Evolution and Trends in Scientific Entrepreneurship in Spain's Health Sector

An Analysis of Companies Originating from the Public Research System (2001-2023)

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SPANISH HEALTH SPIN-OFF ECOSYSTEM (2001-2023)

SPIN-OFFS

199

Spin-offs

EXITS

26

Spin-off exits

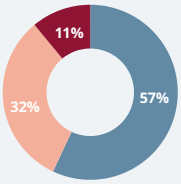
TOP INSTITUTIONS (*SPIN-OFFS*):

1. Consejo Superior de Investigaciones Científicas (21)
2. Universidad de Barcelona/Fundación Bosch i Gimpera (19)
3. Instituto de Investigación Vall d'Hebrón (15)
4. Universidad de Santiago de Compostela (11)
5. Universidad Politécnica de Cataluña-Barcelona Tecnología (9)

TOP INSTITUTIONS (*EXITS*):

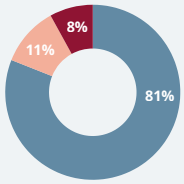
1. Consejo Superior de Investigaciones Científicas (6)
2. Universidad de Barcelona/Fundación Bosch i Gimpera (5)
3. Instituto de Investigación Vall d'Hebrón (3)
4. 6 institutions with 2 exits each

TYPE OF COMPANY (*SPIN-OFFS*):



BioTech	57%
Digital Health	11%
MedTech	32%

TYPE OF COMPANY (*EXITS*):



BioTech	81%
Digital Health	8%
MedTech	11%

TOP AUTONOMOUS REGION (*SPIN-OFFS*):

1. Catalonia (55%)
2. Madrid (12%)
3. Valencia (7%)
3. Galicia (7%)
4. Andalucía (5%)

TOP AUTONOMOUS REGION (*EXITS*):

1. Catalonia (16 *exits*)
2. Madrid (4 *exits*)
3. Valencia (3 *exits*)
4. Andalucía, Balearic Islands and Galicia (1 *exit* each)

INVESTMENT AND EXIT DETAIL

TYPE OF INVESTORS

Majority Private

ORIGIN OF INVESTMENT

50% Spain
30% North America

AVERAGE TIME FROM INCORPORATION TO EXIT

9 years (± 4.6 years S.D.)*
Min: 1 year / Msx: 17 years

***Figure 1**. Key findings from analysis of Spanish healthcare spin-offs and exits (2001-2023).*

*Standard deviation

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2
Glossary and Abbreviations

AI: Artificial Intelligence

Exit: Liquidity event that occurs when founders and early investors cash out some or all of their ownership shares, e.g. through an acquisition by another company, a public offering of shares, investment by a business group, etc.)

IP: Intellectual Property.

TTO: Technology Transfer Office. This term refers to the structures dedicated to promoting and managing the transfer of knowledge and technology generated within research institutions.

Spin-off: Company established around an Intellectual Property asset, based on a technological innovation developed at a research institute or academic institution such as research centre, university, hospital.

3 Introduction

In recent decades, bio-entrepreneurship has become a significant contributor to the global business and economic landscape, particularly in the health sector. Spin-offs and start-ups from academic research institutions have been instrumental in transferring knowledge and developing innovative solutions in areas such as advanced therapies, messenger RNA, the microbiome, precision nutrition, CRISPR gene editing tools and advanced diagnostics, among many others.

In recent decades, bio-entrepreneurship has become a significant contributor to the global business and economic landscape, particularly in the health sector.

Technology Transfer Offices (TTOs) in academic institutions play a vital role in supporting spin-offs. Their work encompasses a wide range of activities, including intellectual property protection and its transfer through the formalisation of licensing agreements. Furthermore, these offices play a pivotal role in assembling a support team around the lead inventor, offering resources, training, mentoring and networking opportunities. These services are crucial for defining the core of spin-offs and ensuring they have the team and skills needed to succeed. However, TTO support has limitations, and additional financial investment is required to take spin-offs to the next level and realise both their technological and market potential.

Spain is a leading player in the biotechnology sector, **ranking 9th in global scientific production** as indicated in the latest report by the Spanish Association of Biotechnology Companies (AseBio)[1]. However, Spain's performance in innovation is significantly lower, as evidenced by its 28th place in the Global Innovation Index 2024[2]. This discrepancy demonstrates a gap between the country's scientific output and its ability to generate high-impact innovations. At the European level, Spain is classified as a "modest innovator" according to the European Innovation Scoreboard (EIS)[3], being almost 11% below the European average in indicators measuring research and innovation outcomes. This places Spain behind neighbouring countries such as France – considered a highly innovative country with more than 14 percentage points above the European average – and Denmark, the European leader in innovation, exceeding the average by 37.6%. According to the EIS, Spain's main strengths lie in the areas of digitalization and human resources, while the most notable weaknesses are related to employment in innovative companies, private R&D expenditure, and the number of innovative small and medium-sized enterprises (SMEs). It is worth noting that our innovation performance has been on an

1 ASE Bio Report 2023 https://asebio.com/sites/default/files/2024-09/AseBio%20Report%202023.pdf

2 WIPO Global Innovation Index 2023, https://www.wipo.int/global_innovation_index/en/

3 European Innovation Scoreboard 2023, https://op.europa.eu/en/publication-detail/-/publication/04797497-25de-11ee-a2d3-01aa75ed71a1

upward trend since 2016, and in the last analysed year (2023), it grew above the European average.

These figures underline the need to strengthen technology transfer mechanisms and foster greater collaboration between research centres, universities and the private sector, especially in critical areas such as health. However, this collaboration is hampered by specific characteristics of the Spanish ecosystem, such as the predominance of small and medium-sized enterprises (SMEs) in knowledge-intensive sectors and the overall low level of investment in R&D by Spanish companies. For example, in 2021, industrial R&D expenditure in the 27 EU Member States was 2.27% of GDP, compared to 3.46% in the United States, 4.8% in Korea, 3.30% in Japan and 4.90% in Israel. In contrast, in Spain it was 1.44% of GDP.[4]

For research institutions and other public and philanthropic actors to be effective in transferring scientific advances to the market, they need sufficient support from industry and the investment ecosystem. The involvement of scientists is also crucial, especially in the early stages of the transfer process. Furthermore, for decades, research funding and the professional development of researchers have been largely dependent on academic indicators related to the generation and dissemination of knowledge, such as the number of publications and the impact factor of scientific journals. This has led to an excellent position for Spain in terms of scientific output, but there is still much room for improvement in the process of translating these results into innovations that meet societal needs.

It is now time to take stock of the progress made and to apply the lessons learned in order to face the challenges that lie ahead in a realistic and efficient manner.

4 European Union Eurostat Database https://ec.europa.eu/eurostat

4 Motivations and Objectives

4.1 Motivation

In 2010, Fundación Botín launched the Mind the Gap programme with the objective of promoting entrepreneurial initiatives based on knowledge generated in Spanish research institutions that, although not yet at a stage where they could attract industry or professional investors, were ready to transition to the business environment. Through an impact investment model, Mind the Gap provides both funding and strategic guidance, with the aim of transforming projects originating in the academic sphere into viable business initiatives that generate social impact.

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Since 2013, Inveniam has been engaged in strategic consultancy for technology transfer in the fields of life sciences and resource sustainability. Over the past 11 years, Inveniam has supported over 400 projects originating from academic institutions including universities, research centres, technology centres and hospitals. By providing continued support in the financing and consultancy of these projects with public and private instruments, Inveniam has gained invaluable first-hand knowledge of the sector's needs, challenges and achievements.

In the period 2001-2023 covered by this study, the Spanish bio-entrepreneurship ecosystem has undergone a profound transformation. With this report, Fundación Botín and Inveniam aim to provide an overview of the evolution of healthcare spin-offs in Spain over the last 24 years.

For this report, only spin-offs that have demonstrated a certain degree of private financial traction (in addition to public funding) have been considered. These spin-offs are based on technology-based IP transferred by the TTOs listed in Annex 8.2 of this report. In this first edition of the analysis, spin-offs from technology centres, private universities or private research institutions have not been included.

The report analyses the extent to which these companies have managed to raise funds and complete exit operations in order to bring the solutions developed to the market, to benefit patients and to reward the investors who took the high risk of the early stages. It also aims to highlight the crucial role of TTOs and other players in the entrepreneurial ecosystem.

4.2 Objectives

The specific objectives of the report are:

To analyse the evolution of spin-offs in the health sector: This objective is carried out by collecting data on spin-offs generated from Spanish research centres, hospitals and universities between 2001 and 2023. The aim is to identify trends and variations among the different Autonomous Communities of the country;

To examine exit transactions: A detailed analysis of the exit transactions carried out will be provided, assessing the current state and future prospects of the sector;

To highlight the role of the TTOs and other agents supporting the innovation and entrepreneurship ecosystem: The work of the TTOs in accompanying and advising spin-offs in their early stages of development will be assessed, as well as the importance of fostering cooperation and synergies among the various actors in the ecosystem to create a favourable environment for innovation; and

To start a comprehensive database of Spanish healthcare sector spin-offs: The report will be the first comprehensive compilation of the creation and development of spin-offs in the health sector in Spain, providing a valuable source of information for actors in the innovation and entrepreneurship ecosystem.

The ultimate aim is to provide the Spanish health R&D and innovation ecosystem with a tool to facilitate the identification of best practices and to encourage the creation of strategies that promote innovation and entrepreneurship in this key sector.

5
The Funding Ecosystem for Bioscience and Health Projects

5.1 The Funding Cycle

Biomedical entrepreneurship projects are **long-term ventures – averaging between 7 to 15 years to reach the market** – and are **capital-intensive** due to the significant efforts required for research, product development, and clinical and regulatory validation[5,6].

On the other hand, there are significant differences between various segments within the biomedical field (biotech, medtech, digital health, etc.) in terms of market entry timelines, resource requirements, and access to funding.

To classify and map the various stakeholders throughout this lifecycle, the following funding stages have been established according to the maturity level of the projects:

01 **Pre-seed**, which covers identifying the problem to solve, conceptualising the solution, conducting an initial proof of concept, and the establishment of the company.

02 **Seed**, which includes the period from company formation to the end of the initial regulatory phases – in drug development, this would be the regulatory preclinical trials, and in medical devices, the initial clinical phase (or subsequent phases).

03 **Startup**, which covers the period from advanced clinical studies and certification of the solution according to regulation (e.g., CE marking) to the beginning of initial sales.

04 **Growth**, which starts with the consolidation and scaling of sales and the validation of the business model.

However, any attempt to map existing stakeholders to this scheme should be approached with caution, as project funding needs and the business strategies of funders are subject to numerous variables.

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5 CSIS article: "RAI Explainer: The Drug Development Process", [accessed online]

6 ETH Zurich article: "ETH Zuric spin-offs put to the test", [access online]

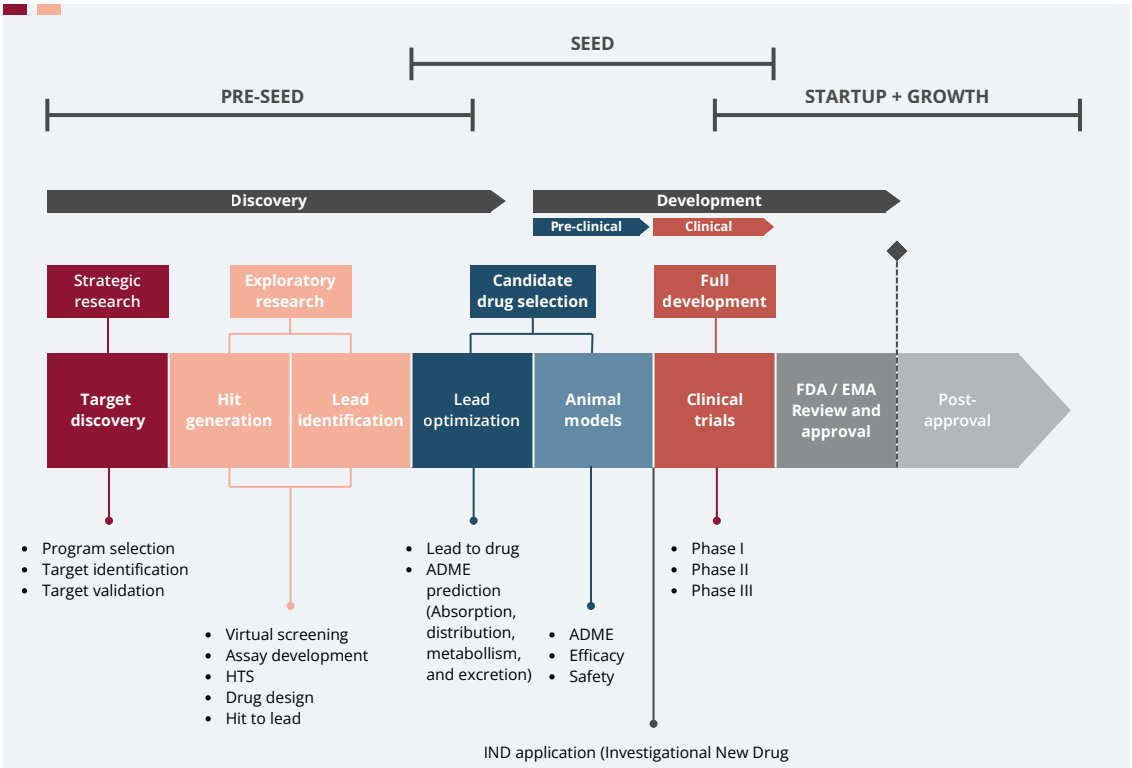

Figure 2. *The Development Cycle of Biotech Products. Adapted from Introduction to Biotech Entrepreneurship: From Idea to Business (pp.89-128), Robin Duelen et al., August 2019.*

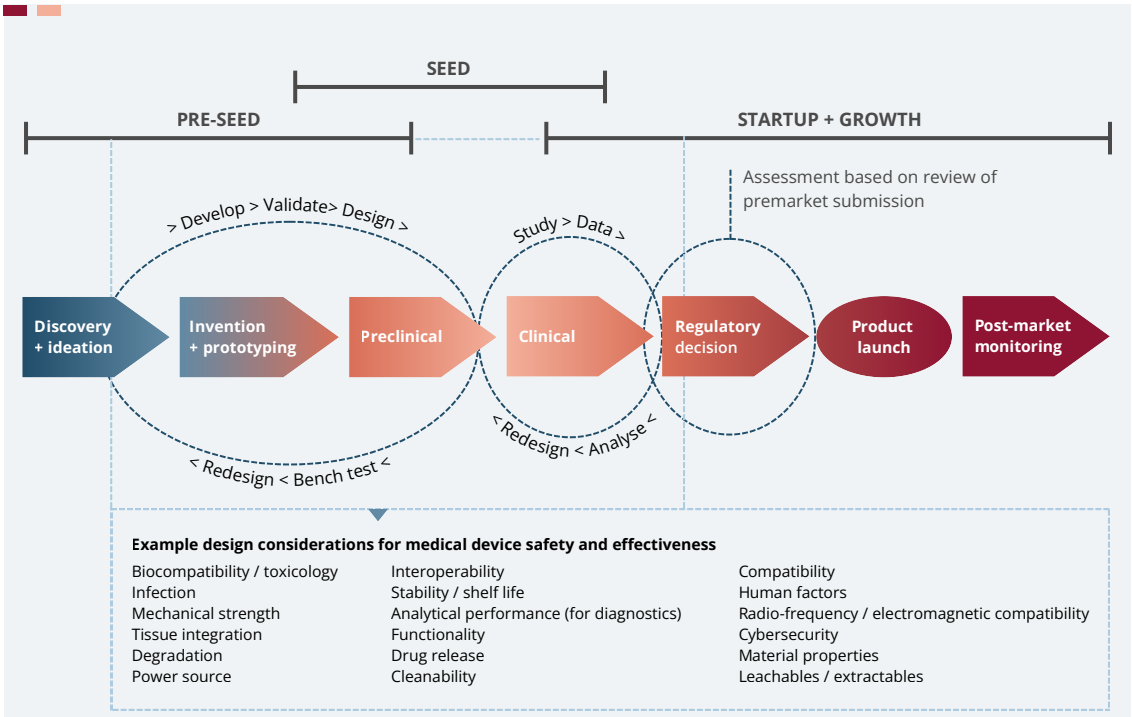

Figure 3. *The Development Cycle of Medtech and Digital Health Products. Reproduced from Medical devices on chips, Nature Biomedical Engineering, Allan Guan, Parisa Hamilton, Yi Wang & Maud Gorbet, March 2017.*

5.2 The Funding Ecosystem

As the number of biomedical entrepreneurship projects has steadily grown over recent years, the support and funding ecosystem has also matured and diversified significantly, further enhancing the system's capacity to generate new projects.

Emerging players include:

- Various private and public entities specializing in supporting projects at one or more stages of their lifecycle,
- Different support and funding instruments, both dilutive (equity investment) and non-dilutive (grants or soft loans).

Below, we describe the current ecosystem of stakeholders and instruments throughout this lifecycle:

5.2.1 Pre-seed stage

5.2.1.1 Public initiatives

In this phase, public funding, which remains predominant, has gradually evolved to expand its scope beyond the generation of research results and to facilitate the transition to market. This approach is focused on a primary objective – the creation of start-ups – channelled through the promotion and funding of programs with a dual focus.

In this phase, public funding, which remains predominant, has gradually evolved to expand its scope beyond the generation of research results and to facilitate the transition to market.

On one hand, the main objective is to fund the development of the first pre-competitive product prototypes. Additionally, some of these programs also finance training, advisory, and mentoring services for the preparation of business plans and market analysis, formal company establishment, and pitching to funders.

These programs are generally broad in scope, not specialised in health. However, we highlight below, in a non-exhaustive and illustrative manner, some specific programs that have had an impact in this field at different administrative levels, including the year of creation if available:

LOCAL LEVEL

Programs developed by universities, such as the **Prova de Concepte Fund** by the Bosch i Gimpera Foundation at the University of Barcelona (offering grants up to €25,000), the **UPF INNOValora** program at Pompeu Fabra University, or the **Acelerador de Transferencia** (Transfer Accelerator, up to €40,000) at the University of Santiago de Compostela.

REGIONAL LEVEL

Key examples include:

- **Indústria del Coneixement Program** (Knowledge Industry Program, 2015, Catalonia), promoted by the Agency for Management of University and Research Grants of the *Generalitat de Catalunya*. This program is structured in three stages to progressively support the maturation of projects: Seed, Product and Innovator.

- **Ignicia Program (2016, Galicia)**, promoted by the Galician Innovation Agency of the *Xunta de Galicia*, which continues the "Science Fund," a technology transfer program originally promoted by the Barrié Foundation. This program provides funding ranging from €200,000 to €400,000 per project.

NATIONAL LEVEL

The *Spanish State Research Agency*, under the Ministry of Science, Innovation, and Universities, sponsors The ***Proof of Concept*** *Call*, with funding up to €300,000 per project, aimed at entities that have previously received support for research projects.

EUROPEAN LEVEL

Particularly relevant programs include:

- **Proof of Concept Call** by the European Research Council (ERC), designed to help researchers who have already received a previous grant from the ERC to explore the commercial or social potential of their research results. It provides financial support (up to €150,000) to validate innovative ideas, conduct technical or market feasibility studies, protect intellectual property, and establish connections with industrial partners.

- **Transition Call** by the European Innovation Council (EIC), aiming to bring EIC Pathfinder, FET Flagship, or ERC Proof of Concept project results closer to the market. This line provides grants of up to €2.5 million to validate and demonstrate technologies in a relevant application environment (from TRL[7] 3/4 aiming to reach TRL 5/6) and to develop business and market aspects.

5.2.1.2 Private initiatives

The private sector has picked up the baton and promotes various programs that also combine business maturation for projects and the development of proof of concepts. In this segment, there are two main reference models, often complementary:

PRIVATE FOUNDATIONS WITH INTERESTS IN SCIENCE AND HEALTH:

La Caixa Foundation, through its **CaixaImpulse Health Innovation Program** (2015), supports researchers from Spanish and Portuguese research centres (with Catalonia representing nearly 50% of projects). This program is structured in three phases, with the ultimate goal of facilitating the creation of spinoffs by the end of the process, and provides funding ranging from €50,000 (phase 1) to €500,000 (phase 3). The Foundation reserves the right for the Criteria Group to subscribe to a 1% stake in exchange for a cash contribution of up to €100,000.

7 TRL: A scale used to assess the maturity level of a technology, ranging from Level 1 (basic principles observed) to Level 9 (actual system proven in operational environment). This scale is widely used in the management of R&D&I projects, particularly in projects funded by European funds: https://horizoneuropencpportal.eu/sites/default/files/2022-12/trl-assessment-tool-guide-final.pdf

Among the programs of the Scientific Foundation of the Spanish Association Against Cancer is the AECC Innova call (2019), aimed at funding oncology research projects with high potential for technology transfer. Its objective is to facilitate the commercialization of innovative scientific results and promote the creation of spin-offs, driving practical solutions for the diagnosis and treatment of cancer.

Fundación "la Caixa"

asociación española contra el cáncer

VENTURE BUILDERS[8]

Venture Builders which identify, fund (usually with up to €100,000), and develop opportunities to transfer research results, such as **Chasing Science** (2017), **Genesis Ventures** (2017), **Nowture** (2017), **BHV Partners** (2018), and, with a broader Deeptech[9] focus, **The Collider** (2017).

CHASINGSCIENCE

GENESIS Biomed

NOWTURE Driving innovation

BHV partners Startup Builders

The Collider

8 A *Venture Builder* is an entity or program dedicated to creating, developing and accelerating startups through a systematic working model. Unlike incubators or accelerators, which typically support existing companies, a Venture Builder identifies business opportunities, designs projects from the ground up, and builds startups either from in-house ideas or in collaboration with entrepreneurs and experts.

9 The term *Deeptech* refers to a group of technologies rooted in scientific and engineering breakthroughs, aimed at solving complex, global problems through disruptive innovation. This concept is commonly associated with sectors such as artificial intelligence, biotechnology, nanotechnology, robotics, quantum computing and renewable energy, among others.

5.2.2 Seed stage

5.2.2.1 Public instruments

For new entrepreneurs developing proprietary technologies, not only in the biomedical field, the range of public funding instruments in this seed phase constitutes a basic source of financing for the vast majority of projects.

However, it is important to consider certain specific characteristics of these instruments:

1. They often involve significant administrative complexity, requiring resources, internal or external, dedicated to obtaining and managing these grants.

2. They are often tied to the ability to attract private funding, which incentivizes but also limits the amounts funded.

3. They have rigid schedules for implementation, execution, and specific conditions, which can slow down projects.

These characteristics encourage the progressive and complementary use of private instruments that leverage public funds. The following programs stand out across various levels of administration:

REGIONAL LEVEL

In this regard, the Autonomous Communities have been particularly active in recent years in developing such support instruments for new entrepreneurs (including grants, standard or participative loans, and equity investments). For example, due to their scale and impact in the biomedical field, we highlight the programs developed in Catalonia by:

- **ACCIÓ**, which has launched the **Startup Capital grant program** (€100,000) and the **Startup Capital co-investment** line (between €75,000 and €250,000, through a 10-year loan and a 20% grant), tied to investments formalized by business angels or venture capital funds.

- **Institut Català de Finances (ICF),** which complements ACCIÓ's activities with its **IFEM Proof of Concept Program**, aimed at spin-offs from the Catalan research system, offering loans between €50,000 and €200,000 per project. It also provides **IFEM Innovation**: co-investment with private investors, a line of participative loans ranging from €50,000 to €200,000 per project (with potential follow-on funding up to €200,000 under the same conditions).

Additionally, venture capital management companies tied to regional or local development agencies within the various Autonomous Communities are also key players, frequently co-investing with specialized investors in the biomedical sector. Some of the more notable among these include **SODENA** (Navarra), **Seed Capital Bizkaia**, **SPRI Taldea**, **Elkargi**, **Orza** (Basque Country), and **XesGalicia** (Galicia).

NATIONAL LEVEL

At the national level, there are historically established instruments within the tech entrepreneurship ecosystem, such as:

- **Center for the Development of Technology and Innovation (CDTI)**, a public business entity under the Ministry of Science, Innovation, and Universities, promoting innovation and technological development in Spanish companies. It channels applications for support for R&D&I projects by Spanish companies at both national and international levels. The main line of support for entrepreneurship at this stage is:
    - The **NEOTEC** line, possibly the most recurrent instrument supporting the creation of technology-based companies, with particular attention to knowledge transfer from public research organizations and universities. NEOTEC provides grants covering up to 70% of the eligible budget of the activity, with a maximum grant amount of €250,000 per project (up to 85% of the eligible budget, with a maximum grant amount of €325,000, if hiring at least one PhD).
    - The co-investment instrument (see section on private investment funds), **Innvierte**, with two lines:
        - A generalist line open to investors regulated by the CNMV[10], co-investing with several venture capital firms specializing in this stage (e.g., Nara, Clave, etc.) and in later stages (e.g., Asabys, Ysios, Inveready, etc.).
        - A second line specializing in Technology Transfer, co-investing with venture capital firms such as Beable, Clave, and Bullnet.

10 *CNMV* stands for National Securities Market Commission, which is the "body in charge of supervising and inspecting the Spanish securities markets and the activity of all those involved in them", https://www.cnmv.es/Portal/quees/funciones/funciones?lang=en#:~:text=The%20National%20Securities%20Market%20Commission,all%20those%20involved%20in%20them.

- **National Innovation Company (ENISA)**, under the Ministry of Industry and Tourism, which provides financial support for innovative entrepreneurship projects:
    - Participative loan lines for **Young Entrepreneurs** (from €25,000 to €75,000) and **Entrepreneurs** (from €25,000 to €300,000), requiring partners to contribute at least 50% of the loan amount.

EUROPEAN LEVEL

At this level, a key player for health entrepreneurs is the **European Institute of Innovation & Technology** (EIT, 2008), the largest innovation ecosystem in Europe, which brings together over 2,400 members from leading business, educational, and research organizations across Europe through more than 50 innovation hubs. EIT is an entity of the European Union and an integral part of Horizon Europe, the EU Framework Programme for Research and Innovation. Through dynamic pan-European partnerships, known as Knowledge and Innovation Communities (KICs), EIT offers a wide range of innovation and entrepreneurship activities, strengthening innovation in Europe and driving solutions to urgent global challenges while fostering entrepreneurial talent to generate sustainable growth and skilled jobs in Europe. EIT operates in the health sector through its KIC, EIT Health (2016). Due to its special relevance, it is covered in more detail in the chapter on "Support Programs for Biomedical Entrepreneurs."

5.2.2.2 Private initiatives

In this field, we find instruments with different profiles:

PRIVATE FOUNDATIONS WITH INTERESTS IN SCIENCE AND HEALTH

- **Fundación Botín**, whose Technology Transfer Program began in the early 2000s, was an early supporter of biomedical projects by providing flexible funding and professional management of technology transfer. It pioneered the implementation of an impact investment model with a primarily social purpose, funding projects in exchange for returns only in the event of success. This Technology Transfer program continues through the ***Mind the Gap*** call, which offers investment (up to €500,000) and expert support for spin-offs, including the involvement of an expert who guides and supports the team in addressing critical aspects necessary to turn academically rooted projects into viable business ventures.

- **Fundación Ship2B** (2015), a foundation specializing in "impact projects" that selects investments through its acceleration program, *S2B Health&Care* (see the section on "Support Programs for Biomedical Entrepreneurs"). It manages two funds, ***Impact Equity BF*** (2016) and ***Equity4Good*** (2018), the latter co-invested by the European Investment Fund, with a maximum investment of €100,000 (first round) + €400,000 (subsequent rounds). Additionally, its Impact Investment Network has over 400 members.

- **AECC Scientific Foundation** (previously mentioned in section 5.2.1) launched the **AECC Impulso** program (2023) to support technology-based startups developing innovative solutions in the oncology field. The aim is to enhance their social and health impact. Support is provided through convertible participatory loans designed to stimulate the attraction of additional funds.

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Ship2B Foundation

asociación española contra el cáncer

FINANCIAL ENTITIES MANAGING INVESTMENT FUNDS SPECIALIZING IN SEED-STAGE BIOMEDICAL ENTREPRENEURSHIP PROJECTS

Sabadell Bstartup Health, part of Banco Sabadell's BStartup 10 (2014) investment program. Its standard investment is €100,000, mostly in Medtech and Digital Health projects.

Sabadell

VENTURE CAPITAL FIRMS SPECIALIZING IN HEALTH OR MANAGING SPECIFIC FUNDS WITH FREQUENT DOCUMENTED ACTIVITY IN SEED STAGE (ALPHABETICALLY)

There are numerous Spanish VCs investing in the Spanish ecosystem as well as a number of foreign VCs investing in Spanish companies. For example:

- **AdBio Partners** (2016): A French company with offices in Barcelona, specializing in early-stage investments in life sciences startups in Europe, with a particular focus on new therapies.

- **Clave Capital** (2015): A venture capital management firm that places strong emphasis on technology transfer projects. Among others, Clave manages two funds in this area: UN I+D+I Technology Transfer, linked to the University of Navarra, and Innohealth, which specializes in healthcare.

- **DosBio50** (2011): An investment company managed by the business consulting firm DCN. It is currently in liquidation.
- **Grow Ventures** (2018): A venture capital company focused on deep tech spin-offs at the pre-seed and seed stages. It manages the *Grow Tech Fund*.
- **Nara Capital**: An investment management firm specializing in impact sectors with a focus on technological, social, and environmental transformation. It manages the *Nara Health* fund, among others.
- **Nina Capital**: A venture capital company focused on medtech and digital health projects. Its activity is global, with only a minority of its investments based in Spain.
- **Noso Capital:** A private equity fund manager dedicated to investing in technology-based SMEs with social impact in various sectors. It manages the *Bio & Tech Smart Capital* fund.
- **Ship2B Ventures** (2020): An investment firm that backs impact-driven startups in Spain and Europe, aiming to generate both economic returns and social and environmental impact. It manages the *BSocial Impact Fund*, a European social entrepreneurship fund, and the *Montana Impact Fund*, an impact fund focused on pediatrics that invests at the European level.

BUSINESS ANGELS

Business Angels, individually or associated in networks. Although this is a very fragmented segment, the role of these BAs is significant in the seed phase. It is also relatively common for them to channel investments through crowdfunding platforms like Capital Cell or other generalist platforms. Notable names in this segment include:

- Successful entrepreneurs, investing themselves or through their firms.
- Business Angel networks like:
  - **WA4STEAM** (2019), focused on projects led by women and STEAM activities or those relevant to women's health and well-being;
  - **StapleCat-Inveniam**, focused on tech transfer projects in the Life Sciences, Deeptech and Sustainability fields.

- **FINAVES-IESE**, affiliated with IESE Business School since 2000, supports and funds startups, particularly those emerging from the IESE community and the broader Spanish entrepreneurial ecosystem.

- **ESADE-BAN**, a network of private investors promoted by ESADE Alumni, has been operating since 2006 as a bridge between investors seeking opportunities and entrepreneurs with innovative projects in need of early-stage funding.

- **EconomistesBAN**, the business angel network created by the Col·Legi d'Economistes de Catalunya, was established in 2012 as a meeting point for private investors and entrepreneurs, facilitating the financing of innovative projects and promoting entrepreneurship in the region.

OTHER

- **Family Offices**, that is, private investment management entities often associated with Spanish families in the pharmaceutical sector, such as **Namarel Ventures** (Werfen) and **CG Health Ventures** (Almirall).

- **Venture Capital Firms Specializing in DeepTech** with occasional seed investments (<€500,000) in biomedical projects, including **Unirisco** (2001), **Bullnet** (2001), **Adara Ventures** (2005), **Beable Capital** (2015), and **Grow Venture Partners** (2022).

- **Spanish Companies in the biomedical and healthcare industry**, such as the **Prous Institute** or **FAES Ventures**.

Finally, **New Players Introducing Innovative Business Models in This Sector:**

- ***Crowdfunding***, where **Capital Cell** (2014), a crowdfunding platform specialized in biomedical projects, stands out, having facilitated deals of up to €2 million.

- **Tax Lease** (also known as Tax Equity or Technology Patronage), a product offered by specialized R&D funding firms such as **Kaudal**, **Ayming**, **Inveready**, and **KPMG**. This new financial instrument allows private investment in R&D&I projects through a corporate structure – an *Economic Interest Grouping (AIE)* – based on tax incentives.

5.2.3 Support Programs for Biomedical Entrepreneurs

In the pre-seed and seed stages, support programs (start-up academies or pre-accelerators) and development programs (accelerators) for entrepreneurs play an essential role, both from public and private initiatives. These programs help structure business ideas through financing for training, advising, and mentoring services, and, in exceptional cases, provide financial assistance, typically under €100,000.

The focus of these programs is primarily on business plan development, investment deck[11] preparation, formal business incorporation, and pitching to potential investors. While this type of entrepreneurship program has already become widespread within the Spanish ecosystem at all levels, the following programs stand out due to their specialization in biomedical projects and their impact:

The focus of these programs is primarily on business plan development, investment deck preparation, formal business incorporation, and pitching to potential investors.

5.2.3.1 Public Programs with Regional or National Reach:

Programa de Apoyo a la Innovación (2012), from the "Platform for Dynamizing and Innovation the Industrial Capabilities of the National Health System (ITEMAS)," one of the platforms of the Instituto de Salud Carlos III (ISCIII). This program targets high-impact projects by researchers in the National Health System.

Healthstart (2017), a program by **Fundación para el Conocimiento madri+d** aimed at health-sector entrepreneurs in the Community of Madrid, providing financial support of €50,000 per project.

Craash (2018), the most popular of BIOCAT's programs. BIOCAT, a public-private foundation initiated by the *Generalitat de Cataluña* and the Barcelona City Council, manages various acceleration programs in addition to Craash, such as "PASS: Innovation Access Program to the Catalonia Health System," the "Startup Support Program," training programs such as "d·HEALTH Barcelona Part Time," and "Short Programs."

11 A brief document used to present a company's business model, strategy, and value proposition to potential investors.

Craash is specifically geared toward research teams and startups in medical devices, diagnostics, and digital health based in Catalonia, and has a marked international aspect with expert mentorship from CIMIT (Consortium for Improving Medicine with Innovation and Technology, Boston).

Acexhealth (2021), an initiative from the **Granada Health Technology Park (PTS)** in collaboration with the University of Granada (UGR), the Junta de Andalucía, and the Granada Chamber of Commerce. *AcexHealth* offers support and mentoring to emerging Andalusian companies in the biomedical field, assisting them in their growth, financing, scaling and commercialisation.

Silo Acelera Bio (2023), a program funded by the **School of Industrial Organization (EOI)** and managed by the innovation consultancy SILO, in collaboration with AseBio. It is aimed at emerging companies and innovative projects in the life sciences sector across Spain, offering specialised training, personalised mentoring, and access to investors, with the goal of driving their growth and consolidation.

5.2.3.2 Private programs

In the private sector, a growing and diverse range of players support biomedical entrepreneurship. The following programs stand out due to their impact:

FOUNDATIONS SPECIALIZING IN "IMPACT PROJECTS"

Fundación Ship2B runs the **S2B *Health&Care* Acceleration Program** (2016), which in turn feeds its investment funds, *Impact Equity BF* (2016) and *Equity4Good* (2018), as well as its investor network.

COMPANIES SPECIALIZING IN PROJECT ACCELERATION

- **Kunsen** (2020), whose project development program specializing in Digital Health includes an investment of €100,000 per project.
- **Lanzadera** (2013), an initiative by Juan Roig, president of the supermarket chain Mercadona, which manages innovation and startup scouting programs for companies in the sector such as Janssen, Ribera Salud, CINFA, and IMED.

PHARMACEUTICAL COMPANIES

In this category, there are numerous programs, though they are often aligned with the innovation and/or communication needs of the promoting companies. Consequently, many of these programs are not continuous or lack sufficient track records to assess their impact. The following have notable experience:

- **ChemoStart** by **Insudpharma**, a non-profit program.
- **Emprende Inhealth** by **Lilly**, in collaboration with Fundación Unlimited.

5.2.3.3 The European Institute of Innovation and Technology (EIT)

The **European Institute of Innovation & Technology (EIT)**, a European Union body whose Knowledge and Innovation Community in health – **EIT Health** – represents the leading health alliance in Europe. It drives innovation in the sector with the primary goal of improving the quality of life for European citizens.

5.2.3.3.1 Key Role and Structure

The organization is headquartered in Munich, Germany, and operates eight regional nodes across Europe. Its network of top health innovators, comprising **approximately 120 partners**, energizes key players in European health innovation and integrates the three pillars of the "knowledge triangle" – research, education, and business creation – to foster technology transfer and generate social and economic impact.

Its network of top health innovators energizes key players in European health innovation and integrates the three pillars of the "knowledge triangle" – research, education, and business creation – to foster technology transfer and generate social and economic impact.

Its commitment to advancing healthcare is reflected in its role in mentoring, funding, and facilitating research. Recognized as a fundamental player in health innovation, EIT Health's track record includes:

- catalyzing more than 2,500 startups and scaleups,
- helping EIT Health-backed startups attract €1.9 billion in investments,
- driving 113 healthcare solutions to market, and
- training 49,000 students and professionals.

EIT Health offers Spanish innovators and startups opportunities through its ***Flagship*** programs and calls to acquire new skills, connect with a broad network of European experts, scale into new international markets, gain access to funding, receive specialized advice and mentorship, achieve visibility, and much more. Its initiatives focus on fostering the development and adoption of digital health solutions, maximizing the use of health data, adopting new value-based healthcare models, and strengthening the European healthcare industry.

5.2.3.3.2 Entrepreneurship programs

Among its numerous entrepreneurship programs, we find:

- **Catapult**: A European competition and acceleration program that mentors and financially rewards the best health startups, providing them with international visibility among industry experts and investors across Europe.

- **Deep Tech Venture Builder**: This program helps transform medtech patents from research centers into impactful startups in healthcare. It offers funding, training, mentoring, and access to pilot projects.

- **Thematic Bootcamps and other training programs**: These are designed to equip health entrepreneurs with the necessary skills.

- **Venture Center of Excellence (VCOE):** This program is aimed at health startups seeking funding rounds between 5 and 30 million euros, supported by the European Investment Fund. It provides assistance throughout the process (reviewing and adjusting the business plan, identifying and contacting investors, preparing materials, etc.), and involves some of the leading VC and corporate funds in Europe.

5.2.4 Startup & Growth stages

Lastly, the **Life Sciences and Health Investment Landscape** for start-ups has also expanded with new players in this stage in recent years. Four major segments are at play in this stage:

EUROPEAN INNOVATION COUNCIL

The European Innovation Council (EIC), that runs its **Accelerator Program**, a highly competitive hybrid program (recent success rate about 5%) that is shifting from seed-stage to later stages. This line offers:

- **Grants** up to €2.5 million for innovation activities (TRL 5-8) to be completed within 24 months.

- **Direct Investment (dilutive)** of up to €10 million for market access (TRL 9), with a 7-10 years' time horizon.

Projects can be classified as Grant Only (receiving the grant and a potential equity tranche if they reach a certain milestone), Blended (receive a combination of the grant and equity investment) or Equity Only if they are in a mature phase.

European Innovation Council

SPECIALIZED VENTURE CAPITAL FIRMS IN SPAIN

Notable historical actors in life sciences include:

Aliath Bio (formerly Alta Life Sciences, 2019), a venture capital manager specialising in the biotechnology and life sciences sector. Aliath focuses its strategy on innovative projects related to human health, with a special emphasis on personalised medicine and advanced therapies.

Asabys Partners (2019), a venture capital firm focused on biotechnology, medical devices, and digital health. Asabys manages the Sabadell Asabys Health Innovation Investments fund, which targets early-stage companies developing disruptive technologies in the healthcare sector.

Buenavista Equity Partners (formerly GED, 1996), an investment fund manager specialising in venture capital and private equity. Through its funds, Buenavista supports projects in strategic sectors, including health, biotechnology and technology, with a focus on high-growth potential companies.

Columbus Venture Partners (2016), a venture capital firm that specialises in investments in biotechnology and life sciences projects. Columbus manages several funds, such as Columbus INNVIERTE Life Science, focused on innovative companies in Spain, and Columbus Life Sciences II, aimed at emerging companies in the healthcare sector.

CRB Inverbio (2008), a venture capital manager focused on biotechnology and life sciences. CRB Inverbio leads initiatives like CRB Bio II, specializing in innovative companies in human health and biomedicine.

Invivo Capital Partners (2019), a fund specializing in investments in emerging companies in the agri-food and biotechnology sectors. It manages the InVivo Ventures funds, which invest in early-stage projects in the biomedical sector.

Ysios Capital (2008), a venture capital firm focused on early-stage or growth-stage biotechnology and medical device companies. Ysios manages, among others, the Ysios BioFund II, which invests in disruptive health technologies.

INTERNATIONAL VENTURE CAPITAL FIRMS

A growing number of international investors, primarily European, have also shown interest, with at least **17 firms** identified as investing in Spanish life sciences spinoffs, especially in therapeutic projects.

BELGIUM	DROIA ventures
DENMARK	LUNDBECK FONDEN
PORTUGAL	Biovance Capital
ITALY	INNOGEST
AUSTRIA	APEX VENTURES
LUXEMBURG	EDMOND DE ROTHSCHILD
FRANCE	Kurma Partners, andera PARTNERS, bpifrance, PARTECH, Sofinnova partners
UNITED KINGDOM	Advent Life Sciences, CRISTA GALLI VENTURES, Amadeus Capital Partners
USA	OMEGA FUNDS, Baxter
THE NETHERLANDS	Forbion. Ventures, Gilde HEALTHCARE, SCRANTON ENTERPRISES

GENERALIST VENTURE CAPITAL MANAGERS WITH SPECIALIZED HEALTH FUNDS

Caixa Capital Risc: Through its *Criteria Bio Ventures* fund, this VC manager focuses on scientific-based startups in the biomedical sector. *Criteria Bio Ventures* collaborates closely with the *CaixaImpulse Innovación* program from Fundación "La Caixa."

Inveready (2008): Active in life sciences since 2012, this firm currently operates the *VC Life Sciences* fund.

GENERALIST VENTURE CAPITAL MANAGERS WITH SPECIALIZED HEALTH FUNDS

Corporate Venture Capital (CVC) Managers, a new wave of sector-linked investment actors specifically targeting health innovation.

Healthgrower (2023), a corporate venture capital firm recently established by the Gallardo family (owners of Almirall and Vithas).

6
Analysis of Spin-offs in the Healthcare Sector

6.1 The Funding Cycle

Over the period 2001-2023, 199 spin-offs related to the life sciences sector were identified in Spain. As previously mentioned, this tidy includes only those spin-offs that have demonstrated some degree of private financial traction (in addition to public funding) and are based on technological IP transferred by the Technology Transfer Offices listed in Annex 8.3 of this report (this first edition of the analysis does not include spin-offs originating from technology centres, private universities, or private research institutions.)

The following sections analyse the landscape of spin-off generation.

6.1.1 Institutional Origin of Spin-offs

All of the companies listed throughout this report are spin-offs originating from Spanish research institutions. The spin-offs analysed come from universities (44%), hospitals (29%), and research centres (27%) (Figure 4). If a spin-off originates from multiple types of institutions, they have been accounted for in the total proportion of institutions. For example, Gate2Brain includes a university (UB/FBG), a research centre (IRB) Barcelona, and a hospital (SJD). The 199 spin-offs identified in this study come from 55 institutions. Most spin-offs (81%) originated from a single institution, while 19% emerged from the collaboration of two or more institutions (Figure 5).

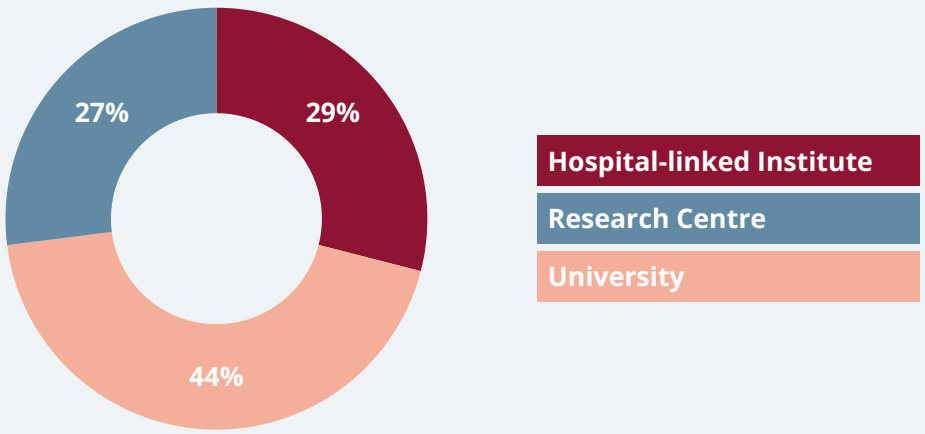


Figure 4. *Proportion of spin-offs by institution type.*

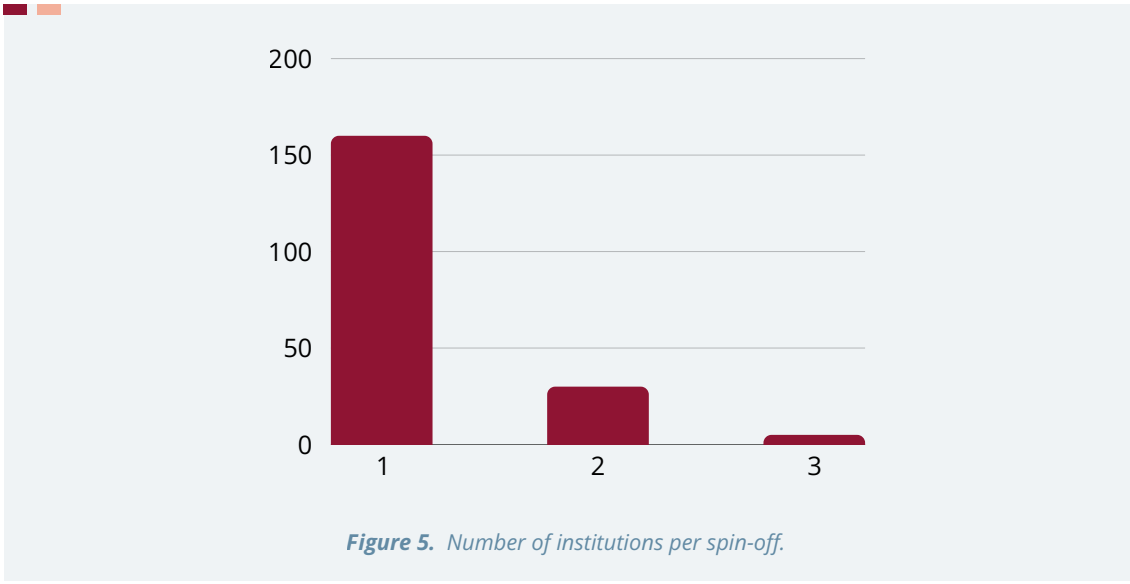


Figure 5. *Number of institutions per spin-off.*

This high level of collaboration can be attributed to several beneficial factors, such as the joint development of intellectual property, pooling of resources, and shared risk mitigation among institutions.

Within these figures, some institutions were particularly active in technology transfer, with the top five institutions accounting for more than a third (37%) of all the companies studied (Figure 5). The Barcelona hub achieved especially good results in the creation of spin-offs, ranking in three of the top five positions (No. 2, No. 3, and No. 5). The University of Barcelona/Bosch i Gimpera Foundation (UB/FBG) with 19 spin-offs, the Vall d'Hebron Research Institute (VHIR) with 15 spin-offs, and the Polytechnic University of Catalonia (UPC) with 9 spin-offs. Leading the top five is the Spanish National Research Council (CSIC) with 21 spin-offs, and in fourth position is the University of Santiago de Compostela (USC) with 11 spin-offs.

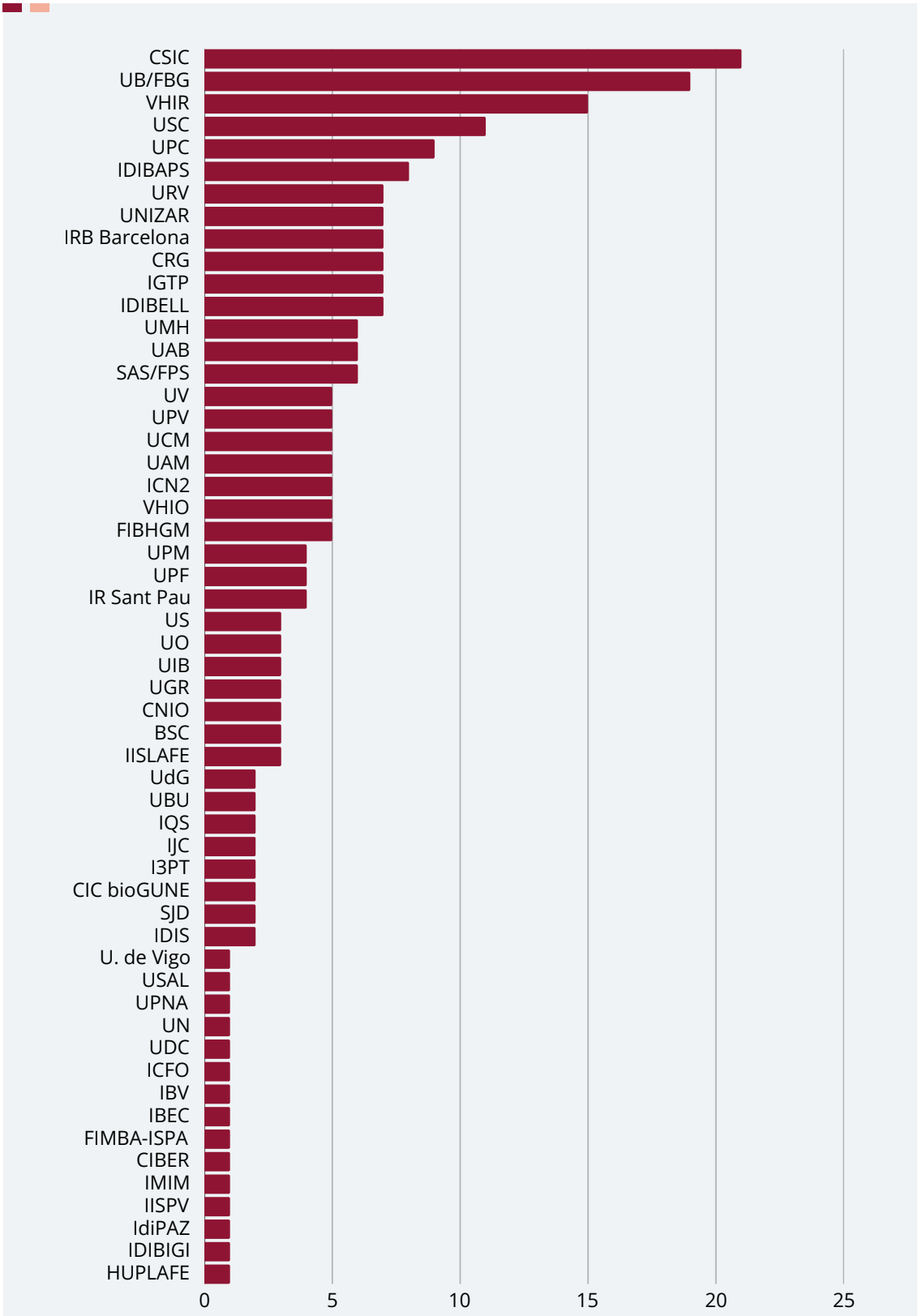


Figure 6. *Spin-offs by institution.*

6.1.2 Regional Distribution of Spin-offs

For administrative and governance purposes, Spain is divided into 17 Autonomous Communities (ACs), the first-level political and administrative division. When mapping spin-offs by Autonomous Community, (Figure 7), different regional concentrations of spin-off generation can be observed, with the highest level of activity in Catalonia (54.5%), Madrid (11.5%), the Valencian Community and Galicia (both 7%), Andalusia (5%), the Basque Country (4.5%), and Aragon (3.5%), among others.

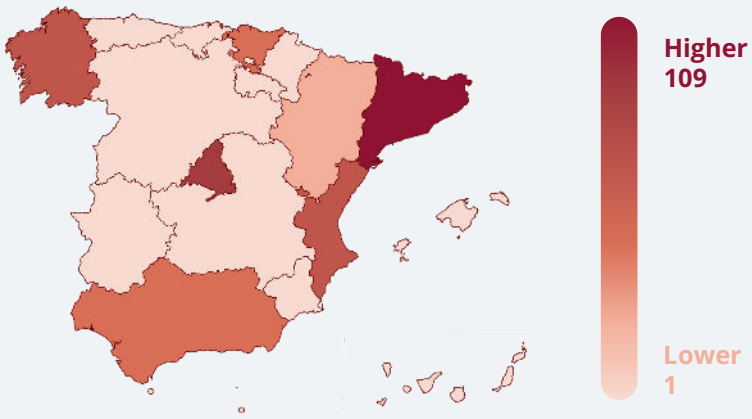
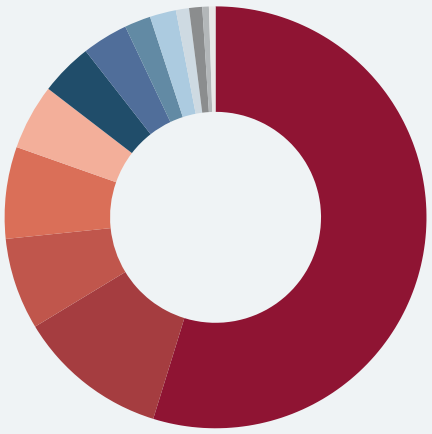


Figure 7. *Map of Spain by number of spin-offs set up.*

Looking more closely at the numbers, Catalonia is by far the strongest AC in terms of spin-off creation, as shown in Figure 7, as might be expected based on the strong presence of Barcelona research institutes in the top institutions by number of spin-offs as discussed in section 6.1. Catalonia has 5 times greater representation in spin-offs than the next AC, Madrid, and 6 times greater representation than Valencia, the 3rd most active ACs. Note that in the case that a spin-off was incorporated from multiple institutions in different ACs, the spin-off has been accounted for in the Autonomous Community where its headquarters are located. Although interregional collaboration was common, the most common collaboration notes was intraregional.



Catalonia	109
Comunidad de Madrid	23
Galicia	14
Comunidad Valenciana	14
Andalucía	10
País Vasco	8
Aragón	7
Asturias	4

Castilla y León	4
Balearic Islands	2
Madrid	2
Canary Islands	1
Navarra	1
Grand Total	**199**

Figure 8. *Creation of spin-offs by Autonomous Regions.*

6.1.3 Spin-offs by Sub-sector

Spin-offs were categorised by sector according to existing TTO classifications covering the key sectors including Biotech, MedTech and Digital Health:

- The **Biotech subsector** comprises the use of biological processes, organisms, or systems to develop products and technologies that improve health and quality of life. It includes the development of drugs of biological or chemical origin, technological platforms or technologies related to biological development and drug delivery.

- The **MedTech subsector** involves the development of all kinds of medical devices and technologies that improve patient care, diagnostics, and treatment outcomes and includes diagnostic equipment, surgical instruments, diagnostic imaging devices, and in vitro diagnostic tests.

- The **Digital Health subsector** refers to the use of digital technologies and innovations, including artificial intelligence (AI), to improve health outcomes, healthcare services, and health research. It includes a broad range of applications such as mobile health solutions (mHealth), health information technologies (health IT), wearable devices, telemedicine, personalised medicine and research tools for drug discovery.

Overall, Biotech was the strongest subsector in terms of spin-off creation, representing 52% of the total, followed by MedTech (35%) and Digital Health (13%) (Figure 9).

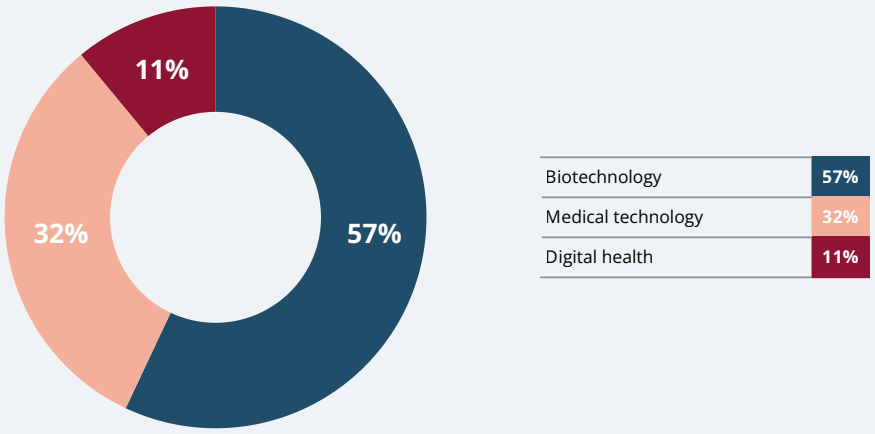


Figure 9. *Spin-offs by sub-sector.*

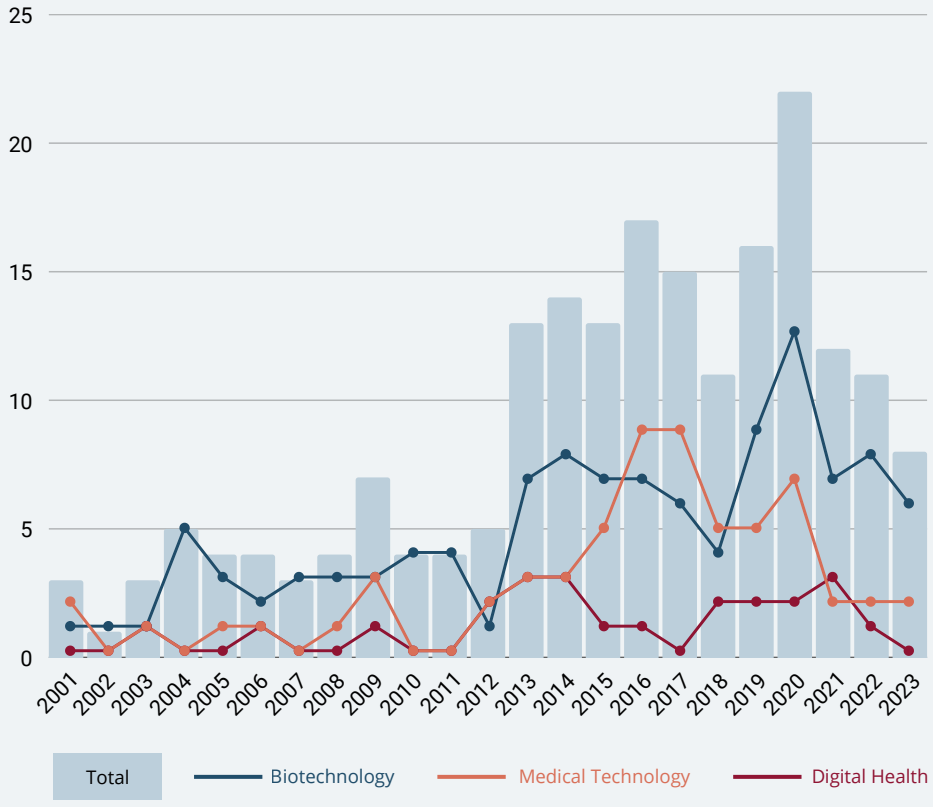


Figure 10. *Spin-offs by sub-sector and year.*

However, we need to look closer at the distribution of spin-offs over time, as it reveals additional insights into the ecosystem. Looking at proportions by sub-sector over time, they feature more of an erratic behaviour during the 2001-2011 period. However, these stabilise somewhat in the second decade studied (2012-2023) as numbers increased, coinciding with a rise in the overall number of spin-offs (Figure 10).

2020 stands out as an exceptional year for spin-offs, with a record 22 spin-offs, predominantly in the Biotech (13) and MedTech (7) sectors. Interestingly there was not a clear focus of these companies on COVID-19 related activities. Looking at the trends over the full time period studied (2001-2023), there is a clear distinction between the first and second decades in terms of the number of spin-offs incorporated (Figure 10). The numbers of spin-offs in each sector increased between the two decades, with an average of 4 spin-offs per year in the first decade compared to 14 spin-offs per year in the second decade. Within these shorter time periods, there were not general observed trends, instead the overall number of spin-offs remained fairly consistent between 2001-2012 and again within 2013-2023, with the exceptions of 2020, as mentioned, and 2023.

Biotech was, on average, the most represented sector throughout the full time period, although the rise of MedTech is seen between the first and second decade. In the first decade only 9 MedTech companies were incorporated and there were 4 years with no MedTech spin-offs, compared with the second decade where there were 6 years when 5+ MedTech spin-offs were incorporated in a single year.

Interestingly, the Digital Health sector did not experience consistent spin-off creation as might be expected based on current market trends – In particular, Digital Health was noted in the biocat 2023 BioRegion Report as a key sector of investment in Catalonia that has seen investment increase from €21M in 2019 to €63M in 2023[12]. The lack of growth in Digital Health spin-offs is at odds with the general trend in this sector, suggesting that the majority of Digital Health companies are not spin-offs.

12 Biocat 2023 BioRegion Report https://report.biocat.cat/

6.2 Spin-off Exit Analysis

Exit operations represent a critical moment in the lifecycle of spinoffs. These transactions, which may take the form of acquisitions, mergers or IPOs, not only allow early-stage investors to recover and multiply their investment but also serve as a key indicator of the value generated by technological innovation. In sectors such as healthcare – characterised by long development timelines, high failure risks and significant capital requirements – exits take on strategic importance. Analysing these operations can shed light on the mechanisms that drive the sector's economic sustainability and can also inform decision-making by investors, entrepreneurs and public policy makers.

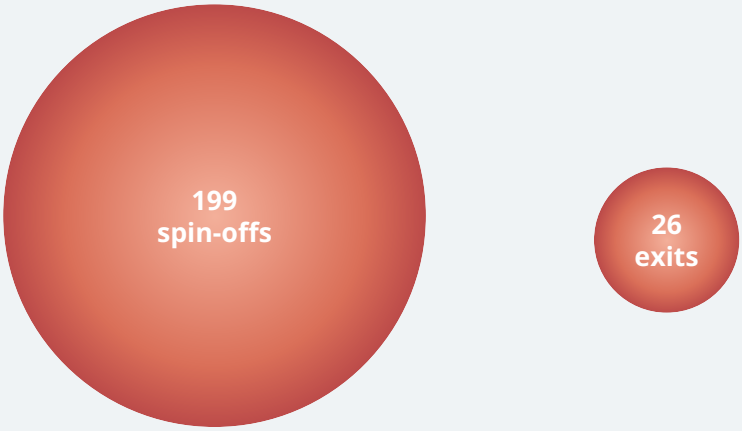


Figure 11. *Number of spin-offs created and exit transactions.*

In the 2001-2023 period analysed, **26 spin-offs completed an exit operation**. An additional 3 were in the process of exiting at the time this study was conducted. It's worth noting that during the same period, a total 199 health-related startups were established (see Figure 11).

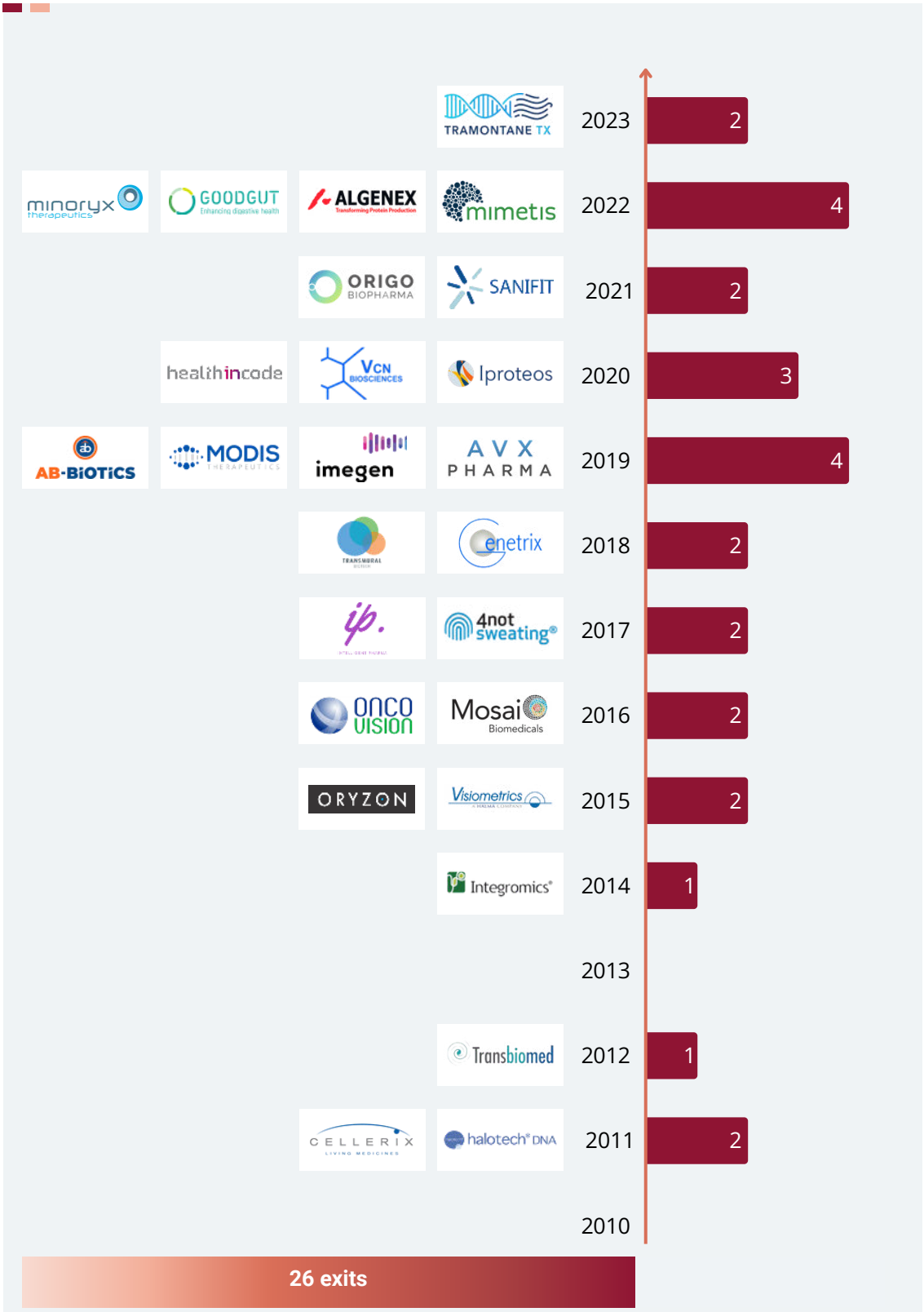


Figure 12. *Chronology of health spin-off exit operations (2001-2023).*

Figure 13 shows the evolution of the annual spin-off creation rate and the number of exit operations per year. The number of spin-offs established annually has increased since 2013, with a significant surge in 2020, followed by a return to pre-COVID levels from 2021 onward. The first recorded exit took place in 2011, and since then, the number of exits per year has remained between 1 and 4.

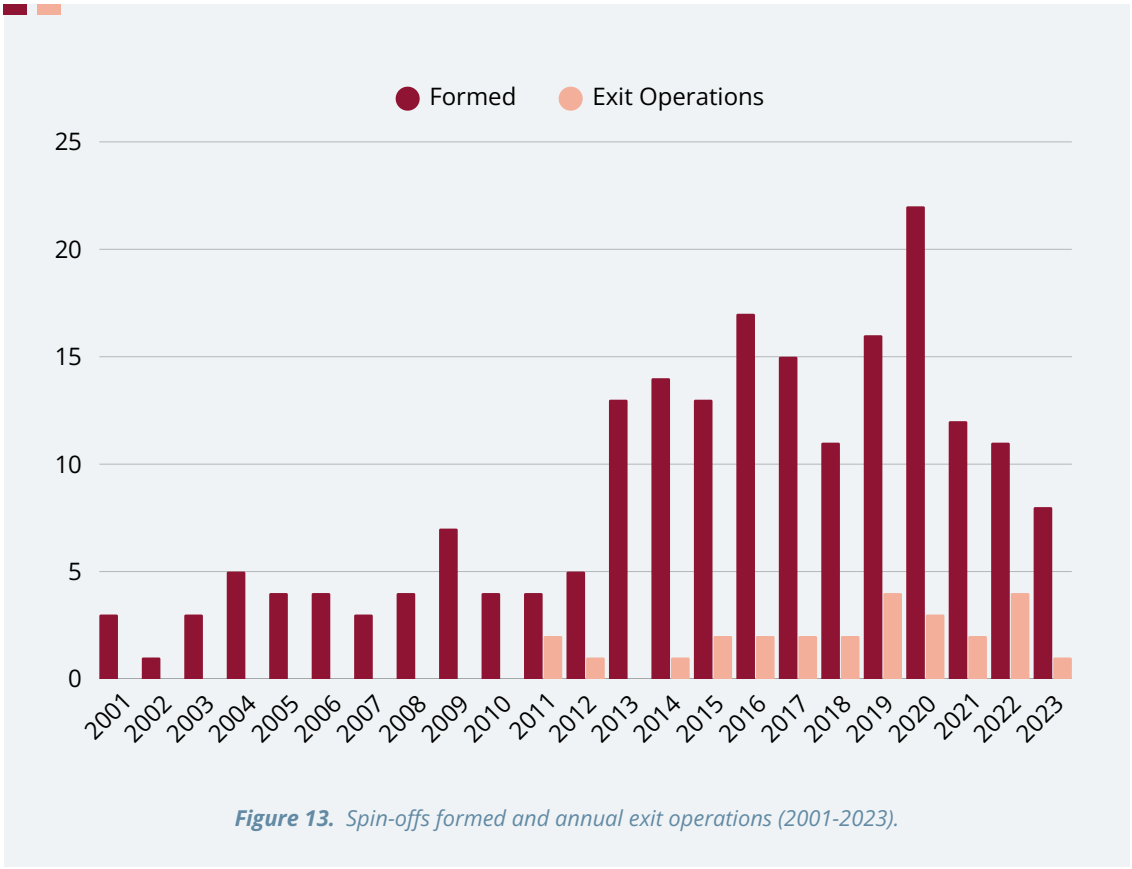


Figure 13. *Spin-offs formed and annual exit operations (2001-2023).*

It is important to note that the time period analysed (2001-2023) does not offer a complete picture of all identified spin-offs, as some companies founded in the later years of this period may not yet have had the opportunity to carry out an exit due to being at too early a stage. For this reason, the aim of this analysis is to present overall trends and the general state of the Spanish healthcare spin-off ecosystem, rather than to track the full trajectory of the 199 spin-offs established between 2001 and 2023.

6.2.1 Exits by Institutional Origin

Of the 26 exits identified, the leading institutions in terms of the number of spin-offs exiting in the period 2001-2023 were Spanish National Research Council (CSIC) with 6 exits – around ¼ of the total and University of Barcelona with 5 exits – around ¼ of all exits. Let's not forget that these two entities hold the first and second spots in terms of company creation (see section 6.1.1).

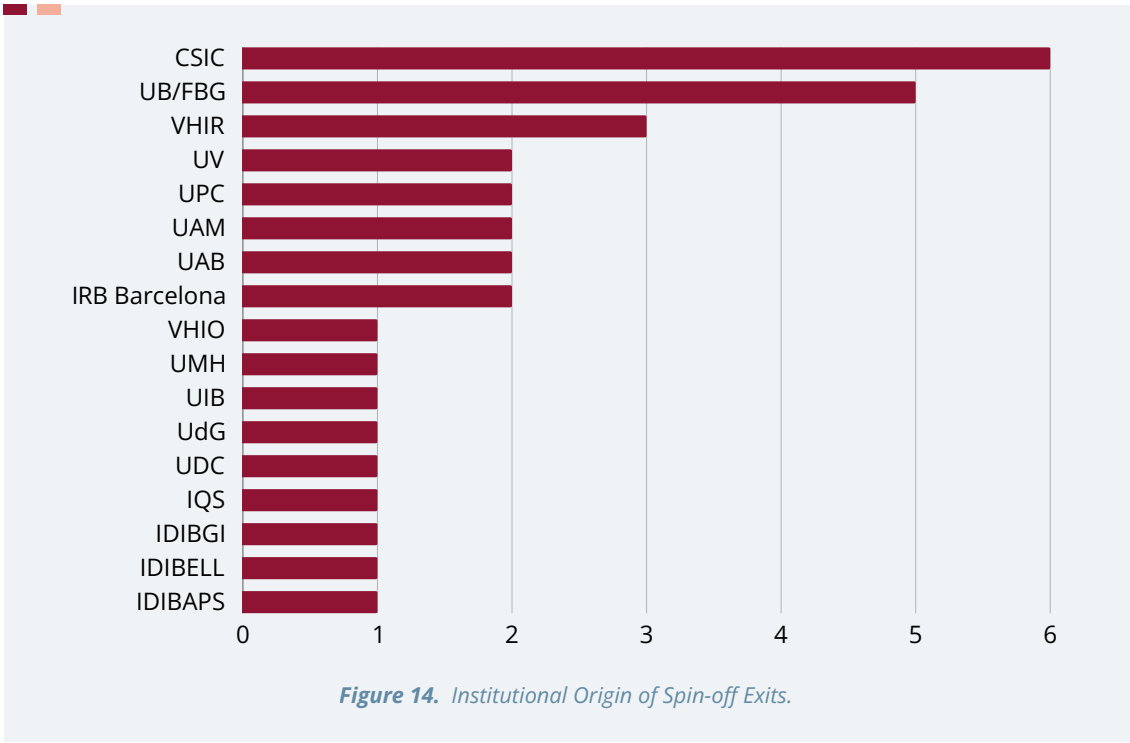


Figure 14. *Institutional Origin of Spin-off Exits.*

It's worth noting that institutions that began engaging in technology transfer activities earlier are more likely to have completed exit operations. In contrast, other institutions may not yet have recorded any exits because their companies were established more recently. For example, if an institution began creating companies in 2019, and the average time to exit is approximately 9.3 years (see Section 6.2.4 of this report), it would not be expected to have completed aby exits within the study period (2001 - 2023).

Figure 15 shoes the distribution of spin-off incorporation and exits over time by institution. Blue bubbles represent spin-off creation (with bubble size proportional to the number of companies), while maroon ballons represent exit operations from those same institutions.

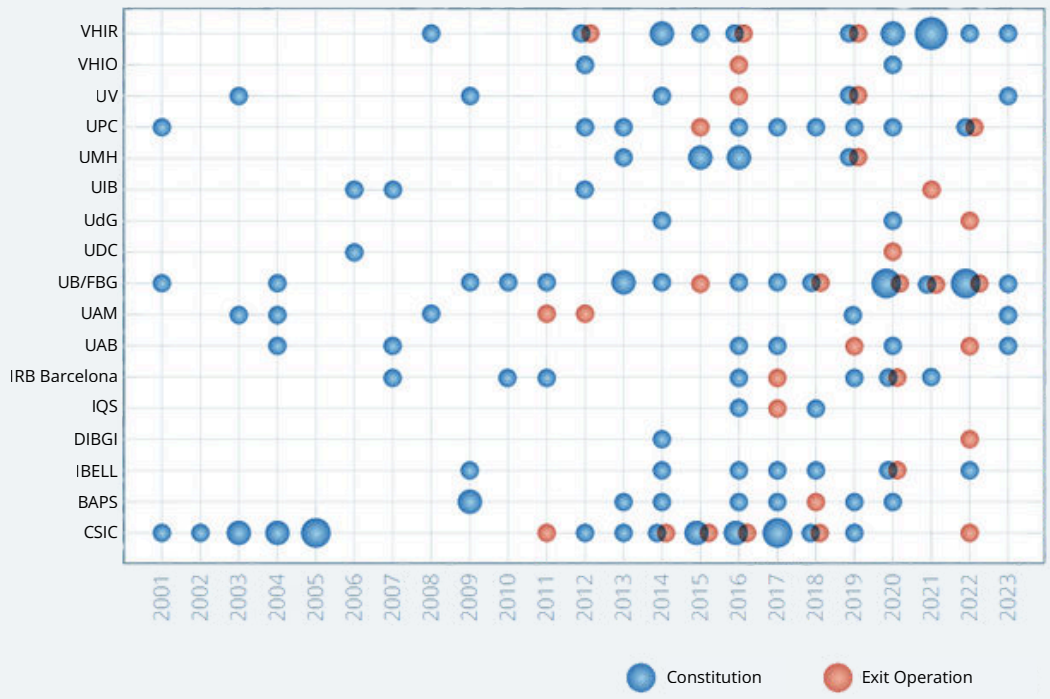


Figure 15. *Bubble chart of spin-offs formed and exit operations of institutions that have had at least 1 or more exit operations (Fundación Botín)*

In terms of spin-off exits, 19 of the 26 exits (73%) were from spin-offs that originated from 1 institution, slightly higher than the proportion of spin-offs incorporated from >1 institution (27%), but not significant enough to conclude that this is an advantage for exiting.

6.2.2 Regional Distribution of Exits

The regional distribution of exits followed a similar pattern to the number of spin-offs incorporated in the period 2001-2023 (Figure 16), with Catalonia leading the way with input in 16 of 26 exits (over 60% of all exits). This was followed by Madrid (15.4%), Galicia (11.5%), Valencia (3.8%), Andalusia (3.8%) and Balearic Islands (3.8%).

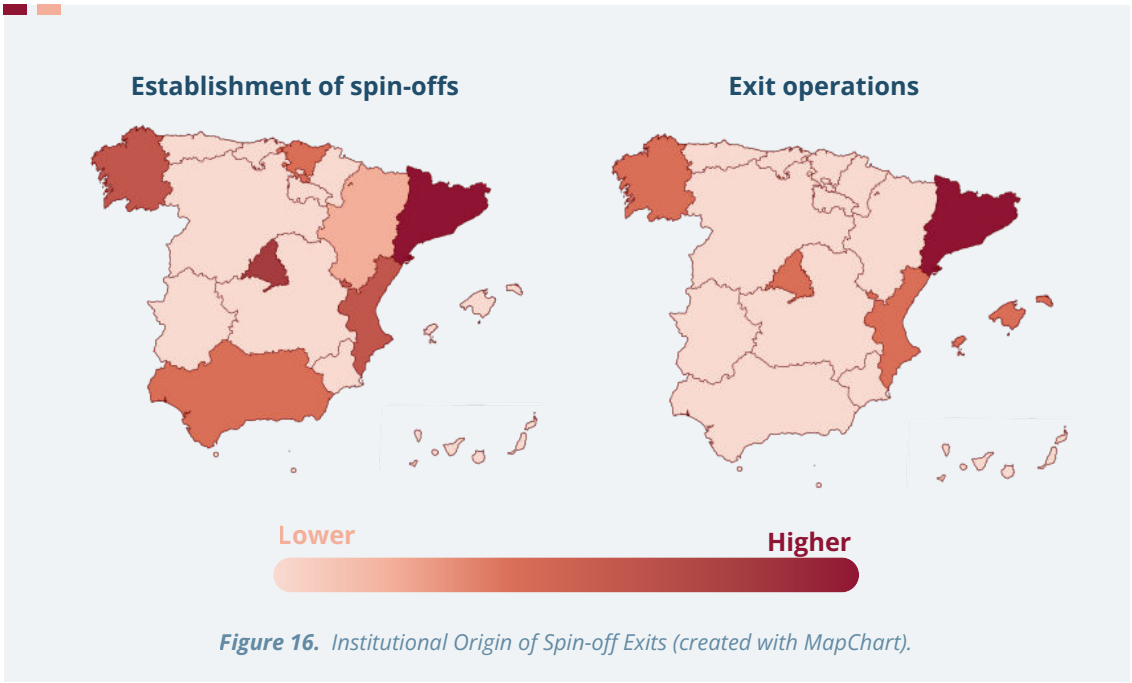
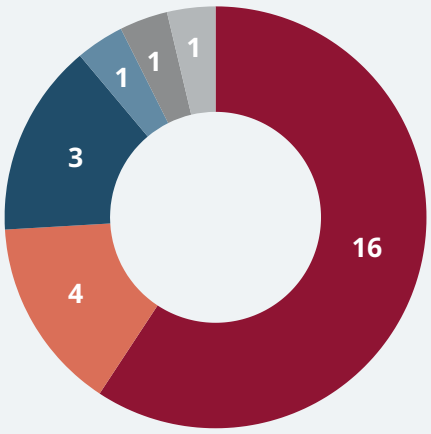


Figure 16. *Institutional Origin of Spin-off Exits (created with MapChart).*

These results from Catalonia confirm its position as a leading hub for research and innovation in the health and life sciences sector. In other regions, seven autonomous communities have spin-offs but no recorded exits – primarily due to the younger age of the spin-offs established there, which are not yet mature enough for an exit. Furthermore, there are 2 companies in the process of exiting that originate from 2 CC.AAs that using the current data, have no exits and so the current numbers do not tell the complete story.



Catalonia	16
Comunidad de Madrid	4
Comunidad Valenciana	3
Andalucía	1
Balearic Islands	1
Galicia	1
General Total	**26**

Figure 17. *Exit operations by autonomous community.*

Also, it should be noted that that the number of spin-offs or exits are not the only indicators of the health of an ecosystem; the economic amounts of the operations are also relevant. For example, the Balearic Islands which had 2 spin-offs in the time period studied (8th placed autonomous community by number) and only 1 exit. These numbers may appear low, but this exit was significant in terms of volume which will have a strong impact on the regional ecosystem: Sanifit was acquired by a Swiss pharmaceutical company, Vifor, for €205M in 2021 with additional milestone payments of up to €170M expected related to a pre-clinical asset plus sales royalties, making this deal one of the largest in the Spanish biotech industry[13].

13 ASE Bio article on the acquisition of Sanifit [online]

6.2.3 Exits by Sub-sector

Of the 26 spin-offs that underwent an exit between 2001 and 2023, the majority were in the Biotech sector (81%), followed by MedTech (11%) and digital health (8%). (Figure 18). This is in line with the spin-off creation statistics but in fact, biotech appears to be even more successful in exits as they represent an 24% greater share of the exits than the share of spin-offs.

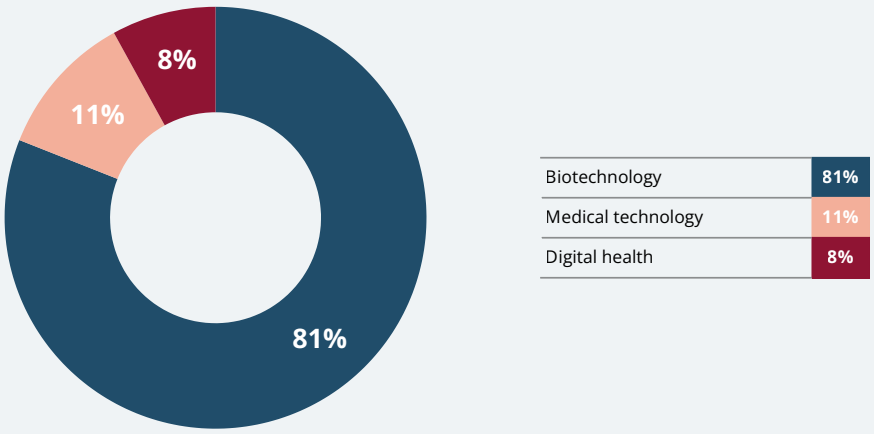


Figure 18. *Exit operations by sub-sector.*

Perhaps this is not surprising given the timing of spin-off incorporation (see 19) where Biotech has shown a consistent presence from 2001 to 2023 compared with the emergence of MedTech and Digital Health only in the second decade studied (2013-2023). These companies may not have reached the stage of maturity for exiting yet and so are not reflected here in the exit figures. Analysis in coming years will be interesting to see the trends develop.

Looking at a year-by-year breakdown of the exits, we see many years with zero exits in the first decade (2001-2011) as shown in Figure 19 and again, Biotech is the dominant subsector, with 7 years in which only exits from this subsector occur. Within this second decade (2011-2023), there are no significant trends, with the number of Biotech exits per year ranging from 1-4, while medical technology or digital health companies have at most 1 exit per year.

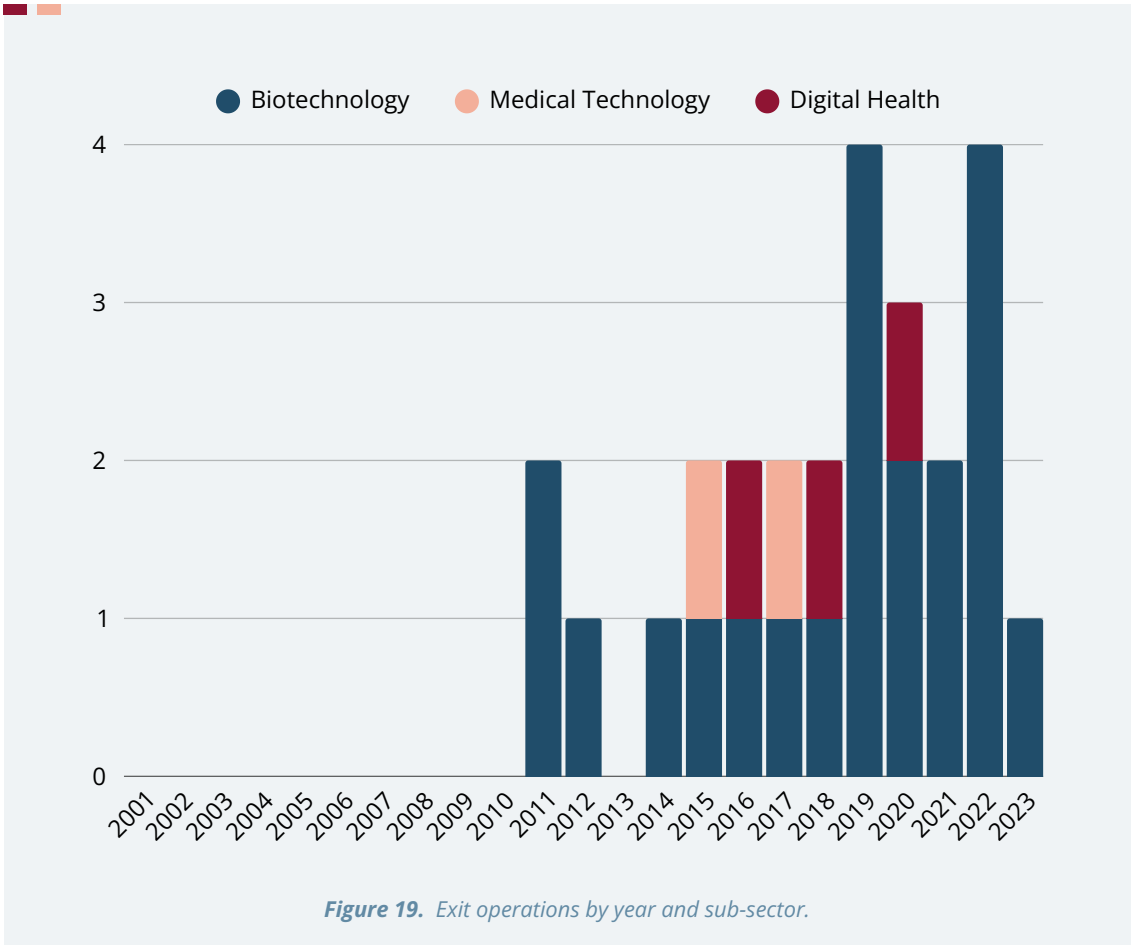


Figure 19. *Exit operations by year and sub-sector.*

6.2.4 Further Detail on Spin-off Exits

Due to the often undisclosed nature of funding rounds, the available data is frequently fragmented. For this reason, the present study does not go into detail on investment trends or specific key investors, as doing so could result in a partial or unrepresentative analysis. Instead, using publicly available information and data provided by TTOs, this report seeks to identify broad trends within the ecosystem that may be of interest for entrepreneurs, investors and policy makers.

As might be expected, the majority of investors involved in the deals analysed were private investors in the form of venture capital firms such as Ysios Capital and Caixa CR. Despite this, it should be noted that there was a relatively strong presence of public and non-profit funding within the capital rounds of some companies from the likes of the European Innovation Council, Fundación Botín (Mind the Gap program), Fundació la Caixa, the Spanish Ministry of Science and the Centre for Industrial Technological Development (Neotec program) which can help to attract and de-risk additional private investment especially for early-stage companies.

For the spin-offs studied, the average number of investors per round was 3 although great variation was observed with many rounds financed by only 1 or 2 investors, but examples were observed of 8+ investors in one round. It was noted that the total finance raised per round was correlated to the number of investors – indicating that it is more attractive for investors to co-invest.

The vast majority of exits were in the form of acquisitions, such as the example given of Sanifit, which was acquired by Vifor. Other examples of larger companies acquiring Spanish healthcare spin-offs include AstraZeneca (UK), Grifols (Spain) and Halma (UK).

Among the exit transactions identified for the report, there are none that have taken place by delisting to the secondary market, which is an indication of the low number of transactions and of the low number of underwriting in this type of company.

In terms of the origin of exit funding, exactly half of all exits were financed by Spanish entities. This was followed by the USA/Canada (30%), the rest of Europe (17%) and one exit from Japan (3%) (Figure 20). The strong presence of Spanish entities is interesting given the commonly held view that internal investment by Spanish investors is poor due to a predominance of SMEs over large companies with investable income. Even still, there is clearly a strong market opportunity for international buyers to acquire spin-offs originating in Spain, as shown by the remaining 50% purchasing being from international companies.

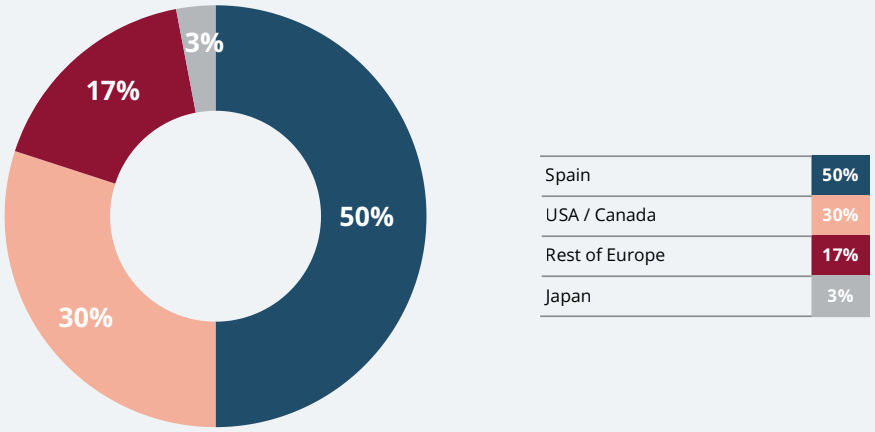


Figure 20. *Origin of financing for outgoing operations.*

Analysis of the time between incorporation and exit of the different Spin-offs studied showed that, on average, it took Spanish healthcare spin-offs 9.3 years to exit with no significant difference between Biotech and MedTech spin-offs. Looking deeper at the numbers, presented here, shows a wide range of times between company formation and exit from 1 year to 17 years, with 14 years being the most common time (the mode).

7 Conclusions

The data presented in this report was gathered from the TTOs of universities, research centres and hospitals across Spain (see Section 8.3), in addition to publicly available data on spin-offs and exits, with the aim of better understanding the Spanish healthcare spin-off ecosystem. It should be noted that the conclusions below are based on the data available to us at the time of data collection (March/ April 2024) and any omissions are likely due to lack of publicly available data or incomplete institutional information. This is pertinent when analysing the financing and exits of the spin-offs as this information was often not available and so at times, hard to draw conclusions on the overall state of the funding and exit ecosystem.

Below, we present the main conclusions from the report:

7.1 Ecosystem

- **A growing, increasingly sophisticated ecosystem that extends across the national territory**: In recent years, the investment ecosystem in life sciences and health in Spain has seen notable growth in terms of its sophistication and reach. This innovative environment is better connected and structured, integrating both public and private agents and facilitating essential resources for entrepreneurs and start-ups.

- **Public funding plays a crucial role in the early stages** of biomedical projects. The importance of this contribution extends even into more advanced stages (prior to exit), where it holds significant weight through programs that accompany investment funds in financing rounds, matching private investment with public funds. This is the case with the INNVIERTE program by CDTI or the EIC Fund of the European Research Council. Public support is essential to meet the development needs of disruptive technologies and accelerate their market entry, providing a solid foundation for the creation and growth of new companies.

- After the temporary peak experienced by the healthcare sector during the COVID pandemic, **Spanish biomedical spin-offs have faced increasing difficulties in securing investment rounds prior to exit in recent years.** In other words, emerging companies in the sector are finding it harder to obtain the resources needed to reach the maturity level that would eventually enable early investors to exit. This situation seems to go beyond a mere corrective effect following the 2020 peak. Contributing factors likely include macroeconomic uncertainty post-pandemic, the inflation crisis, and recent conflicts, which have reduced investors' risk tolerance and possibly diverted their attention to sectors with quicker returns.

- **Limited funding capacity per project and overall for life sciences projects:** Despite growing support, the funding capacity per project remains limited, with contributions generally below that of European and American counterparts. This poses a challenge for high-tech projects requiring significant resources to take impactful products from the lab to the market. On the other hand, the number of projects grows steadily over the years, largely thanks to the encouragement and support for technology transfer from research institutions. This growth has outpaced the availability of funds. In fact, global funding capacity has also actually shrunk over the last couple of years increasing the competition among a growing number of start-ups for available funding.

This ecosystem, though still facing challenges in terms of the investment scale required for biomedical projects, is progressing toward a more structured and specialised model, promoting the development of innovative technologies in health and life sciences in Spain.

7.2 Spin-off incorporation

- A total of 199 **health-related spin-offs originating from public research were identified in Spain between 2001 and 2020.**

- **Biotech companies were the predominant category of spin-offs** across the full time period studied (57%), followed by MedTech (32%) and Digital Health (11%).

- The data showed two distinct phases between 2001-2012 and 2013-2023 in terms of spin-off incorporations. Interestingly, within each decade there was no obvious growth trend. Instead, from 2013 there were simply more spin-offs incorporated per year consistently than during 2001-2012, with an average of 2.5 spin-offs incorporated per year in 2001-2012 compared with 12 per year in 2013-2023.

- **MedTech showed significant growth between the 1st and 2nd decade.** Digital Health did not show significant growth despite the current market trends in this sub-sector. This suggests that Digital Health is largely being driven by startups outside the academic sphere.

- **2020 was a record year with 22 spin-offs incorporated.** Although it looks like this is not indicative of a sustained upwards trend, it may be otherwise explained by the circumstances of the COVID-19 pandemic- in which awareness and investment in biotechnology and healthcare generally increased.

- Regarding the origin of these spin-offs, according to the data analysed, **44% of spin-offs originate from universities, 27% from research centres and the remaining 29% from hospitals.** The predominance of university-originated spin-offs is to be expected, given the long-standing tradition of supporting knowledge transfer as a core mission of the university sector. University Technology Transfer Offices (TTOs) began to be promoted in the late 1980s, and this model later expanded to other non-academic institutions engaged in scientific research. Support structures for innovation and technology transfer within hospitals began to take shape around 2010, linked to Health Research Institutes accredited by the Instituto de Salud Carlos III[14] through ITEMAS, a platform of the Carlos III Health Institute that supports RDI in Biomedicine and Health, which provided the resources needed for their establishment. With a few exceptions, it was from this point onward that technology transfer activities more closely tied to spin-off creation started to emerge. This initial support helped embed dedicated transfer units within hospitals, which now operate as part of the broader infrastructure supporting researchers. Despite being more recent, spin-offs originating in hospitals already represent 29% of the total, and 2 of the leading institutions in terms of spin-off creation are hospital-based: the Vall d'Hebron Research Institute and IDIBAPS, both located in Barcelona.

- According to the analysis performed, there were 58 institutions that contributed towards the creation of a spin-off. **The majority of the spin-offs (76%) were created by one single institution**. But still, 1 in 5 spin-offs were formed by multi-institutional partners, indicating strong cooperation between institutions.

Of the spin-offs analysed, 44% come from universities, 29% from the hospital environment and 27% from research centres".

7.3 Geographical analysis

- **The strongest region in terms of spin-offs and exits was Catalonia with Catalan institutes involved in over half of all healthcare related spin-offs** (55%) and exits (61%) in Spain from 2001-2023. In fact, Catalan institutes were involved in 5 times the number of spin-offs of the second ranked region (Madrid) and 4 times the next highest region in terms of exits (Madrid and Valencia).

- **Emerging regions of spin-off activity include Madrid, Valencia, Galicia and Andalusia** which have seen increasing activity in recent years in terms of spin-off incorporation and exits. The Balearic Islands should also be noted as despite completing one exit in the time period studied, it was particularly significant in size (Sanifit, 2021, spun-off from the Universitat de les Illes Balears in 2003).

14 https://www.isciii.es/institutos-investigacion-sanitaria-presentacion

The predominance of Catalonia in the statistics is perhaps unsurprising given its long industrial tradition and track record of tech transfer support programmes, through TTOs, business incubators in addition to targeted and sustained support from government. For example, ICREA, the Catalan Institute for Research and Advanced Studies supported the founders of almost 1 in 10 of all spin-offs in this analysis. This early-stage support has a significant effect on the ecosystem by encouraging innovation and supporting the co-location and interaction of scientists, industry, entrepreneurs and investors to create tech and digital hubs, which further attract top international companies and startups. With its strong cluster[15] policy, high-quality scientific facilities, and a pool of skilled talent, Catalonia has become a magnet for R&D and tech innovations.

7.4 Exit analysis

- We counted a total of **26 health-related spin-off exits in Spain between 2001 and 2023**. The majority of spin-off exits were from companies originating from 1 institution (81%) compared with >1 institution (19%).

- The **average time between spinoff creation and its exit was 9.3 years,** with no significant variation between BioTech and MedTech companies (although it should be noted that MedTech only accounted for 11% of spin-off exits whilst Digital Health represented 8%). This long-term perspective explains why companies founded between 2001 and 2023 still have potential for exit, as only 13% have achieved it during this period.

Twenty-six exit transactions were identified, where the average time between incorporation and transaction was 9.3 years.

- It's important to recognize that the success of a spin-off cannot be measured solely by its exit, as in some fields, they may grow into fully structured companies or corporations.

- No exits were reported between 2001 and 2010 but from 2011-2023, there were on average 2 spin-offs per year with minimal variation within this time period and the best performing year having 4 exits (2022). Given the trend in spin-off incorporations between the 1st and 2nd decades studied (around 6x higher on average in 2013-2023 compared 2001-2012) and the average length of time to exit (9.3 years), **it is expected that a greater number of exits will be seen in the coming years as the spin-offs from 2013 onwards mature towards exit.**

15 A 'cluster' is understood as a group of companies, governmental entities and other agents (such as universities, research centres, etc.) that are geographically close and interact with each other to promote innovation, development and competitiveness in a specific area or sector.

- The average length of time between incorporation and exit of the spin-offs analysed here may cover changes in government (at local and national level) that may change the environment in which they operate e.g. by implementing new policies and regulations. Although not the focus of this report, it is important to note that these shifts can delay the progress of a spin-off, as companies may need to adapt to new regulatory environments and policy changes. However, these changes can also be beneficial and facilitate R&D&I.

As previously mentioned, the lack of investment data restricted the depth of this analysis. Future analysis would benefit from more comprehensive financing information to better understand the drivers and barriers in the funding ecosystem by for example assessing the impact of funding source, timing and size (e.g. public vs private funding) on spin-off trajectory. Based on the data analysed, despite overall improvements in the technology transfer and entrepreneurship ecosystem, access to funding remains insufficient for the growing number of spin-offs being created in the health sector. National and regional policies with consistent and robust strategies can shape the sector's development and, in turn, help attract private investment.

8 Annexes

8.1 Report Methodology

The initial data for this study have been prepared from the information provided by the Technology Transfer Offices (TTOs), by press publications, Capital Cell, the Centre for Industrial Technological Development (CDTI), the State Research Agency (AEI) and the National Innovation Company (ENISA). Additional online resources used are also detailed in the table 'Additional Web Sources'.

The criteria followed for the TTO dataset selection were mainly the sector (healthcare related) and the incorporation year among others. In brief, the data were filtered using the following criteria:

- **Origin**: Spain
- **Incorporation**: 2001-2023
- **Institution type and name**: University, Research Centre, Hospital
- **Region**: Autonomous communities of Spain
- **Type of investment and investor name**: Public, private
- **Stage of funding**: Pre-seed, Series A, Series B, Series C
- **Milestone**: Exit

A visual overview of methodology is shown below in Figure 21:

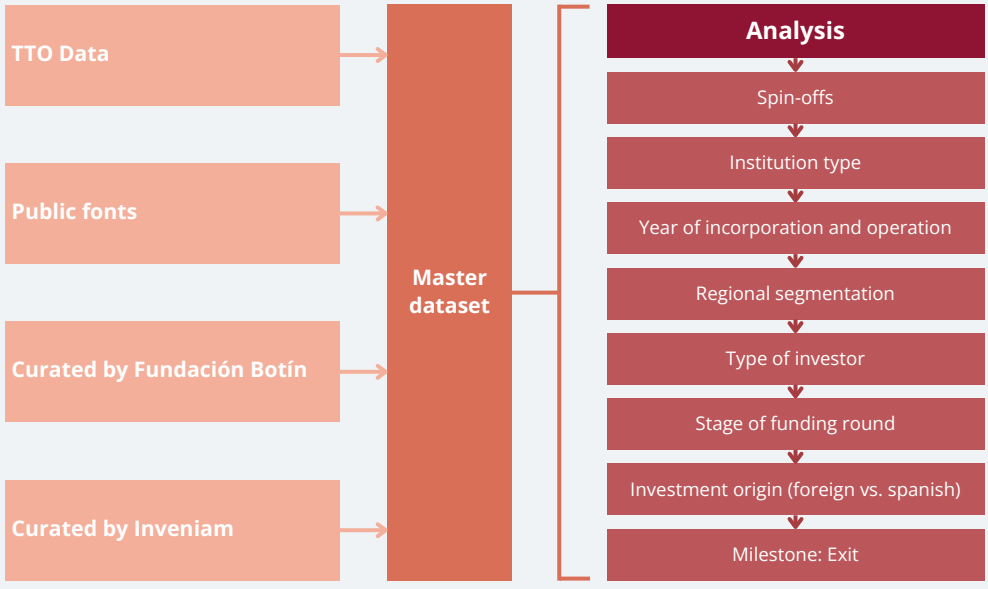


Figure 21. *Visualisation of the report methodology.*

8.2 Additional Web Sources

A
abf.co.uk
accure.health
agc.com
agomab.com
airtools-vitrolife.prod-mid-euw3.investis.com
alantra.com
alimarket.es
apheon.com
apricityfertility.com
arcline.com
ardena.com
asebio.com
assets-dam.takeda.com
atryshealth.com
B
bayer.com
bettercare.es
biotech-spain.com
bmegrowth.es
boe.es
bolsasymercados.es
business.teladochealth.com
C
Capitalriesgo.com
cicbiogune.es
cincodias.com.elpais
cincodias.elpais.com
clarivate.com
clearwaterinternational.com
columbusvp.com
corporate.amplifon.com
corporate.qiagen.com
cuideo.com
D
dara-pharma.com
deltalab.es
dr-healthcare.com
driosec.com
E
elconfidencial.com
eleconomista.es
elpais.com
eqtgroup.com
esteve.com
expansion.com

F
fremman.com
futurelifegroup.com
G
gacetadental.com
grifols.com
H
halma.com
healthincode.com
hetero.com
hipra.com
I
imaisd.usc.es
informacion.es
ir.bruker.com
ir.thomsonreuters.com
ir-corporate.docmorris.com
italfarmaco.es
K
kaneka.co.jp
kriyatherapeutics.com
L
laboratoriosrubio.com
lifesci.s3.amazonaws.com
N
nasdaq.com
nobelbiocare.com
O
oryzon.com
P
palexmedical.com
personal-care.evonik.com
phibo.com
plantadoce.com
probisearch.com
R
reigjofre.com
S
s28.q4cdn.com
sanifit.com
scgp.listedcompany.com
scgpackaging.com
schuelke.com
T
therivabio.com
tradebe.com

U
unilabs.com
V
venterpharma.com
verisimlife.com
veristat.com
versantventures.com
vhir.vallhebron.com
vidara.com
viralgenvc.com
vytrus.com
W
webcapitalriesgo.com
Y
ysioscapital.com
Z
zendal.com

8.3 Spin-off institutional names and data contributors

Between March and April 2024, a survey on spin-off creation was conducted with the TTOs of the public institutions listed below (marked with a single * next to the institution's name). We would like to thank all the TTOs that were contacted and responded to the survey (marked with double **), whose data provided the foundation for this analysis. To ensure the broadest possible coverage, data for the remaining public institutions (those without an asterisk) was supplemented using publicly available information, as detailed the additional sources listed in the Annex 8.1.

Acronym	Full name
BIOEF *	Berrikuntza Ikerketa Osasuna Euskal Fundazioa
BSC **	Barcelona Supercomputing Center
CABIMER	Centro Andaluz De Biología Molecular Y Medicina Regenerativa
CAR	Centro de Automática y Robótica
CIBER **	Centro de Investigación Biomédica en Red
CIC bioGUNE **	Centro de Investigación Cooperativa en Biociencias
CIC BiomaGune **	Centro de Investigación Cooperativa en Biomateriales
CIEMAT *	Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas
CBM *	Centro de Biología Molecular
CNIC *	Centro Nacional de Investigaciones Cardiovasculares
CNIO *	Centro Nacional de Investigaciones Oncológicas
CRG **	Centre de Regulació Genòmica
CSIC *	Consejo Superior de Investigaciones Científicas: Centros propios del CSIC[16]: • Instituto de Óptica • Centro Nacional de Biotecnología (CNB) • Centro de Investigaciones Biológicas Margarita Salas • Centro Nacional de Microelectrónica • Instituto de Agrobiotecnología • Instituto de Investigaciones Quimicas • Instituto de Microelectrónica de Barcelona • Instituto de Productos Lácteos de Asturias

16 I.e. excluding mixed centres - co-administered by the CSIC with other entities.

Acronym	Full name
FIBHGM **	Fundación de Investigación Biomédica del Hospital Gregorio Marañón
FINBA-ISPA	Fundación para la investigación y la innovación biosanitaria del principado de Asturias
I3PT **	Insitut d'Investigació i Innovació Parc Taulí
IACS *	Instituto Aragonés de Ciencias de la Salud
IBEC	Institut de Bioenginyeria de Catalunya
IBGM	Instituto de Biomedicina y Genética Molecular
IBV	Instituto de Biomecánica de Valencia
ICC	Insitut Català de Ciències Cardiovasculars
ICFO **	Institut de Ciències Fotòniques
ICN2 **	Institut Català de Nanociència i Nanotecnologia
ICO	Insitut Català d'Oncologia
ICREA **	Institució Catalana de Recerca i Estudis Avançats
IDIAPJGol *	Institut Universitari per a la recerca a l'Atenció Primària de Salut Jordi Gol i Gurina
IDIBAPS	Institut d'Investigacions Biomèdiques August Pi i Sunyer
IDIBELL **	Institut d'Investigació Biomèdica de Bellvitge
IDIBGI *	Institut d'Investigació Biomèdica de Girona Dr. Josep Trueta
IDIPAZ **	Instituto de Investigación Sanitaria del Hospital Universitario La Paz
IDIS *	Instituto de Investigación Sanitaria de Santiago
IdiSSC *	Instituto de Investigación Sanitaria del Hospital Clínico San Carlos
IDIVAL *	Instituto de Investigación Sanitaria Marqués de Valdecilla
IGTP *	Institut de Recerca Germans Trias i Pujol
IIS Biogipuzkoa	Instituto de Investigación en Salud de Guipuzcua / Biogipuzkoa Osasun Ikerketako Institutura
IISGS *	Instituto de Investigación Sanitaria Galicia Sur
IISLAFE/HUPLAFE **	Institut d'Investigació Sanitària La Fe de Valencia
IISPdH *	Instituto de Investigación Sanitaria Puerta de Hierro
IISPV	Institut d'Investigació Sanitària Pere Virgili
IMIM *	Institut Hospital del Mar d'Investigacions Mèdiques

Acronym	Full name
IMPPC	Instituto de Medicina Predictiva y Personalizada del Cáncer
INIA *	Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria
IQS **	Institut Químic de Sarrià
IR Sant Pau	Institut de Recerca de l'Hospital de la Santa Creu i Sant Pau
IRB Barcelona **	Institut de Recerca Biomèdica de Barcelona
SAS/FPS **	Servicio Andaluz de Salud / Fundación Progreso y Salud
SJD	Hospital Sant Joan de Déu
U. de Vigo *	Universidade de Vigo
UA *	Universitat d'Alacant
UAB **	Universitat Autònoma de Barcelona
UAL *	Universidad de Almería
UAM **	Universidad Autónoma de Madrid
UB/FBG **	Universitat de Barcelona / Fundació Bosch i Gimpera
UBU **	Universidad de Burgos
UC *	Universidad de Cantabria
UC3M *	Universidad Carlos III de Madrid
UCLM *	Universidad de Castilla la Mancha
UCM **	Universidad Complutense de Madrid
UCO	Universidad de Córdoba
UDC **	Universidade da Coruña
UdG **	Universitat de Girona
UDL *	Universitat de Lleida
UdPV/EHU *	Universidad del País Vasco / Euskal Herriko Unibertsitatea
UGR **	Universidad de Granada
UHU *	Universidad de Huelva
UIB *	Universitat de les Illes Balears
UJA *	Universidad de Jaén
ULL *	Universidad de La Laguna
UM *	Universidad de Murcia
UMA *	Universidad de Málaga

Acronym	Full name
UMH **	Universidad Miguel Hernández de Elche
UNED *	Universidad Nacional de Educación a Distancia
UNEX *	Universidad de Extremadura
UNIRIOJA *	Universidad de La Rioja
UNIZAR **	Universidad de Zaragoza
UO **	Universidad de Oviedo
UPC **	Universitat Politècnica de Catalunya
UPCT *	Universidad Politécnica de Cartagena
UPF **	Universitat Pompeu Fabra
UPM *	Universidad Politécnica de Madrid
UPNA *	Universidad Pública de Navarra
UPV *	Universitat Politècnica de València
URV **	Universitat Rovira i Virgili
US **	Universidad de Sevilla
USAL **	Universidad de Salamanca
USC **	Universidade de Santiago de Compostela
UV **	Universitat de València
UVIC *	Universitat de Vic
VHIO **	Vall d'Hebron Institut d'Oncologia
VHIR **	Vall d'Hebron Institut de Recerca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