciences and healthcare in Europe. The BioRegion has the responsibility to contribute to a global solution. Catalonia has responded quickly with high-quality research, leading a number of studies and clinical trials on Covid-19. In order to go even further and lead solutions, it is essential to identify points that need improvement and implement the necessary actions to maximize the impact of local capacities and technology. To mitigate the consequences (health, social and economic) and prepare for this and future pandemics, the capacities, strategy and talent of this vibrant, internationally competitive ecosystem will have to all work in the same direction.

Covid-19 Clinical Trials in Europe



## 2 Investment

The capital raised by startups in the BioRegion from various funding sources has grown steadily over the past five years. Although the biggest operations are mostly in biotech and medtech, digital health companies are growing the fastest, with investment multiplied by 7 since 2016. In 2020, total investment in the BioRegion hit a new record of €226 million, with venture capital being the predominant source of investment and +€100 million from this channel alone for the first time. Four in ten rounds included international investors (mainly from the rest of Europe and the United States), mostly syndicates with established investors in the BioRegion. This capital is essential for advancing a pipeline that started out the year with 41 drugs and therapies advancing through the clinical phases on their way to patients.

## 3 Science and Technology Assets

These drugs, therapies and technologies come out of the ecosystem's hospital institutes, research centers, universities, large infrastructures and companies, which make up one of the most powerful life sciences and healthcare hubs in Europe. In this sector, Catalonia attracts as much competitive European funding as Austria or Belgium, and is awarded more ERC grants than Finland or Denmark. In this comparison to leading European countries that are similar in size and population, Catalonia also stands out in terms of the volume and impact of scientific production in the life

sciences, as well as in patent applications (more than Austria or Finland). If we broaden our focus, Catalonia was ranked among the top 15 globally and the top 10 in Europe in number of active clinical trials in 2019, many in collaboration with multinational pharmaceutical companies.

## 4 Future Challenges

Catalonia has trouble generating innovation, according to European competitiveness indicators. Championing the BioRegion's successes, which have increased in recent years, shouldn't stop us from identifying pressure points and needs for improvement to promote the scale up of a solid sector that can be a key driving force for the Catalan economy and society. To support this, we must tackle challenges in technology transfer to achieve a robust, competitive academic innovation ecosystem. We have to work on our strategy for attracting and developing talent in the ecosystem in order to meet the sector's needs and how it is changing. It is essential to further leverage capital and attract more investment, driving a dealflow with the right number of investment-ready projects of the best quality, in line with the country's great potential. And we need a quality, financially sustainable public health system that can adopt valuable innovations quickly and easily in a structured, transparent manner. Tackling these challenges will open up a whole slew of opportunities aligned with the 2025 Strategic Vision for a highly innovative, competitive, prepared Catalonia, which all the stakeholders have to start helping build now.

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# Overview and Key Indicators



# A Strategic Sector for Catalonia

Representing 7.3% of the GDP, the life sciences and healthcare sector's growth model is based on excellent research, education, innovation and entrepreneurship.



## Revenue of Life Sciences Companies, among the Highest in Catalonia

Automotive	€23,842 M
Life Sciences and Healthcare	€19,767 M
ICT	€18,325 M
Textile and Fashion	€14,500 M
Smart Cities	€9,717 M
Beauty	€9,000 M
Cybersecurity	€809 M
IoT	€520 M
Robotics	€460 M
Videogames	€431 M
3D Printing	€325 M

Source: ACCIÓ, Biocat

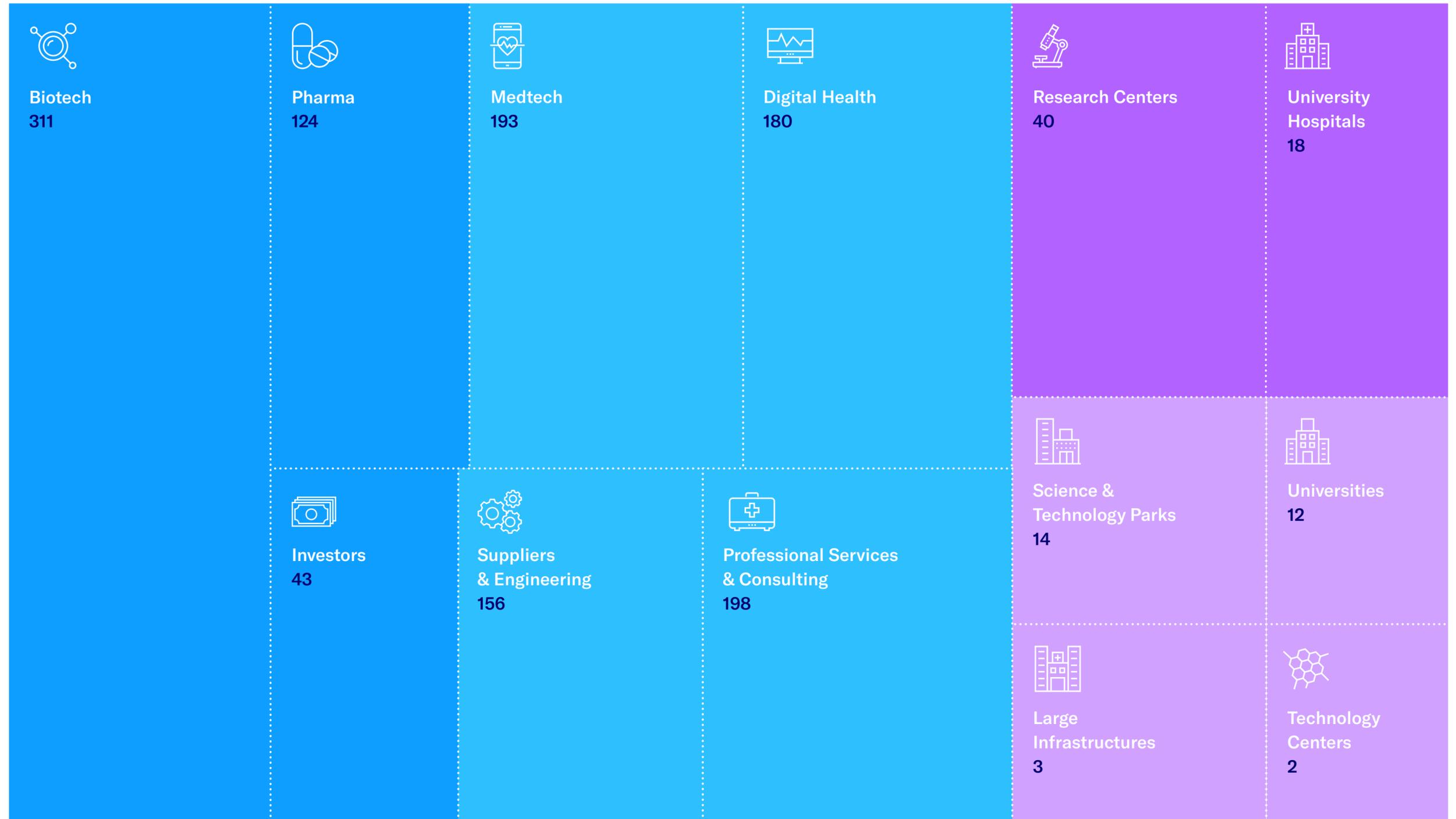
Figures indicate the number of stakeholders in each subsector. Dark colors highlight the strongest capabilities among the stakeholders.

Source: Biocat

## Mapping the BioRegion of Catalonia Ecosystem

+ 1,200 Companies

89 Research Institutions



# Revenue and Employment

The macroeconomic indicators for the BioRegion show **sustained growth** since 2011.

## Size of Companies

The great bulk (78%) of companies in the BioRegion is small and micro enterprises. Medium-sized companies make up 14%.

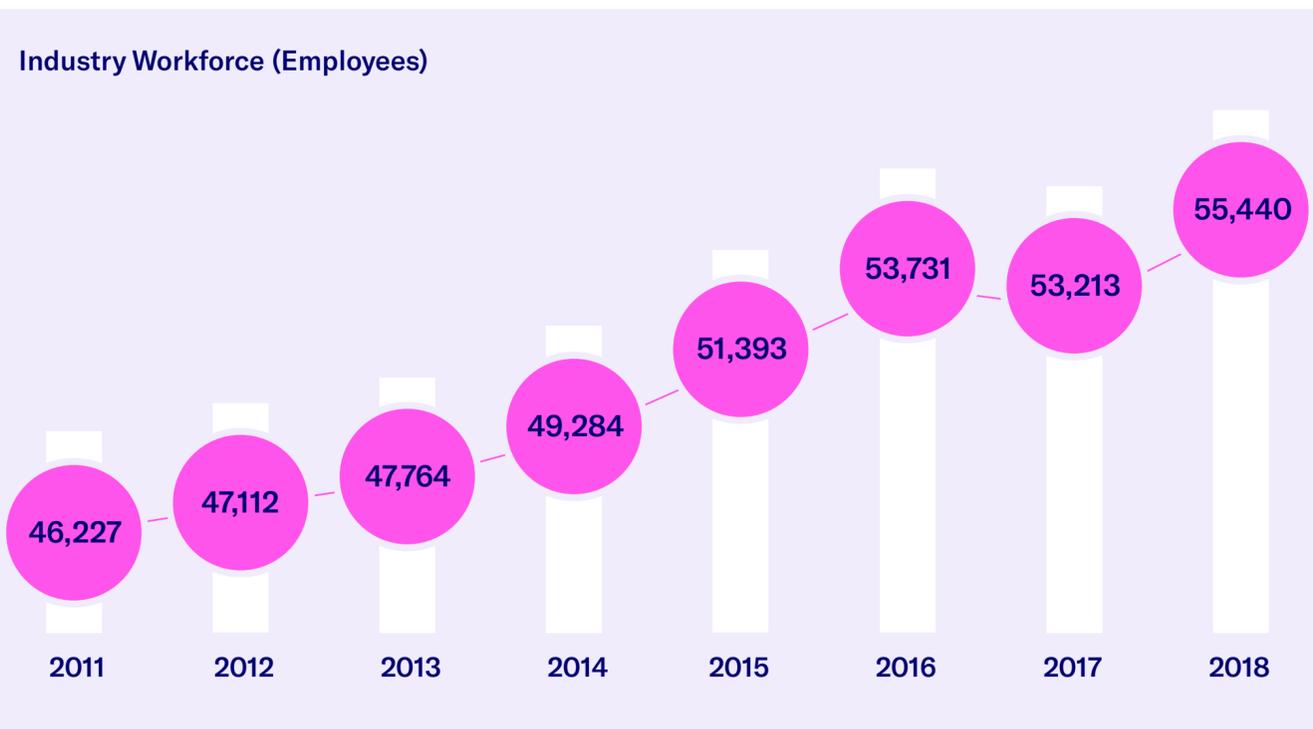
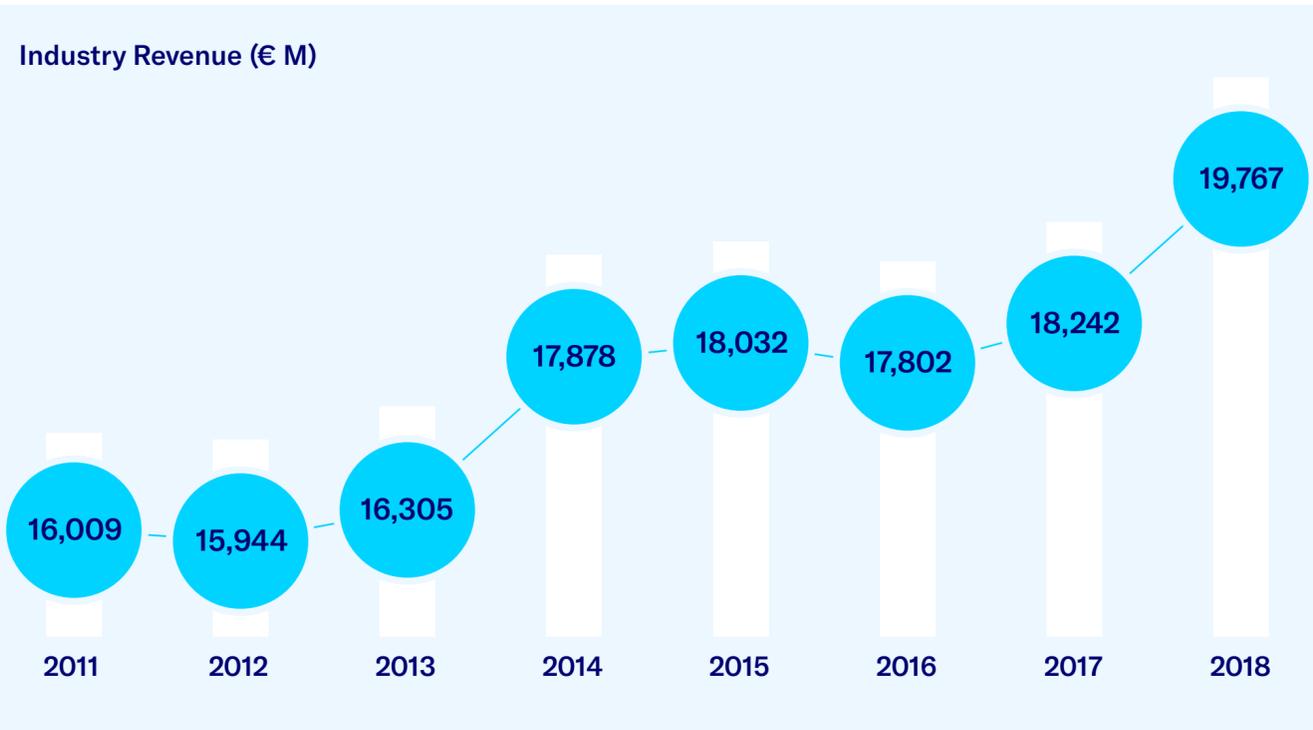


↗ (\*) Health Services: Including the provision of healthcare and social services to health institutions that provide accommodation and that offer diagnostic and medical treatments to patients.

Sources: Biocat, SABI 2018, Idescat 2016

## Macroeconomic Indicators

Revenue Workforce



## Industry Revenue 2018

Digital Health	€119 M
Professional Services & Consulting	€672 M
Supplier & Engineering	€2,611 M
Medical Technology	€3,109 M
Biotechnology	€4,098 M
Pharma	€9,158 M

# Headquarters and Multinationals

Catalonia is home to 50% of the Spanish pharmaceutical industry and the birthplace of the 5 largest companies (Almirall, Esteve, Ferrer, Grifols and Uriach).

Since 2016, Catalonia has consistently ranked #1 as Southern Europe's best region for foreign investment.

Source: Global Cities Investment Monitor - FDI Markets Database, 2018 and FDI Markets Magazine, 2019

## Main Foreign Investments in Catalonia (2017-2019)

Boehringer Ingelheim opened new production plant	↑ €101.7 M
Zoetis expanded its production plant	↑ €45.5 M
Sanofi-Aventis established a financial operations center	↑ €42.9 M
Merck expanded its production plant	↑ €31.7 M
Esteve Teijin Healthcare opened a new logistics center	↑ €13.3 M
Intas Pharmaceuticals expanded its offices	↑ €13 M
B. Braun opened a new R&D center	↑ €11.5 M

ACCIÓ based on FDI Markets

↗ Note: Partial representation of multinationals in the life sciences and healthcare ecosystem in Catalonia.

## Top Global Companies Established in Catalonia

### BioRegion Headquarters



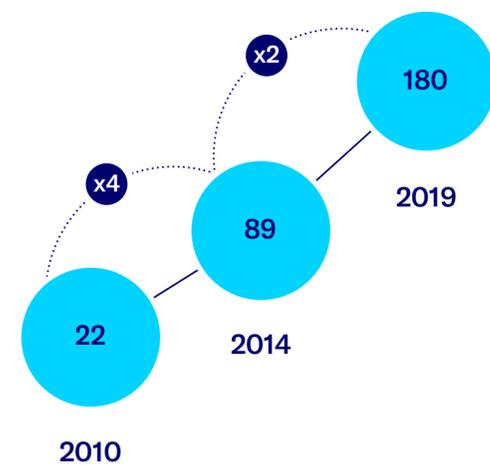
### International Companies



# Digital Health Subsector is the Fastest Growing since 2010

Digital health companies are seeing rapid growth, providing the ecosystem with a wide range of digital solutions and becoming an essential stakeholder for facing the quickly changing landscape.

## Growth in Digital Health Startups



## Mapping the BioRegion Digital Health Landscape

Note: This market map is not meant to be exhaustive. Companies are categorized according to their main focus area.

Source: Biocat

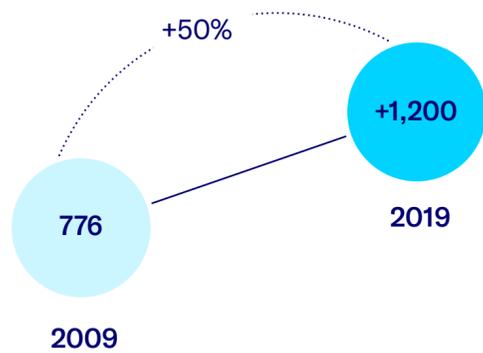
<h3>Drug R&amp;D (17) R&amp;D (15)</h3> <h3>Clinical Trials (2)</h3>	<h3>Education &amp; Training (10)</h3> <h3>Clinical Tools (35) Online Consulting (20)</h3> <h3>Diagnosics (14)</h3>	<h3>Clinical Decision Support (15)</h3> <h3>Health Services (31) Technology Providers (15)</h3> <h3>Search Services (7)</h3> <h3>Home Care Services (6)</h3> <h3>Insurance (3)</h3>	<h3>Digital Therapeutics (33) Self-Management (13)</h3> <h3>Active Monitoring (13)</h3> <h3>Treatment (7)</h3>	<h3>Genomics (4)</h3> <h3>Interoperability (4)</h3> <h3>Health &amp; Wellness (16)</h3>
<h3>Management (7)</h3>	<h3>Patient Follow-up (8)</h3>	<h3>Logistics &amp; Other (8)</h3>	<h3>Marketplaces (5)</h3>	



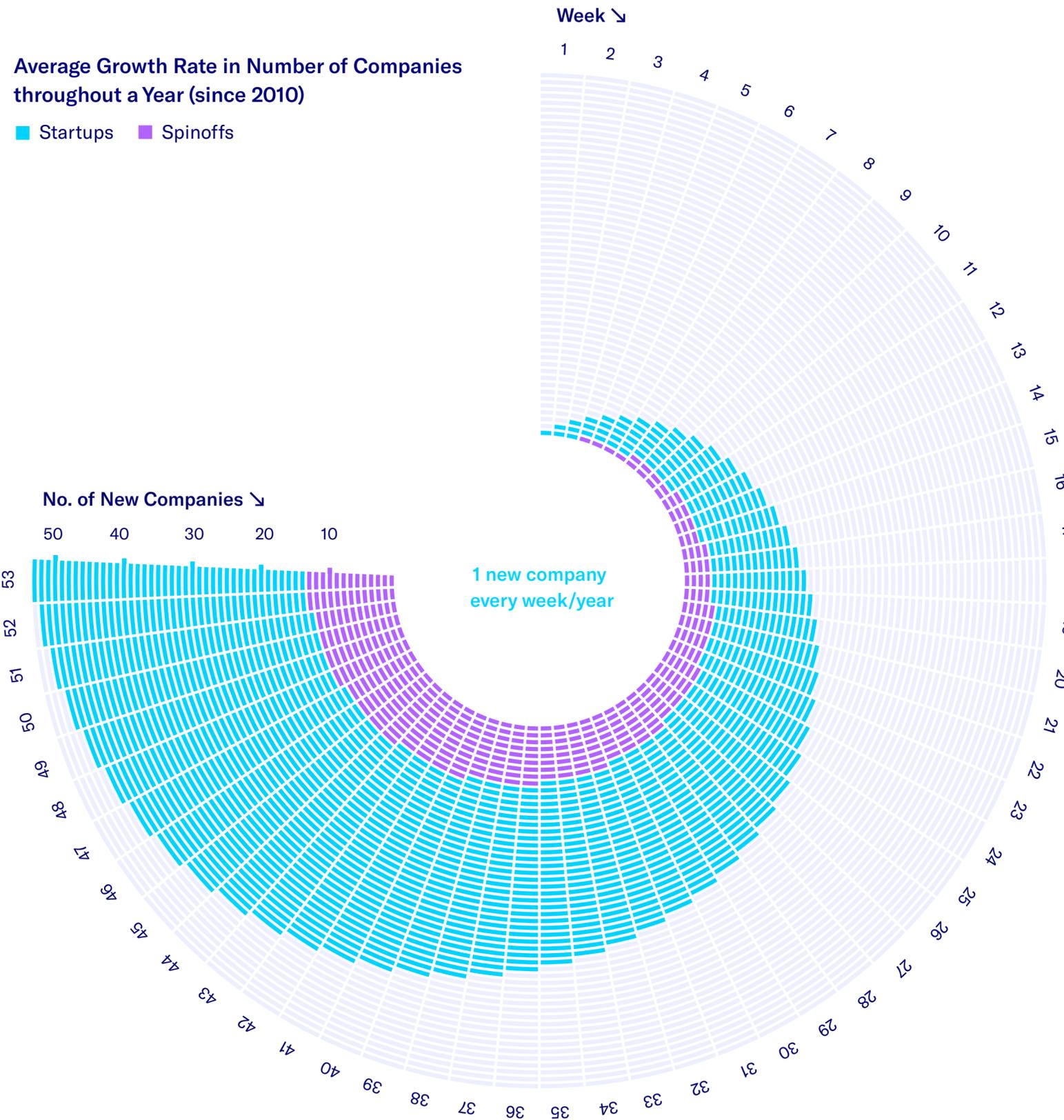
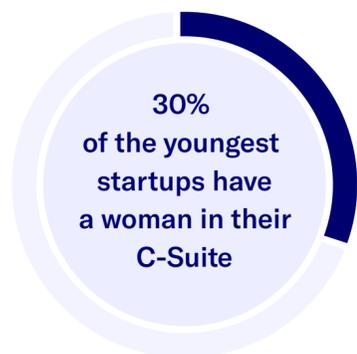
# A Booming Startup Ecosystem

One new company has been created in the BioRegion every week since 2010.

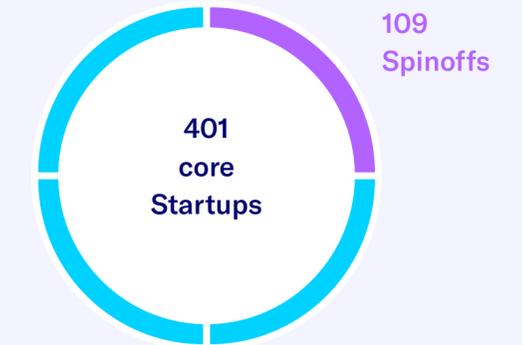
In 10 years (2009-2019) the Number of Active Companies has Increased +50%



Startups (< 2 years) Founded or Managed by a Woman



1 in 4 Companies is a Spinoff



Investment Raised (2020 YTD) by Active Spinoffs of:

University of Barcelona	€191.5 M / 24 Spinoffs
ICREA	€122.7 M / 22
Universitat Autònoma de Barcelona	€40.4 M / 15
Institute for Research in Biomedicine	€38.4 M / 5
Hospital Clínic de Barcelona	€21 M / 6
IrsiCaixa AIDS Research Institute	€17.2 M / 2
Universitat Politècnica de Catalunya	€16.2 M / 10
IDIBAPS	€11.9 M / 8
Vall d'Hebron Institute of Oncology	€11.1 M / 2
Pompeu Fabra University	€9.7 M / 9

# Accelerators and Entrepreneurial Support

Accelerators in the BioRegion vary widely, depending on their origin (public or private) and services (funding, networking, mentoring, training, etc.) but most of them help push startups forward. In 2019 we saw a **boom in open innovation accelerator programs launched by pharma companies.**

## Hubs & Support Entities

### Hubs



### Support Entities



## Top 10 Healthcare Accelerators in the BioRegion (out of 30)

+ <20 hours

++ <20-40 hours

+++ >40 hours

(\*) Only for projects

Life Sciences	Months	Direct Funding	Equity	Training	Mentoring	International Features	Investors Day
Caixa <b>impulse</b>	5 months	€100-300,000	1%	+++	++	International trainers, mentors and evaluators Trips/access to other countries (through EIT Health)	-
<b>CRAASH BARCELONA</b>	6 months	-	-	++	+++	International trainers, mentors and evaluators Trips/access to other countries (through EIT Health)	✓
<b>d-HEALTH BARCELONA</b> (*)	6 months	-	-	+++	+++	International trainers, mentors and evaluators Need's validation in other countries (through EIT Health)	✓
<b>Sabadell BStartup</b>	n/a	€75-100,000	% variable	+	+	International mentors	-
<b>Digital Health</b>							
<b>digitalgarden</b> powered by Almirall	9 months	Up to €50,000	-	+++	-	International startups	✓
<b>ferrer for good</b>	3 months	-	-	+	+	-	-
<b>Novartis Cancer Startup Program</b> Powered by Conector	5 months	-	% variable	+++	-	International startups	✓
<b>The Collider</b> (*)	6 months	Up to €50,000	Up to 20%	+++	++	International mentors Pilot programs with global corporations	✓
<b>Generalist</b>							
<b>IQS NEXT TECH</b> THE INDUSTRIAL ACCELERATOR	6 months	-	-	+++	+	International startups and mentors	✓
<b>Barcelona Activa</b>	4 months	-	-	+++	+	-	✓

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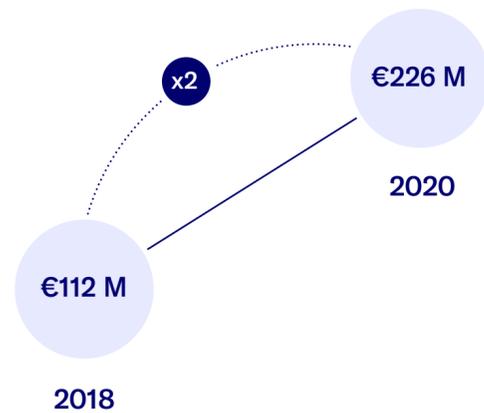
# Investment in Startups



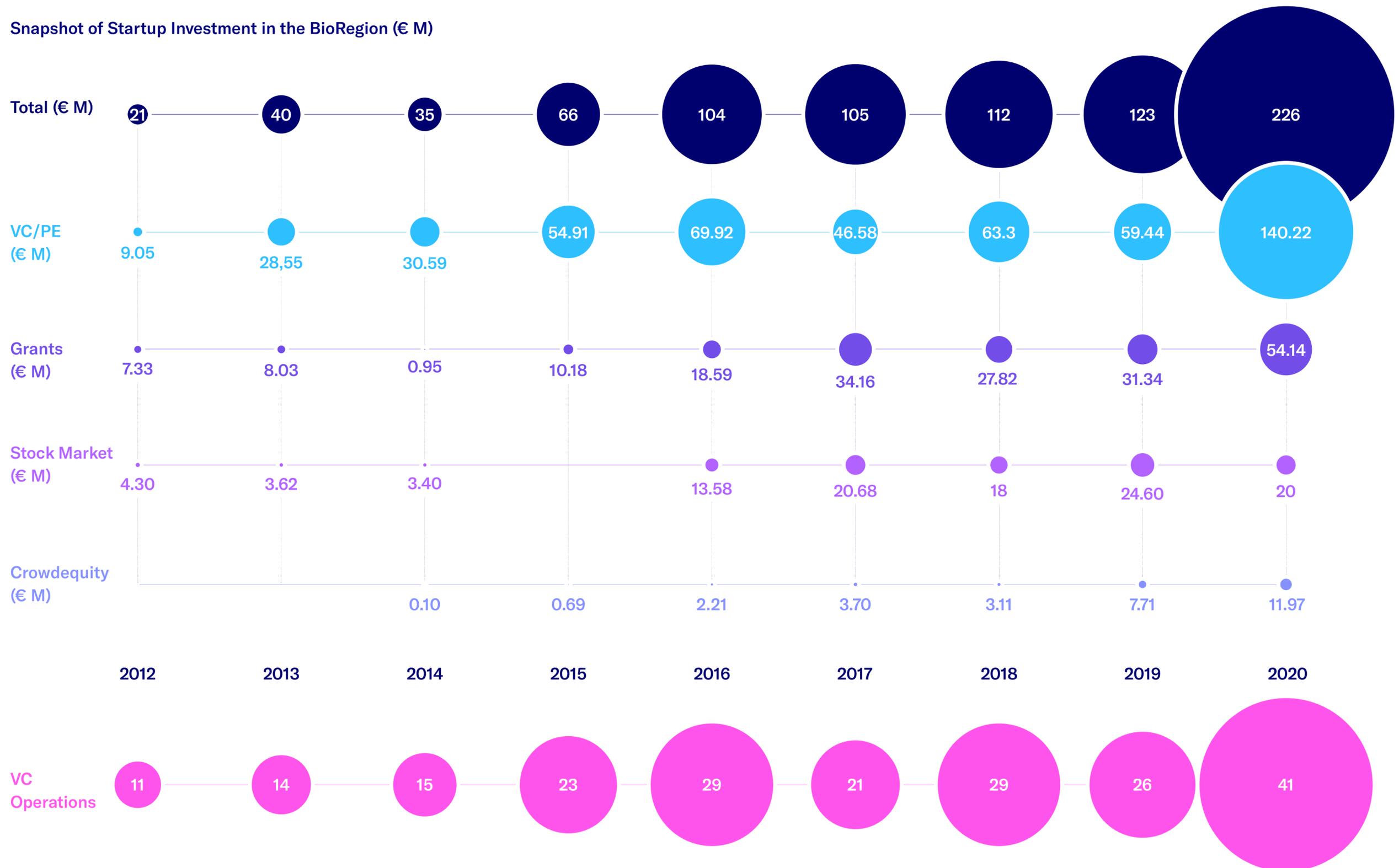
# Investment Surpasses €200 million for First Time Ever

Venture capital is the main source of funding for startups, and has doubled since 2019.

Investment has doubled in the past two years



Snapshot of Startup Investment in the BioRegion (€ M)



Investment includes capital raised by startups in Catalonia in biopharma, medtech, digital health, R&D services sectors. It also includes some investment raised by startups working for the life sciences sector, such as suppliers and engineering companies and professional services.

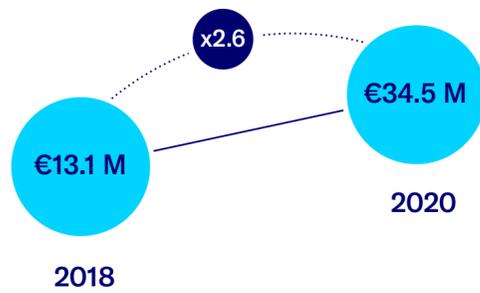
Source: Biocat

# Investment in Startups by Subsector

The biggest increase in investment was seen in biotech and medtech startups.

However, given the solid growth that digital health has experienced in recent years (x7 between 2016 and 2020) and the technological transformation in the sector, this gap will narrow quickly. Since 2016, half of all investment has been concentrated in two or three operations a year, all of them syndicated with international capital. In 2020 we observed an increase in both the number of deals between €10 million and €30 million and ticket size. The top three biotech operations totaled €75 million and Ona Therapeutics closed the largest round ever by a startup in the BioRegion.

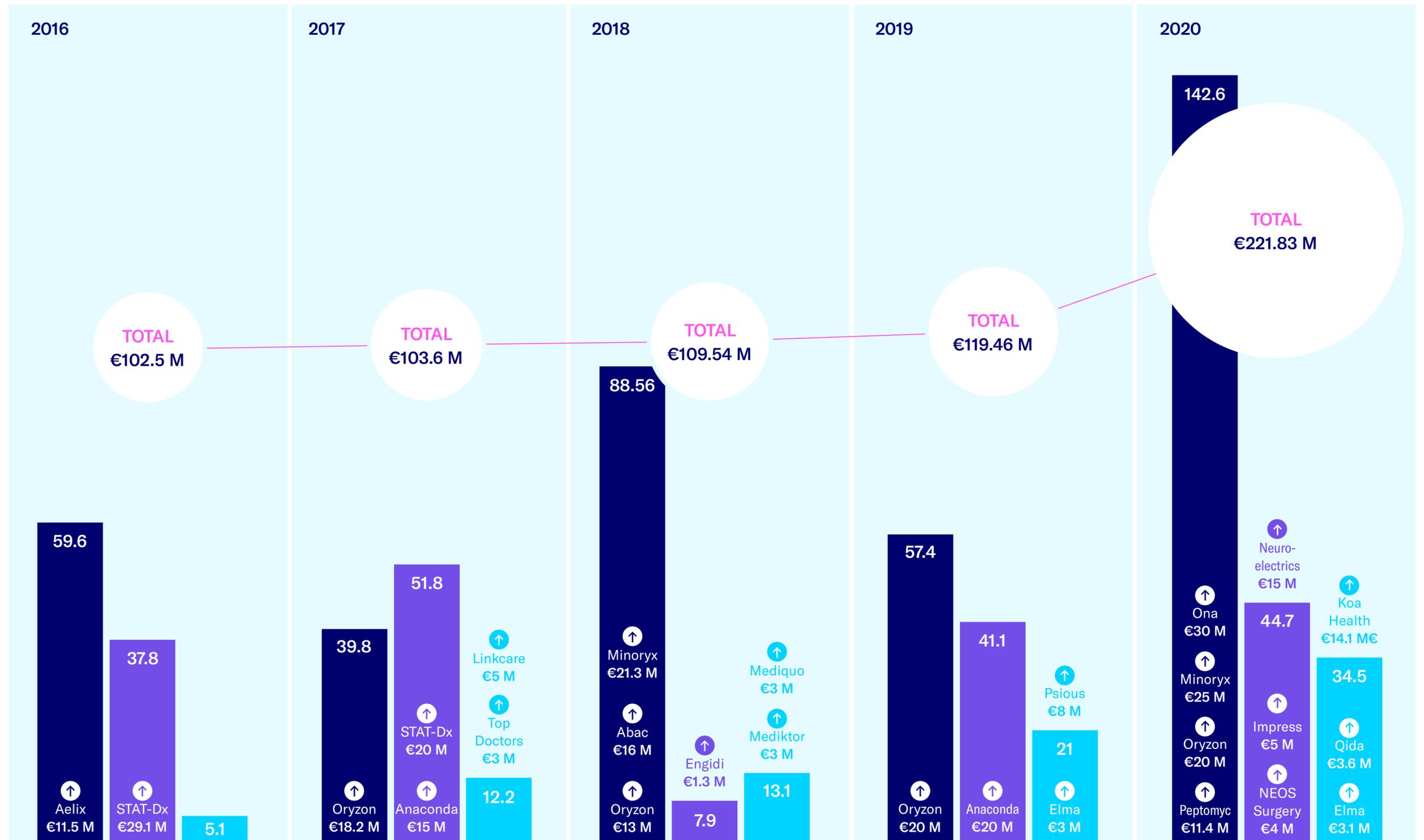
## Investment Growth in Digital Health (2018-2020)



Investment raised includes VC, crowdequity, grants and stock market operations. Unlike the previous slide, R&D services are not included, only biotech, medtech (including diagnostic instruments/in-vitro kits) and digital health startups.

Source: Biocat

Investment in Startups by Subsector (€ M) ■ Biotechnology ■ Medical Technology ■ Digital Health



# Success Stories and Funds Raised

## Exits and M&A Activity 2015-2020

Target	Acquirer
2020 <b>Palex</b> Constant Improvement	<b>ERGON CAPITAL</b> (ES)
<b>COOVACUUM TECHNOLOGIES</b>	<b>Dara</b> (ES)
2019 <b>AB-BIOTICS</b>	<b>Kaneka</b> (JP)
<b>pensa</b>	<b>TOWA PHARMACEUTICAL</b> (JP)
2018 <b>advance medical</b>	<b>Teladoc HEALTH</b> (US)
<b>EUROMED</b>	<b>Dermapharm Holding SE</b> (DE)
<b>iSalud.com</b>	<b>CNP PARTNERS</b> (ES)
<b>PromoFarma.com</b>	<b>R</b> (CH)
<b>STAT Dx</b> Closer to Care	<b>QIAGEN</b> (NL)
<b>GAES</b>	<b>amplifon</b> (IT)
2016 <b>Doctoralia</b>	<b>Docplanner</b> (PL)
<b>Mosai Biomedicals</b>	<b>NORTHERN BIOLOGICS</b> (CA)

## Investment Raised by Startups ↗

Investment operations includes VC, crowdequity and grants. M&A and stock market operations are excluded.

Source: Biocat

	2015	2016	2017	2018	2019	2020
€15-30 M	<b>minorityx Therapeutics</b> <b>ORYZON</b>	<b>STAT Dx</b> Closer to Care	<b>STAT Dx</b> Closer to Care <b>ANACONDA BRAIN</b> ADVANCED THROMBECTOMY SYSTEM	<b>minorityx Therapeutics</b> <b>ABAC Therapeutics</b>	<b>ANACONDA BRAIN</b> ADVANCED THROMBECTOMY SYSTEM	<b>ONA</b> <b>NE neuroelectronics®</b> <b>minorityx Therapeutics</b>
€5-15 M		<b>AELIX THERAPEUTICS</b> <b>AB-BIOTICS</b>	<b>devicare</b> TAKING CARE OF YOU <b>Linkcare</b>	<b>Pangaea ONCOLOGY</b>	<b>SOM BIOTECH</b> <b>psious</b> The Drug Repurposing Company <b>rob surgical</b>	<b>accure therapeutics</b> <b>oxolife</b> <b>AbilityPharma</b> real medicine for real life <b>NEOS</b> <b>PEPTOMYC</b> <b>Koa Health</b> <b>Impress</b>
€3-5 M		<b>Pangaea ONCOLOGY</b> <b>LEUKOS BIOTECH</b> <b>Albajuna Therapeutics, SL</b>	<b>PEPTOMYC</b> <b>TOPDOCTORS®</b>	<b>mediQuo</b> <b>bionure</b> <b>mediktork</b> INTELLIGENT ACCESS TO HEALTHCARE	<b>Pangaea ONCOLOGY</b> <b>elma</b> <b>AbilityPharma</b> real medicine for real life	<b>miwendo SOLUTIONS</b> <b>deepull™</b> <b>ADmit THERAPEUTICS</b> <b>GEN inCode</b> <b>OneChain</b> IMMUNOTHERAPEUTICS <b>CONNECTA</b> <b>Vida</b> <b>elma</b>
€1-3 M	<b>Genmedica Therapeutics</b> <b>iSalud.com</b>	<b>Starlab</b> Living Science <b>THROMBOTARGETS</b>	<b>QMENTA</b> FROM IMAGING TO INSIGHT <b>TRANSMURAL BIOTECH</b>	<b>AbilityPharma</b> real medicine for real life <b>Vida</b>	<b>able</b> human motion <b>VEnvirotech</b>	<b>Pulmobiotics</b> Pioneering live biotherapeutics in the respiratory tract <b>Gyala therapeutics</b>
	<b>psious</b> <b>medtep</b>	<b>inbiomotion</b> <b>Mosai Biomedicals</b>	<b>Pangaea ONCOLOGY</b> <b>TRANSPLANT BIOMEDICALS</b>	<b>elma</b> <b>ProteoDesign</b>	<b>PEPTOMYC</b> <b>ZYMVOL</b>	<b>QMENTA</b> FROM IMAGING TO INSIGHT <b>Qrem</b>
	<b>TOPDOCTORS®</b> <b>TRANSPLANT BIOMEDICALS</b>	<b>cebiotex</b> BIOMEDICAL NANOFIBERS <b>GOODGUT</b> Enhancing digestive health	<b>inkemia</b> IUCT group <b>GlyCardial Diagnostics</b>	<b>AELIX THERAPEUTICS</b> <b>DyCare</b>	<b>ONA</b> <b>MJN</b> Quality of life for everybody	<b>INBRAIN NEUROELECTRONICS</b> <b>cuideo</b>
	<b>Greenaltech</b> Microalgae Technologies <b>GALGO MEDICAL</b>	<b>lproteos</b> <b>ZeClinics</b> Drug Discovery Through Zebrafish	<b>iMICROQ</b> Integrated Microsystems for Quality of Life S.L. <b>bionure</b>	<b>AHEAD THERAPEUTICS</b> <b>AROMICS</b> APPLIED RESEARCH USING OMIC SCIENCES	<b>devicare</b> TAKING CARE OF YOU <b>mediQuo</b>	<b>BCN3D TECHNOLOGIES</b> <b>IOMED</b>
	<b>DRACONIS PHARMA SL</b> <b>ClinicPoint</b>	<b>PromoFarma.com</b> <b>bioprognos</b>	<b>SocialDiabetes</b> <b>SOM</b> BIOTECH The Drug Repurposing Company	<b>iMICROQ</b> Integrated Microsystems for Quality of Life S.L. <b>CONNECTA</b>	<b>bionure</b> <b>DyCare</b>	<b>MADEOFGENES</b> <b>Safe365</b>
	<b>CUANTUM MED-COS</b> <b>idp-pharma</b>	<b>YOUR MOVE TO WELL-BEING</b> <b>MOWOOT</b> <b>PEPTOMYC</b>		<b>AHEAD THERAPEUTICS</b> <b>AROMICS</b> APPLIED RESEARCH USING OMIC SCIENCES	<b>SONICAT SYSTEMS</b> <b>AROMICS</b> APPLIED RESEARCH USING OMIC SCIENCES	<b>Methinks</b> <b>8Wires</b>
				<b>vytrus biotech</b> <b>GlyCardial Diagnostics</b>	<b>MADEOFGENES</b> <b>NATURAL MACHINES</b>	<b>emjoy</b> <b>RUTI</b> IMMUNE
						<b>SPLICEBIO</b>

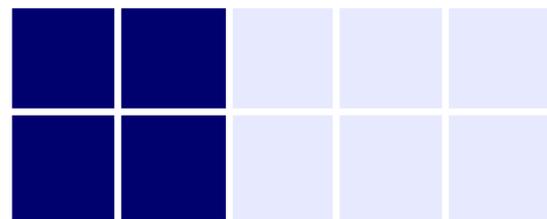
# In 2020 International Investment Grew Exponentially

Joint operations by Catalonia-based and international investors yield the largest rounds of investment year after year.

In 2020 venture capital investment more than doubled compared to previous years.

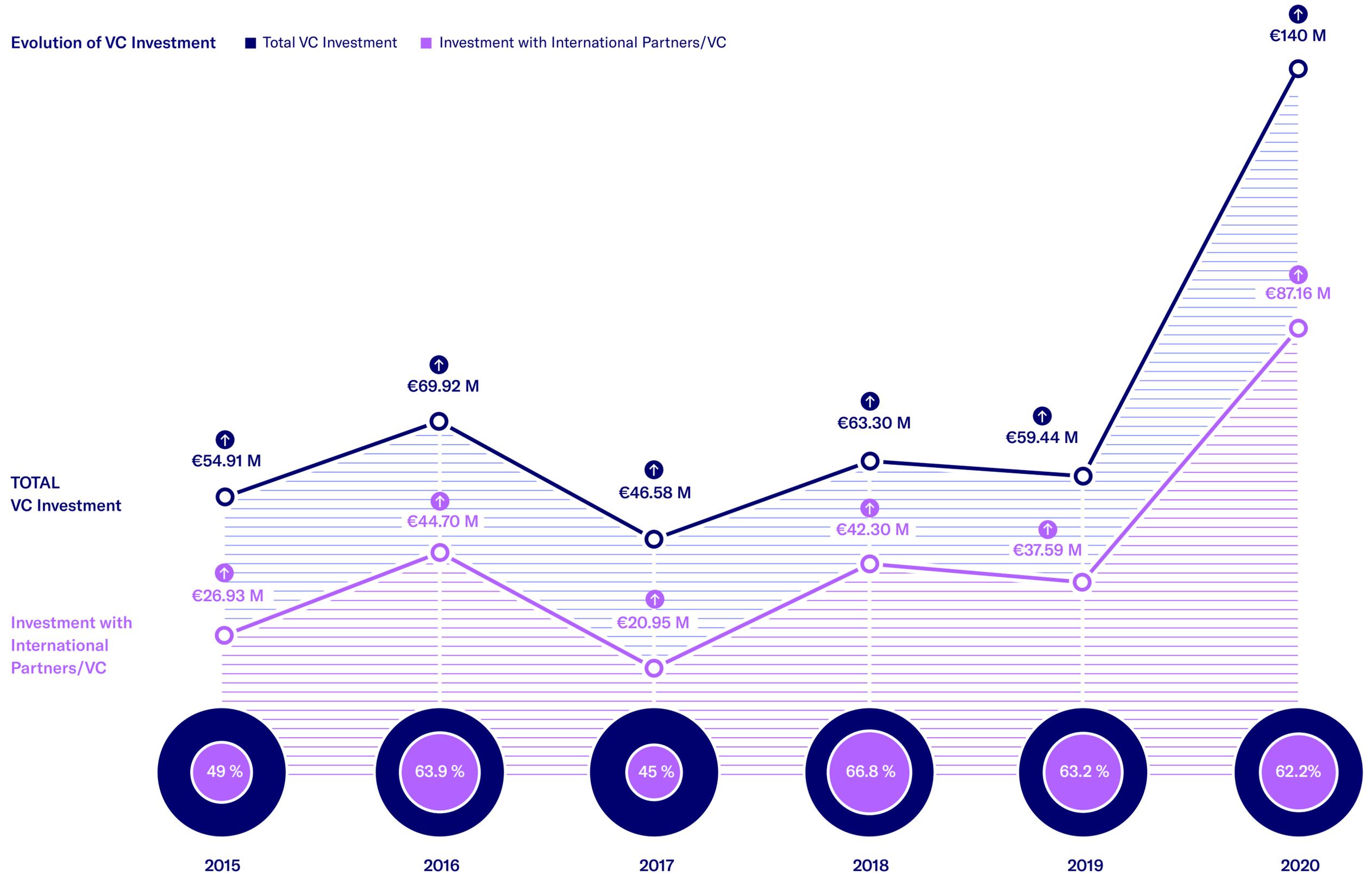
More than 60% of that investment includes international participation.

International Firms Invest in 4 out of 10 Deals



Venture capital operations (VC)

Evolution of VC Investment ■ Total VC Investment ■ Investment with International Partners/VC



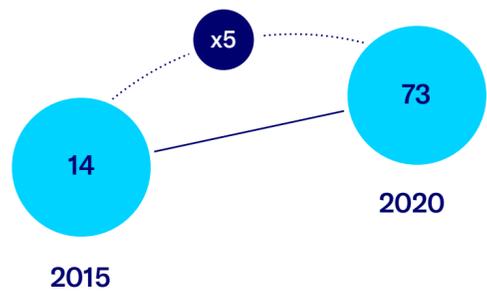
Source: Biocat

# International Investors have Increased 5x (2015-2020)

The BioRegion has a diverse pool of specialized investors who coinvest with international VCs in the largest rounds.

On average, the 2 or 3 biggest international rounds make up over half of all VC investment each year.

Number of Foreign Investors in the BioRegion's Life Sciences and Healthcare Startups



Number of International Investors

Europe	42
United States	22
Asia	6
Other	3

Source: Biocat

Top 10 International Investors in the BioRegion



BioRegion-based Specialized Investors



Total raised in all rounds each fund invested in

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# Assets in Science and Technology



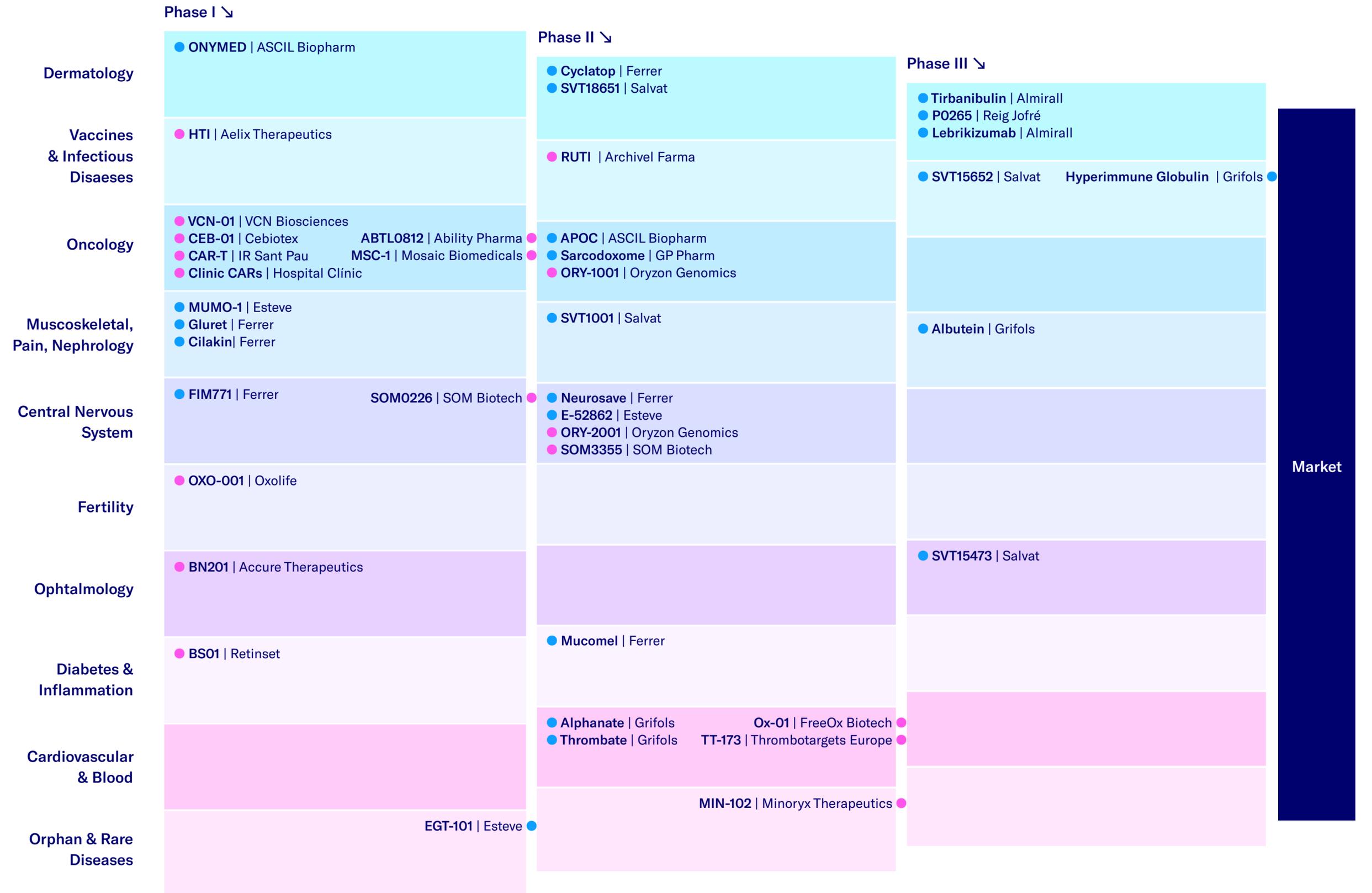
# Bringing Top-notch Science to Patients

BioRegion companies have **41 drugs and therapies in clinical development**, covering a wide range of therapeutic areas.

## Biotech and Pharma Companies' Clinical Pipeline ↗

- Pharma
- Biotech

Source: Biocat



Market

# One of the Leading Science Hubs in Europe

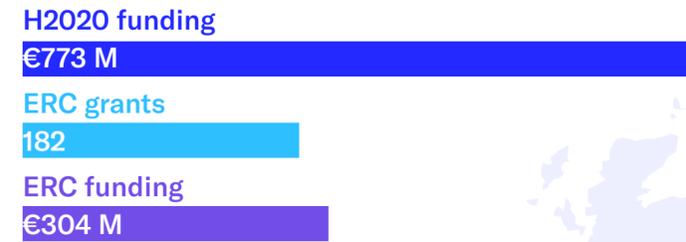
Catalan institutions and companies are very competitive in attracting EU funds supporting the best research and innovation in Europe.

The European Research Council (ERC) awards Europe's most prestigious and well-funded research grants.

Life Sciences researchers in Catalonia have been awarded over 100 ERC grants, more than almost any country in Europe, including Finland and Denmark, and nearly on par with Austria.

## EU-funded Life Sciences and Healthcare R&D Projects (2014-2019)

### SWEDEN



### DENMARK



### IRELAND



### CATALONIA



### FINLAND



### BELGIUM



### AUSTRIA



Source: CORDIS, UNiCS (SIRIS Academic), Biocat

[Population] BEL=11.6M SWE=10M AUT= 9M CAT=7.5M DNK=5.8M FIN=5.5M IRL=4.9M

# Catalonia Produces Large Volume of High Quality Life Sciences and Healthcare Research

Catalonia also outperforms in number of publications in the biomedical arena. Scientific production has nearly quadrupled over the past 20 years, and one out of six (16.5%) biomedical publications signed by researchers in the BioRegion are among the most cited papers in the world.

Catalonia has a higher percentage of publications in top journals than countries like Ireland, Finland and Austria.

## Life Sciences and Healthcare Scientific Publications (2014-2019)

### SWEDEN

No. of pubs.

108,947

% in top journals

42.60

### DENMARK

No. of pubs.

78,490

% in top journals

45.73

### IRELAND

No. of pubs.

36,320

% in top journals

40.78

### CATALONIA

No. of pubs.

63,481

% in top journals

40.91

### FINLAND

No. of pubs.

45,576

% in top journals

40.62

### BELGIUM

No. of pubs.

90,087

% in top journals

42.97

### AUSTRIA

No. of pubs.

62,499

% in top journals

40.34

Source: Scopus (Elsevier), SCIMAGO, SIRIS Academic

[Population] BEL=11.6M SWE=10M AUT= 9M CAT=7.5M DNK=5.8M FIN=5.5M IRL=4.9M

# Life Sciences and Healthcare Patents

(EP + US + WO, 2015-2019)\*

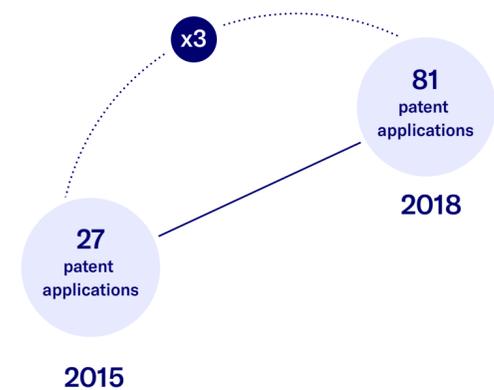
Catalonia accounts for over 40% of Spanish innovation capacity in the life sciences.

However, European countries like Denmark, Sweden and Belgium have four times more EP, US, WO patent families than the BioRegion of Catalonia.

In collaboration with:



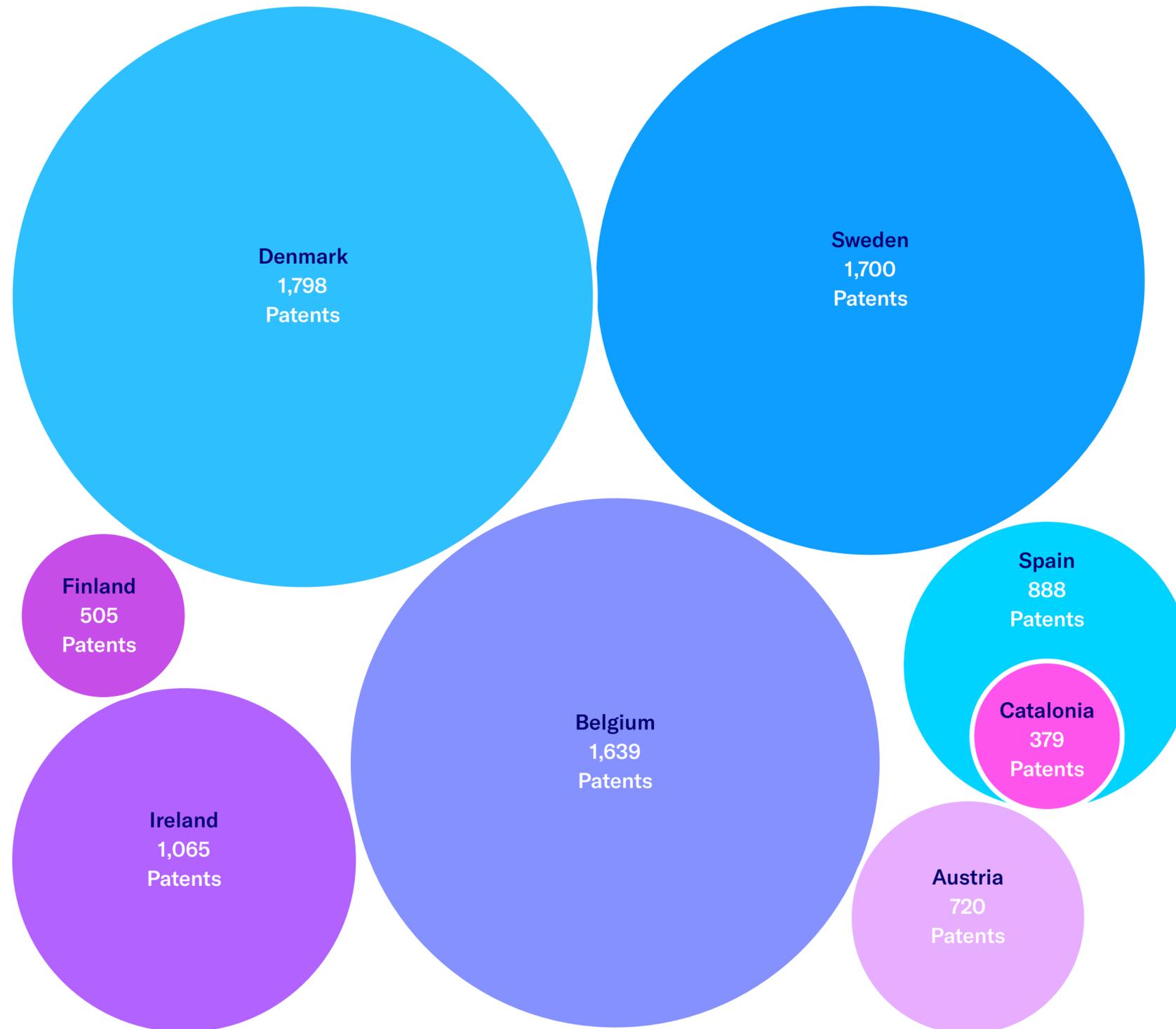
## The BioRegion has 3x more Patent Families (EP+US+WO) (2015-2018)



Note: This analysis shows protected inventions through European, American and international patent documents (EP+US+WO), with first application date from 2015, where at least one applicant is located in Catalonia in the life sciences and healthcare sector.

Source: Patbase, Clarivate, Invenes, IP PONS

## Families of Other European Countries (EP+US+WO, 2015-2019)



## Top Patent Applicants in the BioRegion

Companies	Universities / Research centers
Esteve	UPC
Almirall	UAB
Interquim	VHIR
Oryzon	IDIBELL
Minoryx	Hospital Clínic

## Breakdown of Applicants by Category



## Patent Applications with the European Patent Office Continue to Grow as a First Option

Catalan companies and research entities' first registries have a clearly international focus. Between 2015 and 2019, 57% of innovations by BioRegion-based applicants were first registered with the European Patent Office (EPO).



# A Prime Destination for Clinical Trials

## TOP 15 WORLDWIDE Number of Active Clinical Trials (2019)

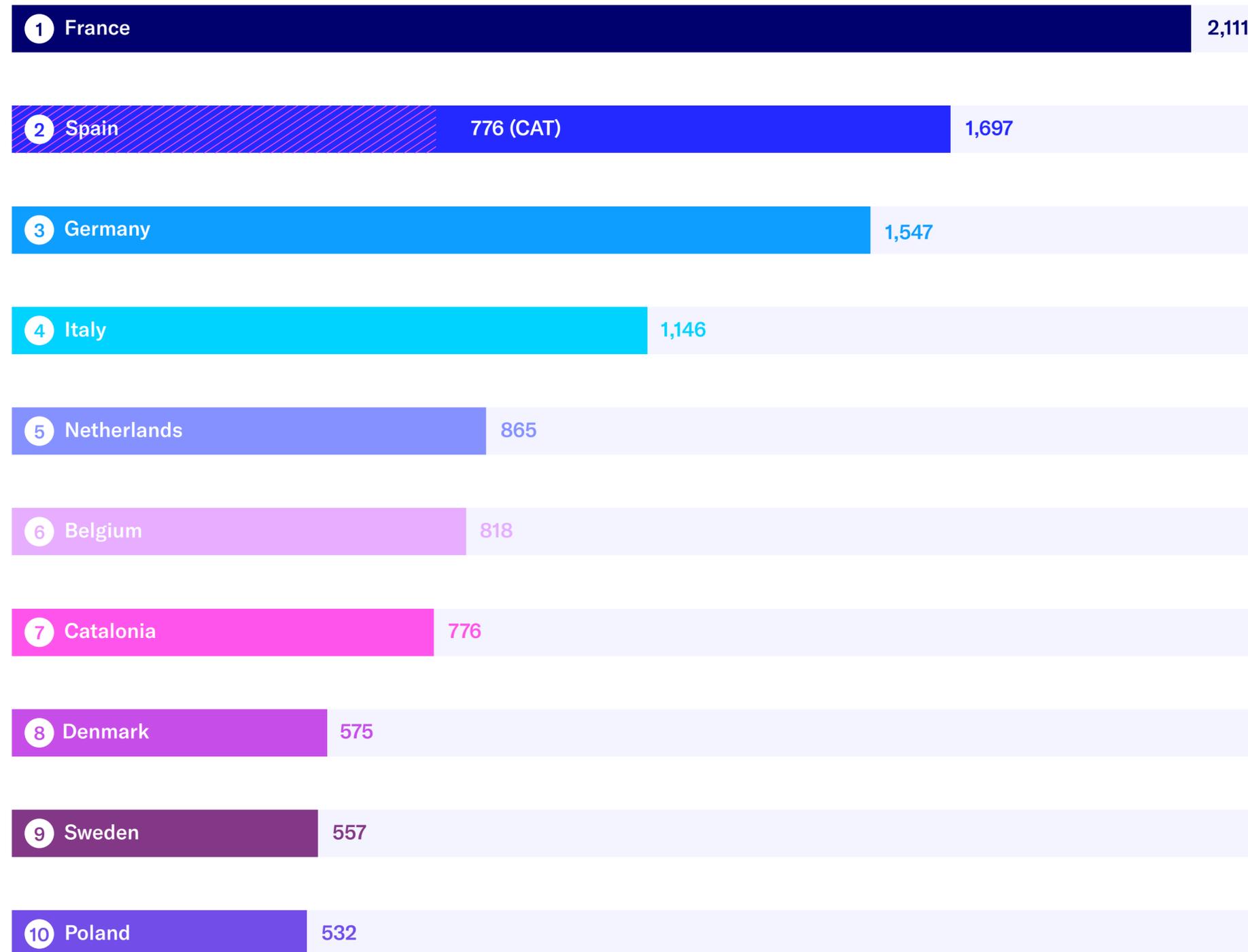
1. United States	10,690
2. France	2,111
3. Canada	1,706
4. Spain (*)	1,697
5. China	1,581
6. Germany	1,547
7. United Kingdom	1,314
8. Italy	1,146
9. Korea, Republic of	865
10. Netherlands	865
11. Belgium	818
12. Australia	790
13. Catalonia	776
14. Switzerland	615
15. Denmark	575

(\*) Spain including Catalonia

Source: Clinicaltrials.gov, SIRIS Academic

Source: Clinicaltrials.gov, SIRIS Academic

## TOP 10 EUROPE Number of Active Clinical Trials (2019)



## Top Pharma Companies Conducting Clinical Trials in Catalonia (multinationals ranked by number of trials)



Source: UNEIX

# 04 Challenges Ahead



# How Can We Maximize the Potential of Catalan Innovation?

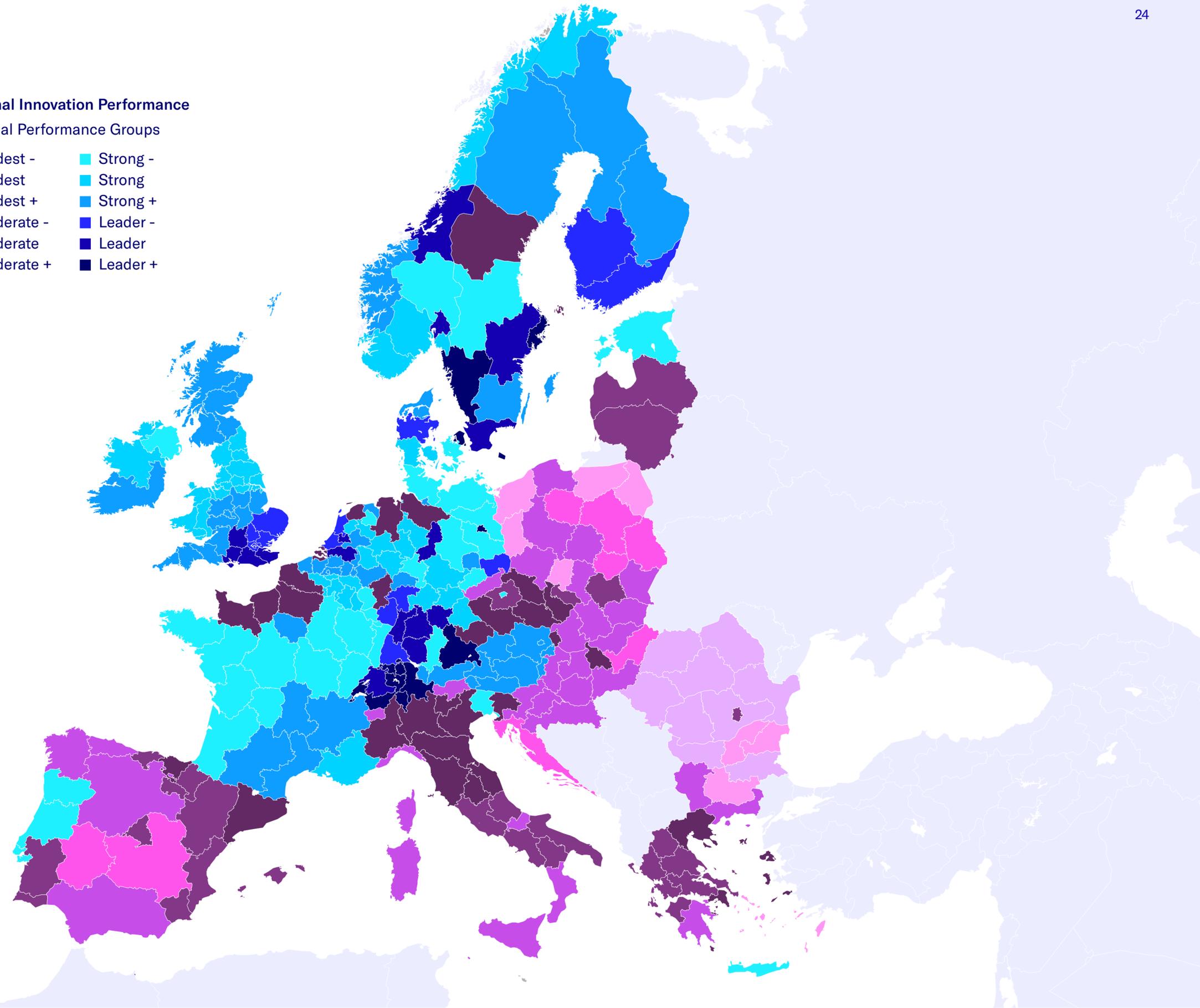
Despite performing well on the innovation indicators showcased previously, Catalonia is losing positions on the EU Regional Innovation Scoreboard.

The life sciences and healthcare sector is one of the key drivers of innovation and it could effectively help reverse this trend. However, some important challenges must be addressed first.

## Regional Innovation Performance

### Regional Performance Groups

- |            |          |
|------------|----------|
| Modest -   | Strong - |
| Modest     | Strong   |
| Modest +   | Strong + |
| Moderate - | Leader - |
| Moderate   | Leader   |
| Moderate + | Leader + |



ARENA

- 1
- 2
- 3
- 4
- 5

# Technology Transfer

## Challenge 1 ↘

### To have a strong, structured technology-transfer system that is focused on the market and unmet needs

- Identify priority areas of innovation to promote projects on an international level. Analyze the Catalan healthcare system's real needs and challenges.
- Encourage technology transfer (TT) through matchmaking activities to promote relations among the stakeholders in the healthcare ecosystem (researchers, pharma and biotech companies, investors, etc.) and boost interactions/deals between technology and research projects from research institutions/hospitals and investors (national and international), and with potential licensees to transfer technology and knowledge.
- Establish a technology-transfer framework that is in line with international parameters.

## Challenge 2 ↘

### To build a pipeline of competitive projects, with proof of concept

- Have immediate funding mechanisms to valorize projects.
- Foster coordinated structures, with multidisciplinary research, that share resources, structures and knowledge.

## Challenge 3 ↘

### To consolidate structured resources and incentives

- Establish a policy for financial and career incentivization and/or intensification for researchers, doctors and healthcare professionals, as well as for innovation managers.
- Lay out a professional development and recognition plan. Heighten social prestige and training for innovators.
- Promote knowledge of the international market and training on how to negotiate a deal.

## 2025 vision ↘

- By 2025, we need to have maximized the number of projects prepared to be competitive and attractive to international companies and investors.
- By 2025, there must be a robust, competitive academic innovation ecosystem, with good mechanisms for transfer to the private sector.
- By 2025, technology-transfer professionals must be consolidated, motivated and professional.

ARENA

- 1 2 3 4 5

# Talent Development and Acceleration

## Challenge 1 ↘

### To meet demand for capacities in light of the changes in the life sciences and healthcare system

- Identify gaps between supply and demand for skills (market, technology, regulatory issues, etc.), explore training available on a local and European level and validate how present and future needs are being addressed (upskilling and reskilling as strategies to ensure the capacities of the pipeline of future talent).
- Bridge the gap between needs and talent-acceleration programs based on unmet needs.
- Help make talent one of the main driving forces for transforming the healthcare system.

## Challenge 2 ↘

### To consolidate the Catalan healthcare innovation system's competitiveness in attracting and retaining talent

- Identify possible barriers to competitiveness in attracting innovative and executive talent.
- Anticipate the sector's needs with competitive programs like "ICREA innovators".
- Anticipate macroeconomic factors and external dynamics, particularly for preparing the system to face large-scale challenges.

## Challenge 3 ↘

### To boost the critical mass of executive talent to scale up the life sciences and healthcare ecosystem

- Entrepreneurship programs focused on various levels and subsectors.
- Promoting female leadership on an executive level.
- Maximizing interaction between industry and technology suppliers; training multidisciplinary teams.
- Incentives for hiring C-Suite talent.

## 2025 vision ↘

- By 2025, the ecosystem must have the talent to meet the sector's needs how it is changing.
- By 2025, Catalonia must have a significant pool of professionals with high potential and a proven track record in entrepreneurship.
- By 2025, the life sciences and healthcare ecosystem must have scaled up in size, with local and international executive talent.
- By 2025, there must be an optimal level of interaction between industry and technology providers, with training for multidisciplinary teams that contribute a transversal view.

## ARENA

1 2 3 4 5

# Mobilizing Capital and Attracting Investment

## Challenge 1 ↘

**To reach an optimal project dealflow, in quantity and quality, in order to attract private Catalan and international capital**

- Develop a public-private investment instrument for proof of concept and prototyping of advanced technology (deeptech) that improves the quantity and quality of investment-ready dealflow, maximizing the potential of the whole country.
- Gear this instrument towards leveraging private capital and make this its main goal.
- Ensure suitable financial return on public investment in proofs of concept.
- Promote tax instruments and eliminate fiscal barriers that facilitate and reward the financial role and support of patrons, business angels and professional investors in the very early stages of the most innovative projects.
- Focus investment policies on proving financial, economic, social and health returns.

## Challenge 2 ↘

**To provide a financial ecosystem and instruments for industrial investment, and tools to incorporate research innovations into companies**

- Promote investment, with participation from the Government of Catalonia, that aims to fund early-stage projects in the industrial arena and Industry 4.0, mainly in biomedicine and healthcare as a sector that acts as a driving force and has great potential for growth.
- Promote agile public-private financial instruments to facilitate the incorporation of innovation from research centers and universities into companies. For example, hybrid mechanisms with subsidies for the center and loans for companies in collaborative projects.

## Challenge 3 ↘

**To achieve public-private financial instruments to foster company growth**

- Promote public-private investment funds geared towards growing high-tech companies, mainly for industrial scale-up and internationalization.

## 2025 vision ↘

- By 2025, the dealflow of investment-ready projects must have reached optimal levels, in quantity and quality, in line with the country's great potential. All investment-ready projects must have been able to fund their prototype or proof of concept.
- By 2025, the healthcare innovation sector must be attractive to professional capital, both local and international, and in all arenas (biomedicine, digital health, advanced therapies, diagnostics and medical devices).
- By 2025, innovation must be incorporated from the academic setting into companies through flexible mechanisms and with the right support.
- By 2025, an industrial innovation ecosystem in healthcare must have been developed that is as powerful as the biotechnology and digital ecosystems.
- By 2025, public-private financial instruments must have been achieved to accompany the growth and globalization of high-tech companies.

## ARENA

1 2 3 4 5

# Adopting Technology in the Public Health System

## Challenge 1 ↘

### To lay out structured paths for innovation (biotech, medtech, digital, organizational/processes) to access the public market

- Activate ecosystem assets and resources (institutions, funds, talent, tools) and the capacities involved in the adoption of innovation.
- Draw the assets' journey and identify the impact-generating agents involved in the innovation adoption roadmap.
- Set criteria to regulate access of innovation to the public market. Deploy tools to assess, valorize and prioritize innovation systematically and transparently, overcoming resistances to “de-innovation”.

## Challenge 2 ↘

### To encourage transformation of public system through innovation

- Foster the co-developer role of the public system (an asset for valorization) in innovation (e.g. clinical development or validation bench).
- Deploy strategies and instruments to encourage public procurement of innovation and innovation in public procurement (e.g. value-based purchasing, results-based purchasing, risk sharing) in the public administration.
- Overcome barriers (regulatory, data interoperability, clinical validation) to the transformative adoption of technologies and innovation by the system.

## Challenge 3 ↘

### To increase impact of public innovation assets (clinical data, medical imaging, advanced therapies, etc.)

- Connect and activate cross-system network-based initiatives around strategic public assets, geared towards co-developing innovation at all phases.
- Develop system-wide strategies addressed to increase the return of the benefits of public innovation assets to the healthcare system.
- Promote locally and globally the public innovation assets' value to unleash innovation and sustainable healthcare management.

## 2025 vision ↘

- By 2025, the public health system must be able to adopt valuable innovation by order of priority, in a transparent, fast and agile manner.
- By 2025, the public health system must be top quality and financially sustainable, thanks in part to the return of the impact of innovation.
- By 2025, the public health system must be able to embrace transformation drivers based on innovation development and adoption.

## ARENA

1 2 3 4 5

# Business Consolidation

## Challenge 1 ↘

### To establish long-term corporate strategies and policies

- Under the framework of the National Agreement for a Knowledge Society (PN@SC), to have stable programs that facilitate long-term planning throughout the sector's value chain, recognizing and adapting to its specific needs (technological risk, highly regulated sector, long time-to-market, closed prices, global market).
- Value and measure companies' success in building a business environment, knowledge, stable, qualified jobs and ability to bring innovative products to market.

## Challenge 2 ↘

### To improve the scalability of companies and decrease fragmentation

- Detect the resources needed at each phase of project development to prioritize consolidation (facilities, internal development of core technology, pilot plants, GMP production plants, etc.).
- Promote the “digitalization of healthcare” to effectively integrate new digital technology in businesses and the ecosystem, while also maximizing development of therapies, medical technology, diagnostic methods and services supported by scalable, compatible technology facilities.
- Encourage alliances within the industry and with key players in the sector (technology centers, hospitals, regulatory bodies) to advance larger projects with a greater impact.

## Challenge 3 ↘

### To encourage the ability of consolidated companies to act as a driving force on a local level

- Incentivize open-innovation programs at consolidated companies.
- Accompany and provide tax incentives for investment and co-development between large and small companies.

## 2025 vision ↘

- By 2025, the business ecosystem must have consolidated public policies and infrastructures that fit the sector's specific needs and foster the creation, development and consolidation of business initiatives in a more agile, structured way.
- By 2025, the BioRegion industry must be diverse, mature and stable, with a balanced distribution of different-sized companies at various stages of the development cycle.
- By 2025, there must be a constant, efficient dealflow within the companies of the ecosystem that allows the development of projects from bench to market. Thus, companies must have the right infrastructure, in order to feed the growth of robust portfolios of innovations “made in Catalonia”.

# Methodology

- The BioRegion of Catalonia is the life sciences and healthcare ecosystem in Catalonia. The Report is published since 2009, and this current edition is a joint effort of Biocat together with CataloniaBio & HealthTech. The analysis are based on information from the Biocat Directory, which covers more than 1,200 companies and organizations operating in Catalonia in the life sciences and healthcare sector. This platform is managed in collaboration with Venture Valuation, the owners of BiotechGate, one of the most complete international databases of the industry. It is available at [catalanlifesciences.com](http://catalanlifesciences.com). This data is then cross-referenced with the Biocat CRM, which has nearly 10,000 active organizations and over 30,000 contacts.
- The companies' core subsectors that were analyzed in depth are: biotechnology, pharmaceuticals, medical technology (medtech) and digital health. The definitions of the sectors and subsectors used in this report are available at [catalanlifesciences.com/cat/portal/definitions.php](http://catalanlifesciences.com/cat/portal/definitions.php)
- For the data on the companies' revenue and employment, the source used was the SABI database (Iberian Balance Sheet Analysis System), which gets its information from the business registry. Companies that operate in the area but don't have their official business address in Catalonia are not counted. The method for calculating the sector's weight in terms of the GDP (gross domestic product) is available on page 45 of the [2017 Biocat Report](#).
- The date are noted on the graphs. The chapter on investment in startups is up to date as December 2020.
- The definition of a startup used in this Report requires a special note. On one hand, it is used in its most common sense, to denote companies established within the past 10 years. On the other, it is used in a broader sense, taking into account aspects associated with the activity and characteristics of the companies, whether they are innovative and/or technologically disruptive, based on entrepreneurship and focused on research, services or products that address complex issues. This second group is where we find most of the companies we refer to as deeptech or deepscience firms, working in areas like artificial intelligence, robotics, computer vision, AR/VR, genomics, immunotherapy, synthetic biology, bioinformatics, 3D and bio printing, etc., which are also classified as startups in the Report.
- To study investment in startups, Biocat follows emerging or innovative companies in the core subsectors established in the BioRegion directly. Data on public and private capital, through formal investment vehicles or instruments, is compiled internally. The data usually comes from the company itself and/or public sources (press releases or news articles, investors, VC reports, etc.). Other qualitative indicators on investment in the sector are available in the [study](#) Biocat and CataloniaBio & HealthTech published in June 2020 in collaboration with independent consultancy EY.
- To monitor the clinical pipeline of biotechnology and pharmaceutical companies, the website [clinicaltrials.gov](http://clinicaltrials.gov) was used, along with information provided by the companies themselves.
- For some analyses of the BioRegion's R&D capacities, EU countries have been selected for comparison that are similar in GDP and population (Finland, Denmark, Sweden, Australia, Ireland and Belgium).
- The information and analysis on Catalonia's publications, public funding through European competitive funds and positioning in terms of clinical trials was done by SIRIS Academic. The sources used are cited in each case. For the bibliometrics, the areas belonging to the field of biomedicine were manually selected on SCOPUS and the percentage of publications in biomedical research published in the top 10% of journals with the greatest scientific impact is according to the SCIMAGO ranking.
- The analysis of patents in the sector is a collaboration with IP Pons to study EP, US and WO patent families between 2015 and 2019.

## BioRegion of Catalonia 2020 Report

report.biocat.cat  
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Barcelona, December 2020



Biocat is the institution that brings together the Life Sciences and Healthcare community in Catalonia. Set up in 2006 at the behest of the Government of Catalonia, Biocat's mission is to maximize the economic and social impact of life sciences and healthcare innovation of the BioRegion. More information at [www.biocat.cat](http://www.biocat.cat)



CataloniaBio & HealthTech is the association of more than 160 companies and pioneer agents in research, development and innovation in the life sciences industry in Catalonia. Its mission is to help companies generate new solutions that improve people's health, as well as positioning Catalonia as one of the top health hubs in the world. More information at [www.cataloniabioht.org](http://www.cataloniabioht.org)

Biocat



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