

The year "2024" is displayed in a large, bold, black sans-serif font, centered horizontally. The numbers are partially overlaid by various images and graphics, including a map of Europe, a sunflower, and a laboratory setting.

Towards a more
competitive Europe

2024

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competitive Europe

Published by the Spanish Bioindustry Association (AseBio)

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Rocío Arroyo, AseBio Chairwoman

Biotechnology, a driving force for a more competitive, self-sufficient Europe.

Over the past decade, **biotechnology** has moved from an emerging technology to a consolidated strategic global asset, with a market of over a billion dollars that shows solid, steady growth¹. Its ability to transform sectors like health, agriculture, energy and the environment makes it a key tool for tackling structural challenges such as food security, the energy transition, industrial transformation and the fight against climate change.

Large global powers have recognised its **transformative capacity** and taken **strategic measures** to lead its development. The United States has put biotechnology at the core of its industrial strategy, mobilising more than \$2 billion through programmes like the National Biotechnology and Biomanufacturing Initiative. Furthermore, China invested over \$4 billion in bioindustry and biomanufacturing in 2024, through its 14th Five-Year Plan. These two countries are competing for global leadership, while Europe is starting to react with a somewhat more cohesive vision, although yet to fully coalesce, to mitigate the limitations of its structural fragmentation.

In response to this situation, the **European Union has begun** to put biotechnology at the centre of its industrial and technological agenda, recognising it as an essential tool for guaranteeing the EU's strategic autonomy. Both

the 2024-2029 Strategic Agenda and the Resilient EU2030 roadmap stand out for their capacity to promote health, the green transition and food security. This priority has been further bolstered with the STEP Regulation, which includes biotechnology among technologies critical to Europe's future, and the forthcoming EU Biotech Act, expected for 2026.

This commitment is in line with the vision in reports by Mario Draghi, Enrico Letta and Manuel Heitor that call for increased R&D investment, adapting financial markets to the liquidity needs of technology start-ups and more integrated governance to drive innovation. At the same time, initiatives like the Strategic Compass, the "Building the future with nature" communication, the Strategy for Life Sciences and the European Health Data Space (EHDS) are establishing a new institutional framework that will offer a **unique opportunity** for biotechnology to make a structural contribution to the main challenges of the European project.

In this context, **Spain is in a favourable position** to make biotechnology one of the vectors of its leadership in innovation and its industrial sovereignty. In 2023, Spanish biotechnology companies invested €865 million in R&D, 15% more than the previous year, and are the fourth-

¹ Cervicorn Consulting. Global Biotechnology Market Outlook 2025–2033. Market study, published in January 2025. Available at: <https://www.biospace.com/press-releases/biotechnology-market-size-to-worth-around-usd-3-54-trillion-by-2033>



largest industrial sector in terms of investment. The business sector's vibrancy can be seen in the 66 new companies created in 2024, the over 129 products launched to market and the 26% growth in funding operations, which totalled €181 million. The national ecosystem is also highly specialised, international and generates jobs for qualified employees.

This positioning of the ecosystem not only reflects **positive evolution** in terms of investment, knowledge generation and business activity, it also shows that Spain is prepared to contribute actively to European leadership in biotechnology.

To accelerate our growth, we have to reinforce the mechanisms that connect scientific talent and industry, consolidate financial instruments that suit our companies' needs and continue working on regulatory frameworks that keep pace with innovation. Spain has a solid business fabric, a benchmark research community and an ecosystem that has proven to be resilient, collaborative and results-orientated.

In this context, the work of organisations like AseBio is important, connecting the various stakeholders in the ecosystem and facilitating better understanding among

our academic, industry and governmental arenas. Its role over these years has been key in **aligning the biotechnology community** and getting their innovations to market faster. Because it isn't just competitiveness that is at stake, it is also Europe's (and Spain's) ability to respond effectively, sustainably and sovereignly to the great challenges of our time.

The convergence of the European strategy and our national capacities is a unique opportunity we have to make the most of. It is time for Europe to experiment and take new risks, as Heitor said a few days ago. The sector is ready.

Ion Arocena, AseBio CEO

Putting biotechnology on the public agenda in Europe and Spain.

A new term of the European Union government began in 2024, with political leanings that will guide the European Commission's actions over the next five years. These approaches saw **biotechnology as an opportunity to modernise whole sectors of the economy** and made boosting competitiveness the main goal for this term. Guidelines that address the main goal of the Draghi Report: to maintain and expand the European Union's capacity to develop R&D through a radical change in the old continent's economic policy.

With this course change in Europe, AseBio has promoted its work alongside CDTI in order to **transfer European priorities to Spain** and reinforce its role as a key stakeholder for promoting the biotechnology sector. In this context, we are celebrating reactivation of the Fund of Funds line under the INNVIERTE programme, and believe it is positive that the CDTI Strategic Plan 2024-2027 integrates AseBio's philosophy and includes several of our proposals.

In line with our work with CDTI, the Ministry of Science, Innovation and Universities announced the **launch of the Deep Tech Strategy**, which features the proposal led by AseBio to create a High Commissioner for Strategic Deep Technologies. This strategy will be rolled out through instruments to **drive deep tech in Spain** and tackle the

challenges of technology transfer in this arena.

2024 was a year of **intense legislative and strategic activity, both in Spain and Europe**. In this context, AseBio has worked very hard to ensure the Spanish biotechnology sector's voice is heard and taken into account. We would like to highlight our participation, in conjunction with Europabio, in communication regarding biotechnology and biomanufacturing; our analysis of the Commission's proposal on plants obtained by NGTs, as well as the European Parliament's position and the Commission's work in this area, and ongoing dialogue with Spanish authorities on this topic. And, of course, the Reform of the EU pharmaceutical legislation, where we highlighted the need for a stable, favourable framework of incentives that drives the capacity of European biotechnology companies to attract the investment they need to develop their innovations.

On a national level, we've taken part in **many consultation processes on legislative initiatives that will establish the playing field for the sector over the coming years**.

These include the Royal Decrees on Health Technology Assessment and on Pricing and Reimbursement of Medicines, as well as the Royal Decree on the transfer sexennium. Also noteworthy is our participation in the



Spanish Pharmaceutical Industry Strategy and in the Joint Committee of Ministers and Industry coordinating its governance.

AseBio's participation in setting the Spanish public agenda

would never have been possible without the collective intelligence of our members through the workgroups. In order to address the sector's evolution and concerns, in 2024 we set up workgroups on Food Innovation, which works to promote the impact of biotechnology companies in the Spanish agrifood sector; and on Internationalisation, to strengthen the global presence of our companies and innovations.

The workgroups and members' needs played a particularly important role in promoting some of AseBio's strategic initiatives in 2024. We would like to highlight three particularly significant ones: launching the ICEX soft-landing programme "Desafia Boston", thanks to work by AseBio; our work to promote professional development as a key focal point to strengthen the biotech ecosystem by drafting the first study of professional profiles in the sector; and finally, our analysis of the challenges and opportunities for our country of the expansion of artificial intelligence in the healthcare data spaces, in a joint symposium with the Secretary of State for Health.

Furthermore, AseBio has continued acting as a **meeting point and catalyst for a stable collaboration environment**, hosting events like the Green Innovation Forum, AseBio Investor Day and BioLatam Digital, which aim to promote connections among our companies and investors, collaborators and markets of interest.

And all of this has coincided with the **25th anniversary of AseBio**. A quarter of a century that has seen us consolidate our role as a key stakeholder for transforming the biotechnology sector, thanks to the support of our 321 members, their knowledge, our joint ability to come up with proposals, and our work to invigorate the sector. We hope to have your support for many years to come so we can keep doing our very best.



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Introduction

The AseBio Report, considered the benchmark publication in the biotechnology sector since 2000, is published annually by the Spanish Bioindustry Association. Its mission is to analyse every area that makes up the situation in which biotechnology is being developed in our country today, and how it is evolving.

This edition is framed within Europe’s decision to prioritise boosting its competitiveness, identifying biotechnology as a strategic sector. In order to drive and facilitate this competitiveness, work is under way to review and update regulations, and to draft new strategies that will have a significant impact on the biotechnology sector.

So, this edition of the AseBio Report includes an analysis of how biotechnology is positioned in Europe and the most important news in regulatory affairs this year, to facilitate analysis of this changing environment and its impact on the sector’s evolution. Plus, it will analyse indicators on R&D investment, funding secured, economic impact, companies in the sector, talent, female representation in the sector, the sector’s perception of its work environment, advances in biotechnology developments, how the sector collaborates, scientific and technological production, products and services launched to market, and how our companies are internationalising.

Content

The 2024 AseBio Report has 11 sections. Each of its chapters takes a closer look at the most important issues affecting the Spanish biotechnology sector:

- Introduction and executive summary: introduce the Report, its scope and main goals, plus a brief summary of its overall content.
- R&D investment (chapter 1): covers R&D investment in the sector, how it has evolved and a comparison to other sectors.
- Funding (chapter 2): describes the main financial operations, venture capital activity in 2024 and how it has evolved, and the public administration’s support for the sector.
- Talent and diversity (chapter 3): shows the number of students enrolled in biotechnology, researchers in the sector and female participation in the sector.
- Business fabric (chapter 4): analyses the number of companies that make up the sector and how it has evolved. It also provides information on what these companies are like and where they are located.
- Environment (chapter 5): analyses the national and European political and regulatory issues that affect the sector and how the biotechnology sector sees its environment.
- Results of the biotech sector (chapter 6): includes scientific publications, what the sector has patented, the main advances in biotechnology and products and services launched to market.
- Collaboration and internationalisation (chapter 7): we include the partnerships established in the sector in 2024 and international markets companies have moved into.
- Impact (chapter 8): analyses the biotechnology sector’s impact on the economy, employment and taxes.
- Who’s who: features information on members of the AseBio Board of Directors, work committees and members.
- Methodology: explains the methodology used to compile the 2024 AseBio Report.

Thanks

AseBio would like to thank all our collaborators for their support. Without their help, this report would not have been possible. And, especially:

- Amadix, MSD, Oryzon and Tebrio, our main collaborators, and 3PBiovia, Amgen, BTI, Certest Biotech, Konexio Biotech, Madrid Science Park, Promega Biotech, SMED clinical research, Vicomtech and VIVEbiotech.
- All our members who have contributed the information needed to draft the contents.
- The National Statistics Institute (INE) and the Economic Forecasting Centre (CEPREDE) for their help in compiling the statistics on the sector.
- The Department of Studies and Indicators at the Spanish Foundation for Science and Technology (FECYT) for the information contributed for the section on scientific production.
- The Madrid Science Park and ClarkeModet for their analysis of patents applied for and granted in 2024.
- All the organisations that helped identify companies established in 2024.
- The Centre for the Development of Industrial Technology (CDTI) and the National Innovation Company (ENISA) for their collaboration on the chapter on funding.

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Executive summary

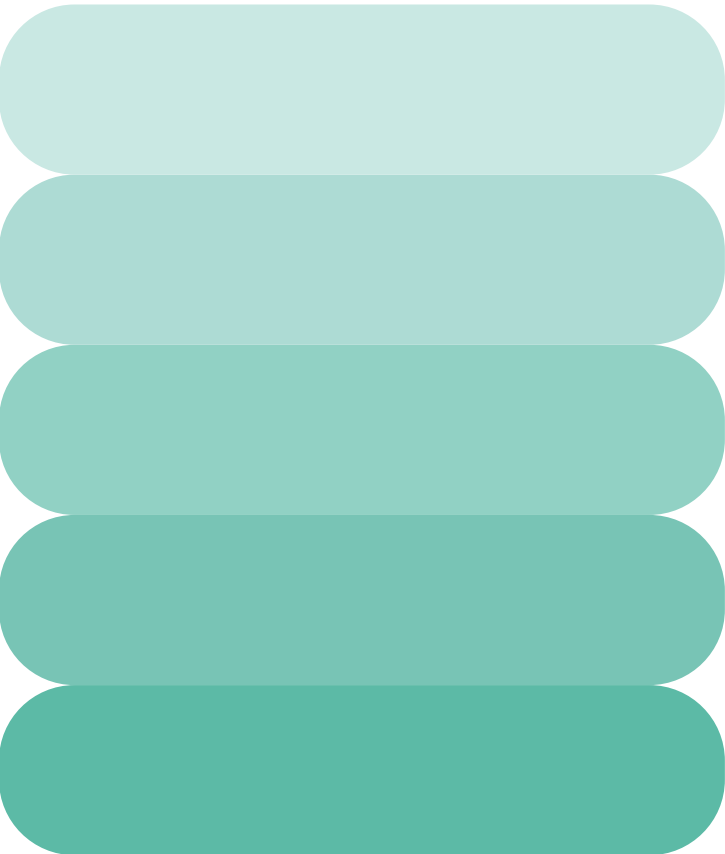
R&D investment

Biotechnology companies invested €1.282 billion in R&D in 2023.

Of this €1.282 billion, biotech firms invested 68% or €865 million, up 15%.

This €865 million came from the companies' own funds (68%) and 44% of it goes to pay research and technical staff.

The biotechnology sector is now ranked fourth in R&D investment intensity, only behind R&D services, education and transport materials.



Funding

The biotech sector raised €181 million in 2024.

After an exceptional year in terms of investment for the biotech sector in 2023, €181 million was raised in 2024 through 53 operations.

Plus, biotech firms raised over €6 million in crowdfunding and financial investments from the European Investment Bank and ENISA, making these key tools for funding biotech companies.

Three new investment funds specialising in the health sector were closed in 2024. Since 2012, the cumulative volume of funds for the biotechnology sector has been more than €1.5 billion.

Funding through public instruments run by the Centre for the Development of Industrial Technology (CDTI) rose considerably. The number of projects approved was 12% higher than in 2023, with a notable increase in total funds, over 48% more, and in public contribution, roughly 31%.



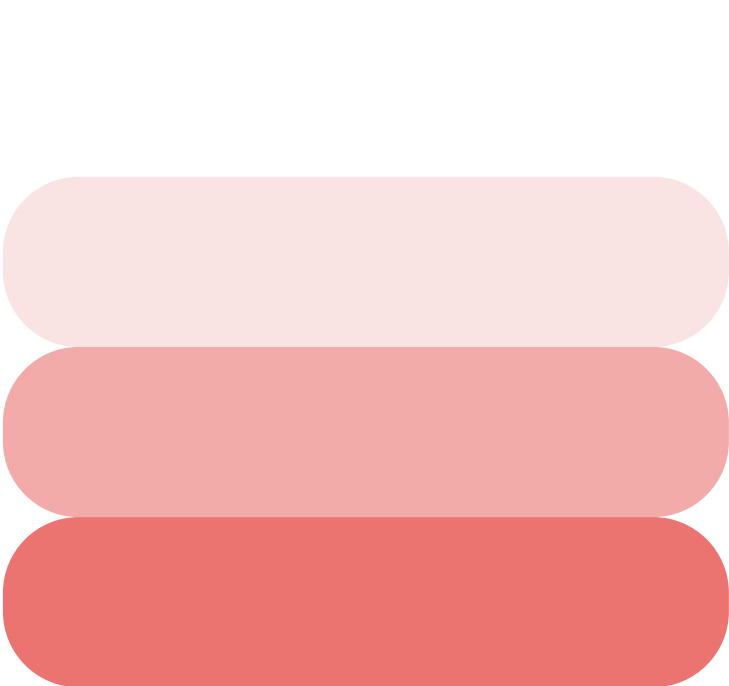
Talent and diversity

Biotech firms still have more researchers than any other sector and 55% of employees are women.

The number of students enrolled in university studies in biotechnology continues to grow and in 2023-2024, there were 9,798 students and 61.82% of them were women. Biotechnology remains among the degrees that require the highest marks on university entrance exams and is also offered in combination with other subjects.

The biotech sector still has the highest percentage of researchers to total employees, 15%, surpassed only by R&D services, and the average salary per employee is nearly double the national average.

Biotech companies were ranked third again in terms of women in R&D activities, where they make up 60% of all employees in these positions. On the ranking of female researchers as a percentage of total employees, biotech is second after R&D services. Plus, women make up 29% of executive teams at biotech companies, well above the average of 19.2 for IBEX-35 companies.



Business fabric

4,411 companies carried out biotechnology activities in 2023, of which 1,014 are biotech firms.

In 2023, the number of companies carrying out biotechnology activities dipped slightly and the number of biotech firms rose 4.1%. Of these, 52% are micro-SMEs and 43% are small and medium-sized companies.

Among biotech companies, 58% focus on human health, 27% on food applications, 16% on agriculture and forestry production, 16% on animal health and aquaculture, 15% on the environment and 10% on industrial biotechnology.

By autonomous communities, Catalonia leads in both number of biotech companies and turnover. In number of companies, behind Catalonia are Madrid, Andalusia, the Basque Country and the Valencian Community; and in turnover, Madrid with 35% of the total turnover with the rest of the autonomous communities trailing far behind.



Executive summary

Environment

Biotechnology is among the European Union’s top priorities and will get a new regulatory framework.

Recommendations from the European Commission have put biotechnology among key sectors and both Europe and Spain are kicking off new strategies and regulations that will have an impact on the biotechnology sector over the coming years.

The economic situation is a negative factor for sector development.

AseBio members believe employee training is one of the factors most driving the sector. On the other hand, as usual, the economic situation and regulatory framework were the lowest rated factors for sector development.



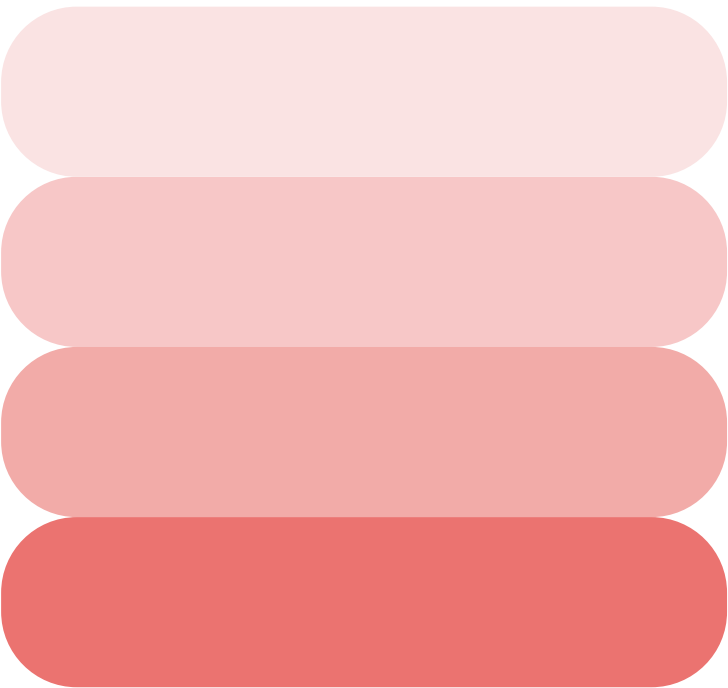
Results

Spanish scientific production and innovation are excellent. Plus, these innovations continue to be protected internationally.

In 2023, Spanish scientific production in biotechnology made up 2.49% of global production and was cited 20% more than the global average. Spain remains ranked ninth in the world in number of papers in biotechnology.

Technological innovation continues to be protected, above all internationally. Patents through PCT and the European Patent Office make up 82% of all patent applications.

In 2024, we identified 129 new products launched to market by AseBio member companies.



Collaboration and internationalisation

The sector has forged 335 partnerships, mainly with public entities.

Biotech firms forged 335 partnerships and 242 of them were with public entities and foundations, 114 with another biotech company and 75 with other types of companies.

R&D is the companies' main goal with these partnerships: 152 of the 335 partnerships were forged for this purpose. Regarding the partners' country of origin, Spain remains the main one with 254 of the 335 partnerships, followed by countries in the European Union (135) and the United States (30).

AseBio member companies increased internationalisation 5%, with 8 new subsidiaries. 44 AseBio members, one more than the previous year, have a direct presence in 62 countries on all continents, with the United States having the most direct presence of AseBio member biotech companies.



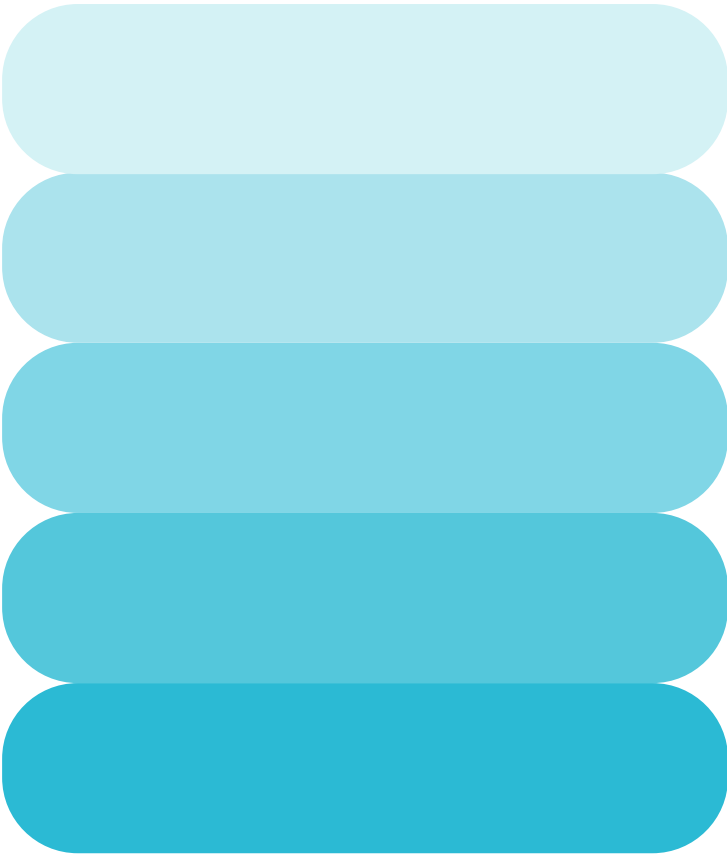
Impact

Biotech firms contribute 1.1% of the GDP and more than 131,000 jobs.

The joint activity of biotech companies generated over €13.094 billion in income, which is 1.1% of the Spanish GDP.

Total tax revenue was €5.229 billion, or 0.4% of the GDP, and these companies employed 131,214 people, which was 0.67% of all employment.

The turnover of biotech companies underwent a correction after the impact of selling COVID-19 vaccines in 2021 and 2022, dropping 24.7%. In 2023, joint turnover was €14.813 billion or 1% of the GDP.



01. R&D investment

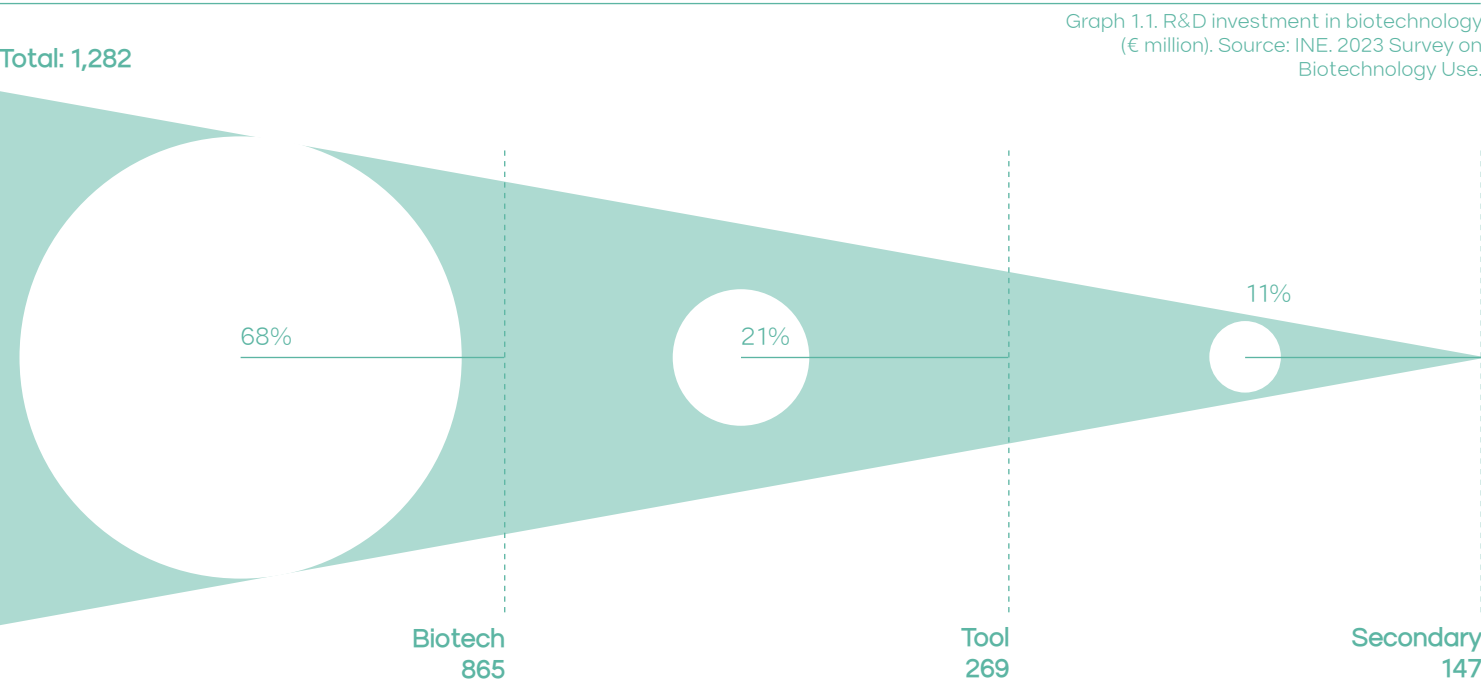
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R&D investment

Biotechnology companies invested €1.282 billion in R&D in 2023.

The biotechnology business sector, meaning companies with biotechnology as their main (biotech firms) or secondary activity, or that use it as a production tool, continued increasing their stake in total investment in R&D in 2023, with €1.282 billion (graph 1.1), 68% of which was invested by biotech firms.

R&D investment in biotechnology (€ million)



This R&D investment comes 68% from the biotech companies' own funds and 45% goes to pay research and technical staff.

Internal R&D expenditure remains similar at the different types of companies involved in biotechnology activities: biotech firms, companies that use biotechnology as a tool in their production processes or ones with biotechnology as a secondary activity. 92% of R&D investment goes to paying research and technical staff and to operating expenses, with the other 8% to investment expenses. This has remained practically the same as in previous years.

At biotech firms, 29% of R&D investment goes to paying researchers, 15% to technicians and assistants, and 47% to other operating expenses. This breakdown was practically identical to the previous year.

In terms of the origin of the funds, there have been some small changes. At companies that use biotechnology as a tool in their processes, 74% comes from their own funds, while this figure is 69% for companies with biotechnology as a secondary activity

and 68% for biotech firms. Companies with biotechnology as a secondary activity received 15% of funds from the public administration, while both biotech firms and companies using biotechnology as a tool in their production processes get 9%. Finally, at biotech firms, 12% of R&D investment is from the business sector; at companies that use it as a production tool, 8%; and companies with it as a secondary activity, 9%.

R&D investment in 2023 by nature of expenditure and source of funds (€ million)

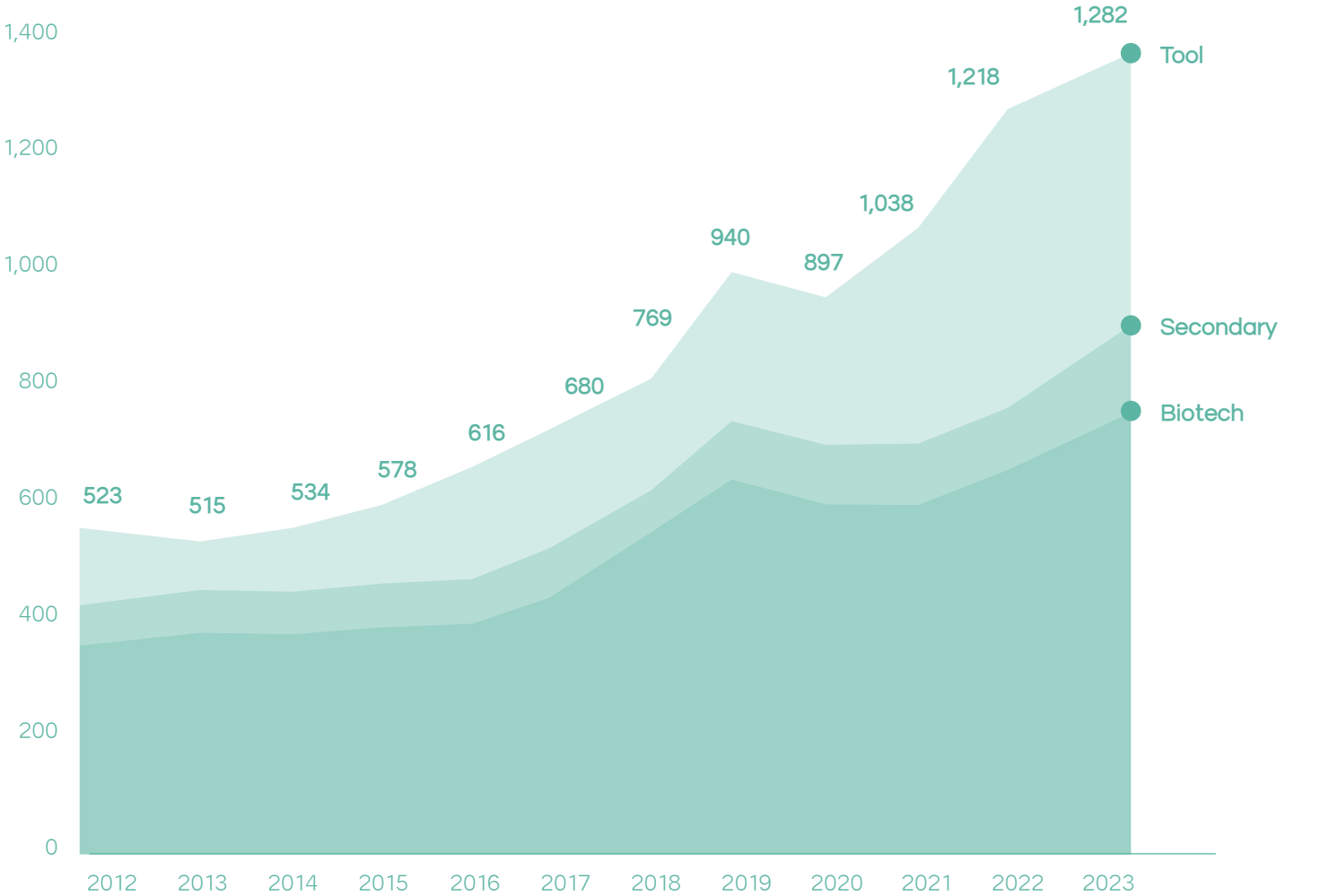
Table 1.1. R&D investment in 2023 by nature of expenditure and source of funds (€ millions).
Source: INE. 2023 Survey on Biotechnology Use.

	Biotech	Secondary	Tool	Total Biotechnology
Internal R&D expenditure in biotechnology	865.08	147.49	269.54	1,282.11
A) By nature of the expenditure				
Operating expenses	791.39	138.65	249.20	1,179.24
Paying researchers	252.88	43.49	75.27	371.64
Paying technicians and assistants	132.26	35.41	62.23	229.90
Other operating expenses	406.24	59.76	111.71	577.70
Capital expenditures	73.69	8.84	20.34	102.87
Land and buildings	7.32	0.21	3.34	10.88
Equipment and instruments	38.32	7.58	13.20	59.10
Acquisition of specific R&D software	4.68	0,22	0.73	5.62
Other intellectual property products specifically for R&D	23.37	0.82	3.07	27.26
B) By source of funds				
Internal funds	585.92	101.82	199.28	887.02
Funds from the business sector	107.36	13.97	22.12	143.44
Funds from the public administration	79.86	22.85	23.84	126.55
Funds from the higher education sector	0.08	0.00	0.02	0.09
Funds from private non-profit institutions	11.46	0.10	1.06	12.62
Funds from the rest of the world	80.40	8.75	23.22	112.38

Biotech firms invested 15% more in R&D.

In 2023, R&D investment for the biotech sector as a whole grew more moderately than the previous two years, 5% compared to 16% and 17%. However, biotech firms maintained the same level of growth as the previous year, investing 15% more in R&D. Except in 2020, the height of the pandemic, the growth rate for R&D investment by biotech firms has grown steadily since 2014.

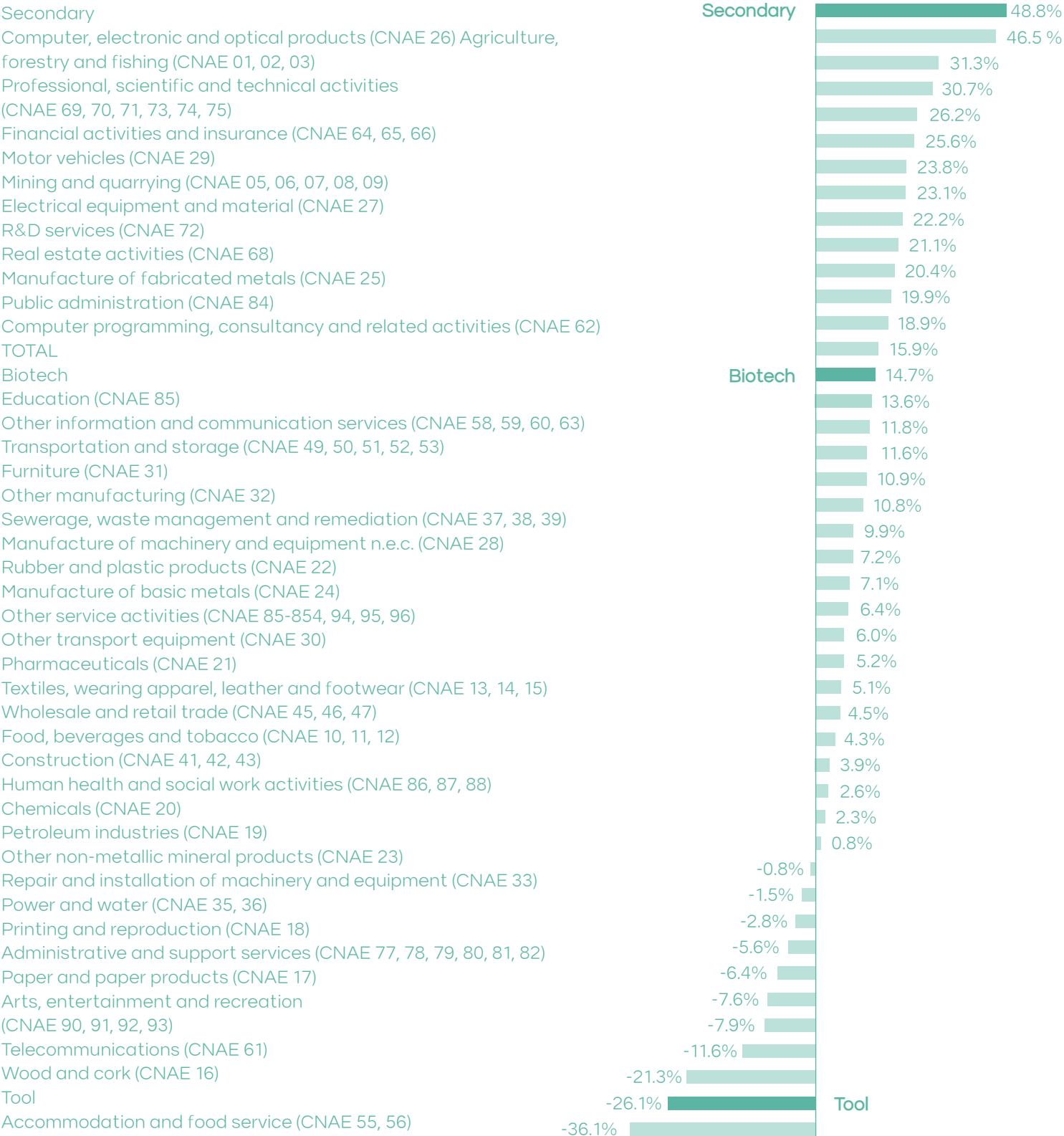
The total R&D investment increased by €64 million. Breaking this down by type of companies, businesses that use biotechnology as a tool invested €95 million less in R&D and companies with biotechnology as a secondary activity, €48 million more. For their part, R&D investment by biotech firms rose €111 million to over €865 million.



Graph 1.2.
Evolution of R&D expenditure (€ millions) 2012-2023. Source: INE. Survey on Biotechnology Use.

As graph 1.3 shows, R&D investment held steady for the Spanish economy as a whole in 2023, thanks to EU Next Generation funds. Compared to this generalised growth in R&D investment, biotechnology companies as a whole invested somewhat more moderately, although with big differences depending on their biotechnology activity.

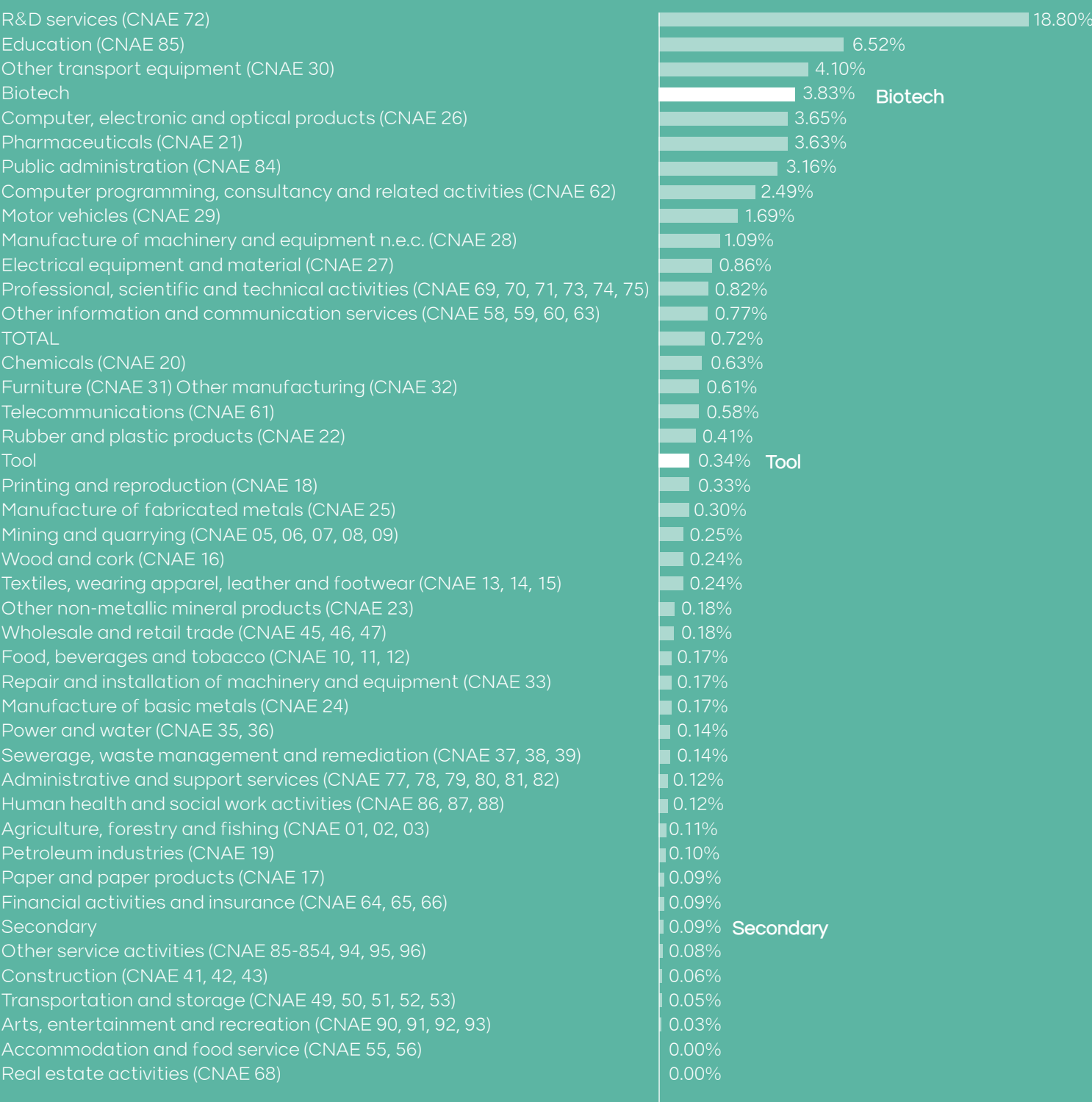
So, while biotech companies are quite similar to the average and moved up the ranking with 14.7% growth, companies that use it as a tool saw a larger decrease in investment (-26.1%) and those with biotechnology as a secondary activity led the ranking in terms of growth (48.8%).



Graph 1.3
Growth in R&D investment in 2023 (Year-on-year growth rate). Source: Compiled internally from 2023 Survey on Biotechnology Use and Statistics on R&D activities. INE.

Biotech firms moved up into fourth place on the ranking of industrial sectors that invest most in R&D.

Companies working exclusively in biotechnology ranked one place higher than the previous year among the top sectors for R&D investment compared to production, with 3.83%. New this year, these firms were only surpassed by R&D services, education and other transport materials and ranked ahead of the pharmaceutical sector (graph 1.4).



Graph 1.4. R&D Investment intensity in 2023 (Percentage of production). Source: Compiled internally from 2023 Survey on Biotechnology Use and Statistics on R&D activities. INE.



Branded Content

Carlos Buesa,
CEO, Oryzon Genomics



Grand future for biotechnology “made in Spain”: quality, internationalisation and institutional collaboration

Europe needs strategic autonomy in critical sectors. Developing new drugs is not only essential from a healthcare perspective, but is also a strategic pillar to bolster Europe’s technological autonomy. Can Spain consolidate its own industrial champions in key sectors like biotechnology? We firmly believe it can, and that Oryzon can become one of them, thanks to our cutting-edge innovation and international focus.

Oryzon is working on clinical stage epigenetic treatments that correct gene-expression disorders involved in many diseases, including certain types of cancer and neuropsychiatric disorders. Our research focuses on diseases with significant unmet medical needs: areas where innovation is urgently needed and patients can benefit from safe, effective, well-tolerated therapies.

We have two main molecules currently in active clinical development in Europe and the USA: vafidemstat and iadademstat, both of which are LSD1 inhibitors.

Vafidemstat is being tested for several indications in the psychiatric arena. The Phase 2b PORTICO study showed signs of clinical improvement in managing aggressiveness among patients with borderline personality disorder, as well as a favourable safety profile. With the backing of renowned psychiatrists in the USA, we’ve designed a Phase 3 protocol, which will soon be submitted to the FDA. If approved, we will be the first company to launch an advanced-phase study for this indication, which currently has no approved treatments and is a great business opportunity.

Plus, vafidemstat has also been tested to treat schizophrenia and has shown positive preliminary signs of controlling aggressiveness in patients with conditions such as attention deficit hyperactivity disorder, autism and Alzheimer. We want to continue exploring its potential for controlling aggressiveness in some of these indications, as it is a symptom with a huge social and clinical impact.

For its part, iadademstat is being developed for oncology. In the FRIDA trial, it is being administered with gilteritinib to patients with relapsed/refractory FLT3+ acute myeloid leukaemia (AML). It is also being tested with azacitidine for high-risk myelodysplastic syndrome, and through our CRADA agreement with the US National Cancer Institute (NCI) in combination with venetoclax and azacitidine as a first line of treatment for AML patients.

Results show promising results for both AML indications and we hope to announce preliminary results by the end of the year, at the ASH conference.

Plus, research is being done on iadademstat for small-cell lung cancer, an extremely aggressive cancer, in combination with immunotherapy, in a trial at US centres of excellence such as Memorial Sloan Kettering, Dana-Farber, MD Anderson, Yale University and Johns Hopkins University, among others. Iadademstat’s potential to treat these indications is huge, according to preliminary preclinical data produced by US-based scientists.

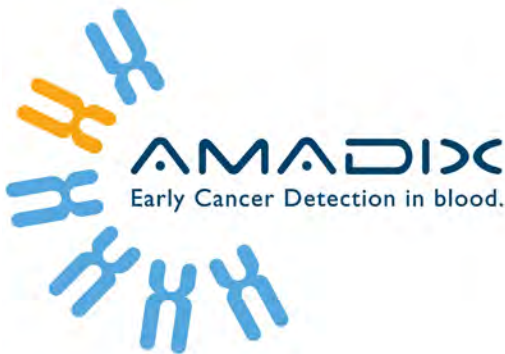
This strategy combines cutting-edge science, top-notch institutional partnerships and a solid international presence. In addition to our collaborations with leading centres in Spain, we also work with centres in the USA, with five active clinical trials currently under way. It is worth noting that a significant part of our clinical team is based in Boston and California.

The fact that Oryzon is traded on the Spanish Continuous Market also boosts our visibility. We are one of the few Spanish biotechnology companies in the advanced clinical phase. We recently completed a €30-million capital increase, with 50% taken up by a specialised institutional investor in the USA. The ability to self-fund, grow in size and internationalise: these are key elements for Spanish biomedical innovation to compete and lead on a global level. At Oryzon we are doing just that with a firm commitment to patients, science of excellence and clinical collaborations.



Branded Content

Elena Sánchez-Viñes, Chief Operating Officer, AMADIX



Catching cancer early for a more resilient, sovereign Europe

In 2025, cancer is expected to affect 2.83 million people in Europe and cause the death of 1.34 million. According to the International Agency for Research on Cancer (IARC), this figure will continue to rise, with an estimated 22.5% growth in new diagnoses through 2045, with the most common being breast, prostate, lung and colon cancers.

These figures reflect an alarming trend that requires an ambitious coordinated response. This is why the European Union has made cancer one of its strategic priorities, structured through **Europe's Beating Cancer Plan and the EU Cancer Mission**. This is a key moment for Europe, when technological sovereignty, healthcare autonomy and the resilience of healthcare systems are essential focal points for EU politics, developing European technologies is crucial for reducing our dependence on third countries and ensuring a quick, effective response to structural challenges.

Within this framework, innovation will take on a decisive role. Emerging technologies like the liquid biopsy, use of advanced real-world data (RWD) and new analytical capabilities will allow us to detect diseases earlier, improve patients' prognosis and make treatments more effective.

Amadix aims to align with Europe's strategic goals in health and innovation, getting out ahead of cancer before the first symptoms even appear, using new diagnostic tools and a non-invasive approach. With a vision focused on prevention, personalisation and the use of advanced technologies, Amadix, among many other biotechnology companies, is helping strengthen European healthcare autonomy and consolidate our strategic competitiveness in a key sector like biomedicine, through initiatives such as:

- **Developing innovative diagnostic solutions** "made in Europe", in line with the IVDR, that strengthen Europe's healthcare autonomy by reducing our dependence on critical external technologies and contributing local competitive, strategic capacities for the European ecosystem.
- **Promoting the European biotechnology ecosystem** by developing key technological competences in molecular diagnostics, bioinformatics and artificial intelligence applied to personalised medicine, areas considered top priorities in the 2030 Digital Compass and Draghi report on European competitiveness.

- **Accessible diagnostic innovation** that is non-invasive and highly precise to improve clinical efficacy and bolster the sustainability and resilience of healthcare systems, helping make Europe more self-sufficient, with its own technological capacities and prepared to tackle structural challenges in public health.
- **Advancing in early detection of cancer** with non-invasive liquid biopsies that can catch the disease in the early stages, optimising clinical resources, improving decision-making and helping achieve the EU Cancer Mission goals, for earlier, more personalised care.

These lines of action reflect European biomedical innovation's potential to tackle these structural healthcare challenges. Committing to prevention and early diagnosis, with our own technological solutions, is not only a clinical priority but also a **strategic decision that reinforces technological sovereignty, reduces foreign dependence and makes healthcare systems more efficient**.

In an increasingly competitive global scene, **consolidating European leadership in health requires investing in unique capacities and scalable solutions that are accessible and aligned with EU priorities**.

Amadix represents the commitment of European biotechnology companies to a more autonomous, resilient and technologically sovereign Europe.

02. Funding

Introduction	Executive summary	05. Environment	06. Results
10-11	12-17	78-87	88-107
01. R&D investment	02. Funding	07. Collaboration and internationalisation	08. Impact
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03. Talent and diversity	04. Business fabric	Who's who	Methodology
50-63	64-77	132-151	152-158

Funding

- Private funding instruments
- Public funding instruments

Private funding instruments

The biotech sector raised €181 million in 2024.

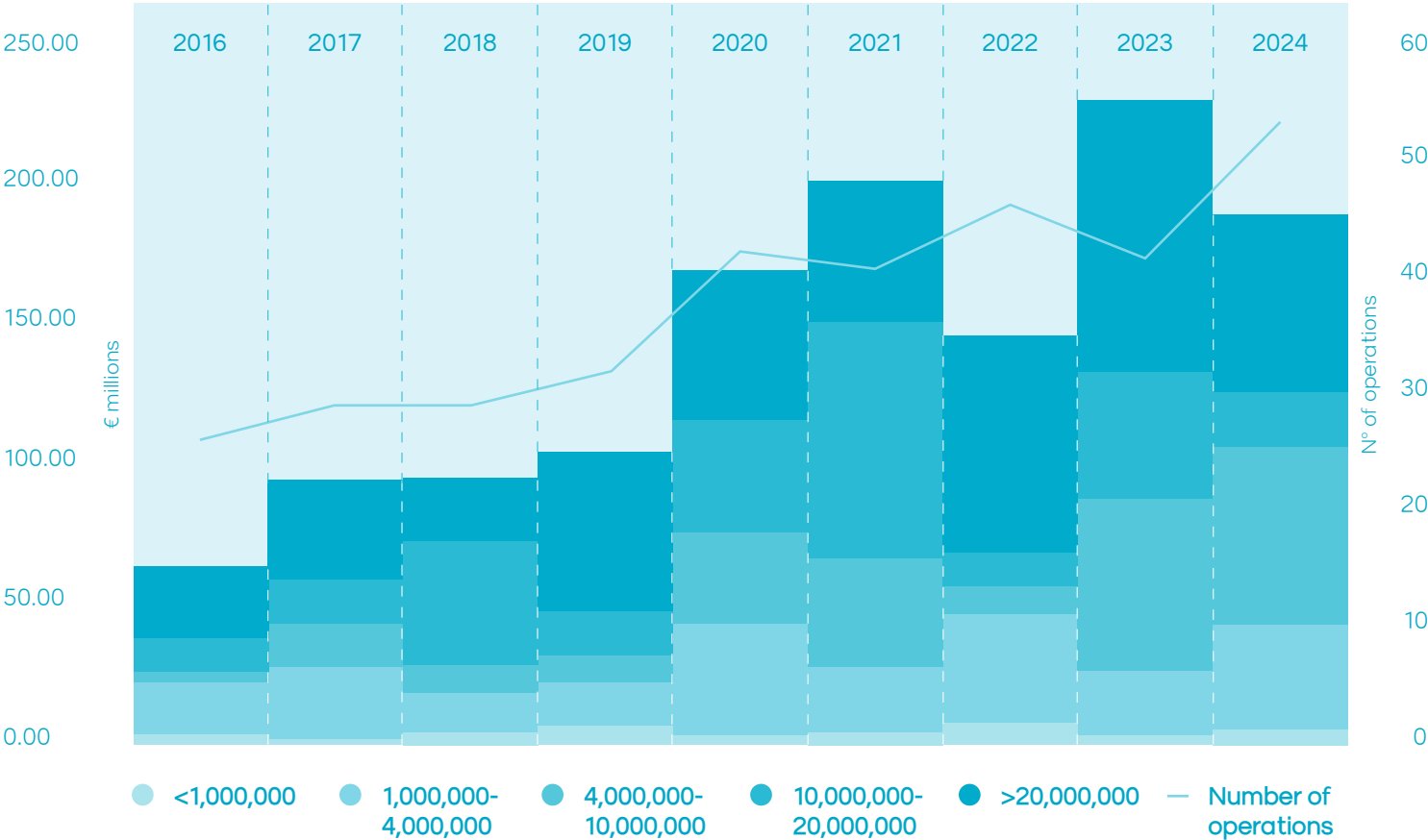
After an exceptional year in terms of investment for the biotech sector in 2023, €181 million was raised in 2024 through 53 operations.

These figures show a 21% drop in the total amount secured, from €228 million to €181 million, and a significant increase in number of operations, up 26%.

So, the average volume per operation dropped considerably, down 37% from €5.4 million in 2023 to €3.4 million in 2024. As graph 2.2 clearly shows, the largest operations have a decisive impact on the total volume for the year. So, in 2023 operations over €20 million contributed considerably to that year's total investment volume.

Evolution of private capital operations by operation size (2016-2024)

Graph 2.1 Evolution of private capital operations by operation size (2016-2024). Source: AseBio.



Below are some of the operations that raised the most investment.

Tebrio, a biotechnology firm focused on industrial production of *Tenebrio molitor*, closed the largest round of funding in 2024 at €30 million. Participants in the round included Banco de Santander, Sodical, GPC and CDTI. This investment will go towards boosting the company's production capacity and optimising its new 90,000 m² plant in Salamanca.

Sequentia Biotech raised €10 million in a capital increase led by Seventure Partners and the EIC Fund to promote bioinformatics solutions for clinical, industrial and research applications.

Advanthera Solutions, through a joint venture with Gradocell, secured €9 million in a capital increase featuring Columbus Venture.

Integra Therapeutics raised €8 million through the EIC Accelerator programme.

Syngoi, a CDMO company that specialises in synthetic DNA for advanced therapies, secured €8 million in a Series B capital increase led by Columbus Venture that also included Japanese company Asahi Kasei Medical, Athena Investments, Danish investors and Spanish investors Zeus Investments and Buenavista Equity Partners. Both **Palobiofarma**, a company that is working on drug discovery

in adenosine receptor modulators, and **Ability Pharma**, a biopharmaceutical firm focused on autophagy to treat cancer, raised €7 million each in capital increases. The Palobiofarma round featured Inveready, Sodena and Darpaufarma, and for Ability, the operation was led by Canadian CTI Life Sciences Fund, Inveready and the EIC Fund, also including CDTI Innvierte and FITalent.

Continuing with the new stakeholders we've seen in past years, the **Asociación Española Contra el Cáncer (AECC)**, through its AECC IMPACTO programme, funded three participation loan operations for **Batea Oncology Nanobot Therapeutics** and The Blue Box.

In 2024, the CDTI co-investment vehicle INNVIERTE, which accompanies professional private investors investing jointly in rounds of funding, invested €12.84 million in Oncomatryx, Alloxx, Oncostellae and Gyala Therapeutics. Since the beginning of 2019, the INNVIERTE co-investment instrument has taken a stake in 38 biotech companies, investing a total of €113 million.

Organisation	Participating investors	Instrument	Total investment volume pledged (€)
Tebrio	CDTI Innvierte / GPC / Banco de Santander / Sodical	Capital increase	30,000,000
Oncomatrix	CDTI Innvierte	Capital increase	10,000,000
Sequentia Biotech	EIC Fund / Seventure Partners	Capital increase	10,000,000
Advanthera Solutions	Columbus Venture Partners	Capital increase	9,700,000
Laminar Pharma	Private investors	Capital increase	8,936,655
Integra Therapeutics	EIC Fund	Capital increase	8,000,000
Syngoi	Columbus Venture Partners / Asahi Kasei Medical / Athena Investments / Zeus Investments / Buenavista Equity Partners	Capital increase	8,000,000
Palobiofarma	Inveready / Sodena / Darpaufarma	Capital increase	7,090,857
Ability Pharma	CTI Life Sciences Fund / Inveready / EIC Fund / CDTI Innvierte / FiTalent / Family offices IVAMOSA and GESAMO	Capital increase	7,000,000
Cocoon Bioscience	Columbus Venture Partners / SANPI Inversiones/ Mercantil Biotori / Viscofan / Master Cocoon / SPRI / Oriarso S. Coop. / Mondragon Desarrollo	Capital increase	5,982,177
Amadix	Private investors	Capital increase	4,442,717
Laboratorios Rubió	CIMA Science / Products & Technology / Rubió Metabolomics / Nanoboost	Convertible participation loans	4,252,724
Gyala Therapeutics	CDTI Innvierte / Nara Capital / Invivo Capital	Convertible note	3,000,000
MOA Foodtech	ICOS Capital / Sodena / Clave / Viscofan	Capital increase	3,000,000
Disrupt Therapeutics	Inveready	Capital increase	3,000,000
MIMO Biosciences	Sanitas / Gutinver / Green Eyes	Capital increase	2,750,000
Telum Therapeutics	Invivo Capital / Clave / CDTI Innvierte	Capital increase	2,700,000
Allox	CDTI Innvierte / Asabys	Capital increase	2,600,000
Biohope	Vanquish Group	Capital increase	2,500,000
Fecundis	Zentynel rontier Investments / GridX / DuneGlass Capital	Capital increase	2,400,000
Rubió Metabolomics	Laboratorios Rubió	Convertible participation loan	2,200,000
Bioclonal	Bioknostic	Capital increase	2,000,000

Organisation	Participating investors	Instrument	Total investment volume pledged (€)
Mikrobiomik	Orza / Seed Capital Bizkaia / Finnova Desarrollos / Urtxondo Investments / Gardoqui e Hijos / San Ignacio / Family Offices	Capital increase	1,600,000
Viva In Vitro Diagnostics	Murcia Emprende / Family Offices / Forma Inversiones / Toport Mith Group / Inversiones el Medallón / Nadal & Trueba / Wilder Invest / Rocosta Capital	Capital increase	1,340,000
Nanobots	Business Angels	Capital increase	1,176,718
Flomics Biotech	Decelera Ventures / Family offices/ Business Angels / Instituto Oncológico Dr. Rosell - IOR	Capital increase	1,100,000
Vytrus Biotech	Zamit Capital / Boyser / Family office / ICF	Capital increase	1,100,000
Allinky Biopharma	Current partners	Capital increase	1,000,000
Pack2Hearth	JRV Holding GmbH / Mondelēz International / The Food Tech Lab / Private investors / Brigantia Capital Investment	Capital increase	1,000,000
Oncostellae	CDTI Innvierte / Noso Capital	Capital increase	1,000,000
Adntro	Noso Capital	Capital increase	1,000,000
Medlumics	Asabys Partners / CDTI Innvierte / Caixa Capital Risc	Capital increase	926,000
Ysium Medical	Sodena / Vidorreta Design Group	Capital increase	800,000
DAN*NA	BeAble Capital	Capital increase	800,000
CIMA Science	Laboratorios Rubió	Capital increase and convertible participation loan	688,086
Miramoon pharma	Family Offices	Capital increase	612,000
Vaxdyn	Mind the Gap / Business Angels	Capital increase	449,000
Products & Technology	Laboratorios Rubió	Convertible participation loan	400,000
Phoenix Foods	Business Angels / Acció	Capital increase	247,000
Genbioma	Clave / WA4S	Capital increase	353,000
Spinally Medical	Bstartup / GENESIS Venture	Capital increase	325,000
Keyzell Deep Tech	Private investors	Capital increase	200,000
Ecogranular	BeAble Capital	Capital increase	174,000
Nanobots Therapeutics	Fundación Científica AECC	Convertible participation loan	150,000

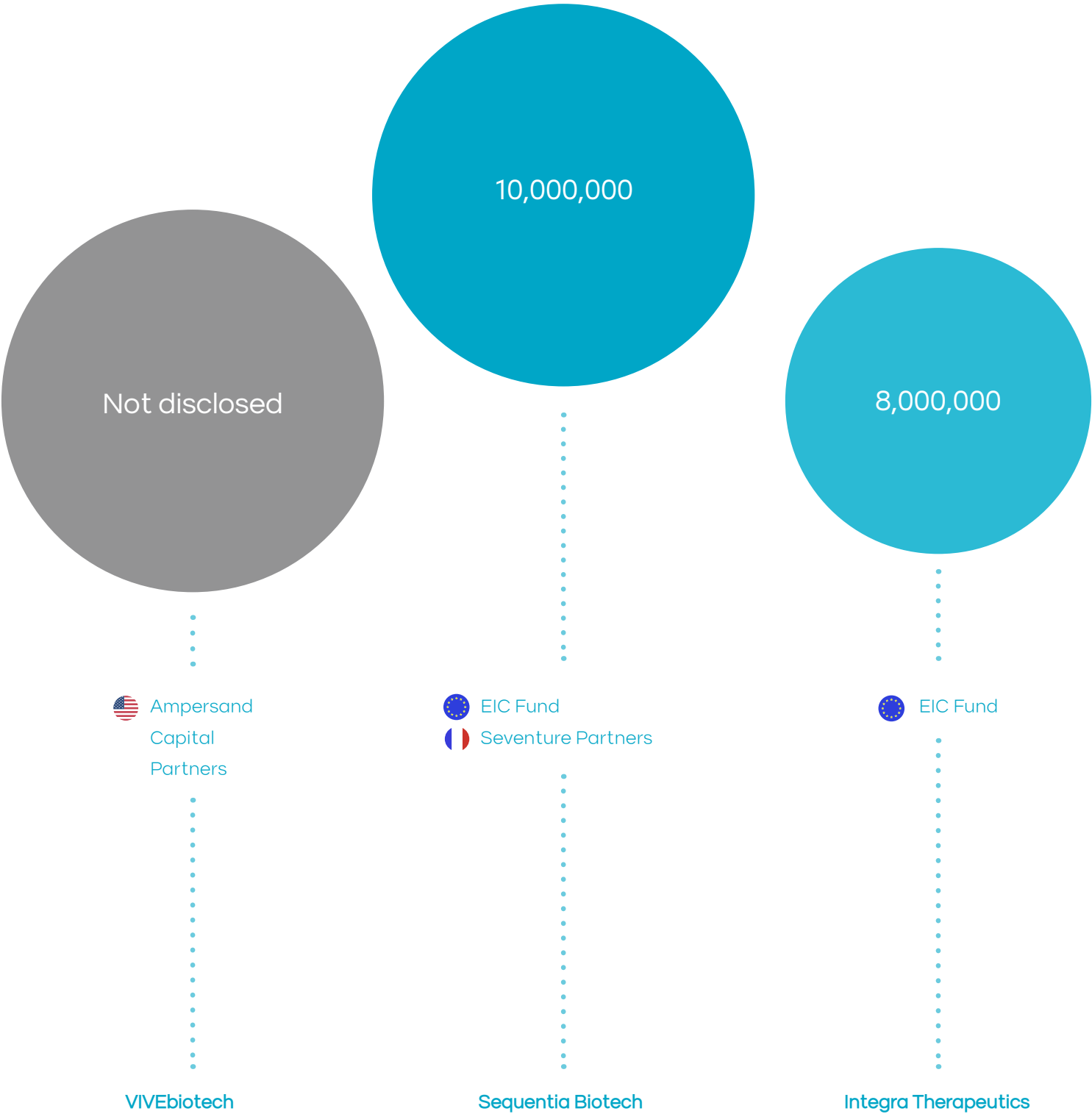
Organisation	Participating investors	Instrument	Total investment volume pledged (€)
The Blue Box	Fundación Científica AECC	Participation loan	150,000
Helenis Biocosmetics	PCUMH / Waterhole Ventures	Capital increase	120,000
Oniria Therapeutics	Mind the Gap	Capital increase	125,000
Batea Oncology	Fundación Científica AECC	Participation loan	90,000
Laboratorios Rubió	Rubió Nutraceuticals	Convertible loan	80,000
Rubió Nutraceuticals	Laboratorios Rubió	Convertible loan	80,000
Servatrix Biomed	Private investors	Capital increase	50,000

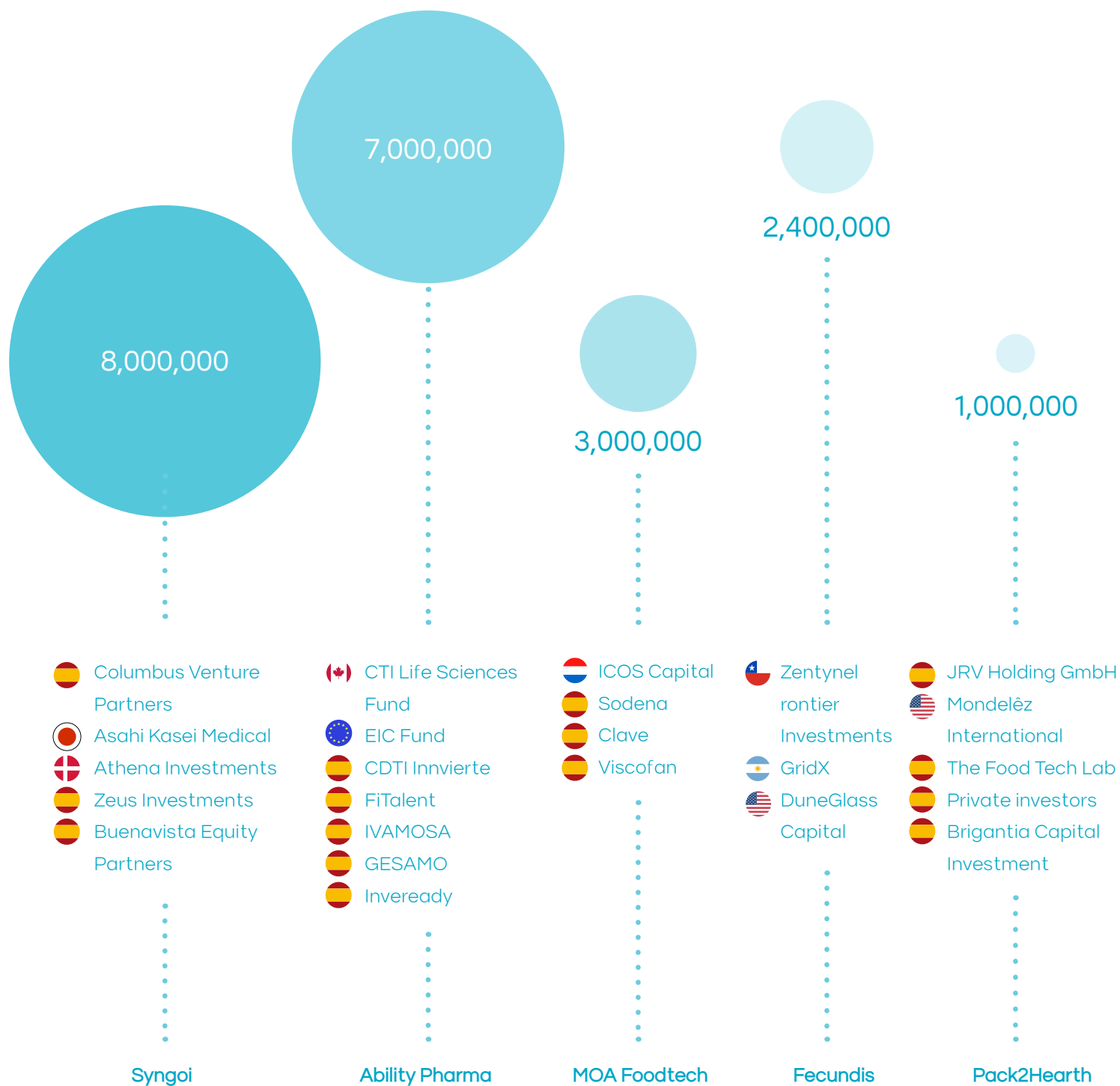
Table 2.1. Private capital increases in Spanish biotechnology companies in 2024. Source: AseBio.



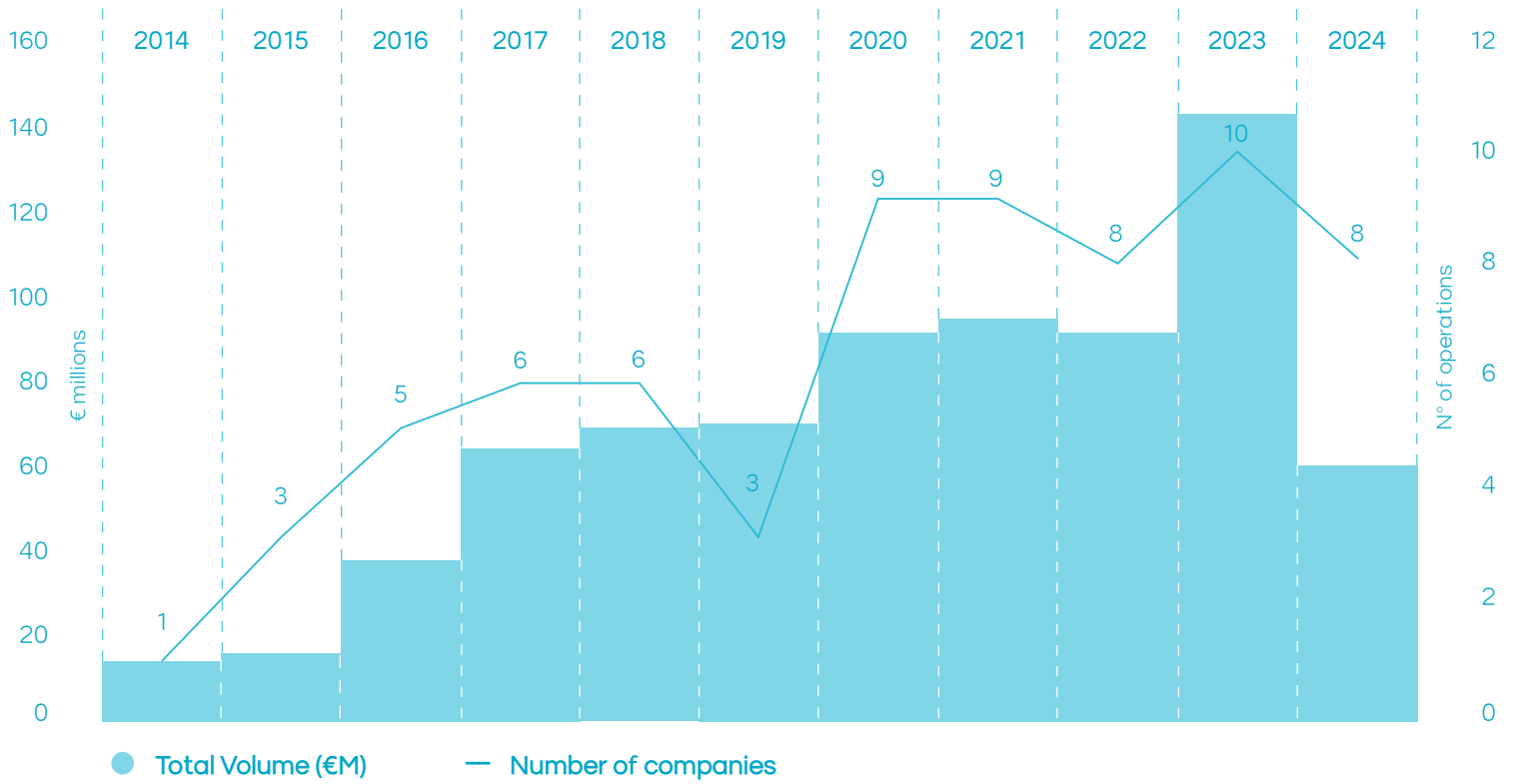
Operations with international investors reached €64 million.

The total secured in capital increase operations that included international investors was €64 million. This year, eight companies received support from investors in countries such as Canada, Chile, Netherlands, Japan, Denmark and USA.





Graph 2.2 Private capital increase operations with international investors, 2024. Source: AseBio.



Graph 2.3 Evolution of volume of private capital increase operations with international investors (2014-2024).

Mergers and acquisitions to grow industrial capacities and diversify markets.

3P Biopharmaceuticals, from Navarra, and Biovian merged to create **3PBIOVIAN** and offer unprecedented end-to-end development and manufacturing services for all protein expression systems and viral vectors, both for active ingredients and pharmaceutical products, from preclinical development to the clinical development and marketing phases.

In late 2024, **ADL BioPharma** announced it was joining the Wacker Group and ADL is now operating under the name **Wacker León**. This happened after ADL acquired the Wacker facilities, investing €100 million. Wacker León now has one of the largest biotechnology facilities in Europe in terms of industrial production and scale-up potential.

Plus, **Leitat** through MedTech Barcelona acquired the cell-kit development and marketing branch of ReadyCell.



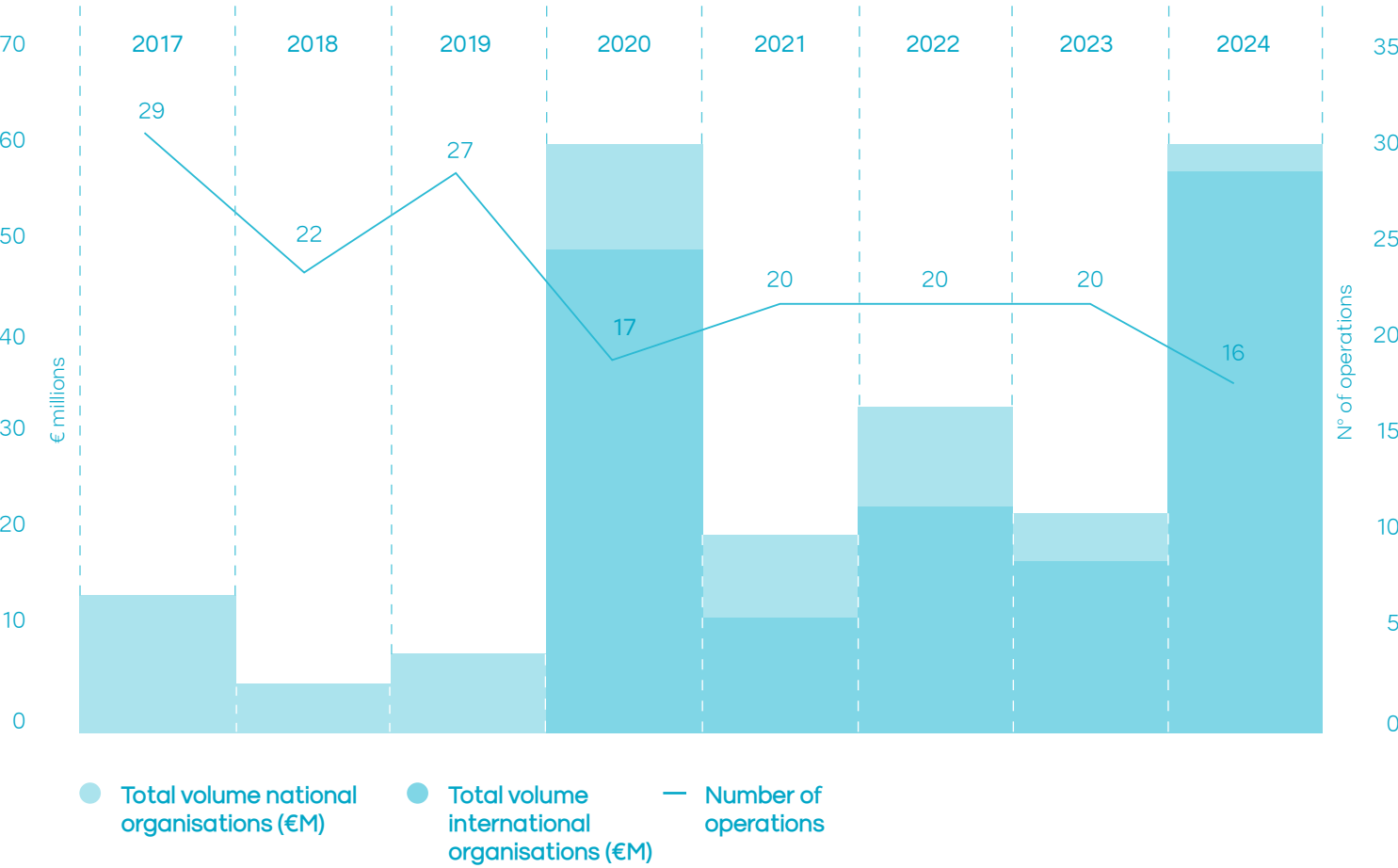
EIB and ENISA, key stakeholders for funding Spanish biotechnology through participation loans and venture debt.

This section looks at complementary funding obtained by biotech companies through participation loans or venture debt held by regional, national or international business development bodies.

Regional entities Sodical and Avança, as well as the participation loans granted by ENISA, a public company under the Ministry of Industry, Trade and Tourism, have helped fund 14 biotechnology companies, contributing €3.4 million.

Plus, the European Investment Bank (EIB) granted €55 million in venture debt to Universal Diagnostics and Greenlight Biosciences, proving once again it is a key stakeholder in funding Spanish biotech innovation.

As graph 2.3 shows, the number of operations in 2024 dropped from 20 to 16. However, thanks to the EIB instrument, as we saw in 2020, the total volume is more than €58 million.



Graph 2.4 Evolution of loans granted by ENISA, regional societies and instruments of international bodies in 2024. Source: AseBio, Sodena, ENISA, AECC and EIB.

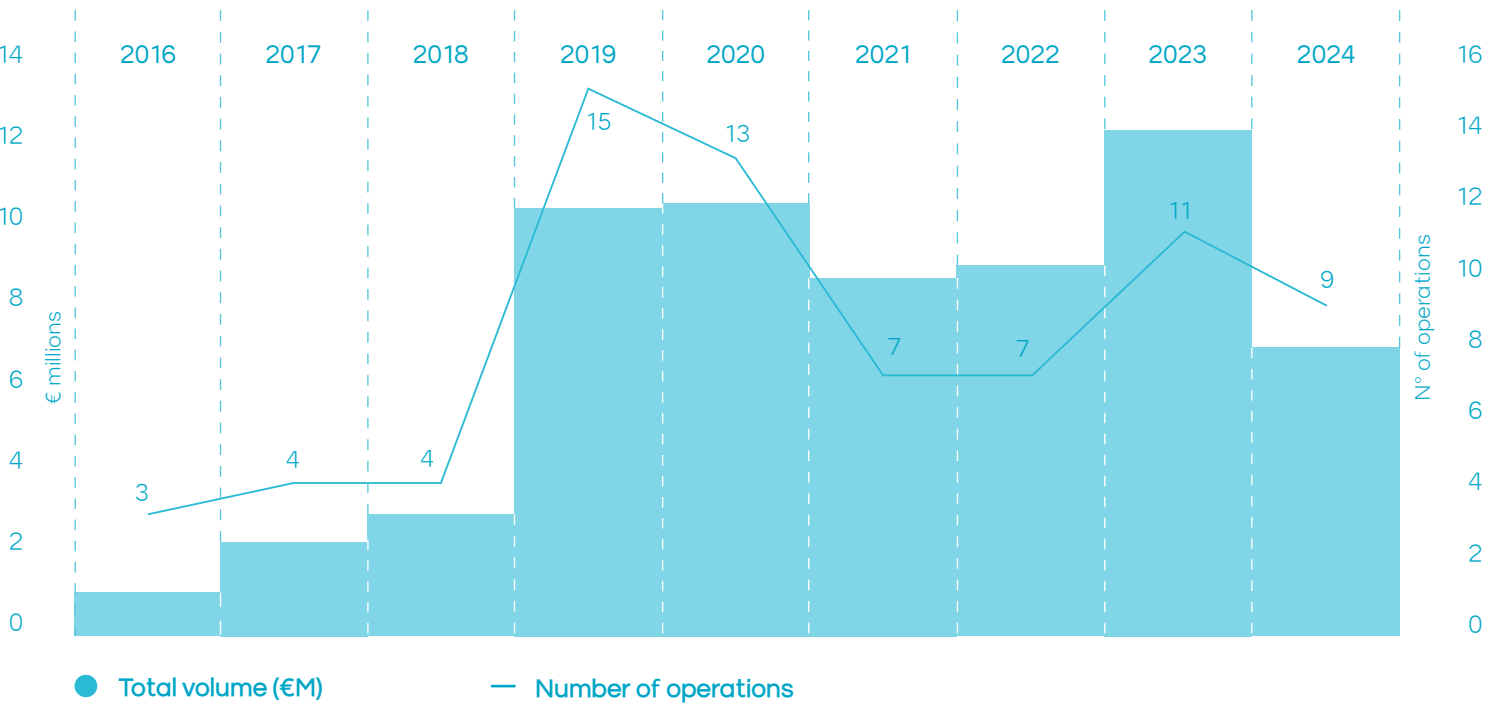
Biotech firms raised over €6 million in crowdfunding.

In 2024, 9 companies raised €6.3 million in crowdfunding, mainly through the Capital Cell platform and one operation on Startupxplore. Compared to the previous year, the total volume dropped 49% and there were 18% fewer operations.

Three companies raised over a million through this type of platform: Lumiris, Mediterranean Algae and Ahead Therapeutics.

Organisation	Crowdfunding platform	Total investment volume pledged (€)
Ahead Therapeutics	Capital Cell	1,242,873
Mediterranean Algae	Startupxplore	1,000,000
Lumiris	Capital Cell	1,000,000
Nanobots	Capital Cell	923,282
Fecundis	Capital Cell	537,539
Flomics	Capital Cell	498,202
Biointaxis	Capital Cell	451,124
Ability Pharma	Capital Cell	304,440
Spinally	Capital Cell	310,604

Table 2.5. Crowdfunding operations by Spanish biotechnology companies in 2024. Source: AseBio and Capital Cell.



Graph 2.5. Evolution of crowdfunding operations in biotechnology companies. 2016 – 2024. Source: AseBio and Capital Cell.

New funds for agrifood biotech companies and investors specialising in health after a two-year drought.

This section includes the new funds closed in 2024 by venture capital fund managers that focus on biotechnology companies, as well as their evolution since 2012. Plus, we also highlight other funds that, although not specifically focused on the biotechnology sector, are geared towards business projects that are indirectly related.

Asabys announced the close of its Sabadell Asabys Health Innovation Investments II fund, with €180 million to invest in companies working in biopharmaceuticals, medicine and digital health.

Columbus Venture secured €100 million for its BV Healthcare Growth Innvierte I fund by joining forces with Buenavista Equity Partners. This fund will be invested in biotechnology companies and hopes to reach €150 million.

Invivo Partners announced its latest fund, Invivo Ventures III Fund, which hopes to secure €100 million to invest in advanced therapies, synthetic biology and artificial intelligence.

This year, AseBio is once again analysing the evolution of funds since 2012, as three fund managers closed three new funds. As graph 2.6 shows, the cumulative volume of funds targeting the biotechnology sector since 2012 is over €1.5 billion.

Broken down by fund manager, **Ysios Capital** has reached the highest total with its three funds, at over €400 million managed. They are followed by **Asabys** with €297 million and Columbus Venture Partners with funds worth €236 million.

In 2024, Fondo de Coinversión (FOCO) was launched with €2 billion managed by COFIDES, a Spanish trading company that specialises in managing State funds. This Fund aims to attract foreign innovation to promote investment in Spain that helps modernise the Spanish production model and boost competitiveness, particularly related to both the

digital and green transitions and technological innovation.

Plus, the government also announced its new Social Impact Fund (FIS), with €400 million, assigned to the Ministry of Inclusion, Social Security and Migration and also managed by COFIDES. FIS is a public financial instrument that aims to strengthen our impact ecosystem by supporting investment projects carried out by companies and other entities in Spain that generate a positive and measurable social and/or environmental impact.

Additionally, Nara Health Partners was chosen by Fond-ICO to drive technology transfer start-ups in the health sector, in the biopharma and healthtech arenas. To do so, Fond-ICO will invest €20 million in Nara Health FCR.

Inveready announced the launch of a new venture capital firm called Inveready Convertible Tech Notes I, which hopes to attract €40 million to invest in companies validating technologies or launching products. Plus, COFIDES announced it has invested €5 million in the Inveready Venture Finance IV Trainera fund, which focuses on technology-based companies with high growth potential and internationalisation strategies.

Grow Venture Partners announced its new fund, Fondo de Inversión en Tecnología Avanzada (FITA), which will have €55 million to help foster the transfer of scientific research from Catalonia to market.

ICF will help set up the fund, contributing €30 million; as will the European Investment Fund, with €10 million, and the other €10 million will be contributed by private investors.

Eatable Adventures announced its new venture capital investment vehicle, Europe Foodtech Acceleration Fund I, which hopes to raise €30 million to invest in foodtech companies.

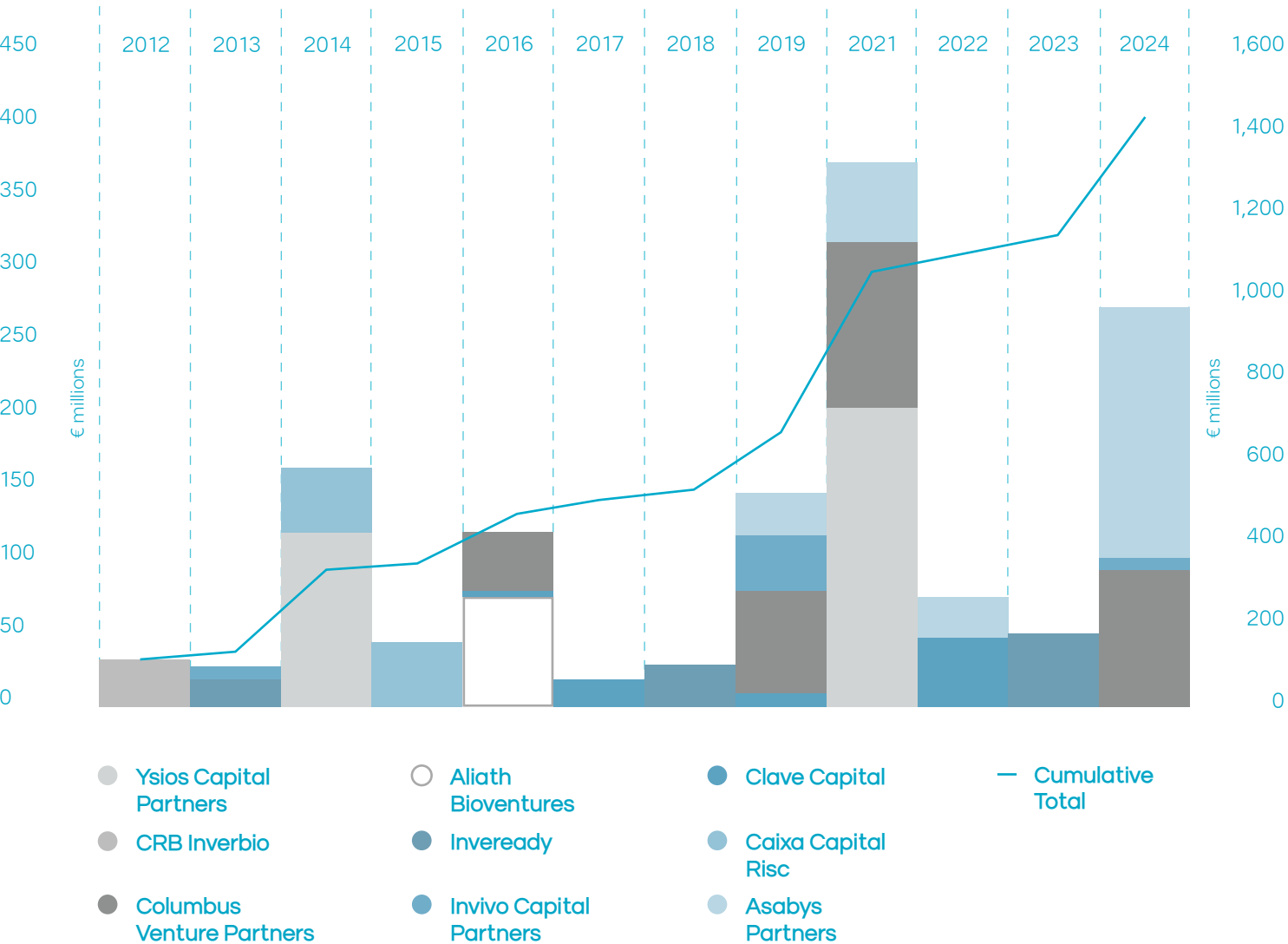
For its part, Basque venture capital manager Inbergune

Capital Partners announced the launch of its Double Helix Venture Fund I, specialising in investment in the biotechnology sector, which hopes to raise €10 million.

CRB Health Tech announced the close of its new digital health fund, CRB Digital Health III, with €20 million from Sanitas, Roca Group Ventures and ICF.

Beka Asset Management in collaboration with TheFoodTechLab announced the launch of TheFoodTechLab Climate Fund to invest in start-ups developing in collaboration with technologies to improve agricultural efficiency, personalised nutrition, new protein sources and the circular economy.

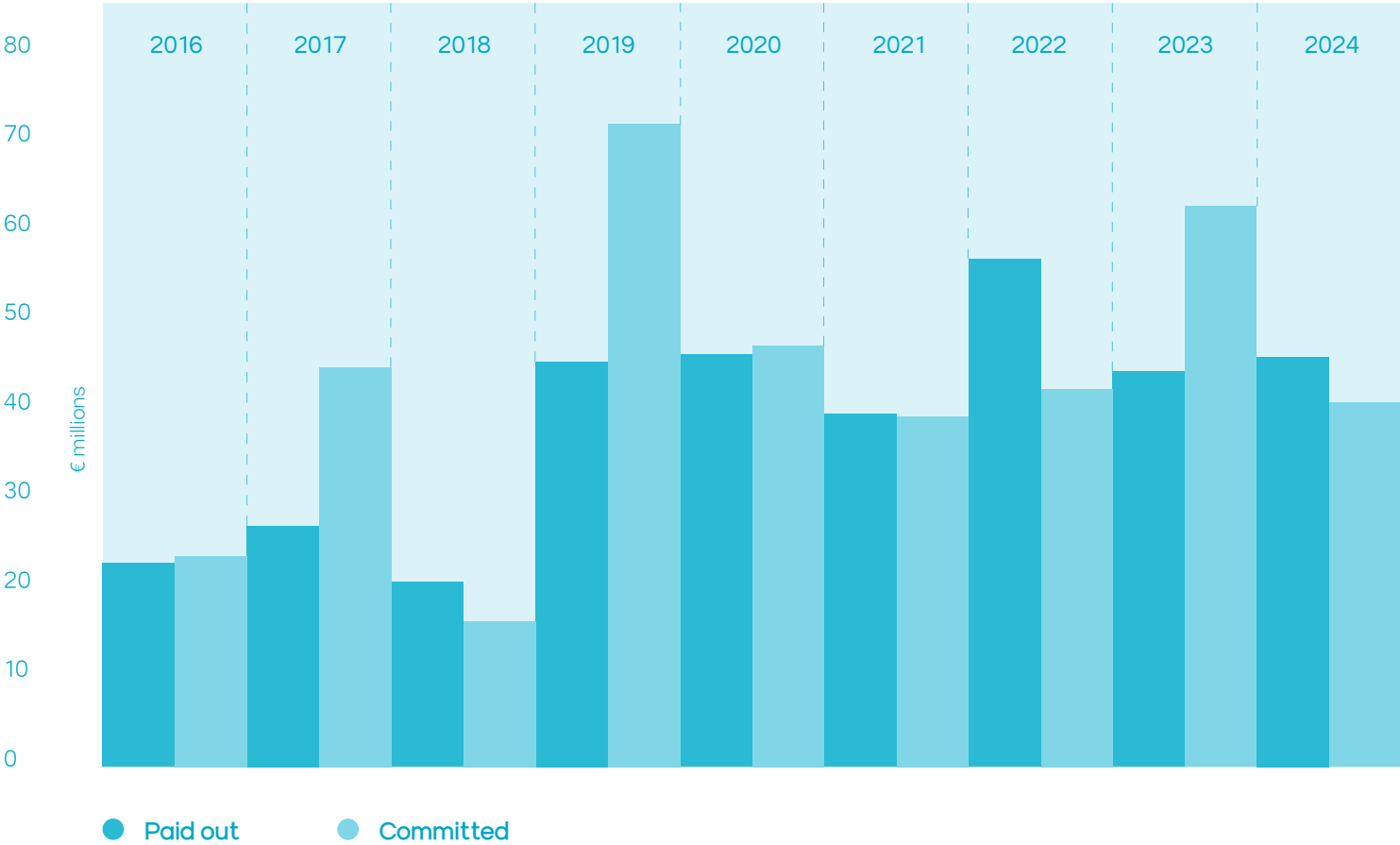
Impact Bridge announced the launch of its IB Sustainable Agrifood Fund I Innvierte to invest in SMEs in the agrifood sector, which hopes to secure €170 million.



Graph 2.6 Evolution of venture capital funds in biotechnology. 2012 – 2024. Source: AseBio.

Capital pledged and paid out by venture capital operators decreased in 2024.

In 2024, there was a decrease in both the capital pledged and paid out by venture capital investors that work with Spanish biotechnology companies. Asabys Partners, Ysios Capital, Clave Capital, Invivo Capital Partners, Inveready, Columbus Venture Partners, Aliath Bioventures and Caixa Capital Risc paid out €47.46 million, down 38% from the previous year, and pledged €42.2 million, or 35% less than in 2023.



Graph 2.7. Evolution of volume paid out and pledged. 2016 – 2024. Source: AseBio.

In addition to private instruments, the biotechnology sector also turns to national public grant programmes run by the Centre for the Development of Industrial Technology (CDTI) and European programmes. Below is information on the grants and other European initiatives of interest given their volume. Plus, as we do every year, we will analyse the evolution of grants for R&D projects related to biotechnology awarded by CDTI since 2012.

Zendal, through its subsidiary Biofabri, and TBVI signed a contract with the European Health and Digital Executive Agency (HaDEA) under the EU4Health programme to

accelerate clinical trials on the MTBVAC tuberculosis vaccine. With this contract, Biofabri secured €12.5 million in funding.

Vaxdyn received more than €1.4 million through the CARB-X accelerator and a €1.1 million grant from the EIC Accelerator.

Integra Therapeutics also secured €2.5 million from the same EIC Accelerator programme.

R&D projects and Neotec Grants supported by the CDTI in the biotechnology arena.

The CDTI supports business projects for industrial research and experimental development to create or significantly improve a production process, product or service, submitted by one or a group of companies. In the innovation arena, it supports projects close to market that help boost the company's competitiveness by incorporating emerging technology in the sector.

Neotec grants are intended to fund new technology-based companies, which are those whose main activity is to exploit products or services that require the use of technology or knowledge developed through research activity.

In 2024, 34 projects in biotechnology were funded, including individual R&D projects, R&D technology transfer projects in the "Cervera" priority technologies, Eurostars projects to support Innovative SMEs, multi-country projects in collaboration with foreign organisations, and joint ventures under the Transmisiones initiative.

For the Transmisiones initiative, the cooperation projects address the challenges posed by the following missions:

- Promoting immunological tools (vaccines), innovative pharmacological treatments and monitoring technologies to prevent and detect the early signs of diseases in animals, and to treat them, as a way to maximise animal health and wellness.
- Advancing research on infectious diseases and antimicrobial resistance in order to build research ecosystems and healthcare systems that are prepared to diagnose, prevent and treat them.

Plus, four projects in biotechnology also received Neotec grants, which help fund new business projects requiring the use of technologies or knowledge developed from research activity, when the business strategy is based on technological development. These four projects include one from the Neotec call specifically for women entrepreneurs.

	Number of projects	Total budget (€)	Total awarded (€)	Repayable portion (€)	Non-repayable portion / grant (€)
R&D	34	29,447,148	19,196,789	7,777,179	11,419,610
Neotec grants	4	1,690,223	1,242,961	0	1,242,961
Total	38	31,137,371	20,439,750	7,777,179	12,662,571

Table 2.6. R&D projects approved in the biotechnology arena in 2024.
Source: CDTI.



Evolution of projects funded by the CDTI in the biotechnology arena.

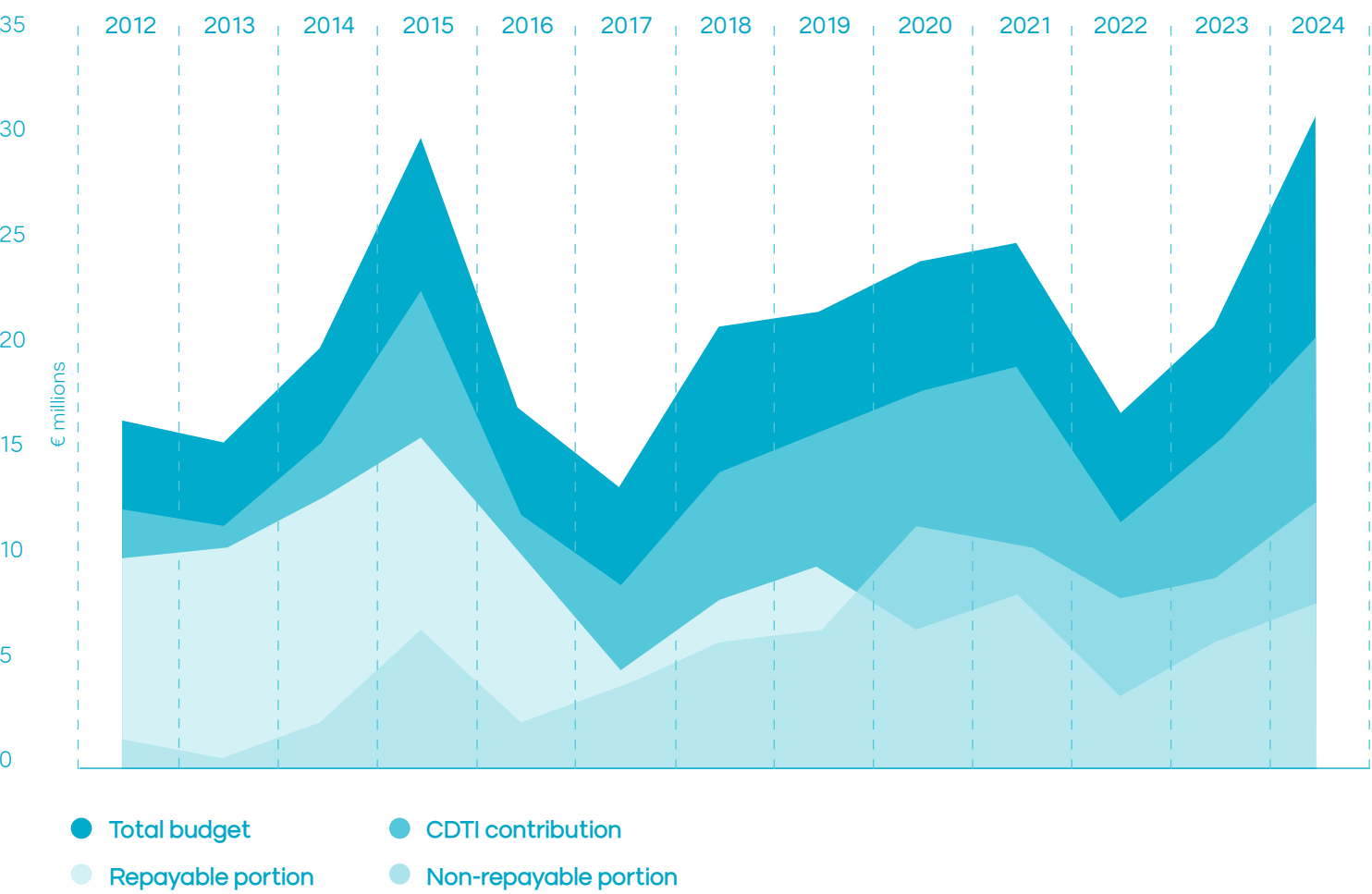
Analysis of the evolution of funding for CDTI projects between 2012 and 2024 looks at the biotechnology R&D projects approved for funding through grants, repayable and partially repayable aid each year.

For 2024, the projects selected were strictly from the biotechnology arena. In this regard, and to gain in precision, our research focuses solely on biotechnology for health, systems biology, synthetic biology and nanotechnology, industrial biotechnology, biotechnology for agrifood and environmental biotechnology.

Of the projects approved in 2024, a significant portion were in the grant programmes: 31 of the 38 projects approved correspond to this type of programme. This means the non-

repayable portion (grant) is much higher than the repayable portion (loan), with €12.66 million compared to €7.77 million.

The number of projects approved was 12% higher than in 2023, with a notable increase in total funds, over 48% more, and in public contribution, roughly 31%. Regarding the grant portion, the increase is nearly 22%, particularly driven by participation of sector companies in consortia for the Transmisiones initiative, with large projects and grant portions.



Graph 2.8. Evolution of R&D projects approved in the biotechnology arena (2012-2024). Source: CDTI.





Branded Content

Adriana Casillas, co-founder and CEO,
Tebrio



Tebrio, driving Spanish biotechnology towards strategic European autonomy

At a time when Europe has identified biotechnology as a key technology to achieve strategic autonomy and boost its competitiveness, Tebrio's 'made in Spain' innovation makes a crucial contribution to positioning the Spanish biotechnology sector on the cutting-edge in Europe. Recent events like the pandemic and the war in Ukraine have highlighted the need to reduce our strategic dependence and driven the European Union to set ambitious goals in R&D, sustainability and autonomy, as the Draghi report shows. In this context, Spanish biotechnology is facing a changing regulatory environment, which will mark the future of the sector over the coming years.

Tebrio, faithful to its commitment to innovation and research, has built its business strategy around these core values. Our multidisciplinary team works to provide biotechnology solutions to challenges in the agrifood and environmental sectors, contributing to a circular economy that is efficient and sustainable, in line with the global challenges we are facing in terms of food security and conserving the environment.

More than a decade ago, Tebrio committed to ongoing investment in R&D and its own technology development, which has allowed the company to develop efficient processes for breeding and industrial processing of *Tenebrio molitor*, an insect with great potential as an alternative source of protein, lipids, fertilisers and biomaterials. This ongoing commitment to innovation has led to patents that cover everything from breeding automation to valorisation of subproducts, making Tebrio a benchmark in the development of advanced biotechnology solutions.

Tebrio's industrial biotechnology is the fruit of years of research, collaborations with centres of excellence and a vision that includes sustainability, efficiency and traceability. The company has implemented real-time monitoring and control systems based on artificial intelligence and data analysis to improve the performance and quality of its products while minimising their impact on the environment. This digitalised, automated model is a clear example of Spanish biotechnology's potential to transform traditional sectors and bring added value to the European agrifood chain.

Given the current situation, Tebrio believes it is essential to have a suitable, stable national and European regulatory framework that makes it easier for biotechnology to contribute to agrifood production and preservation of the environment, and that encourages research and industrial

innovation. Legal security and standardised regulations are key factors for attracting investment, accelerating technology transfer and consolidating an internationally competitive ecosystem.

This is why Tebrio actively collaborates with sector associations, public bodies and regulatory entities, contributing its experience to develop policies that encourage responsible innovation and sustainability. Plus, the company also promotes biotechnology on the public agenda, encouraging support and recognition measures for the sector, which drives economic growth and qualified jobs in Spain.

The products and processes Tebrio has developed show that it is possible to launch innovative, scalable solutions that diversify our protein sources and give us high-quality biofertilisers, reducing our environmental footprint and making more efficient use of our resources.

Public-private partnership and popular science are essential tools for raising awareness in society and among politicians of the positive impact biotechnology has on our daily lives and the future of the planet. We will continue working to consolidate the role of Spanish biotechnology internationally, contributing to a more autonomous, competitive and sustainable Europe. Innovation, research, collaboration and commitment to sustainability must be the foundations of the sector's future.





Branded Content

Jon Alberdi, CEO,
VIVEbiotech



GENE TRANSFER TECHNOLOGIES



VIVEbiotech: European leadership from Spain in advanced therapies

At a time when Europe is looking to consolidate its scientific and industrial leadership in strategic sectors, Spanish biotechnology is proving it has a lot to contribute to the continent's competitiveness. One clear example is VIVEbiotech, a CDMO (Contract Development and Manufacturing Organization) based in San Sebastián that specialises in developing and manufacturing lentiviral vectors. Founded in 2015, VIVEbiotech has become a European benchmark in advanced therapies, participating actively in developing treatments that are changing patients' lives around the world. Some examples of this include the novel, efficient CAR-T therapies to treat blood cancers, based on modifying the genetic make-up of immune cells using lentiviral vectors. More than a hundred leukaemia and lymphoma patients in Europe have already been treated with a CAR-T developed using our vectors, with very positive results.

VIVEbiotech produces lentiviral vectors for roughly 30 clients in Europe. Many are medium-sized biotechnology companies, and some of them are leaders in the market. They include Galápagos NV, evotec, Zelluna, Kiji Therapeutics and TheraVectys.

Currently, VIVEbiotech operates seven latest generation whiterooms, which allows the company to cover all stages of development, from preclinical projects to clinical trials and commercial manufacturing. It complies with both EMA and FDA regulatory standards, which has consolidated its place as a strategic partner for clients all over the world.

VIVEbiotech's international significance has been bolstered by recent high-impact milestones. In late 2024, the company received an important investment from US fund **Ampersand Capital Partners**, which specialises in the life sciences. This strategic investment aims to expand the firm's development and manufacturing capacities, allowing it to accompany more clients in the advanced clinical and commercial stages. This operation is a firm commitment to the industrial talent and capacity in Spain, strengthening Europe's position as a benchmark in advanced therapies.

In January 2025, VIVEbiotech was named **CMO/CDMO of the Year** at the **Advanced Therapies Awards** in Dallas. This award recognises the excellence and innovation of companies in the advanced therapies sector.

Plus, this is a very special year for the company: **VIVEbiotech is celebrating its tenth anniversary**. Ten years of sustained growth, commitment to science, biotechnology, innovation and talent as the best tools for helping boost Europe's strategic competitiveness and autonomy. 'Made in Spain' biotechnology is not only up to the task, it is setting the pace.



03. Talent and diversity

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Talent and diversity

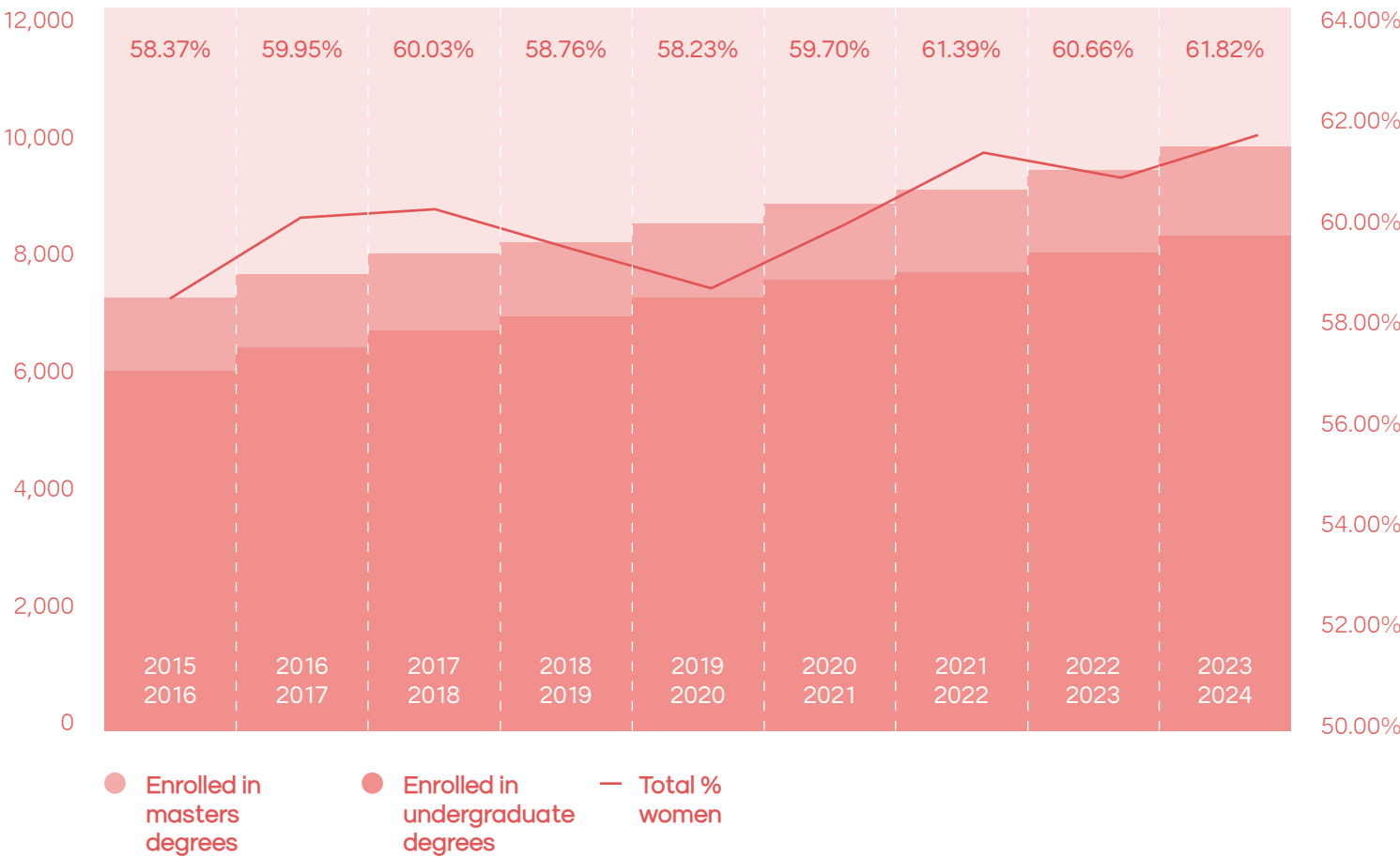
There were nearly 10,000 students enrolled in biotechnology studies the past academic year.

Every year, there are more students enrolled in an undergraduate or master in biotechnology (graph 3.1). Since the 2015-2016 academic year, the number of students enrolled in university studies in biotechnology, both undergraduate and masters level, has increased roughly 36%. In 2023-2024, the latest academic year for which data is available, there were more than 9,798 students in total, including undergraduate and masters studies.

Of these nearly 9,800 students, more than half were women, making up roughly 62%.

Students enrolled in Biotechnology studies

Graph 3.1. Evolution of number of students enrolled in university studies in biotechnology (undergraduate and master). 2015-2024. Source: Compiled internally from Statistics on University Students of the Ministry of Science, Innovation and Universities.



Biotechnology remained among the degrees that require the highest marks on university entrance exams in 2024.

At 19 of the 24 public universities that offer biotechnology studies, this degree is among the 10 highest admissions scores required. This confirms, once again, students' interest in making their professional careers in biotechnology.

Plus, six public universities offer seven dual degrees that combine biotechnology and related subjects such as pharmacy, biology, molecular biology, bioinformatics, data science and other types of engineering. Five of the seven dual degrees are among the ten programmes with the highest admissions scores required. Plus, two are ranked first.

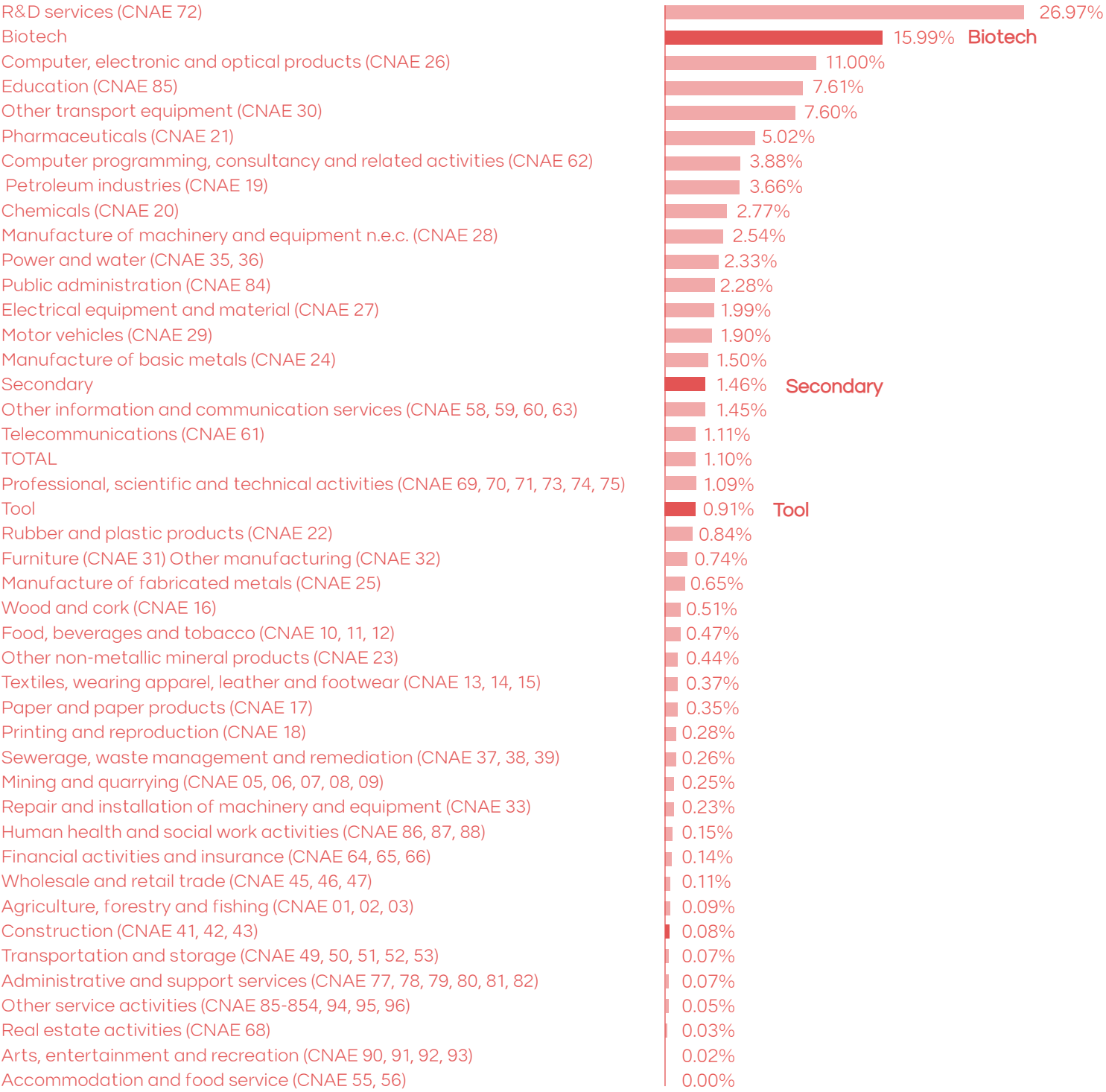
This is similar for directly related degree programmes, such as biomedical engineering, which is also among the most in demand, in the top 10 admissions scores at 18 of the 22 public universities that offer this degree.

Additionally, 33 public universities offer degrees related to biotechnology, such as healthcare biology, molecular biology, nanotechnology, biochemistry, biomedical sciences, healthcare engineering, biomedicine and advanced therapies, bioinformatics and food technology, among others.

Biotech firms still employ more researchers than any other industrial sector.

Biotech firms remain in second place on the ranking of sectors with the highest percentage of researchers to total employees, at 15.99%, surpassed only by R&D services companies.

Companies that use biotechnology as a production tool have a ratio of researchers to total employees of nearly 1% and for companies with biotechnology as a secondary activity it is more than 1.46%.

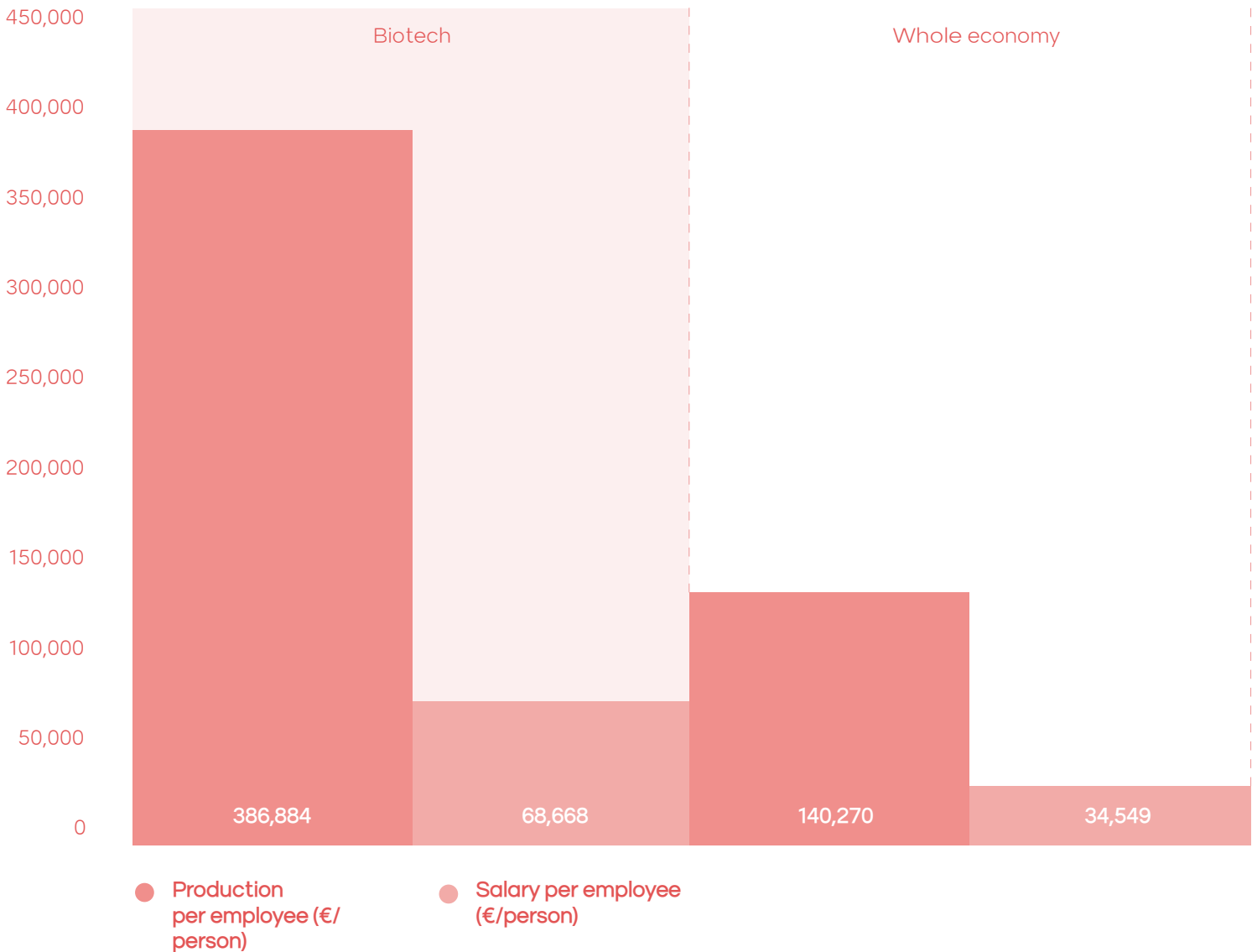


Graph 3.2. Ratio of researchers to total employment in 2023 (percentage of researchers to total employees). Source: Compiled internally from 2023 Survey on Biotechnology Use and INE Statistics on R&D activities.

The salary per employee at biotech firms is more than double the national average.

As noted in the 2023 AseBio Report, due to COVID-19, international companies with a subsidiary in Spain saw a significant boost in turnover in 2021 and 2022 when they were marketing the vaccine. Now, in 2023, these figures have returned to pre-pandemic levels. So, as was to be expected, there has been a considerable drop in turnover.

Nevertheless, the average productivity of biotech companies was more than €380,000 per employee, three times more than the average productivity, with average salaries close to €68,000 per employee, double the national average (graph 3.3).

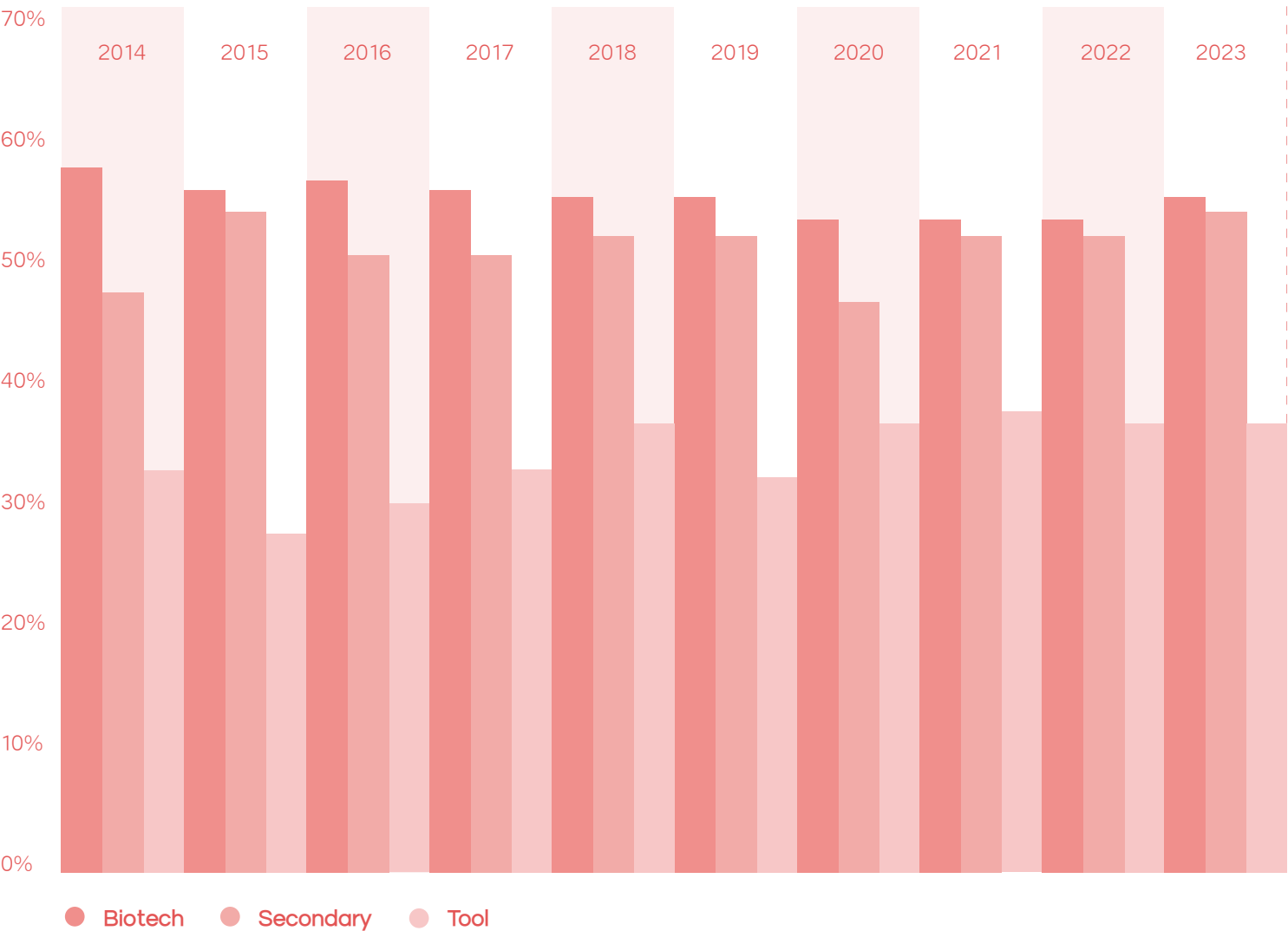


Graph 3.3. Basic productivity and salary ratios for employees at biotech firms. 2023. Source: Compiled internally from the information on companies collected by AseBio.

Women make up 55% of total employment at biotech firms.

Since 2010, the percentage of women at biotech firms has consistently been over 50%. This is the same for companies with biotechnology as a secondary activity, except in 2014 and 2020.

However, at companies that use biotechnology as a production tool women make up roughly 36% of staff (graph 3.4).

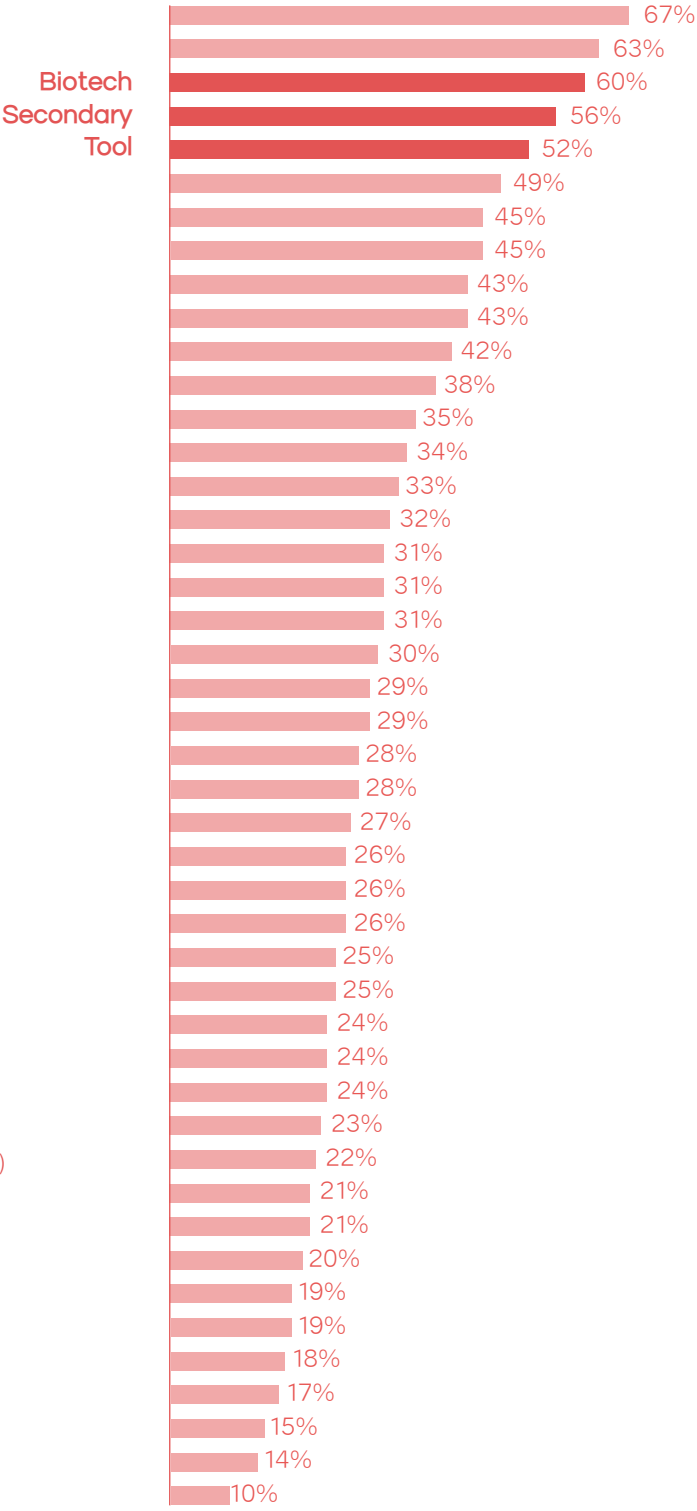


Graph 3.4. Evolution of women in biotechnology activities as a percentage of all biotechnology employees. Source: Compiled internally from Survey on Biotechnology Use. INE.

Women make up 60% of all R&D staff at biotech companies.

If we look at women as a percentage of total R&D employees, the biotech sector remains in third, behind the pharmaceutical sector and healthcare and social services, with 60%.

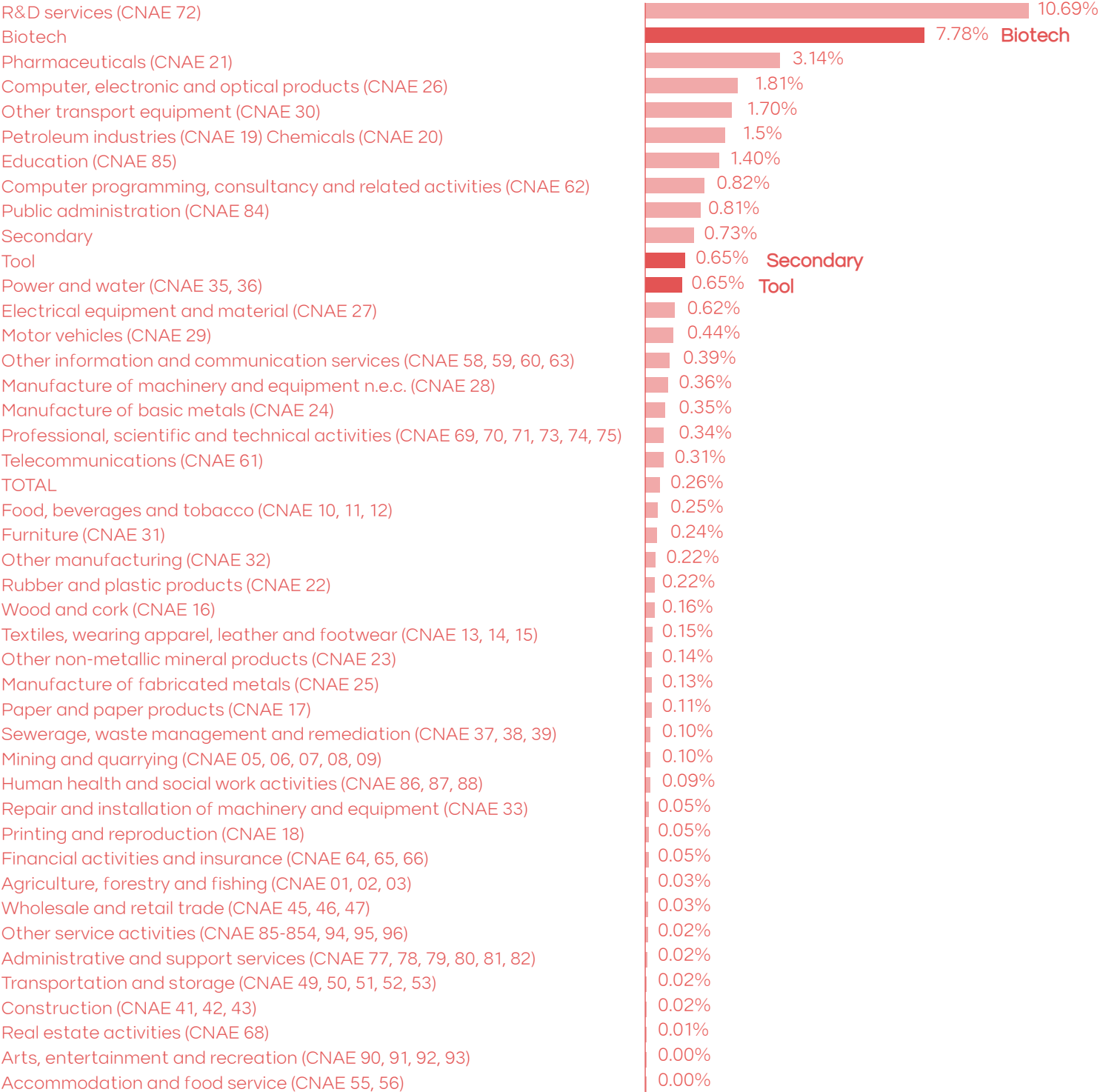
Pharmaceuticals (CNAE 21)	67%
Human health and social work activities (CNAE 86, 87, 88)	63%
Biotech	60%
Secondary	56%
Tool	52%
Chemicals (CNAE 20)	49%
Food, beverages and tobacco (CNAE 10, 11, 12)	45%
Petroleum industries (CNAE 19)	45%
R&D services (CNAE 72)	43%
Textiles, wearing apparel, leather and footwear (CNAE 13, 14, 15)	43%
Other service activities (CNAE 85-854, 94, 95, 96)	42%
Agriculture, forestry and fishing (CNAE 01, 02, 03)	38%
Paper and paper products (CNAE 17)	35%
Other manufacturing (CNAE 32)	34%
Sewerage, waste management and remediation (CNAE 37, 38, 39)	33%
Financial activities and insurance (CNAE 64, 65, 66)	32%
ALL COMPANIES	31%
Real estate activities (CNAE 68)	31%
Wholesale and retail trade (CNAE 45, 46, 47)	31%
Public administration (CNAE 84)	30%
Other activities (CNAE 69, 70, 71, 73, 74, 75)	29%
Transportation and storage (CNAE 49, 50, 51, 52, 53)	29%
Furniture (CNAE 31)	28%
Administrative and support services (CNAE 77, 78, 79, 80, 81, 82)	28%
Other non-metallic mineral products (CNAE 23)	27%
Arts, entertainment and recreation (CNAE 90, 91, 92, 93)	26%
Printing and reproduction (CNAE 18)	26%
Accommodation and food service (CNAE 55, 56)	26%
Wood and cork (CNAE 16)	25%
Telecommunications (CNAE 61)	25%
Mining and quarrying (CNAE 05, 06, 07, 08, 09)	24%
Other information and communication services (CNAE 58, 59, 60, 63)	24%
Power and water (CNAE 35, 36)	24%
Other transport equipment (CNAE 30)	23%
Computer programming, consultancy and related activities (CNAE 62)	22%
Electrical equipment and material (CNAE 27)	21%
Rubber and plastic products (CNAE 22)	21%
Construction (CNAE 41, 42, 43)	20%
Manufacture of basic metals (CNAE 24)	19%
Manufacture of fabricated metals (CNAE 25)	19%
Motor vehicles (CNAE 29)	18%
Computer, electronic and optical products (CNAE 26)	17%
Repair and installation of machinery and equipment (CNAE 33)	15%
Manufacture of machinery and equipment n.e.c. (CNAE 28)	14%
Education (CNAE 85)	10%



Graph 3.5. Percentage of women to total R&D personnel. Source: Compiled internally from 2023 Survey on Biotechnology Use and INE Statistics on R&D activities.

Biotech firms still have a high proportion of women on staff, with nearly 8 female researchers and nearly 7 female technicians or assistants per 100 employees, while the average for all activities is under 1% in both cases. (Graph 3.6).

These ratios of women on research teams are lower at companies with biotechnology as a secondary activity and those that use it as a production tool, although still above the average.



Graph 3.6. Ratio of female researchers to total employment in 2023 (percentage of women researchers to total employees). Source: Compiled internally from 2023 Survey on Biotechnology Use and INE Statistics on R&D activities.

Women make up 29% of executive teams at biotechnology firms.

In 2023, 16% of biotech companies were led by women and nearly 1 in 4 had a female CEO. These figures far exceed the average for IBEX-35 companies, where only 12% of presidents and 3% of CEOs were women in 2023.

Similarly, the percentage of women on management teams was more than 29% at biotech firms, compared to 19% at IBEX-35 companies.

	% Women	
	Biotech	IBEX-35(*)
President	16.2%	11.9%
Executive	25.0%	3.0%
Executive teams	29.0%	19.2%

Table 3.1. Female presence in management teams at biotech companies in 2023.
Source: Compiled internally from the Companies House registry and companies' websites. (*) Data from the INE and Institute of Women. Ministry of Equality.





Branded Content

Sonia Macia,
CEO, SMED Clinical Research



SMED Clinical Research: Science that is driving Spanish biotechnology towards Europe

Over the past decade, biotechnology has seen notable growth in Spain. From new innovative start-ups to new lines of research in advanced therapies, the country has consolidated its place as fertile grounds for biomedical development. However, for this evolution to be sustainable and gain international recognition, it is essential to have structures that allow this science to be used to create specific clinical solutions. This is where SMED Clinical Research comes into play.

Since it was founded, SMED has developed a work method based on close collaboration with biotechnology companies, particularly those in the early stages.

In a country where biotechnology start-ups are emerging with brilliant ideas and talent, but often limited resources and tight deadlines, SMED offers a realistic, effective solution: a full platform of services for clinical research.

WINVEST: when biotechnology meets data intelligence

One of the most powerful examples of how SMED is elevating the level of Spanish biotechnology development is WINVEST, its applied innovation initiative. WINVEST isn't just a technology programme; it's a declaration of intent: clinical research in Spain can be on the cutting edge if it gets the right tools. It is based on integrating technological tools that have proven their value in arenas like transcriptomics, metabolomics, single cell sequencing and full genome sequencing. On top of this, artificial intelligence is being used to analyse medical imaging and anatomical pathology, which can identify response patterns.

Another key component of WINVEST is using deep learning-aided drug discovery models, which can simulate molecular interactions and accelerate identification of therapeutic candidates. This combination of technologies allows us to generate predictive biomarkers, mechanistic models and clinical stratification algorithms.

The technology itself isn't what truly matters; it is how accessible it is. SMED has designed WINVEST so that small and medium-sized companies can integrate it into their R&D processes without having to be part of large international consortia. This is a structural change: it signals the democratisation of access to cutting-edge science in the Spanish biotech ecosystem.

A commitment to applied science, with a nationwide vision

SMED's work is, in the end, a commitment to turning scientific knowledge into specific results that reach patients. But it is also a contribution to strengthening a sector that is strategic for the country. As more Spanish companies gain access to advanced resources, to quality clinical research networks and effective development strategies, the whole national biotechnology sector is gaining presence, recognition and the ability to compete in Europe.

SMED doesn't only contribute value to its clients. Its work helps position the Spanish biotechnology sector as a mature environment that is technologically advanced and scientifically solid. It helps turn local projects into international benchmarks, and to show that Spain not only does quality research, but is also a place for carrying out and validating cutting-edge science.

Our role goes beyond that of a service provider: we are the node connecting different parts of the system, helping consolidate an operating network that, over time, is strengthening the Spanish biotechnology sector's place in Europe. Because SMED doesn't only manage clinical trials: it builds bridges between innovation and patients, between national biotechnology and the European market. And that is perhaps its greatest contribution of all.



Branded Content

Gijs Jochems, General Manager,
Promega Biotech Ibérica



Promega Biotech Ibérica: 20 years driving innovation and talent in Spain

Promega Biotech Ibérica, a consolidated subsidiary in the Spanish biotech ecosystem. Over these two decades, we've accompanied sector growth with a firm commitment to innovation, talent and sustainability. Our activity connects science and society through pioneering technologies applied to health, the environment, education and the justice system.

Innovation for the medicine of the future

Promega is a global benchmark in bioluminescence technologies, used to study cell processes in real time. From Spain, we help position the country as a leader in early drug discovery by developing cutting-edge solutions like the new **GloMax® Galaxy**, an imager that allows users to view intracellular phenomena and study protein interactions without changing the cell physiology.

We also actively partner with industrial research centres in the European Openscreen network, supporting drug development, and are a member of the AseBio Drug Discovery workgroup. These public-private synergies are key to fostering applied research with a real impact.

Advances in forensic and clinical biotechnology

In the forensic arena, one of our latest milestones has been the development of a new **"stutter-free" polymerase** that can eliminate artefacts from DNA amplification that made it difficult to interpret genetic profiles. This innovation has been welcomed excitedly by the forensic community internationally.

Additionally, our **Maxwell®** platform, which is also celebrating its 20th anniversary, has become a fixed element in hospitals and clinical laboratories, where it automates nucleic acid extraction, boosting the efficiency of immunology, microbiology and pathological anatomy services.

Plus, we are introducing a new **PCR kit to detect Legionella** that can differentiate between living and dead microorganisms, which is critical in identifying outbreaks quickly and reliably.

Training, dissemination and connection with society

We believe biotechnology also has a duty to educate. So, we work closely with universities in guiding future biologists and biotechnologists, hosting training sessions and offering them work-experience opportunities.

Plus, we work with the **City Council of Alcobendas**, where our headquarters is located, to bring biotechnology into the local schools through popular science activities. This interaction with the local community reflects our desire to inspire kids to go into scientific careers from a very early age.

A dedicated team and a sustainable vision

Our commitment to sustainability goes beyond our products. We integrate good practices throughout our value chain, such as using reagents that don't require dry ice to reduce the environmental impact of transporting them. In line with the European competitiveness strategy, we believe sustainability and innovation must go hand-in-hand.

The latest satisfaction questionnaire conducted by an external consultancy in 2024 highlighted that our clients see Promega as a responsible company that is committed to science. They particularly value our technical support, innovation and sustainability, which are core pillars of our value proposition.

20 years growing with the Spanish biotechnology sector

This anniversary is a chance to look back and recognise what we've done. We've gone from a small sales office to a key stakeholder in the national biotech ecosystem. We play an active role in growing a sector that now makes up over 6% of national R&D investment.

In the words of our clients, employees and collaborators, Promega Biotech Ibérica is much more than a biotechnology solutions provider; we're a strategic partner committed to scientific advancement, talent training and people's wellbeing.

Over these 20 years, we've learned that the best way to innovate is together. We will continue working passionately in Spain for Europe, for a transformative, sustainable biotechnology that serves the people.



04. Business fabric

Introduction	Executive summary	05. Environment	06. Results
10-11	12-17	78-87	88-107
01. R&D investment	02. Funding	07. Collaboration and internationalisation	08. Impact
18-27	28-49	108-119	120-131
03. Talent and diversity	04. Business fabric	Who's who	Methodology
50-63	64-77	132-151	152-158

Business fabric

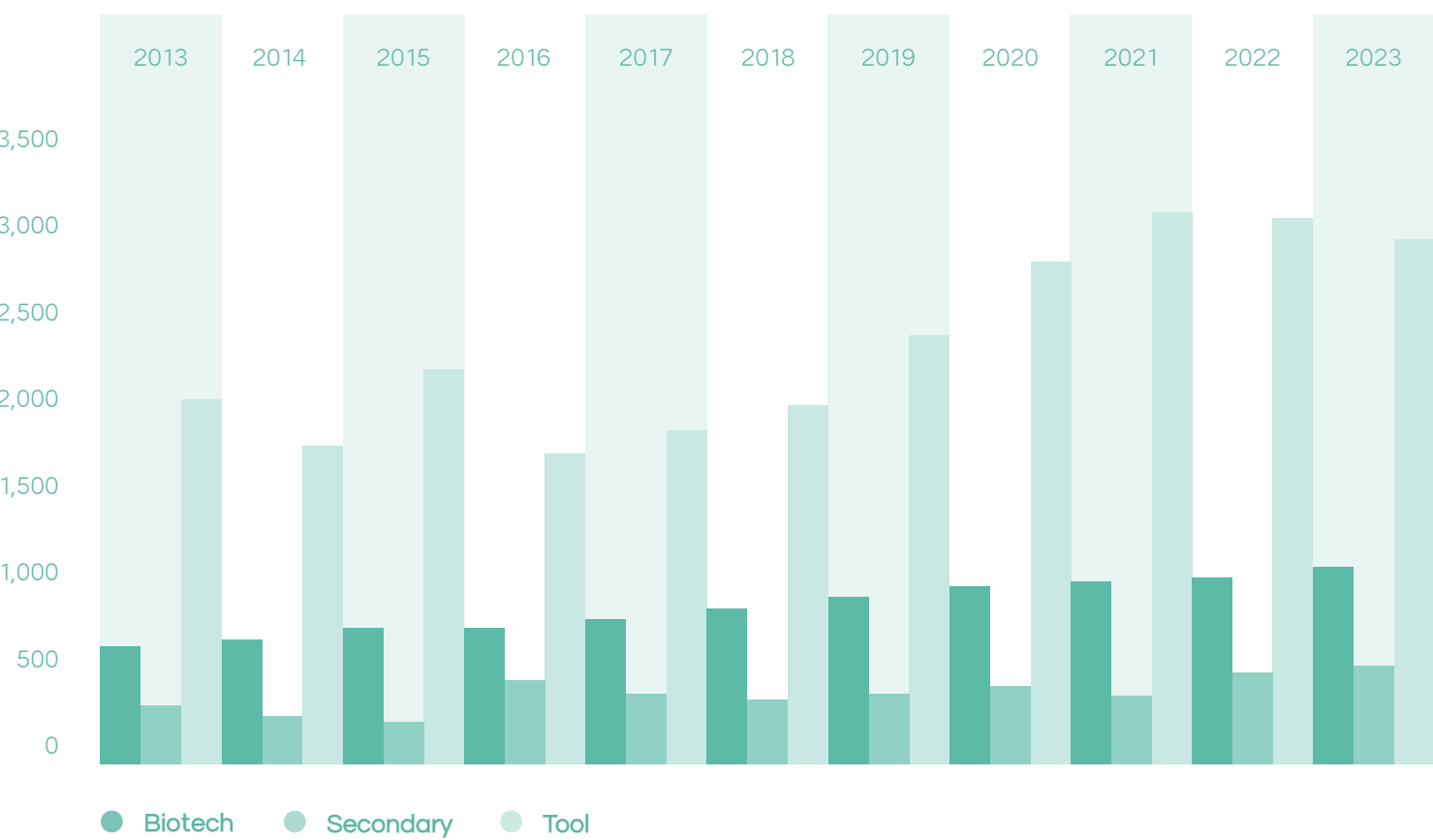
There are now more than 1,000 biotech companies in the sector.

The group of companies carrying out biotechnology activities shrunk slightly in 2023, to 4,411 firms. This led to a slightly lower ratio of biotechnology companies to total companies, down from 3 to 2.8 biotech firms per 1,000 companies.

However, biotech firms grew 4.1% and there are now more than 1,000, specifically 1,014. There are slightly more companies with biotechnology as a secondary activity, up 1.1% to 311, and companies that use it as a production tool dropped to 2,887.

Evolution of the number of biotechnology companies

Graph 4.1. Evolution of the number of biotechnology companies. Source: Compiled internally from Survey on Biotechnology Use, INE, and AseBio lists.

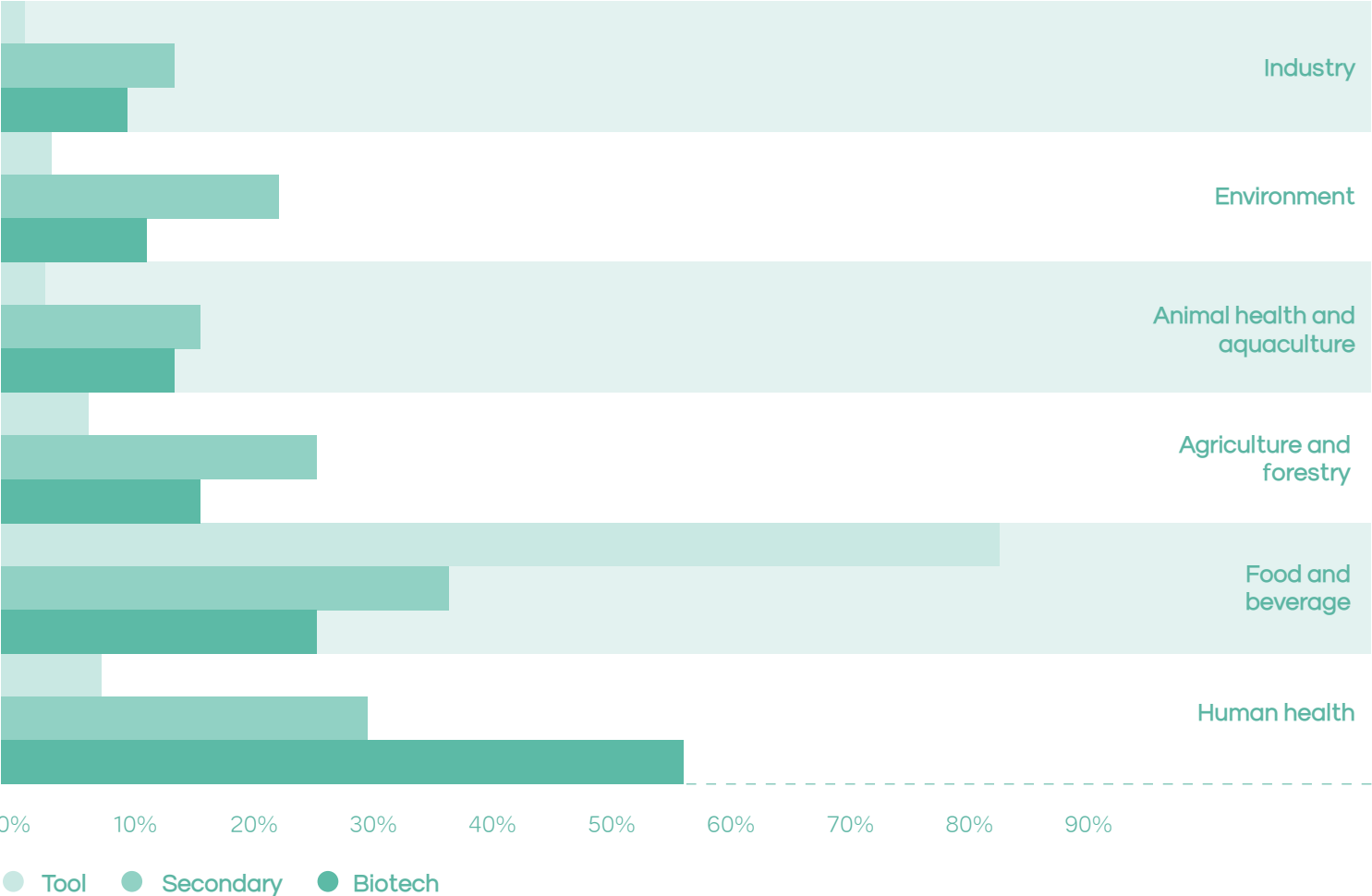


Human health and agrifood remain the main areas of activity for biotech firms.

Human health is still the main area of activity for biotech firms, with 58% of companies working in this area. This is followed by companies working in food, with 27%, and agriculture and forestry, with 17%. Animal health and aquaculture, with 15%, the environment with 12% and industry with 10% round out the list.

Of the companies with biotechnology as a secondary activity, 31% work in human health, 38% in food applications and 27% in agriculture and forestry production.

In the case of companies that use biotechnology as a tool, the breakdown varies widely. Of these companies, 84% work in food and 9% in human health.



Graph 4.2. Breakdown of biotechnology companies by area of application.
Source: INE. 2023 Survey on Biotechnology Use.

Catalonia, leader in biotech companies and average turnover.

In absolute numbers, Catalonia, Madrid and Andalusia still have the highest concentration of biotech firms, and 83% of total turnover. However, in 2023 the fastest growing areas in terms of business were Murcia, Navarra, Aragon and the Canary Islands, with growth in number of companies above 15%.

By number of companies, Catalonia remains at the top of the ranking with 24.56% of the total, followed by the Community of Madrid with 17.95%, Andalusia with

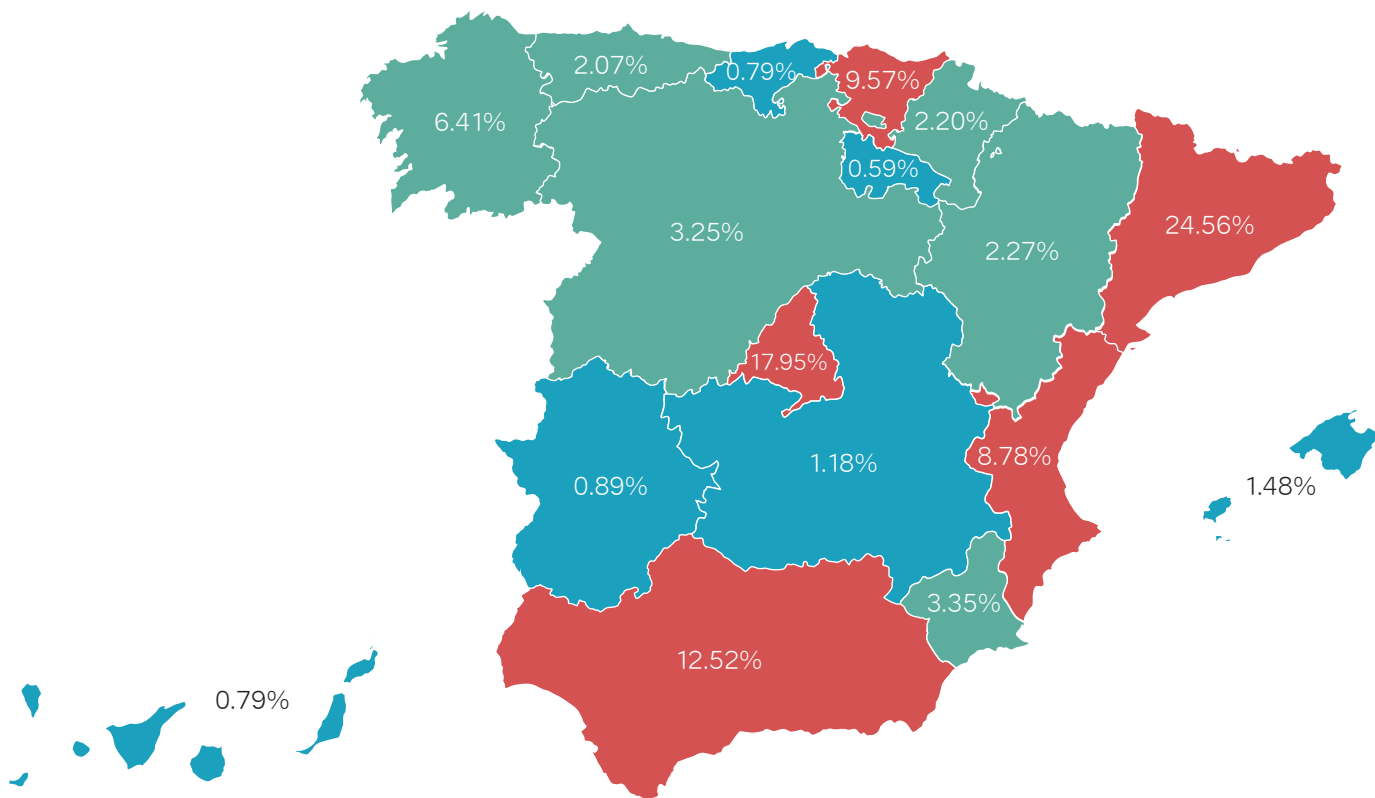
12.52%, the Basque Country with 9.57% and the Valencian Community with 8.78%.

In turnover, Catalonia is ranked first with 43.90%, followed by the Community of Madrid with 34.95%.

By percentage of the sector’s Gross Value Added (GVA) to the regional GDP, Catalonia also leads with 0.53%, followed by Cantabria with 0.39% and the Community of Madrid with 0.31%.

	Number of companies	% of Total	Average turnover (€ millions)	% of Total turnover	GVA in % of Regional total
Andalusia	127	12.52%	5.4	4.49%	0.09%
Aragon	23	2.27%	13.9	2.16%	0.16%
Asturias	21	2.07%	0.6	0.09%	0.02%
Balearic Islands	15	1.48%	0.9	0.09%	0.01%
Canary Islands	8	0.79%	0.6	0.03%	0.00%
Cantabria	8	0.79%	25.4	1.37%	0.39%
Castile and León	33	3.25%	10.3	2.22%	0.17%
Castile-La Mancha	12	1.18%	5.1	0.41%	0.03%
Catalonia	249	24.56%	26.8	43.90%	0.53%
Valencian Community	89	8.78%	4.7	2.73%	0.04%
Extremadura	9	0.89%	4.8	0.29%	0.10%
Galicia	65	6.41%	8.7	3.75%	0.12%
Madrid	182	17.95%	29.1	34.95%	0.31%
Murcia	34	3.35%	1.6	0.37%	0.05%
Navarra	36	3.55%	3.9	0.91%	0.28%
Basque Country	97	9.57%	3.4	2.20%	0.16%
La Rioja	6	0.59%	0.4	0.02%	0.01%
TOTAL	1,014	100%	14.9	100%	0.22%

Table 4.2. Territorial breakdown of biotech firms. Source: Compiled from the information on companies collected by AseBio. 2023.



Colour key:



Graph 4.3. Territorial breakdown of biotech firms. Source: Compiled internally from 2023 Survey on Biotechnology Use.

In 2024, 66 new biotech companies were set up.

At AseBio we constantly monitor the sector to identify new companies created that focus on biotechnology. In the past year, 66 new biotech firms were identified, making it a good year for the sector in Spain.

4 in Asturias, and 3 each in Valencia and Extremadura. Plus, Castile and León and Murcia each had 2 new companies and one new company each was identified in Castilla–La Mancha, Cantabria and Navarra.

Of these companies, 20 were set up in Catalonia, 11 in Andalusia, 7 in the Basque Country, 6 in Galicia, 5 in Madrid,

Company name	Autonomous community	Activity
225 Research Laboratory	Community of Madrid	Designing experimental vaccine prototypes for livestock diseases, such as African swine fever virus
7Talos	Catalonia	Efficacy, evaluation and manufacturing of CAR-T cell therapies
Algarikon	Murcia	Making substrate to grow edible mushrooms from algae and other organisms
Animal Genomics	Murcia	R&D and marketing of genetic tests and services for pet care and wellness
Advanthera	Community of Madrid	Support in preclinical and clinical development stages for advanced therapies, including advisory, quality control and supply chain
Arquea Biological Innovations	Asturias	R&D for diagnostic and food safety biotechnology products
Batea Oncology	Galicia	Developing innovative therapies for glioblastoma
Biocomputing Europe	Basque Country	Computational solutions for biology
Biodigital Tech	Galicia	Cancer research integrating genomics and AI for precision medicine
Bioedge Innovations	Andalusia	R&D in biomedicine for diagnostic methods applied to human health
Biofarm Fly	Extremadura	Production of sustainable foods and derivative products from insects
Bioinnovative Solutions	Basque Country	R&D for food additives
Bioremed Algae	Galicia	Producing active ingredients from algae for food, nutraceuticals and cosmetics
Biotasmart	Valencian Community	Analysis of the intestinal microbiota
Bubbl3s	Andalusia	Developing an air purifier and humidifier by exploiting the potential of microalgae
Caviro Food	Castile and León	Manufacturing functional ingredients in powder format from vegetables that would otherwise go to waste
CellFlow	Catalonia	Lab-on-a-chip technology for cell separation
Celonta Therapeutics	Basque Country	Smart drugs for oncological therapy based on toxin-antitoxin pairs

Company name

Autonomous community

Activity

Cyclope Bio	Asturias	R&D in biotechnology for drug development
Debios Dx	Catalonia	Non-invasive genitourinary diagnostic for unmet clinical needs
Diana Bioinformatic Solutions	Andalusia	R&D in bioinformatics solutions and products
Ecogranular Technologies	Community of Madrid	Technologies based on granular biomass to optimise water-purification processes
ELE Biotech	Community of Madrid	Developing innovative biomarkers for early diagnosis of neurodegenerative diseases
Enviromental Visibility Roadmap	Castile-La Mancha	Reusing waste for the industrial and agrifood sectors
Falon Labs Ingredients for Life	Andalusia	Natural encapsulation for precise delivery of active ingredients in the skin
Fecundis	Catalonia	R&D in sperm-improvement technologies, for fertility treatments
Finmanflies	Catalonia	Developing innovative food products from insects
Flexic	Catalonia	Manufacturing organic chips and flexible electronics components
Fourstrain Labs	Asturias	Manufacturing “dairy” proteins (β -Lactoglobulin and lactoferrin, mainly) using precision fermentation)
Gazella Biotech	Galicia	R&D in advanced therapies to treat metabolic diseases
Golden Gait Biotech	Basque Country	Therapy for falls and gait freezing associated with Parkinson’s disease
Helenis Biocosmetics	Valencian Community	R&D in biocosmetics and products for the microbiome
Insectius	Catalonia	Developing alternative protein sources from the black soldier fly
Intellicyst	Cantabria	R&D and marketing of an AI-based technological solution to improve diagnosis and treatment of Polycystic Ovary Syndrome (PCOS)
Invex Pharmatech	Extremadura	R&D and marketing of natural nutraceuticals to prevent and/or improve human and animal diseases
Iteria Biopharma	Galicia	New chemical entities (NCEs) to treat cancer with significant unmet medical needs

Company name	Autonomous community	Activity
Kalandria Biotech	Andalusia	R&D, marketing, distribution and export of agricultural processes
Lumiris Spectral Solutions	Catalonia	Analysis of the metabolic profile of embryos to support the in vitro fertilisation process
Nanodecal	Catalonia	New generation of fast diagnostic tests for precision respiratory medicine
Nature-inspired Innovation Technologies	Asturias	Designing methodologies applied to agriculture and developing products based on natural principles
Nema Health	Catalonia	R&D in personalised therapies to treat cancer in humans and other animal species
Neuropharmagen	Catalonia	Software for in vitro diagnostic device based on pharmacogenomics
Neuroprotect Life Sciences	Catalonia	Developing a protective treatment for neuro-developmental diseases
NoctuRNA Therapeutics	Catalonia	Designing circulating RNA to prevent the development of diseases
Nutrienic Biotechnology	Andalusia	R&D in the agriculture sector
Omnivorous Smartfood	Andalusia	Developing sweets from fruit and algae
Organdine Nature	Andalusia	Experimental research and development in biotechnology
Ovum SPF	Navarra	Producing SPF eggs (Specific Pathogen Free) as an essential substrate for manufacturing vaccines
Pack2Earth	Catalonia	Manufacturing resistant materials from plant and mineral materials for the packaging industry
Pectus respiratory health	Catalonia	Precision oncology for patients and pharmaceutical companies
Planet Biotech	Catalonia	R&D and marketing products for sustainable agriculture, designed to mitigate the effects of climate change
Polar NanoPharma	Catalonia	Developing a nanotechnology platform for oncology applications
Protforge	Valencian Community	Designing antibodies with AI
Remonda Bio	Andalusia	Reusing waste from oranges in biomaterials

Company name

Autonomous community

Activity

Revalora Biotech	Andalusia	Analysis and reuse of organic byproducts and waste from agriculture, livestock and food industries
Skinotek	Basque Country	Developing non-invasive diagnostic solutions using AI, detecting biomarker and data-based personalisation
Soluciones Dehesa Sana	Extremadura	Optimising formulations for culture media to manufacture postbiotic products
Taldeki Biosolutions	Basque Country	Personalised solutions for biomolecular recognition through hybrid technology
Tecnoalgae	Andalusia	Developing solutions based on microalgae
Tempos microscopy	Galicia	Cryo-electron microscopy (Cryo-EM) services
Tirecat	Catalonia	Medical polymers for chronic and deadly diseases
Vega Oncotargets	Castile and León	R&D of therapies to fight pancreatic cancer
VPM Insect	Catalonia	Developing new food sources from crickets
Xcure Surgical	Community of Madrid	Developing 3D-printed implants that encourage regeneration
Zaec Proyectos de IDI	Basque Country	Developing subproducts from agrifood waste, mainly from the wine industry
Zeneuroid	Catalonia	Bioengineering of iPSCs-derived complex neurosphere network models for cerebral diseases

Table 4.3. Companies devoted to biotechnology that began working in 2024. Source: AseBio, with collaboration from Andalucía TRADE - Agencia Empresarial para la Transformación y el Desarrollo Económico, Área de Innovación y Transferencia de Tecnología Instituto para la Competitividad Empresarial de Castilla y León, Axencia Galega de Innovación, CEEI Asturias, Bioasturias, Biocat, Bioga, BIOVAL, Knowledge Foundation Madri+d, Fundecyt - Science and Technology Park of Extremadura, Institute for the Promotion of the Region of Murcia, Oficina de Transparencia y Buen Gobierno de la Junta de Castilla La Mancha, Albacete Technology Park, Sodecan, SPRI, University of Castilla-La Mancha and Madrid Science Park.



Branded Content

Dr Iván Macía Oliver, head of Digital Health and Biomedical Technologies, Vicomtech

vicomtech

MEMBER OF BASQUE RESEARCH
& TECHNOLOGY ALLIANCE



Introduction: Towards a more resilient Europe

In a context of global transformation, Europe needs to be more competitive and resilient. Investing in health and biotechnology is a strategic tool to achieve this, and Spain is on the front lines thanks to innovations that are driving the transition from reactive medicine to **predictive, preventive, personalised, precision medicine**.

The intersection of health and biotechnology with data and artificial intelligence (AI) provides an important opportunity to transform the sector. The healthcare sector is going to become an industry with exponential growth of data. This is thanks, on the one hand, to the fact data is collected from various sources, such as clinical files, and, on the other, to advances in sensor (e.g. wearables) and diagnostic technologies (imaging, molecular, etc). The full potential of AI is still being developed, and its advance has mainly been limited by the difficulty of gaining access to clinical data and the lack of preparation or availability. One of the biggest exceptions has been in medical imaging, where AI is excellent, enabled by digitalisation and interoperability of imaging networks.

However, the true revolution is yet to come. The increase in information available from data generated by new technologies and digitalisation of healthcare systems is expected to be massive. New molecular diagnostic technologies promise to reveal disease mechanisms and personalise diagnostics, therapies and prevention strategies. Mass sequencing techniques and scientific advancement have revealed a complex molecular machinery involved in complex diseases (e.g. cardiometabolic, cancer, neurodegenerative), whose mechanisms could be discovered by integrating multiple layers of molecular information (omics) and/or imaging. Additionally, sensor technologies (e.g. wearables) have huge potential to measure and remotely monitor various health and lifestyle parameters precisely. On top of this, it is important to make the most of data from medical histories and hospital diagnostic systems.

AI, for its part, has made tremendous progress in these past years, going from models that can analyse and detect patterns in data, images or texts to integrating and processing massive amounts of data and exploiting it naturally and effectively. This revolution kicked off with large language models and has expanded to other multi-mode generative or agent-based models, which opens up many possibilities for diseases that need to integrate multiple sources of clinical and diagnostic information.

While the EU and therefore Spain aren't on the cutting edge in AI globally, the health and biotechnology sector offers very interesting possibilities enabled by key aspects such as mass data availability through healthcare systems, cutting-edge biomedical research, leadership in clinical trials and a series of companies already clearly committed to data and AI. At an increasingly incipient stage, companies, biohealth and university research or technology centres are leading this revolution by discovering biomarkers, disease mechanisms, new therapies, diagnostic devices, sensor platforms and predictive models, among others.

However, we can only take advantage of all these opportunities if the development framework is up to the challenge, which must be sustained on several pillars encompassing aspects such as funding for promising business initiatives or projects, attracting and retaining talent, facilitating access to quality data and suitable facilities, a less restrictive regulatory environment and agile mechanisms for effective development with competitive conditions and a firm commitment from institutions to support these initiatives as a key opportunity for Spanish competitiveness in this sector.



Branded Content

Nelson Fernandes, CEO, Certest Biotec



“Without innovation there will be no biotechnology”

“We know that, in science, there are concepts that can’t be taken separately. This is true of space and time, of energy and mass. So, when we came up with Certest as a biotechnology company, we knew right from the beginning: “Without innovation there will be no biotechnology,” explains Certest Biotec CEO Nelson Fernandes.

And although a lot has changed since then, the first being our more than 20 years in the business, this premise still stands. We remain committed to innovation, just like at the beginning, as can be seen in the fact that the company reinvests 15% of its annual turnover in R&D.

But let’s start our story from the beginning, in 2002, when Certest was established in Zaragoza through the hard work of two entrepreneurs, Carlos Genzor and Óscar Landeta, who started their work together developing and marketing a rapid test to detect *Helicobacter pylori*.

A few years later, Certest was able to offer clients innovative solutions in immunodiagnosics and PCR molecular diagnostics using its own biomaterials and covering the whole value chain for its products. Plus, its freeze-dried molecular diagnostics products are shelf stable for up to 24 months.

The philosophy of product diversification and noteworthy agility to cover market demands proved crucial in 2020 when the SARS-CoV-2 pandemic broke out, as it was one of the first companies in the world to respond to the needs of that time, and the first Spanish company to launch a rapid test and a PCR test to detect SARS-CoV-2. An exceptional situation in which the company made a firm commitment with notable investment to boost its production capacity, which increased six-fold, to produce 6 million PCR tests and 3.3 million rapid tests per month. A huge effort that has allowed Certest to now be developing innovative diagnostic solutions based on Next Generation Sequencing.

But Certest’s milestones don’t end here. In 2021, Certest Pharma was launched, a division focusing on developing technology for nucleic-acid therapeutics. Its noteworthy history has given it a comprehensive platform to develop these advanced therapies and positioned the company as a global leader in lipid nanoparticle delivery (LNP), with one of the largest libraries of shelf-stable ionisable lipids and formulations for target cells.

At this point, it is clear that Certest’s more than 20 years in the business haven’t been pure luck. It has taken a lot of hard work, commitment and perseverance. Talent and knowledge. Anticipating market needs and challenges. Establishing strategic partnerships with companies, universities and research institutes. A history, in short, that is characterised by its firm commitment to innovation. “We’re proud to be helping strengthen the biotechnology business fabric and drive Europe’s strategic autonomy,” highlights Nelson Fernandes.

But this is just another chapter in its history. The more than 300 professionals who now make up Certest are advancing every day at a good pace, sure that biotechnology can change the world. And there’s no doubt that they’re closer to doing so every day.



05. Environment

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- Political and regulatory environment
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Political and regulatory environment

2024 was a year of much regulatory activity, both in Europe and in Spain, bringing new initiatives and public policies that affect our sector. This section discusses the main changes in the public and legislative arenas this year, in order to facilitate analysis of the changing environment and how it may affect the sector's evolution.

Biotechnology is among the European Union's top priorities.

Events like the COVID-19 pandemic, the war in Ukraine and the challenges of climate change, among others, have highlighted a series of strategic dependencies that affect Europe. Proof of this fact and its impact on society and the economy at certain critical moments have spurred the European Union to make autonomy one of its main goals, and they have pointed out biotechnology as a strategic technology.

While Spain held the presidency of the European Union, Resilient EU2030 was launched, a proposed roadmap to strengthen the European Union's open strategic autonomy. This document **identified biotechnology as a key technology** for the EU's strategic autonomy in areas such as agrifood, health and the green transition.

In the same line, **the European Commission has recognised biotechnology on its new Strategic Agenda for 2024-2029 as a key sector for the future of the European Commission** and it is considered one of the critical, transcendental technologies for the future of Europe, as the European Commission notes in its recommendations.

Published in March 2024, the Commission's communication "Building the future with nature: Boosting Biotechnology

and Biomanufacturing in the EU" (COM(2024) 137 final) **identifies the following challenges facing the biotechnology and biomanufacturing sector in the EU:** research and technology transfer to market, regulatory complexity, access to funding, qualifications, hurdles in the value chain, intellectual property, public acceptance and financial security. The document proposes a series of actions to drive biotechnology and biomanufacturing aimed at rationalising EU laws and their application to keep fragmentation to a minimum, explore simplification and shorten the time it takes biotechnology innovation to hit the market.

In April 2024, the European Commission published STEP - **Strategic Technologies for Europe Platform** (Regulation (EU) 2024/795), which aims to support the development and manufacturing of critical technologies, protecting and strengthening the corresponding supply chains. This regulation identifies **biotechnology as one of those critical technologies**.

2024 was the year the Draghi report was published, which not only called for reinforcing Europe's competitiveness by promoting R&D, but also identified the pharmaceutical sector as one of the 10 key sectors for Europe and set the



goal of maintaining and expanding the European Union's capacity to develop R&D, with particular attention to bio-based products, orphan products and advanced therapy medicinal products.

The Report reached a conclusion that AseBio shares, warning that **public investment in R&D in the EU is lower and more fragmented than countries** such as the United States and, increasingly, China. It also warned that our **regulatory framework for medications is slow and complex, on top of the complex roll-out of the European Health Data Space (EHDS).**

Plus, the report **Much more than a market**, by Enrico Letta, provides a strategic view for **revitalising the European single market and strengthening the EU's global position.** This report proposes, among other measures, creating specialised segments in capital markets for small and mid-cap companies, adapted to their specific traits, as well as creating an EU stock market for deep tech companies with specific rules suited to this type of business.

A challenging regulatory environment.

At the same time as these analyses, roadmaps and specific regulations aimed at promoting biotechnology development, the European Union has continued promoting a fledgling yet ambitious agenda of laws and strategic initiatives, that will be set down in new regulations and instruments over the coming months and years.

One of the new strategies that will have a direct impact on the biotechnology sector is the Life **Sciences Strategy**, which aims to strengthen research and innovation in the life sciences in Europe and promote innovation that contributes to Europe's ecological and digital transformations, while also ensuring the safety and widespread use of technologies. By doing so, the European Commission hopes to make Europe more competitive and help promote progress in areas like healthcare, agriculture, power, food and biotechnology.

Plus, the European Commission has launched a public consultation regarding the upcoming **Bioeconomy Strategy** that aims to support European companies and drive progress towards the EU's goals regarding the environment, climate and competitiveness.

It must also be noted that the **EU Start-up and Scale-up Strategy** aims to close the gap between innovation in Europe and competing regions around the world, as well as boosting competitiveness. It aims to foster a favourable environment for innovation that streamlines and eases growth and expansion for innovative European start-ups in the Single Market. It intends to tackle the difficulties facing European start-ups and scale-ups in accessing the capital, markets, services, facilities and talent they need to prosper in Europe and compete on a global level.

In early 2025, the European Commission introduced a roadmap for a prosperous agriculture and agrifood sector in the EU, called the **Vision for Agriculture and Food**, which aims to make the agrifood sector more competitive and

attractive. The vision comprises several priority arenas, simplifying EU regulations, research, innovation and digitalisation as transversal focal points.

2024 was also a prolific year in terms of the European legislative agenda. In April 2023, the European Commission adopted a draft **new Pharmaceutical Directive and Regulation** that will review and replace, once passed, the current general pharmaceutical legislation. One year later, on 10 April 2024, the European Parliament adopted its position on this legislative package. The European Council is currently negotiating it and it is expected to adopt a position some time in 2025 and then move on to the trilogues. Reviewing this regulation aims to ensure that all patients in the EU have suitable, equitable access to safe, effective, affordable medicines, to improve supply safety and to guarantee that patients have access to drugs, regardless of where they live in the EU, while continuing to provide an attractive, innovation-friendly environment for research, development and production of medicines in Europe, making drugs more sustainable from an environmental standpoint and dealing with antimicrobial resistance and pharmaceutical drugs in the environment, through a One Health approach.

In July 2024, the European Commission included the commitment to bring forth a new European Law on Biotechnology or **Biotech Act** in its policy plan for the 2024-2029 term. This future regulation mainly aims to make the EU biotechnology sector larger and more competitive, while maintaining high safety standards. To do so, five key areas will be assessed. The first is reducing the time it takes biotechnology solutions to hit the market with simpler, more streamlined regulatory frameworks. The second focuses on improving access to venture capital at all stages of the lifecycle for biotech companies. The third aims to encourage clusters of excellence in biotechnology and attract investment, helping make the sector more scalable. The fourth works to bolster the talent, skills, attractiveness and retention through entrepreneurship and reorientation programmes. And finally, the fifth hopes to expand access to and storage of data and integrate artificial intelligence tools to accelerate innovation and safe use of biotechnology. The legislative process for the regulation will continue in 2025 with public consultations, participation from the European Parliament, European Commission and Member States, and is expected to be adopted in late 2026.

In 2024, the European Commission created the Critical Medicines Alliance (CMA) in response to the lack of some drugs and the need for greater strategic autonomy in the pharmaceutical sector. This partnership, which AseBio joined, has more than 250 members, including ministries, governmental agencies, industry and key stakeholders. In February 2025, the CMA published its first strategic report, which provided specific recommendations for strengthening production of critical medicines in the EU and guaranteeing strategic associations with non-EU countries. The report laid the groundwork for the **Critical Medicines Act**. In March 2025, the European Commission approved the project for the new Critical Medicines Act, which aims to boost supply security and the availability of critical medicines in the

EU, as well as improving availability and accessibility of other drugs when the market can't guarantee sufficient access and availability. The regulation will apply to critical medicines and drugs of common interest (including innovative products), as well as their active ingredients and key components. At the time of publication, the European Commission was collecting comments on the proposed text to send them on to the European Parliament and Council for debate.

In July 2023, the European Commission presented a new proposal for a Regulation on vegetables obtained from **new genomic techniques (NGT)** and human and animal food made from them. In February 2024, the European Parliament adopted its position, after passing the ENVI Committee Report. However, it took quite a long time before an agreement was reached by all Member States, and it wasn't until March 2025 that representatives of the Member States endorsed the Council's negotiations on the Regulation, which is a step forward towards approval of products obtained using NGT.

Finally, in March 2025, the **European Health Data Space Regulation (EHDS)** went into effect, seeking to establish a common framework for using and exchanging electronic health data throughout the EU. By March 2027, the European Commission should have established the technical and operational requirements, as well as designating key stakeholders for applying them. In 2029, effective implementation of the key dispositions will begin, in 2031 the scope of the regulation will be expanded to include new types and categories of data, and from 2034 third countries and international institutions will be able to request access to the European Health Data Space. In Spain, the Regulation will apply two years after it goes into effect.

New strategic initiatives and laws in Spain.

On a national level, 2024 was also a year of intense work on new strategic initiatives and laws.

In late 2024, the **Strategy for the Pharmaceutical Industry 2024-2028** was published, aiming to strengthen the sector's industry to ensure access to quality medicines, fostering innovation and ensuring the system's sustainability. The main employers' associations in the pharmaceutical industry were involved in drafting it, including AseBio, AESEG, AELMHU, AFAQUIM, ANEFP, BioSim and Farmaindustria. Under the framework of this strategy, a Joint Committee of Ministers and Industry was established as the governing structure for the Strategy, which AseBio is a member of. Plus, the committee has allowed for dialogue and negotiations on rolling out the strategy.

The strategy provides a framework based on three key focal points:

1. Patient access, covering unmet medical needs and national healthcare system sustainability.
2. Fostering research, innovation and development.
3. Competitiveness, resilience and eco-sustainability of the industrial ecosystem and its supply chains.

The framework will be rolled out over the coming years through initiatives and laws, as well as policies and instruments that are expected to help develop and grow the biotechnology sector.

It is worth noting that work has advanced in 2024 to reform and modernise laws that affect medications and healthcare products. In this regard, below is an analysis of the state of affairs at the time of publishing this Report.

First of all, progress was made in drafting the Royal Decree on [Healthcare Technology Assessment](#) to regulate assessment of healthcare technologies, which include medicines, medical procedures, healthcare products, in vitro diagnostic tests and other health-related technologies. The RD aims to provide an independent, transparent, participative system for healthcare technology assessment (HTA) based on scientific evidence that compares its efficacy and efficiency to other alternatives. This system must be in line with Regulation (EU) 2021/2282 on Healthcare Technology Assessment, as well as developing additional aspects to ensure clear governance, lay out the role of each administration in the process and connect assessment with decision-making in the National Health System. It also seeks to reduce the administrative load for developers, encourage early dialogue on new technologies and open up the process to more stakeholders. The draft RD was released for public information and comments in August and September 2024. After reviewing some of the appeals and reports, such as the CNMC report requested by the Ministry of Health, at the time of publishing this report the text was still pending approval from the Council of Ministers and, according to the Annual Policy Plan 2025, should be passed in 2025.

Additionally, in December 2024 and January 2025, the Ministry of Health released the draft [Royal Decree regulating drug reimbursement and pricing](#) for public consultation. This RD will seek to regulate several key aspects of pharmaceutical provisions by the National

Health System, including inclusion and exclusion of medicines, special reimbursement conditions, pricing and review, as well as reimbursement in special situations. It will also develop mechanisms for informing supply and tracking spending on medicines in the national healthcare system. At the time of publishing this report, the preliminary version was being drafted to then be released for public information and comments. As with the RD on Pricing and Reimbursement, the Annual Policy Plan 2025 expects it to be passed in 2025.

The new [Law on Medicines and Medical Devices](#) seeks to speed up the incorporation of innovative medicines, making the system more sustainable and boosting strategic autonomy after lessons learned during the pandemic. After the public information and comments period, in April and May 2025, the text must be approved by the Council of Ministers to then be sent to the Deputies to begin ordinary legislative procedure.

Additionally, in late 2024, the Council of Ministers approved the [Law on Industry and Strategic Autonomy](#) that aims to promote a new industrial strategy for increasing the importance of industry in the Spanish economy, making it more competitive and resilient. At the time this report was published, the Law was still moving through the parliament and we hope its roll-out will help further recognition for biotechnology as a strategic industrial sector for the country.

Undoubtedly, all these regulations will impact the biotechnology industry, establishing a new framework for action among biotechnology companies in our country for the next generation.

- Political and regulatory environment
- How the biotechnology sector sees its work environment

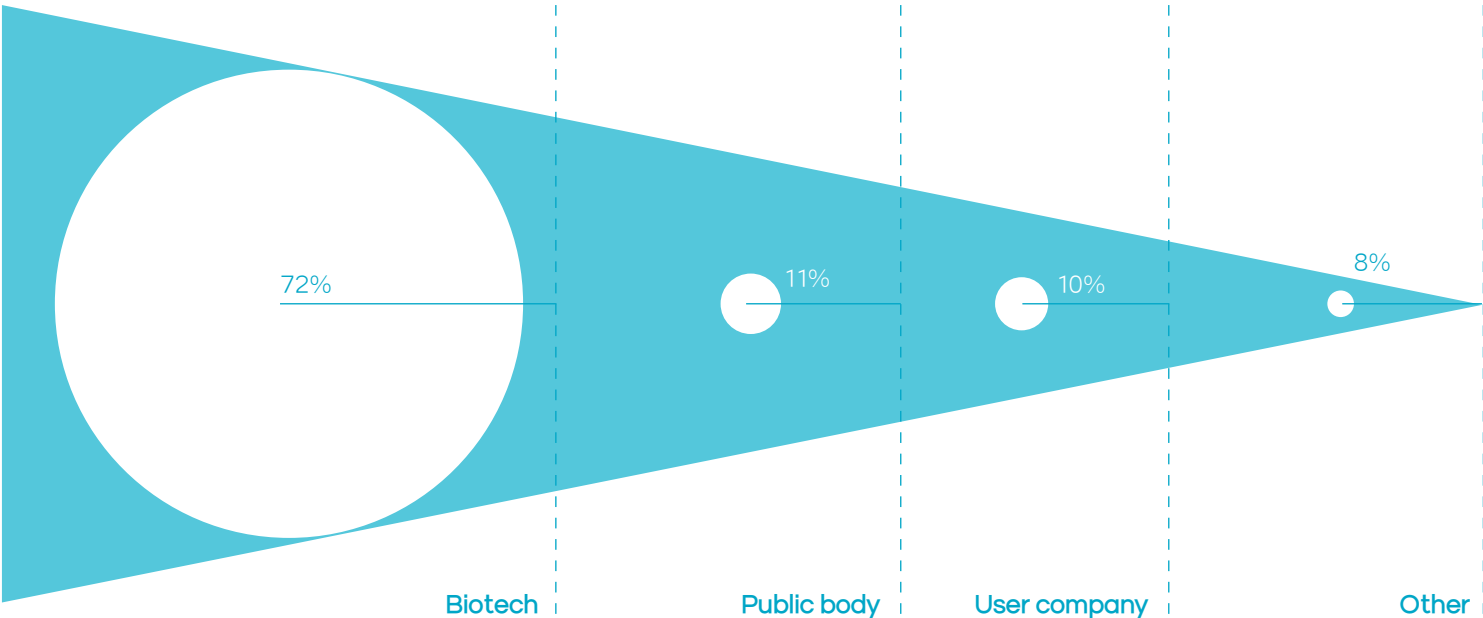
How the biotechnology sector sees its work environment

This section looks at how AseBio members perceive the evolution of the biotechnology sector based on their opinions on a series of factors.

This year’s survey had 93 participants, 72% were biotechnology companies, followed by organisations in the public sphere (10%), companies that use biotechnology (11%) and finally other sorts of organisations (8%), such as private

capital fund managers and private research centres and institutes.

Table 5.1 shows the results of the survey rating 21 factors on the environment. A rating of 1 or 2 is very negative or negative and a 3 or 4 is positive or very positive.



Graph 5.1. Breakdown of participants in the Perception of environment survey by type of organisation. Source: AseBio. 2024.

The most highly rated factor is employee training level.

Employee training level was ranked first among all the factors. Those surveyed rate their employees’ training very highly, as well as the availability of qualified personnel. Since 2000, the latter has been 1.5 points above the average for all the factors rated. Plus, despite having dropped 3 places since 2023, public opinion of biotechnology is still a positive factor, in fourth.

As table 5.1 shows, the factors with a score over 2.5 are rated positively. Along with employee training level and

qualified personnel, the most noteworthy factors are cooperation with universities/IPOs and technology centres, public opinion, number of bioentrepreneurs, creation of national companies and specialised facilities. However, the lowest rated factors include the economic situation, regulatory framework, access to funding, support from the public administration and the cost of innovation.

Factors	2024	2023	Average 2000-2024	% Variation 2023-2024
Employee training level	3.250	3.092	3.802	5%
Qualified personnel	3.239	3.031	2.229	7%
Cooperation with universities/IPOs and technology centres	3.132	3.175	2.326	-1%
Public opinion of biotechnology	3.129	3.231	2.359	-3%
Number of bioentrepreneurs	3.088	3.177	2.382	-3%
Creation of new companies in Spain	3.022	3.095	2.801	-2%
Specialised facilities (technology centres, auxiliary services centres, etc.)	2.956	2.953	2.271	0%
Internationalisation process	2.922	3.016	1.564	-3%
Specialised suppliers (consultants, lawyers, etc.)	2.913	2.952	2.283	-1%
Demand for more sophisticated products with higher value added	2.891	3.127	3.275	-8%
Increase in average size of biotechnology companies	2.890	2.952	2.726	-2%
Information on the biotechnology market	2.839	2.862	2.323	-1%
Mergers/acquisitions/strategic partnerships	2.841	2.855	2.872	0%
Attracting international companies	2.747	2.857	2.772	-4%
Market-orientated nature of the public technology offering	2.689	2.813	2.399	-4%
Time to profitability	2.276	2.267	2.196	0%
Cost of innovation	2.213	2.270	2.195	-2%
Public administration	2.185	2.254	1.056	-3%
Access to funding	2.130	2.266	1.300	-6%
Regulatory framework	2.120	2.109	0.677	0%
Economic situation	2.098	1.984	2.199	6%

Table 5.1. Rating for factors, average and % change from previous year.
Source: AseBio. 2024.

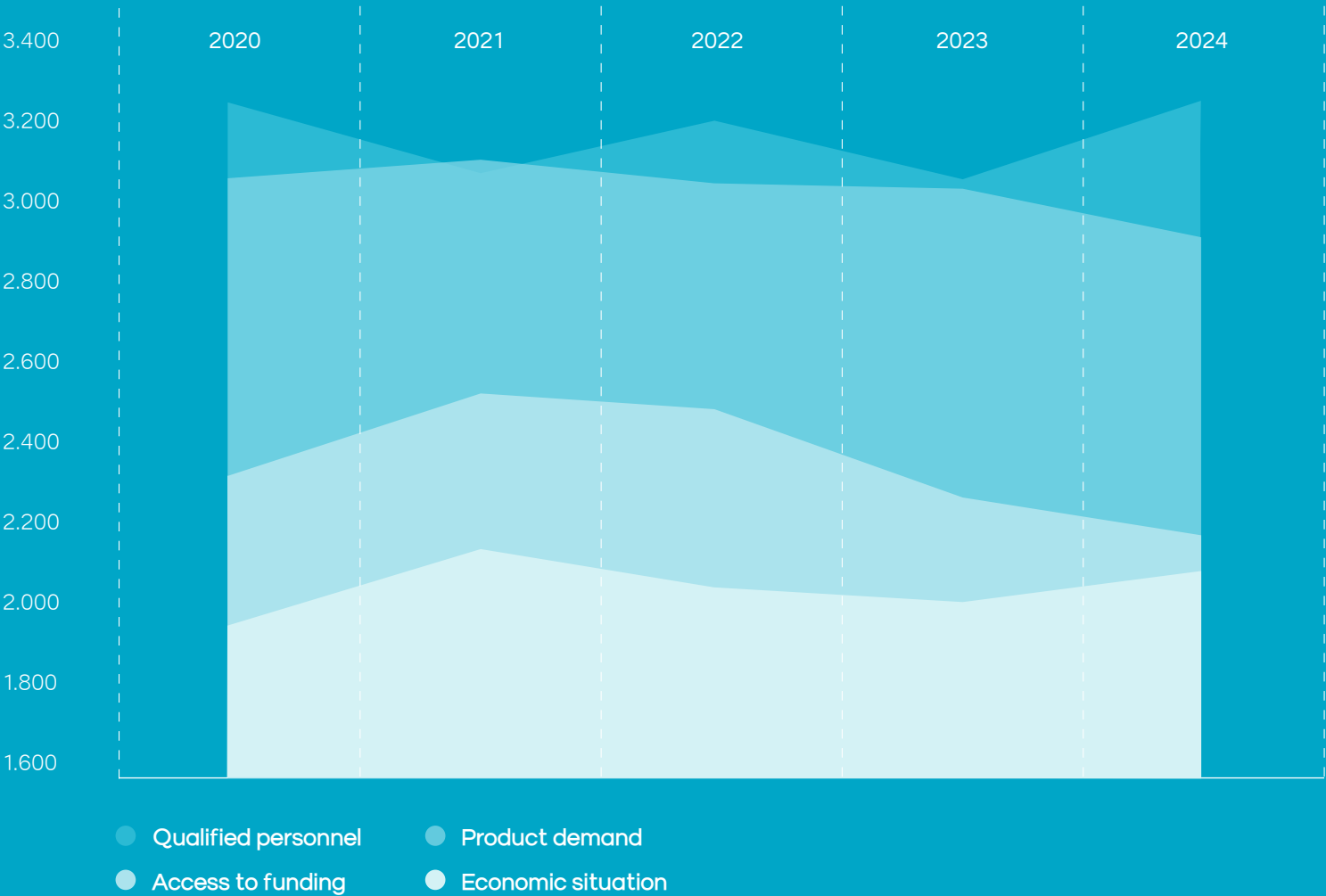
The sector’s view of demand for more sophisticated products with higher value added has dropped.

Graph 5.2 shows the evolution of the factors that saw the biggest change from the previous year. The factor with the largest variation is the demand for more sophisticated products with higher value added, which dropped 8% from the previous year. Nevertheless, this factor is still rated positively and is one of the most highly rated looking at the history of the data.

Plus, the marks for the economic situation rose 6% from 2023, although it is still the worst rated factor for

development of biotechnology companies. Access to funding also dropped 6% from the previous year.

Another factor that saw a big change, but in this case positive, was employees’ level of training, up 7% from 2023, making it second.



Graph 5.2. Evolution of economic situation, qualified personnel, product demand and access to funding factors. 2020-2024. Source: AseBio.



Branded Content

Cristina Nadal Sanmartín, Executive
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Spain



The biotech sector and bioindustry: key to strategic Spanish autonomy

Global events in recent years, from the COVID-19 pandemic to the current tariff wars, have shown that Europe and Spain have to tackle unresolved competitiveness and innovation issues, such as the need to be prepared for future crises, and not just in health. In this context, the European Union has promoted something it calls Open Strategic Autonomy, which aims to make us less dependent, ensuring internal industrial capacities in the European market.

This concept is the basis of legislative proposals such as the European Critical Medicines Act and the future Biotech Act, which aim to strengthen the supply chain and facilitate innovation's production and arrival to market, respectively. This is, undoubtedly, a good example of regulators recognising the biotechnology sector as a key pillar for strategic autonomy, able to guarantee prosperity, and that European citizens have fast, suitable, equitable access to innovative therapies and treatments, improving wellbeing, quality of life and public health throughout the continent.

Policies that foster competitiveness must allow biotechnology companies to grow in global markets, ensuring incentives for investment, innovation and exports, assuming the new geopolitical and strategic framework, and considering the specific needs of our sector. This involved rolling out mechanisms needed to boost the transfer of knowledge from research centres to innovative biotechnology production, ensuring Europe is self-sufficient in areas like health, agrifood and biosecurity. It will also create streamlined public and private funding mechanisms to boost productivity and encourage development and implementation of innovations.

Plus, it requires a clear timetable and effective coordination among all relevant European policies: industrial policy, skills policy and trade policy, biotechnology and pharmaceutical sector policies, and climate change initiatives.

In line with the European framework, the Spanish government has passed a draft Law on Industry and Strategic Autonomy to strengthen the industrial sector, make it more competitive and resilient, attract strategic investment and ensure its growth. The law includes the creation of RECAPI (Strategic Reserve of essential and strategic resources based on Industrial Capabilities), which will guarantee supply in crises, as well as boosting sectors with high value added, such as the pharmaceutical and biotechnology sectors.

Ensuring strategic autonomy requires a solid, competitive biopharmaceutical and biotechnology industry, which is key to the economy, security and social wellbeing. With a One Health approach, this includes not only human health but also animal health and food safety. Spain can and must reduce its external dependence, strengthening its industrial capacities, integrating a One Health approach in all strategies, including the PROFARMA Plan.

This One Health approach involves adopting a broader, more global definition of medicines and vaccines, including human and animal health, in line with the European directives on critical medicines. Additionally, increased production in Spain would have a positive impact on the balance of trade, which according to the Profarma 2021-2022 Report has historically been negative.

In this sense, our manufacturing plant in Salamanca is an example of bioindustrial production of critical veterinary medicines, which ensure food safety and animal wellbeing, reinforce control over the livestock supply chain, reduce dependence on imports and contribute to society's health and wellbeing.

Plus, the Salamanca plant is one of our great strategic commitments to R&D in animal health, both inside and out of the European Union, where we invest in technologies like SPHEREON®, improving our productivity and the environmental impact of our production. We believe this is a clear example of the positive impact biotechnology innovation has on human, animal and environmental health, while also promoting the development of Spain's industrial capabilities.



06. Results

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Results

In this section, we sum up the main indicators of results in the biotechnology sector, in terms of knowledge generation (production and quality of scientific publications), technological innovation (patents), companies' research advances (advances in studies, regulatory authorisations or expanded capacities), products and services launched to market, and finally, licensing deals.



- Production of scientific knowledge
- Technological innovation
- Advances in development
- Product launches

Production of scientific knowledge

Spanish biotechnology makes up 2.49% of global production in this area and is cited 20% more than the global average.

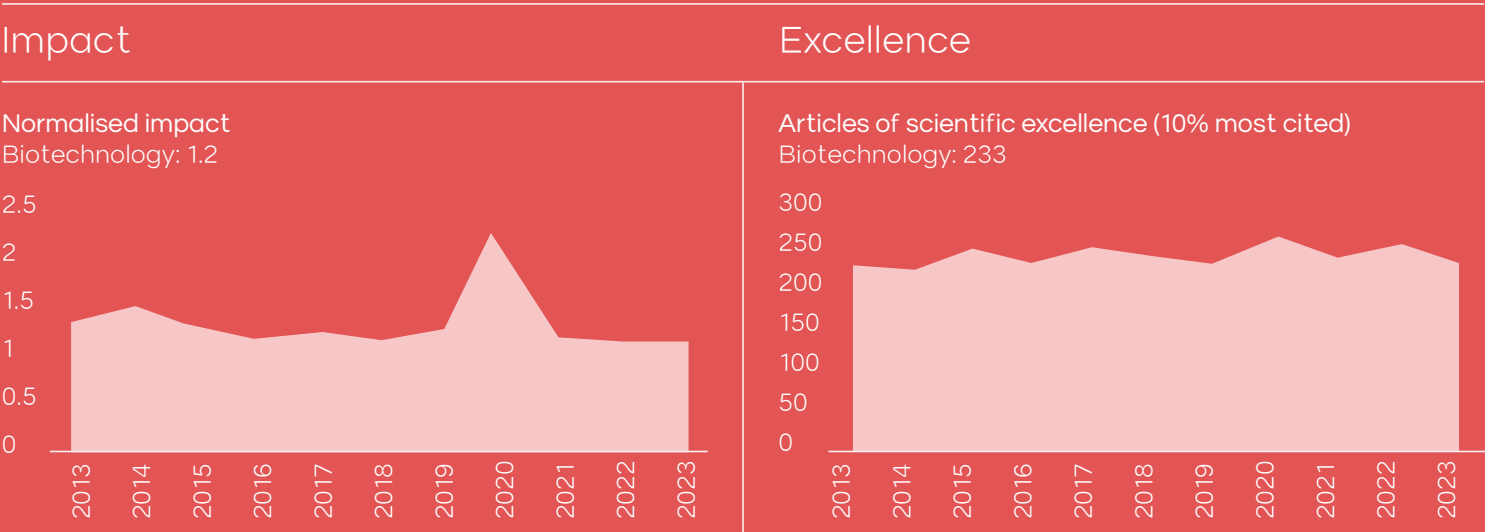
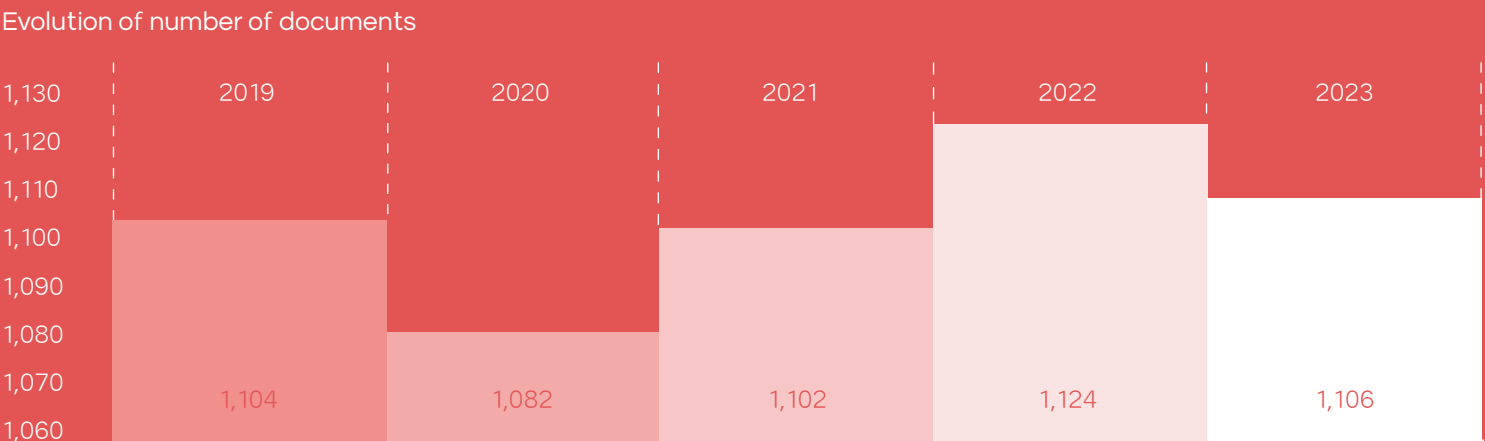
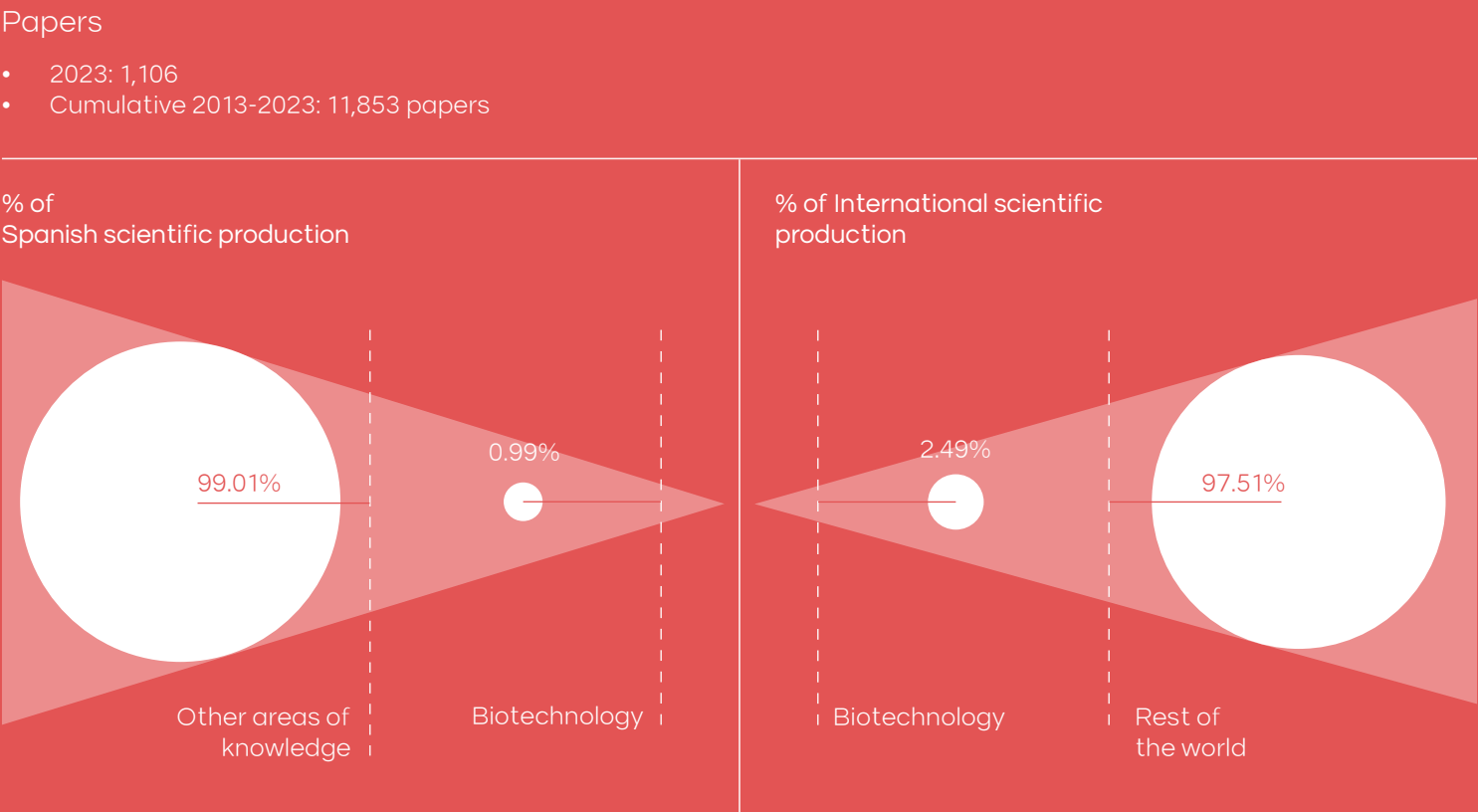
In 2023, scientific production in biotechnology made up 1% of all scientific production in Spain, with 1,106 papers, and 2.49% of global scientific production in this area (graph 6.1).

The normalised impact of biotechnology scientific production in Spain was 1.2 in 2023. This means that it is cited 20% more than the global average in this area.

The quality of research in biotechnology can be judged by observing the number of documents published in high-impact journals. In 2023, of the 1,106 scientific papers produced by Spanish institutions in biotechnology, 719 were published in journals ranked in the first quartile (Q1) by

impact factor, 65.7%. This is four points above the Spanish average.

Another way to measure the quality of research in biotechnology is to look at the number of excellent publications, those among the top 10% most cited in the world in this area. Spain produced 233 documents of excellence in biotechnology in 2023, 21.1% of all papers published in this area. This percentage of excellence in biotechnology is well above the Spanish average for all scientific areas (12.8%).



Spanish scientific production: 1.2

Cumulative biotechnology (2013-2023): 2,574
% of Spanish biotechnology production (2023): 21.2% (12.8% Spanish average)

Spain remains ninth on the global ranking by number of papers in biotechnology.

Spain remains ranked ninth in the world in number of papers in biotechnology. China and the United States still have the highest production in terms of number of documents in this area.

In terms of biotechnology as a percentage of all scientific production in the country, Spain is ranked sixth with 1.13%. In this case, South Korea and India lead the ranking.

Judging the quality of the research, if we look at the number of publications in high-impact journals, Spain is ranked fifth with 63.1%.

The United States and United Kingdom lead this ranking. Analysing publications of excellence, Spain is fourth with 21.7% of publications in the area, with the United Kingdom and the United States at the head of the ranking again. Finally, looking at normalised impact, Spain is also fourth (1.39), tied with France, and the ranking is once again led by the United Kingdom and United States.

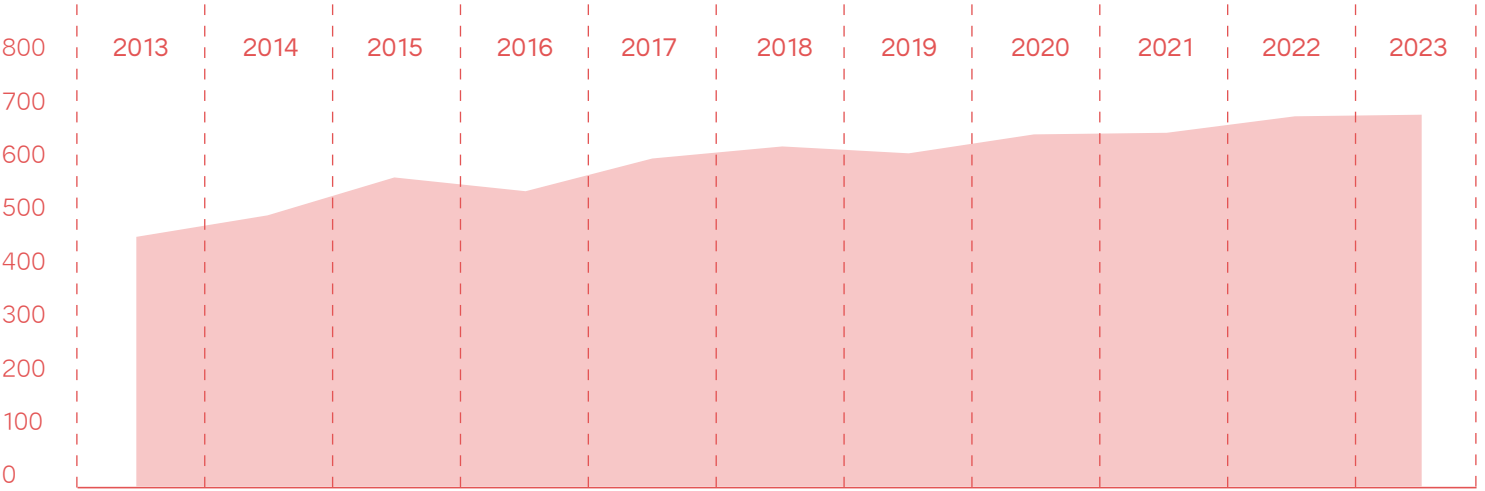
Country	Number of documents	Number of documents in biotechnology	Scientific production in biotechnology as a percentage of total scientific production (%)	Normalised impact of biotechnology	Scientific production in biotechnology in high-impact journals (Q1) (%)	Scientific production in biotechnology of excellence (%)	Scientific production in biotechnology as part of international collaboration (%)
China	7,467,325	116,638	1.56%	1.28	51.9%	22.5%	22.1%
United States	6,661,010	68,084	1.02%	1.54	67.2%	23.3%	45.2%
India	1,943,389	39,531	2.03%	0.78	19.9%	12.8%	17.6%
Germany	1,876,824	22,218	1.18%	1.41	62.8%	19.9%	53.9%
South Korea	955,044	21,890	2.29%	1.02	40.3%	15.7%	26.9%
Japan	1,410,923	18,614	1.32%	0.9	39.5%	9.8%	32.6%
United Kingdom	2,028,240	18,116	0.89%	1.54	66.2%	24.1%	67.8%
Italy	1,276,898	12,435	0.97%	1.35	53.7%	21.0%	50.0%
Spain	1,051,461	11,851	1.13%	1.39	63.1%	21.7%	55.9%
France	1,240,006	11,152	0.90%	1.39	65.0%	19.5%	63.8%

Table 6.1. Top 10 countries in scientific production in biotechnology. 2013-2023. Source: FECYT.

More than 60% of scientific production in biotechnology is done as part of an international collaboration.

International collaboration in Spanish scientific production in biotechnology has grown steadily in recent years. The percentage of documents in this area co-authored by Spanish and foreign institutions made up 62.3% of the total in 2023, with 689 documents. The percentage of Spanish

scientific production in biotechnology published as part of an international collaboration was above the Spanish average of 50.8% in 2023 (11 points above the national average).



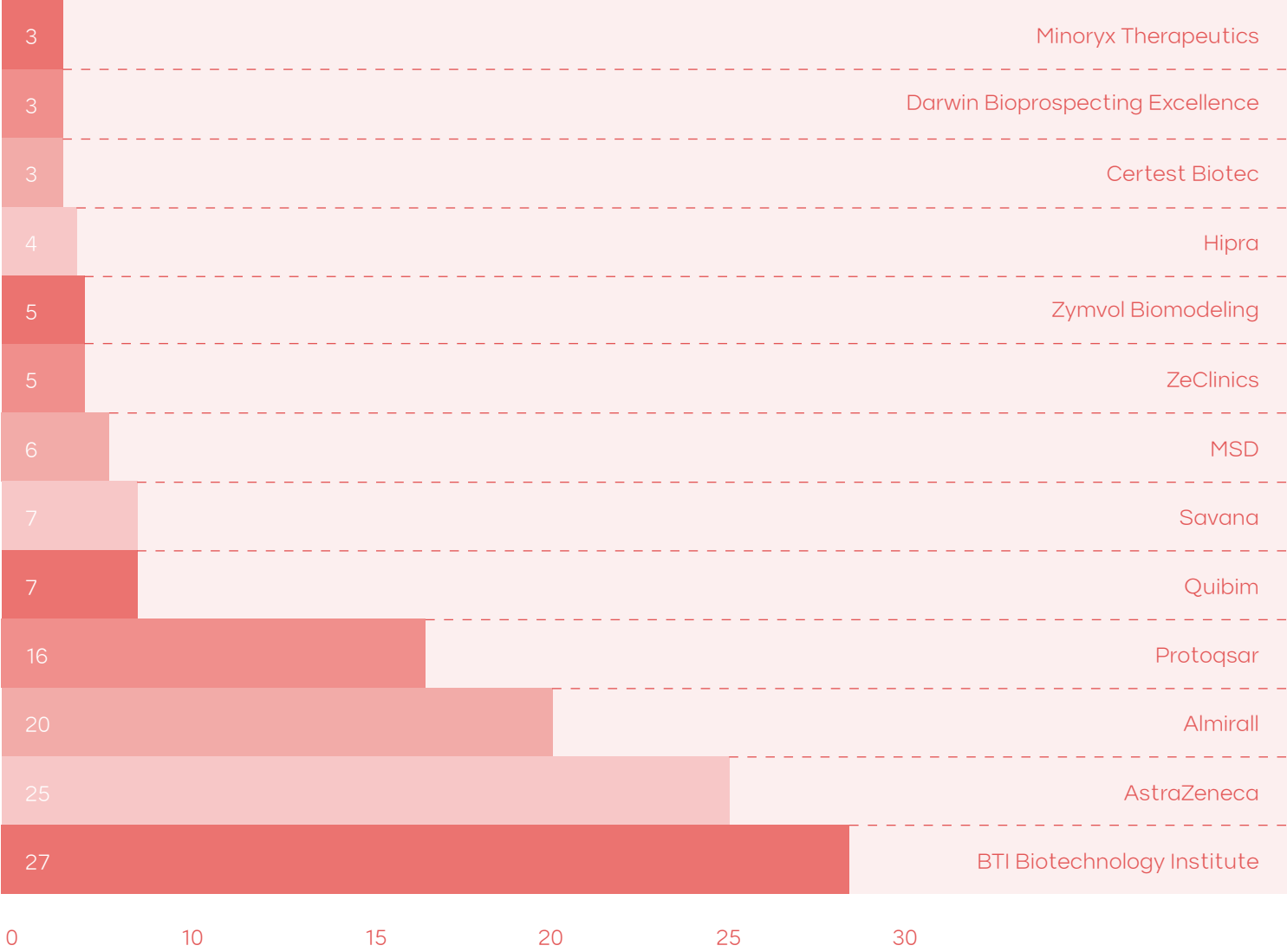
Graph 6.2. Evolution of co-authored papers (2013-2023). Source: FECYT.

AseBio members continue contributing to science with more than 160 papers in biotechnology.

Every year, AseBio surveys its members, both Spanish companies and multinational corporations with offices in Spain, on their publications in high-impact science journals.

In 2024, these companies published 161 papers, which was 42 fewer than in 2023, down 26%. Among the companies with the most publications (graph 6.3), we find BTI Biotechnology Institute first with 27, AstraZeneca with 25, Almirall with 20, ProtoQSAR with 16, Quibim and Savana Med with 7 each and Merck Sharp & Dohme with 6.

Additionally, although not included in this ranking, the publications by other AseBio members are worth noting: PTS Granada with 380, IQS with 34, Tecnalia with 18, AINIA and the Spanish Bank of Algae with 5 each. Plus, Leitat published 2 papers, Fundación MEDINA 1 and IIL La Fe, more than 1,000.



Graph 6.3. Number of biotechnology papers published in 2024 by AseBio member companies. Source: AseBio.

- ☐ Production of scientific knowledge
- ☒ Technological innovation
- ☐ Advances in development
- ☐ Product launches

Technological innovation

The biotechnology sector patents in Europe and internationally.

In 2024, we counted 512 patent applications and 121 patents granted in Spain. Patents with a Spanish priority claim or stakeholder in the biotechnology sector were identified through the patent offices (OEPM, EPO, USPTO, JPO and WIPO).

The sector continues choosing to protect its innovation mainly through the European Patent Office (EPO) and with international PCT patents (table 6.2), which has been the trend since 2013.

The sector chose to protect innovations on a European level, with 234 patents, and through PCT patents, 186, while only 70 patents were issued through the Spanish Patent and Trademark Office.

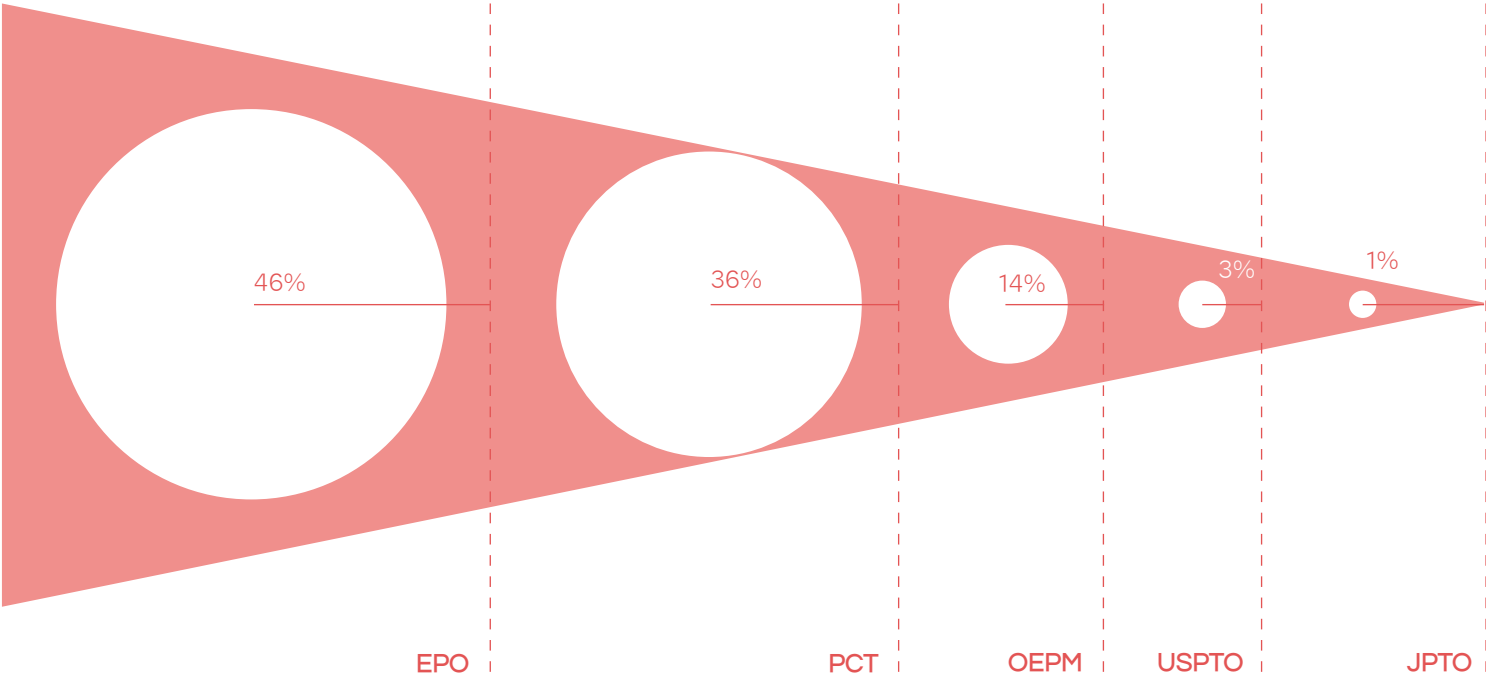
Graph 6.4 shows that the highest percentage of patent applications in the biotechnology sector were filed with the European Patent Office, 46% of patent applications in 2024. 36% protected their IP through PCT patents and 14% with the Spanish Patent and Trademark Office, 3% more than the previous year. Finally, the US office represented 3% of all patent applications (down 3% from 2023) and the Japan Patent Office, 1%.

Regarding patents granted (graph 6.5), EPO patents remain in first with 60%, up 10% from 2023, followed by OEPM patents with 30%, down 10% from 2023. USPTO patents remain at 8% and Japanese patents, through the JPTO, at 2%. Both percentages are practically identical to the previous year.

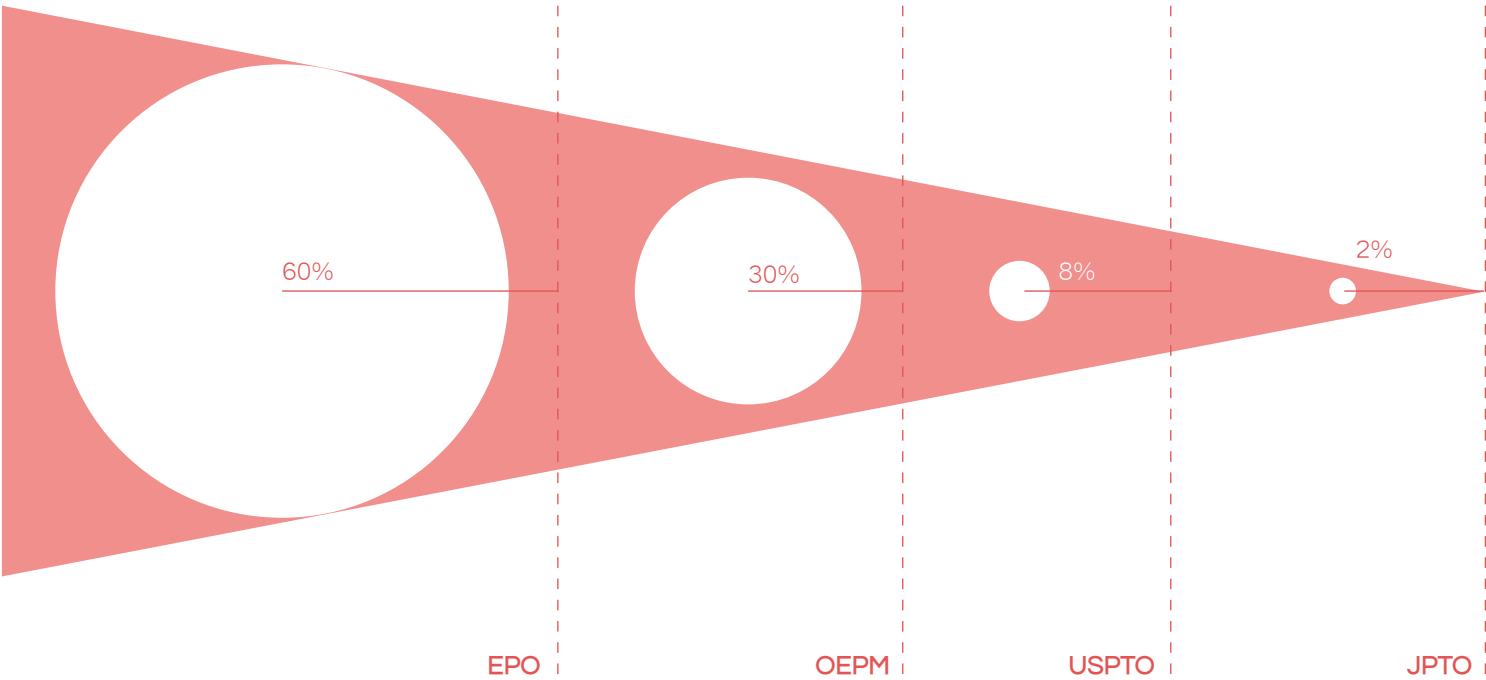
Patents issued	OEPM	EPO	USPTO	JPTO	PCT	TOTAL
Application	70	234	16	6	186	512
Granted	36	72	10	3	(NA)	121
TOTAL	106	306	26	9	186	633

Table 6.2. Number of patent applications and patents granted to Spanish biotechnology organisations (2024). Source: ClarkeModet – FPCM.

In collaboration with:



Graph 6.4. Biotechnology patent applications (2024). Source: ClarkeModet – FPCM.

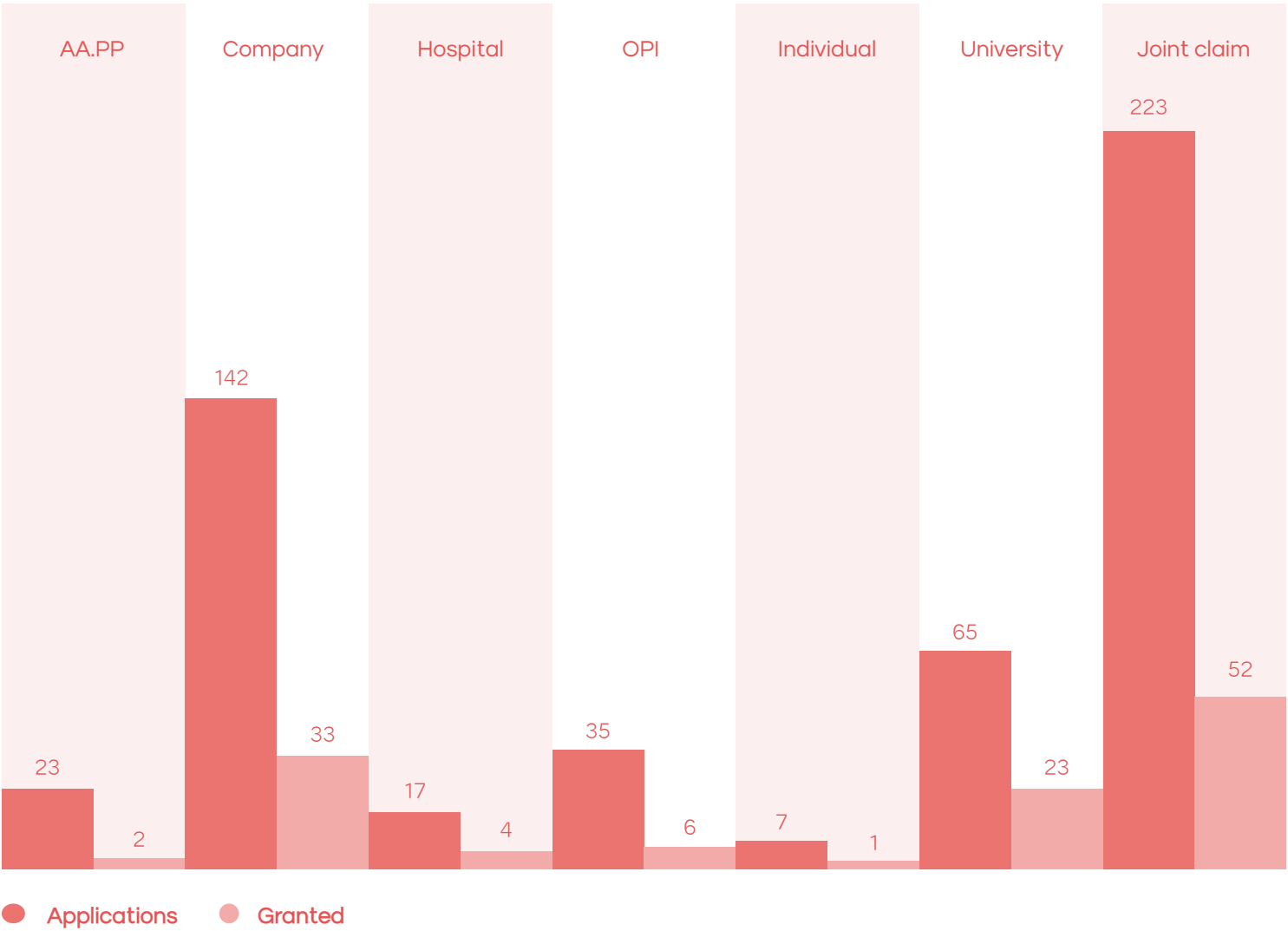


Graph 6.5. Biotechnology patents issued (2024). Source: ClarkeModet – FPCM.

Joint claims remain the main pathway to patents.

Graph 6.6 shows that collaborative patenting remains the most common type in the biotechnology sector, with 223 applications and 52 patents granted.

This is followed by patents held by a single company, with 142 applications and 33 patents granted, and Universities, with 65 applications and 23 patents granted.



Graph 6.6. Holder of patent applications and patents granted (2024). Source: ClarkeModet – FPCM.

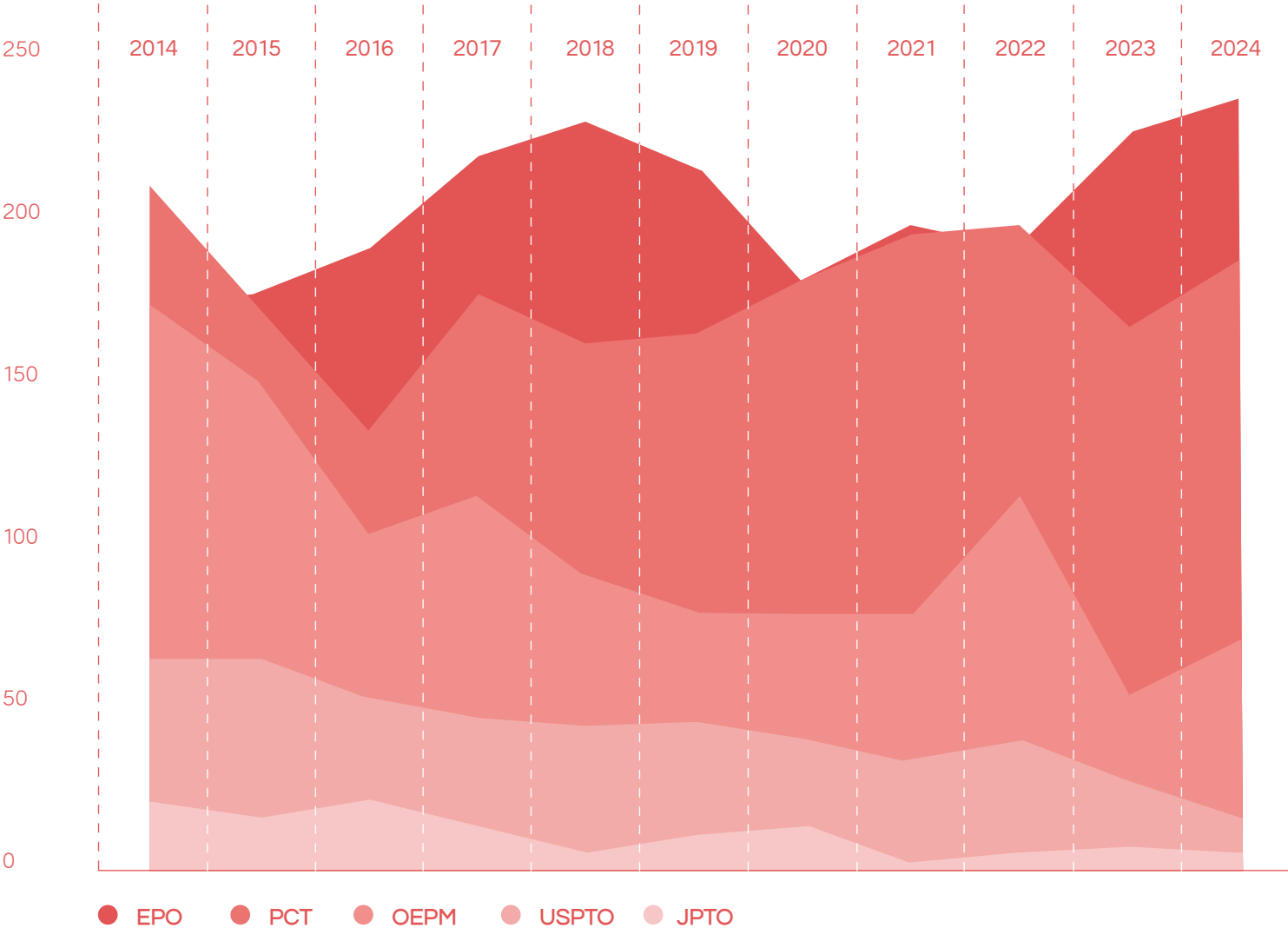
International patents remain ahead of national ones.

As Graph 6.7 on the evolution of patent applications since 2014 shows, the sector continues to focus on patenting in international and European arenas.

Patents through PCT and the European Patent Office made up 82% of all patent applications in 2024.

Patents through PCT rose 12% from 2023 and European Patent Office applications were up 4%.

In turn, US patents dropped 43% from 2023 and Japanese patent applications remained similar to the previous year.



Graph 6.7. Evolution of patent applications (2014-2024). Source: ClarkeModel – FPCM.

- Production of scientific knowledge
- Technological innovation
- Advances in development
- Product launches

Advances in development Biohealth

4Mediks and the Hospital Ramón y Cajal Microbiology Unit completed trials demonstrating the efficacy of the biocide product developed by 4Mediks to eliminate antibiotics-resistant microorganisms without inducing additional mutations.

Agarose Bead Technologies expanded its facilities in Burgos, increasing its agarose resin production capacity to 100,000 litres per year to position it as a powerhouse in the new therapies market.

AINIA presented results from its Healthytooth II project to develop a strategy based on bacteriophages through bioproduction of endolysins enzymes to treat dental caries.

Almirall announced it has completed the decentralised regulatory approval procedure for efinaconazole, indicated for treatment of onychomycosis in Europe, and received FDA approval for Klisyri® to treat actinic keratosis. Plus, it presented positive results for EBGLYSS® (lebrikizumab) to treat moderate to severe atopic dermatitis.

Amgen presented positive results for blinatumomab in paediatric patients with acute precursor B-cell lymphoblastic leukaemia, for inebilizumab to treat generalized myasthenia gravis, a rare autoimmune disease, and for its phase 3 study Mitigate to treat immunoglobulin G4-related disease.

AptaTargets presented results from its preclinical study validating the potential of ApTOLL to reduce inflammation and regenerate myelin in multiple sclerosis models.

Cocoon Bioscience inaugurated the first industrial production plant in the world, at Bizkaia Science and Technology Park, for recombinant proteins using insects in chrysalis form as natural bioreactors.

Grifols announced positive preliminary results from the phase 3 clinical trial on fibrinogen, demonstrating its efficacy in treating acquired fibrinogen deficiency (AFD).

Hipra announced it will have a COVID-19 vaccine adapted to the JN.1 variant, in accordance with EMA and WHO recommendations.

Integra Therapeutics with **VIVEbiotech**, **OneChain Immunotherapeutics** and several public institutions

began a project to design new-generation viral particles using artificial intelligence and produce them for advanced therapies.

IQS kicked off the VEG4COS project, which aims to bring about a paradigm shift in the production of active ingredients for cosmetics, from plant-based materials to plant stem-cell materials.

Laminar Pharma completed recruitment for CLINGLIO, a phase 2b/3 clinical trial on hydroxyoleic acid (LAM561) in combination with RT and TMZ for adults with newly diagnosed glioblastoma.

Lilly presented positive results from the phase 3 study on Tirzepatide, indicated for adults with heart failure with preserved ejection fraction (HFpEF) and obesity.

Mikrobiomik along with Ramón y Cajal Health Research Institute began clinical trial DIREBIOT to assess the efficacy, safety, tolerability and dosing of MBK-01 to treat recurring diverticulitis.

Minoryx with pharmaceutical firm Neuraxpharm Group announced they had completed the pivotal trial NEXUS for paediatric patients with cerebral adrenoleukodystrophy.

Miramoon Pharma presented positive results for its drug MP-010 in treating amyotrophic lateral sclerosis.

OneChain Immunotherapeutics announced treatment of the first patient in the CARxALL clinical trial with its product OC-1 for cortical T-cell acute lymphoblastic leukaemia.

Oryzon received authorisation to begin phase 3 of the PORTICO-2 trial on vafidemstat for patients with borderline personality disorder and presented the results of its FRIDA phase 1b trial in patients with acute myeloid leukaemia (AML). Plus, it received FDA approval for the CTEP-CRADA phase 1/2 clinical trial on 1L extensive-stage small-cell lung cancer.

Palobiofarma announced completion of the phase 2 clinical trial on its investigational therapy PBF-680 in chronic obstructive pulmonary disease (COPD).

Peaches received authorisation to begin its pilot trial in phase 1/2 to obtain an advanced biological drug to help fight cytokine storms, a very common reaction in patients with COVID-19 as well as other conditions such as pancreatitis.

ProtoQSAR kicked off the HYPIEND project to tackle the environmental challenge of exposure to endocrine-disrupting chemicals (EDC) in critical stages of development.

Reig Jofre announced its participation in Med4Cure, the first European macro-project on industrialisation of new therapies and in a consortium to validate and scale up production of human skin created with a 3D bioprinter.

SOM Biotech presented the results of its phase 2b study on SOM3355 in patients with Huntington's chorea.

Telum Therapeutics announced it has applied for a new patent for antimicrobial peptides to fight antibiotics-resistant bacteria.

Viva In Vitro presented advances in Viva Sepscare™, a cutting-edge device for fast, automatic stratification of patients with septic shock and other conditions.

Zendal through its subsidiary Biofabri and TBVI, signed a contract with the European Health and Digital Executive Agency (HaDEA) under the framework of the EU4Health Programme. With this contract, Biofabri secured €12.5 million in funding to accelerate clinical trials on the MTBVAC tuberculosis vaccine.

Regulatory authorisations

Ability Pharma received WHO approval for its cancer drug ABTL0812 to be called IBRILATAZAR, which demonstrated 40% efficacy in patients with endometrial cancer.

Amadix received innovative device designation from the FDA for PreveCol for early detection of colorectal cancer.

ARTHEX Biotech received rare paediatric designation (RPD) from the FDA for ATX-01 to treat myotonic dystrophy type 1 (DM1).

Boehringer Ingelheim and **Lilly** received approval from the Ministry of Health to cover empagliflozin to treat adults with chronic kidney disease.

Corify Care obtained CE marking for its ACORYS cardiac mapping system.

Gate2Brain received EMA orphan drug designation for its platform focused on enhancing drug delivery to the brain: G2B-002.

Grifols-Biotest received FDA approval for immunoglobulin Yimmugo® to treat primary immunodeficiencies and FDA approval to treat surgical haemorrhaging in paediatric patients with its fibrin sealant.

Histocell obtained AEMPS authorisation and GMP certification for its new production plant for cell therapy medicines and associated biologicals in Larrabetzu.

MSD obtained FDA approval for V116, the 21-valent pneumococcal conjugate vaccine to prevent invasive pneumococcal disease and pneumococcal pneumonia in adults, and for sotatercept as first-in-class treatment for adults with Pulmonary Arterial Hypertension (PAH, WHO Group 1). Plus, it obtained approval from the European Commission for pembrolizumab (KEYTRUDA®) as a treatment for non-small cell lung cancer and two new indications in gynaecological cancers.

Sanofi received AEPMS authorisation to market its trivalent version of the high-dose flu vaccine, offering more protection for adults over 60.

- ☐ Production of scientific knowledge
- ☐ Technological innovation
- ☒ Advances in development
- ☐ Product launches

AINIA presented significant advances in its SMARTFARM project, which is working towards producing meat from muscle and fat cell cultures from animals, without having to sacrifice them, using bioengineering and biotechnology. AINIA also kicked off the BOILÀ project, an initiative that seeks to develop new fat structures that are healthier and more sustainable, adapting to the needs of the food industry.

Grupo Natac inaugurated its omega-3 production plant in As Somozas, A Coruña. The plant refines, deodorises and whitens omega-3 oils from fish to preserve its characteristics and quality, and develops innovative ingredients for food, nutraceuticals and animal nutrition. Plus, Natac kicked off the Globalpalm project to develop aromatic and medicinal plants in Extremadura.

Hipra announced it has received approval from the European Commission to market RESPIVAC® aMPV, a lyophilised vaccine for ocular or nasal suspension in drinking water against avian metapneumovirus.

Ingulados presented positive results from its research on INGUBAL Ruminant Lechero® as a postbiotic to tackle mastitis in dairy sheep.

- ☐ Production of scientific knowledge
- ☐ Technological innovation
- ☒ Advances in development
- ☐ Product launches

AINIA presented results from its PrevenPack project, which developed edible packaging and coating solutions made from agrifood waste. Plus, it announced the first results of its CHEERS project to reuse waste from the beer industry in five new products and the GLOBALSAFEFOOD II project, which developed an advanced version of the data-lake and implemented new advanced algorithms to manage food safety information.

Leitat presented results of its GAIA project that optimised conversion of CO2 and wastewater into biofuel.

Advances in development Agrifood

Leitat completed the GO-DIANA project with companies Zyrular Plant and iberinsect, to promote the use of insect protein as an alternative protein source to develop innovative products for human nutrition.

NEIKER announced its participation in the European project PyrTick, which aims to understand and predict distribution, environment and transmission potential of tick diseases to humans and animals in the Pyrenees and began LANDFEED to turn agrifood waste into biofertilisers for use in agriculture. Plus, it kicked off the European project INNOTUB II to develop new diagnostic protocols and tools to control tuberculosis in animals, and developed an innovative solution that reuses hydroponic wastewater to produce microalgae for sustainable agriculture.

Tecnalia launched the Food4stroke initiative to select raw materials for the agrifood industry that are rich in phytochemicals and other compounds with potentially neuroprotective effects as a source of new ingredients, foods and supplements.

Advances in development Industrial

ProtoQSAR kicked off the SUBBIMATT project to develop a new generation of smart, sustainable, bio-inspired technical textiles to tackle energy needs today and in the future, and the CheMatSustain project to assess the security and sustainability of chemical substances in the European Union.

Solutex began the ANIMO3 project for research and valorisation of non-concentrable side fractions as specialized Omega-3 animal feed.

- Production of scientific knowledge
- Technological innovation
- Advances in development
- Product launches

AMSlab AMSlab launched a new serum and plasma mycotoxin testing service.

Archivel Farma announced the launch of a new business line as a CDMO for sterile drugs for clinical studies.

Biolan launched BIOFISH 7000 SAL, a device that measures and quantifies salt based on the amount of sodium.

Gold Standard Diagnostics launched SENSIStrip AFLA and SENSIStrip DON, for early detection of total aflatoxin and deoxynivalenol contamination.

HIPRA presented the results of IN-OVO vaccination against coccidiosis. They showed the performance of attenuated vaccines for coccidiosis administered by injection in-ovo in commercial poultry feed lots, using field data for evaluation.

Immunostep launched to market its HeMoStep kit to detect and quantify blood contamination in CSF.

Lilly announced the Spanish launch of Mounjaro® (tirzepatide), an innovative drug to treat type-two diabetes (DM2) or for weight control in people with obesity and mirikizumab (OMVOH™), a new option for patients with ulcerative colitis.

Nano1Health launched two innovative solutions to detect biomarkers of drug resistance in *Leishmania infantum*, LeishGenApp and LeishGenR.

- Production of scientific knowledge
- Technological innovation
- Advances in development
- Product launches

Almirall and Eloxx Pharmaceuticals closed an exclusive licensing deal through which Almirall acquired global rights to develop and commercialise ZKN-013 to treat rare dermatological diseases and others associated with nonsense mutations. Also, Almirall signed a licensing deal with Novo Nordisk for Almirall to acquire exclusive global rights to develop and commercialise NN-8828 for use in various fields, including dermatological immune inflammatory diseases.

Advances in development

Products launched to market

In this section, we analyse the products and services launched to market by AseBio members and some of the most noteworthy deals to licence or distribute these products and services.

Nostrum Biodiscovery introduced a new model for targeted docking diffusion.

Promega launched a portable 96-well plate reader to quickly analyse results from cell health assays.

Quibim launched a platform to deploy imaging-based algorithms to accelerate drug development programmes and an automated artificial intelligence tool for MR diagnosis of diffuse liver diseases through accurate quantification of tissue fat and iron levels.

Sanofi announced the Spanish launch of dupilumab, the first and only systemic biologic medicine indicated for children from just six months with severe atopic dermatitis and Nexviadyme® enzyme replacement therapy used to treat patients with Pompe disease.

Zendal launched Neoleish, the first DNA technology vaccine for canine leishmaniasis, developed by a team at the Centre for Biological Research Margarita Salas (CIB-CSIC). Plus, CZ Vaccines in the Zendal group received AEMPS temporary-use approval due to a healthcare emergency for its epizootic haemorrhagic disease (EHD) vaccine.

Product launches

Licensing and distributions deals

Amadix signed a deal with MD Anderson Madrid to distribute PreveCol®, an innovative test that detects colorectal cancer and precancerous lesions from a blood test.

Nexotech, a company in the **AMSlab** Group, closed a collaboration agreement with German company Nucleus Biotech to distribute and sell ExoGAG, a product that isolates exosomes for biomarker research. Plus, it closed a

deal with Portuguese companies LEF to expand its offering of services.

Curapath announced a licensing deal with Certest Biotec to offer market access to cutting-edge LNP formulations combining Certest’s proprietary ionisable lipids and Curapath’s shielding lipids.

Integra Therapeutics signed a licensing deal with Lithuanian company Caszyme to incorporate the Cas12l genome-editing tool into its FiCAT 2.0 gene-writing platform.

mAbxience and Teva, a subsidiary of Teva Pharmaceutical Industries, announced their global licensing deal for a biosimilar oncology candidate. Plus, mAbxience also

announced a licensing deal for two biosimilar candidates in key markets in Central and Eastern Europe, with Egis.

SunRock Biopharma and Swedish biopharmaceutical company Debiopharm closed a licensing deal to jointly produce antibody-drug conjugates targeting HER3 in EGFR mutated cancers.

Werfen signed a deal with Palex to license its medical device and scientific instrument

- Production of scientific knowledge
- Technological innovation
- Advances in development
- Product launches

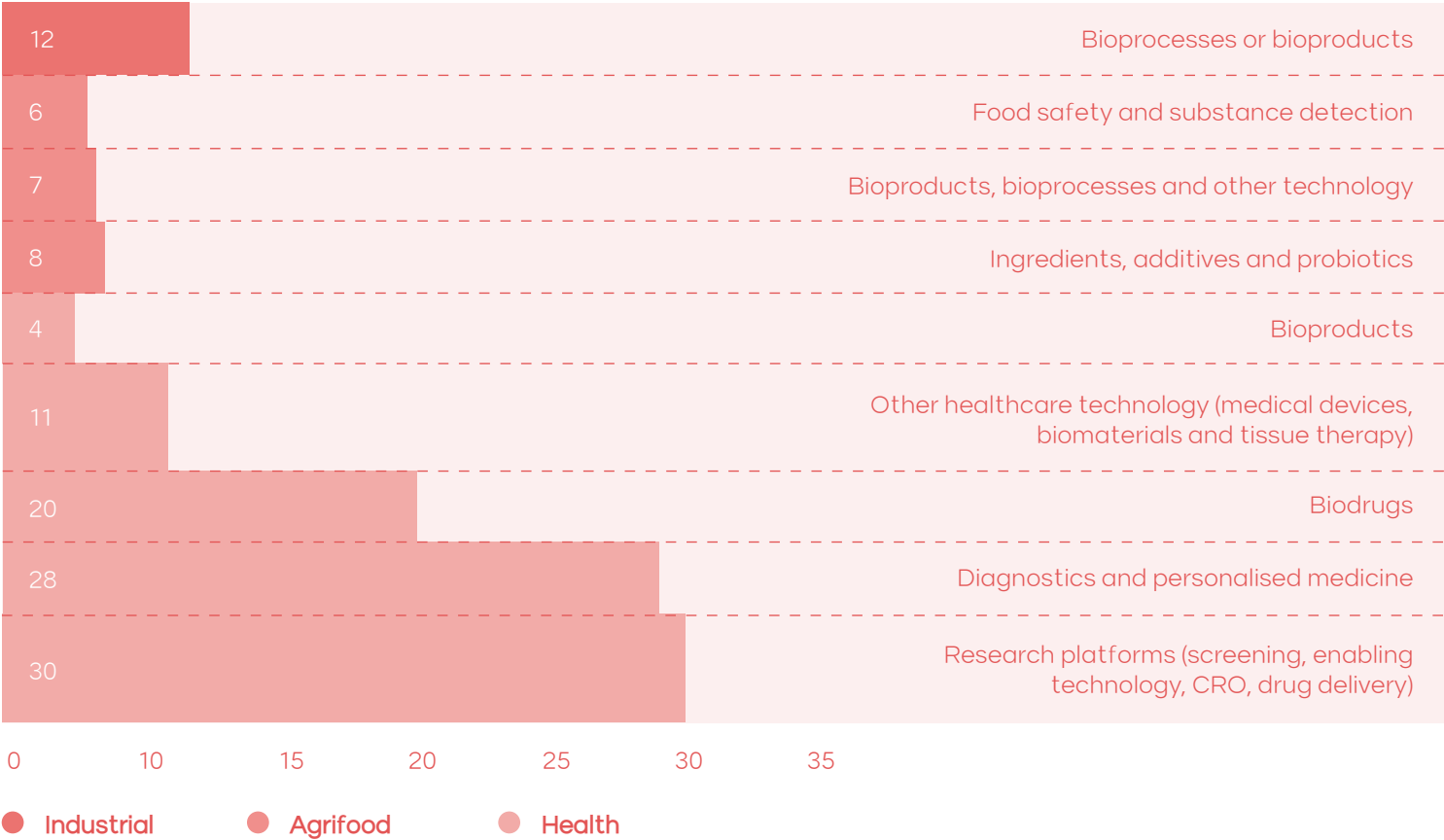
Product launches

Analysis of products and services launched to market

In 2024, we identified 129 new products or services launched to market by AseBio members, 34% more than the previous year.

Once again this year, health research platforms were at the top of the list. This time, the second group was diagnostic and personalised medicine, followed by new biodrugs.

Graph 6.8 shows the breakdown of these products and services by area of activity.

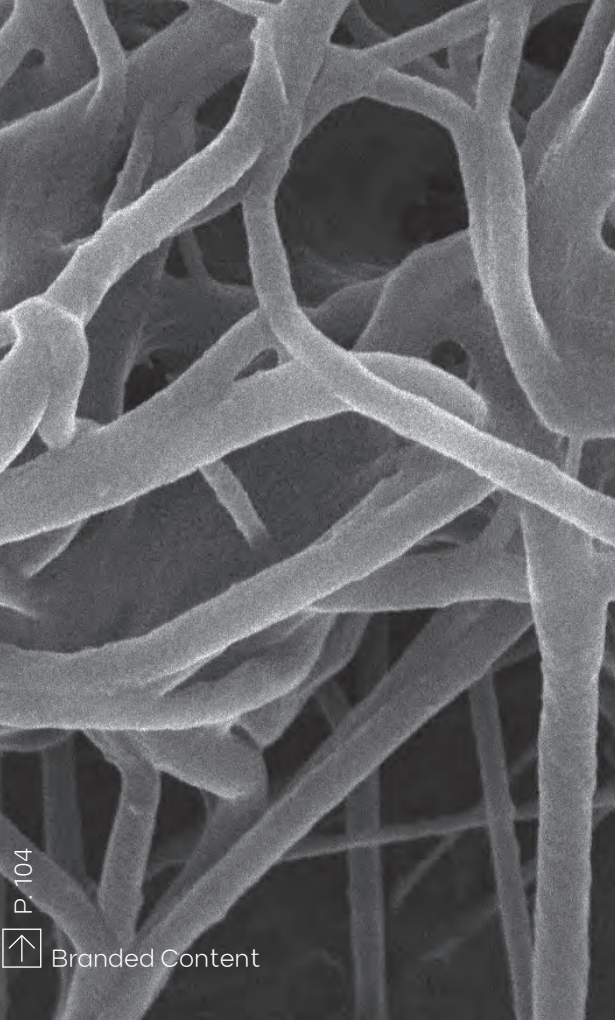


Graph 6.8. Breakdown by area of activity for products and services launched to market by AseBio members in 2024. Source: AseBio.



Branded Content

Dr. Eduardo Anitua, president, BTI
Biotechnology Institute



BTI Biotechnology Institute: driving European innovation in biotechnology and regenerative medicine

Advances in the life sciences, supported by digitalisation and artificial intelligence, and the potential of biology-based solutions to resolve health and social issues make biotechnology one of the most promising technological arenas of this century in Europe, and therefore in the world.

BTI Biotechnology Institute has been promoting ground-breaking projects in biotechnology for over 25 years, developing a wide range of regenerative medicine and oral implant products and therapies that have allowed healthcare professionals to predictably treat numerous conditions. As a result of our hard work, we lead innovation in a sector, biotechnology, where Spain and Europe haven't always stood out or been particularly relevant in previous decades. BTI has been able to tackle some of the challenges facing the biotechnology and biomanufacturing sector in the European Union, such as research and transferring technology to market, a complex regulatory framework, access to funding, capacities, obstacles in the value chain and intellectual property.

BTI Biotechnology Institute was created as a tool for research in biomedicine, focusing on fields such as regenerative medicine, implantology and oral surgery. But it quickly became a vehicle for designing and developing innovative dental implants, and the perfect backing for expanding scientific knowledge of PRGF-Endoret technology. This personalised biotechnology therapy accelerates tissue regeneration and reduces pain and inflammation, cutting functional recovery time and improving quality of life for patients. Our project's versatile technology and innovative, commercial scientific vision have made PRGF-Endoret a benchmark in biomedicine for curing wounds and lesions, which has undoubtedly helped clarify its regulatory position, boost competitiveness and, therefore, universalise use.

A project made in Spain that early on began internationalising its developments and therapies to neighbouring countries, such as Germany, Italy and Portugal. This European period lasted a few years before the company took its main biotechnology achievements to countries such as France and the United Kingdom, both of which were a springboard to markets in the rest of the world. Our R&D, as well as our dental implants, have put us on a level playing field with the rest of the world and set trends.

Our firm commitment to R&D and generating scientific knowledge can be seen in the more than 350 papers we have published in indexed journals, making BTI a leader in

scientific production among Spanish biotechnology companies over the past 10 years, as the annual AseBio reports have reflected. Based on this foundation, over these years we have secured 64 patents and developed over 2,000 innovative biomedical products that are on sale in 35 markets.

Today, BTI is a versatile project with nearly 400 professionals that has developed the first biomimetic dental implants on the market, which encourage fast osseointegration. It has also diversified the regenerative potential of PRGF-Endoret, from dental care to other areas of medicine like orthopaedics and sports medicine, dermatology, ophthalmology and, most recently, reproductive medicine. However, BTI's main asset is the people who comprise it. A highly qualified multidisciplinary team working together in a competitive environment to consolidate BTI as a leader in dental biotechnology and regenerative medicine.



Branded Content

Marta del Castillo Vázquez, CEO,
Madrid Science Park Foundation



Madrid Science Park, guaranteed success for innovative projects in the life sciences and chemistry

The Madrid Science Park (PCM) is one of the benchmark parks in supporting new biotechnology companies in Spain. Since it was established in 2001, the park has been backed by key stakeholders in R&D, such as the Autonomous University of Madrid (UAM), Complutense University of Madrid (UCM), Spanish National Research Council (CSIC), Madrid City Council and Community of Madrid.

One of the PCM's main goals as an incubator for science/technology projects is to provide an effective grouping of professional services and facilities to ensure that new biotechnology companies develop in the best conditions to successfully compete on the market. The majority of the companies at the Madrid Science Park are deep tech firms, providing disruptive solutions with a strong foundation in technology to resolve complex issues. This is precisely the type of entrepreneurship based on deep knowledge that can most benefit from the services the Madrid Science Park offers. In 2024, the Park was home to 33 companies in the life sciences, chemistry, environment, engineering and new materials sector (44% of all member companies that year).

For this type of companies, launch and development times are key and they require significant initial investment for start-up, including access to services and facilities as well as pre-equipped laboratories, shared science equipment and personalised support for technicians in preparing experiments and samples, and PCM allows them to focus their energy and efforts on their continued development, which is vital to ensuring their viability in an increasingly competitive global environment. Plus, PCM has a Scientific Services Unit that specialises in Genomics and offers services for companies, hospitals and research groups. In 2024, this unit carried out nearly 179 projects.

With the desire to drive entrepreneurship in Science and Technology in the city of Madrid, the PCM has launched a collaboration with the Madrid City Council called the CATAPULL UP programme. The third edition in 2024 focused on promoting open innovation in collaboration with through collaboration with six Open Innovation Partners. Nine start-ups signed up and more than fifteen challenges were proposed in sectors like healthcare, aerospace, logistics, circular economy and energy.

Also noteworthy is the PCM's participation in the programme to support science and technology entrepreneurship APTenisa, promoted by APTE and co-funded by ENISA. The Madrid Science Park has pre-accelerated eight projects in its facilities in the first phase

of the programme and supported five projects in the next step of acceleration.

Regarding internationalisation of the most competitive SMEs, the Madrid Science Park, as a member of the Enterprise Europe Network (EEN), offers a series of free services to help companies open up business in new markets and scout for partners, providers or distributors to commercialise their products and services. In this line, we provide personalised advisory services on any issues related to the European Union and third countries, as well as guidance on regional, national and European funding options; and sustainability, digitalisation and innovation diagnostics. With all these services, the Madrid Science Park is helping reach the goals on the 2030 Agenda and improve business competitiveness.



07. Collaboration and internationalisation

Introduction	Executive summary	05. Environment	06. Results
10-11	12-17	78-87	88-107
01. R&D investment	02. Funding	07. Collaboration and internationalisation	08. Impact
18-27	28-49	108-119	120-131
03. Talent and diversity	04. Business fabric	Who's who	Methodology
50-63	64-77	132-151	152-158

Collaboration and internationalisation

- Collaboration
- Attracting international companies

Collaboration

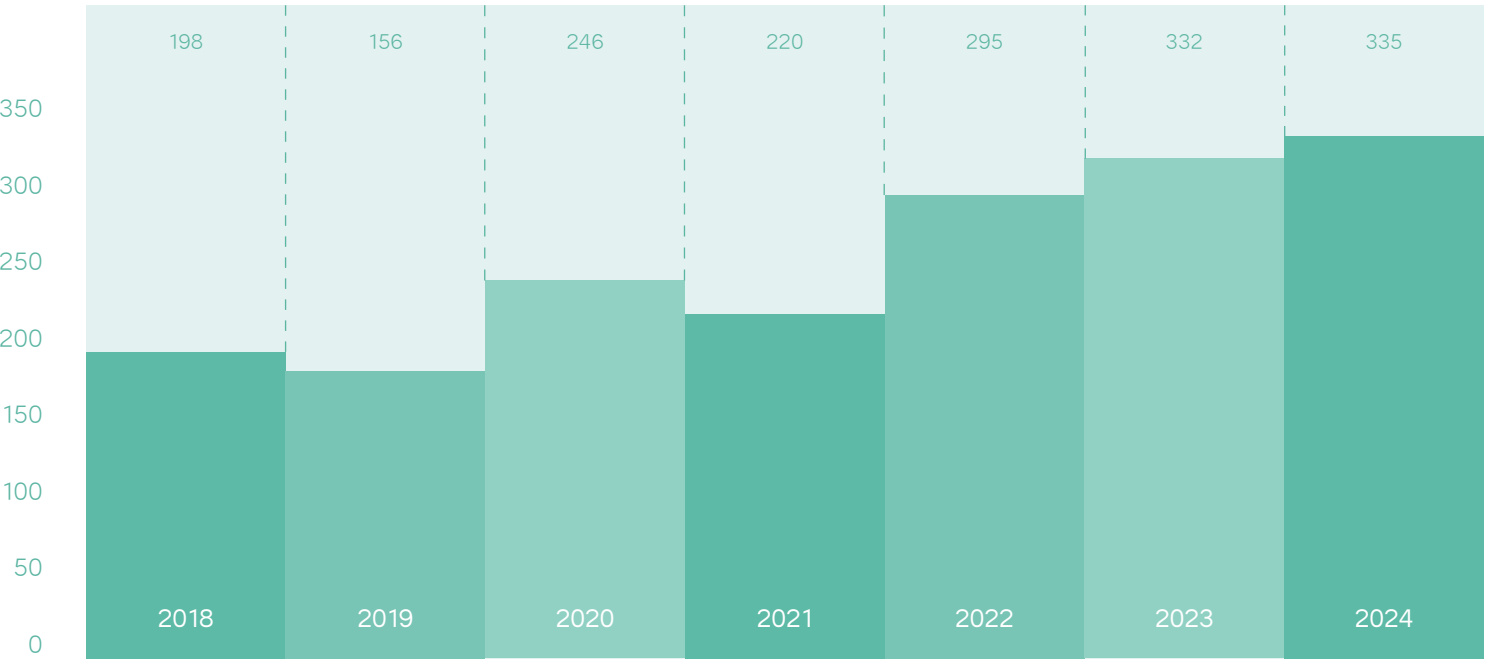
Each year, the AseBio Report compiles the partnerships or collaborations of biotechnology companies as a key element for advancing biotechnology research, analysing the participants in these partnerships, their country of origin and purpose.

The number of partnerships continued to grow in 2024, with a total of 335 and 242 involving public entities and foundations.

Regarding the change in number of partnerships biotechnology companies entered into, this number is up 69% from 2018, from 198 partnerships identified in 2018 to 335 in 2024. (Graph 7.1).

Evolution of the number of partnerships in the Spanish biotechnology sector

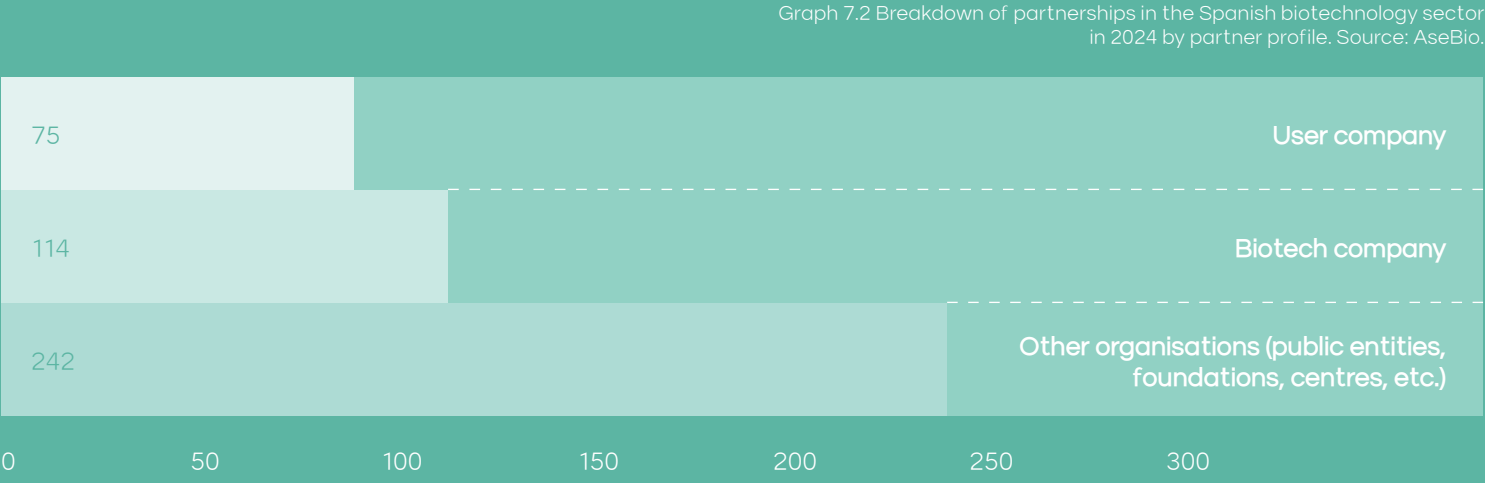
Graph 7.1 Evolution of the number of partnerships in the Spanish biotechnology sector from 2018 to 2024. Source: AseBio.



With these 335 agreements or collaborations, the total is up 1% from 2023. Public-private partnership stands out, with 242 agreements by companies with public research centres or foundations, nearly 20 more than the previous year. As we saw in 2023, grant calls that require consortia be set up influenced the results for this year. Specifically, the Transmisiones call by the CDTI and Spanish State Research

Agency (AEI) required a joint venture among three to eight companies and research and knowledge-dissemination organisations. For the 2023 AEI public-private partnership call, applicants had to set up consortia with both companies and public entities. Public-private partnership is followed by collaborations with another biotech firm and, finally, collaborations with user companies. (Graph 7.2).

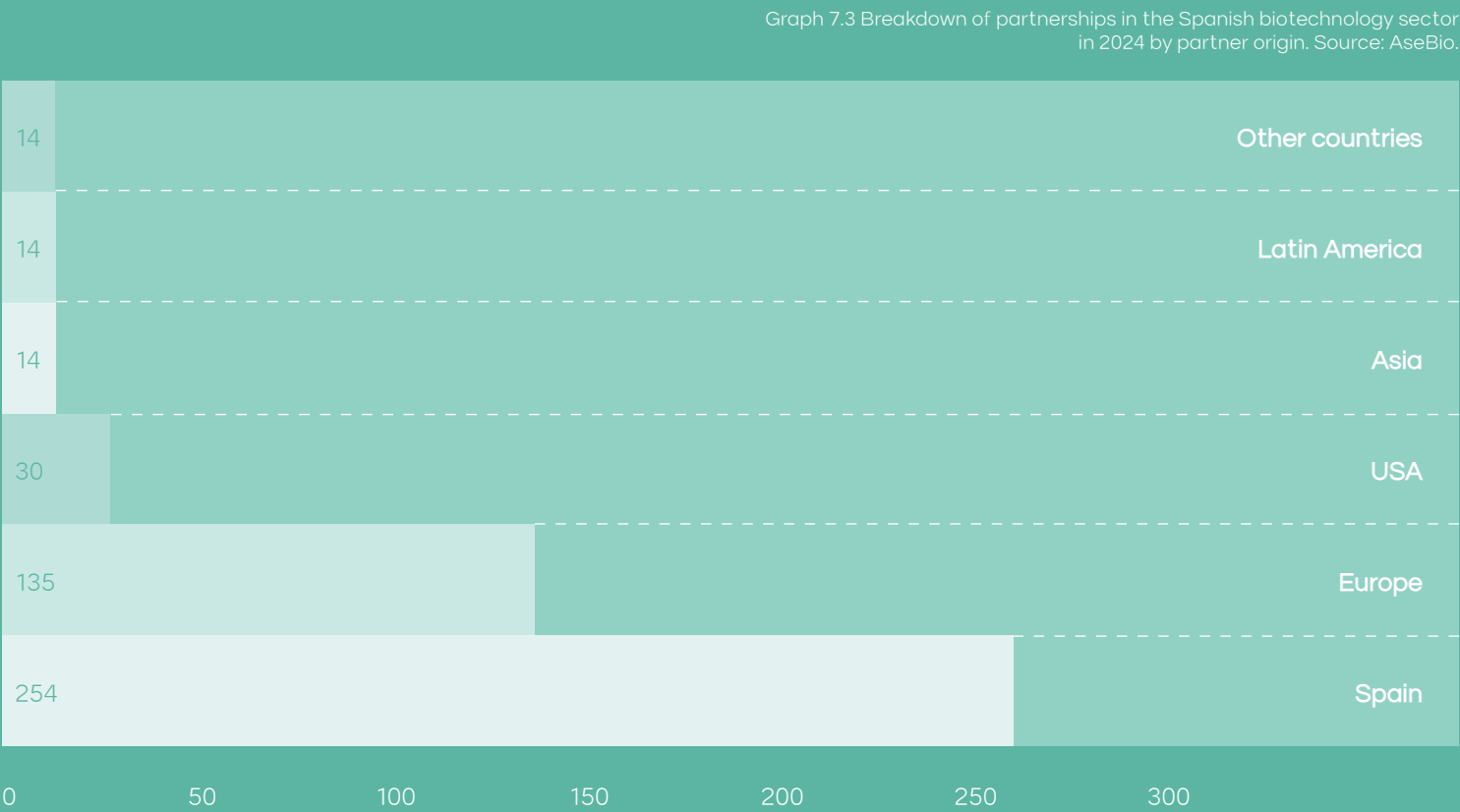
Number of partnerships by partner profile



In terms of country of origin of the entities they reach collaboration agreements with (graph 7.3), 46% are international, up 5% from the previous year. Of these, 30

collaborations were with the United States and 14 with Asian countries.

Number of partnerships by country

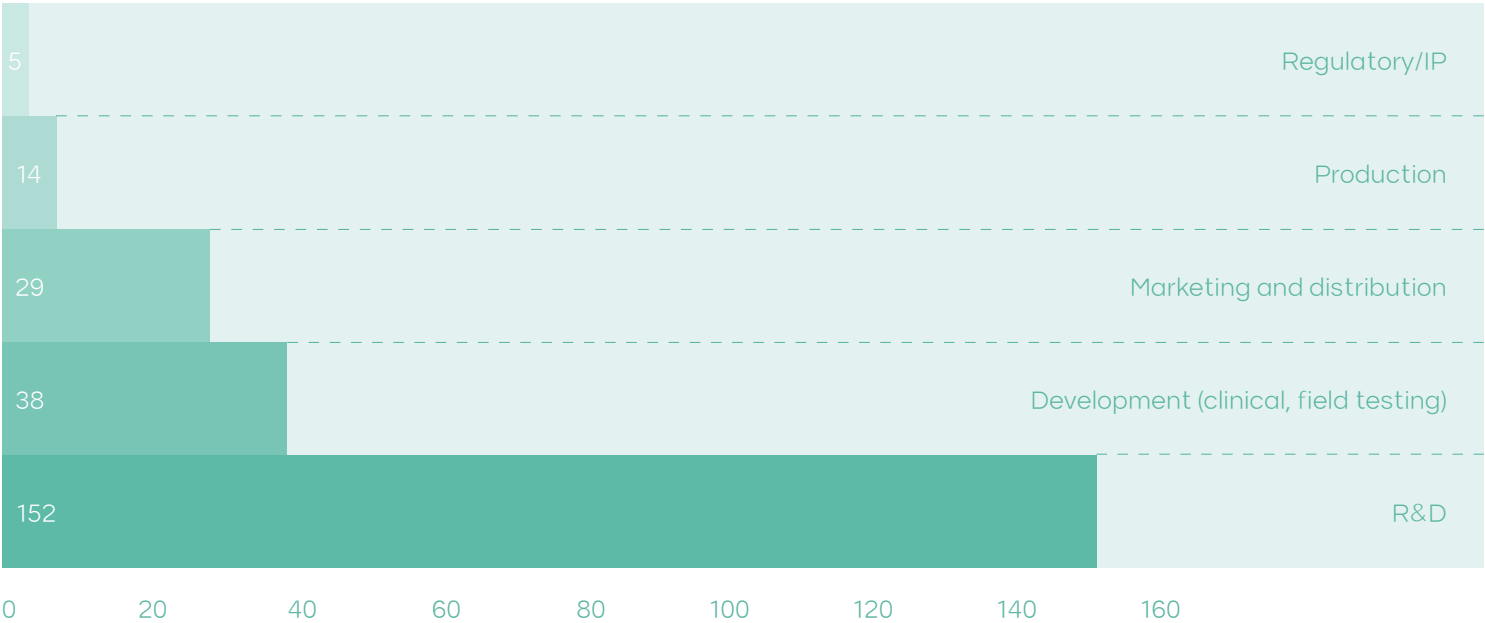


Regarding the purpose of the collaboration (graph 7.4), 45% focus on research and development, with a total of 152 partnerships. These are followed by collaborations for clinical development or field testing, with 38 collaboration agreements, or 11%, followed by marketing and distribution deals, with 29 collaboration agreements, or 9% of the total. 14 of the deals were related to industrial production, which

is 4%, and, in last, collaboration related to regulatory issues with just 1% of the collaboration agreement, 5 in total.

Number of partnerships by purpose

Graph 7.4 Breakdown of partnerships in the Spanish biotechnology sector in 2024 by purpose of the alliance. Source: AseBio.



Research agreements

3PBIOVIAN signed a collaboration agreement with Rokote Laboratories for GMP manufacturing of the FINCoVac 2.1 COVID-19 vaccine based on an adenoviral vector.

AINIA with Atlántica Agrícola, SANSAN Prodesign and Vidres kicked off the DIMAS project to promote the use of biopesticides and sustainable bioactive agents instead of conventional pesticides. AINIA and 12 organisations from 7 countries began the AGRO4AGRI project to provide safe, sustainable solutions to plant protection and nutrition. AINIA also kicked off the AGRISME project to develop low-cost technological solutions to promote the use of precision agriculture and the FRUTALGA project to valorise fruit waste and microalgae for sustainable applications in biorefineries, cosmetics and pet feed.

Almirall announced a collaboration with the Centre for Genomic Regulation (CRG) to find advanced models for atopic dermatitis (AD) to develop new treatment options.

AMSlab announced the start of the SmarTZ4Milk project with 11 companies, to transform the dairy sector, minimising its impact on the environment and reducing food waste.

AstraZeneca signed a strategic partnership with Tucuvi to implement new solutions for conditions treated with AstraZeneca innovations.

Atrys Health initiated a partnership with Hospital Viamed Santa Elena to create a Medical Oncology Unit and Oncology Day Hospital to care for oncology patients and administer chemotherapy, immunotherapy and hormone therapy.

The **Spanish Bank of Algae** signed a collaboration agreement with Ecoalgen to assess the efficiency of using algae to make plant-based products high in amino acids.

Biosfer Teslab and AM BIOTA announced a collaboration to develop an intestinal omics test that will integrate metagenomic analysis and metabolomic studies.

Biolan reached a collaboration agreement with EOSCE (Electrochemistry and Optical Spectroscopy Centre of Excellence), at Chulalongkorn University to continue innovating in new areas. Plus, it announced its participation in the ECOBIOSENSOR project on ecodesign and biosensors for food safety diagnostics.

Hifas Biologics announced collaboration with the CSIC Spanish National Research Council Institute of Natural Products and Agrobiology, under the framework of the CSIC COCREA call, to find antimicrobial peptides in basidiomycota fungi to treat multi-resistant infections.

Ingredalia, with 5 organisations from the agrifood sector, began the BIOGREENFOOD project to develop healthy new ingredients with high value added by applying sustainable biotechnology processes.

Hipra began the VAX4ASF project, along with 17 partners from EU countries, the United States and Kenya, to study live attenuated vaccines and develop an effective, lasting, safe solution to African swine fever.

The **Lilly Spain** R&D centre signed a collaboration agreement with the **Spanish National Cancer Research Centre (CNIO)** and the Barcelona Supercomputing Centre to advance knowledge of pancreatic cancer.

mAbxience and Biosidus, an Argentinian biotechnology company, signed an agreement to manufacture agalsidase beta to treat Fabry disease.

MSD announced a strategic partnership with Vithas to improve healthcare and quality of life for patients with cancer and other conditions.

Neiker with Aclima and the Basque Environment Cluster launched the CO2FARM project to assess the opportunities and identify key aspects for the development of a carbon royalty finance vehicle in Euskadi.

OneChain Immunotherapeutics and NanoCell Therapeutics announced a collaboration to develop a novel in vivo CAR-T therapy for B-cell lymphoma.

Paralab Bio announced an agreement with Tecnal to represent the range of Tecnal benchtop bioreactors in Spain.

Peaches, Histocell and Cardiva announced the creation of a Histokine factory to produce biological medicines.

Peaches also announced the beginning of the 4D-BIOSKIN project with the University of Barcelona, Fundació para la Formació e Investigació Sanitaries de la Regió de Murcia and Vall d'Hebron Research Institute and companies Biocrosmo and **Reig Jofre**. The project aims to produce human skin with a bioprinter.

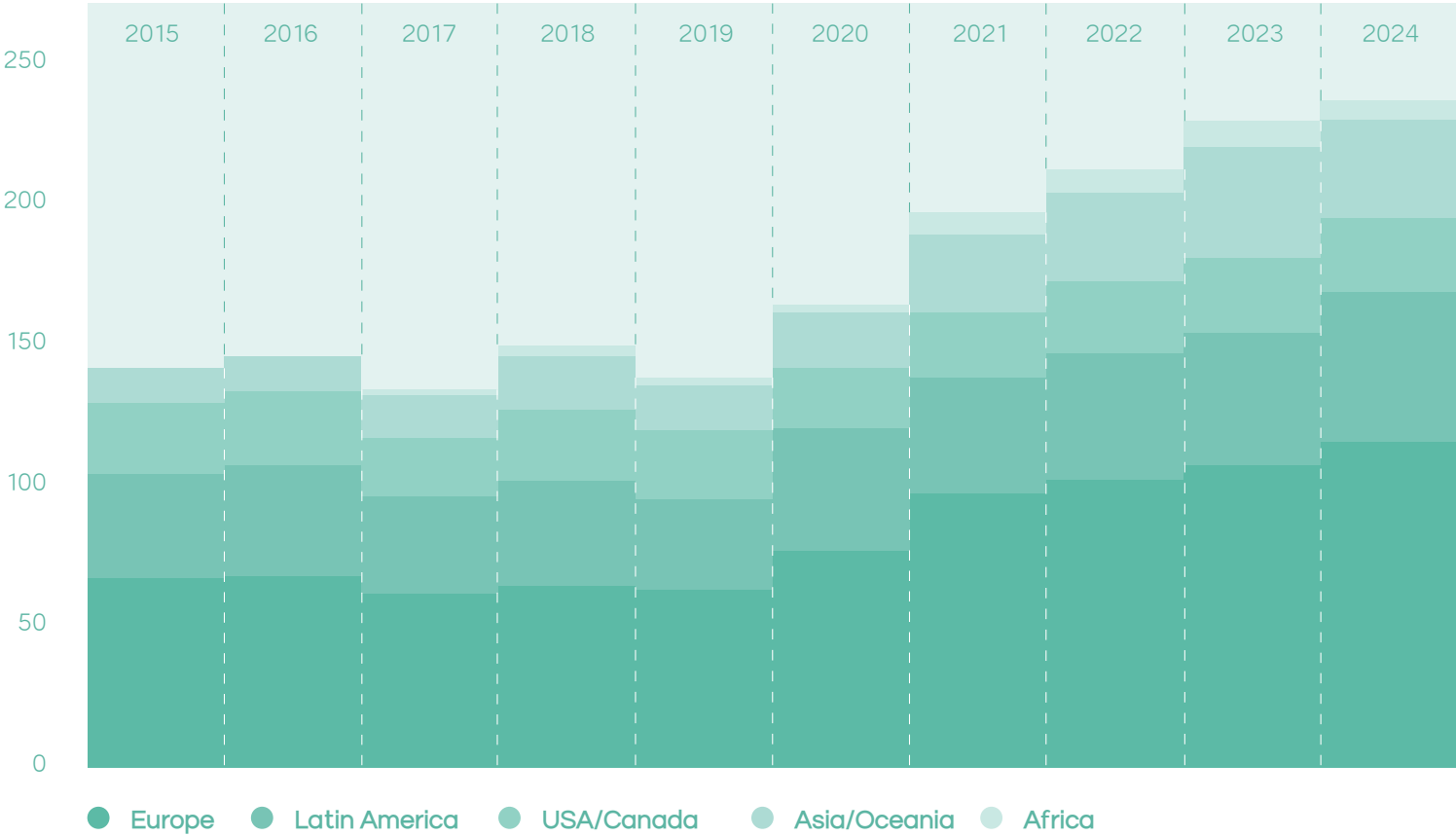
Sanofi with several science associations and societies, announced a collaboration agreement to develop a comprehensive care process to tackle autoimmune type-1 diabetes early on.

AseBio member companies increased their international presence 5% in 2024.

44 AseBio members (one more than the previous year) have a direct presence in 62 countries on all continents, up 5%.

The total number of subsidiaries of our members outside of Spain in 2024 was 235, 8 more than in 2023.

If we analyse where members decide to set up subsidiaries by geographic zone, the most popular region is Europe (49%), followed by Latin America (22%). Then come countries in Asia (15%), which remain ahead of the United States and Canada (11%), and finally countries in Africa (3%).



Graph 7.5. Evolution of presence of AseBio member companies by geographic zones (2015-2024). Source: AseBio.

Company

Countries

3PBiovia	USA, Finland
Ackermann International	Germany, Australia, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Ecuador, Emiratos Árabes, USA, France, Greece, Hungary, Israel, Italy, Malaysia, Mexico, Netherlands, Peru, Poland, Portugal, Czech Republic, Singapore, Switzerland, Turkey
Agarose Beads Technologies	USA
AINIA	Portugal
Almirall	Germany, Austria, Denmark, Slovakia, USA, France, Italy, Netherlands, Poland, United Kingdom, Czech Republic, Switzerland
AMS Lab	Italy, Morocco, Portugal
Antares Consulting	Belgium, Bolivia, France, Portugal
Arosa I+D	Germany, Argentina, Brazil, Chile, China, Colombia, Ecuador, USA, Mexico, Paraguay, Peru, Portugal, Dominican Republic, Uruguay, Venezuela
Arrays4Cells	USA
Asphalion	Germany, United Kingdom
Atrys Health	Brazil, Chile, Colombia, Peru, Portugal
Biobide	USA
Biolan	Chile, Ecuador, USA, Indonesia, Mexico, Morocco, Thailand, Philippines
Biomol	Portugal
Bionet	Germany, USA
BTI Biotechnology Institute	Germany, USA, France, Italy, Mexico, Portugal, United
Curapath	USA
Elzaburu	China
Euronext	Belgium, France, Ireland, Italy, Norway, Netherlands, Portugal
Eurosemillas	Angola, Argentina, Brazil, China, Colombia, USA, Japan, Peru, Poland, Turkey
Fundación Tecnalia Reseach and Innovation	China, Colombia, France, Italy, Mexico, Serbia

Table 7.2. AseBio members and countries where they have a direct presence. Source: Asebio.

Company	Countries
Grifols	Germany, Argentina, Saudi Arabia, Australia, Brazil, Canada, Chile, Colombia, South Korea, UAE, Egypt, USA, France, Hong Kong, India, Ireland, Italy, Japan, Malaysia, Mexico, Poland, Portugal, United Kingdom, Czech Republic, Singapore, Sweden, Switzerland, Thailand, Taiwan
HelixBios	Peru
Hipra	Germany, Argentina, Austria, Belgium, Brazil, Canada, China, Colombia, South Korea, Denmark, Slovakia, USA, Philippines, France, Greece, India, Indonesia, Ireland, Italy, Japan, Luxembourg, Malaysia, Morocco, Mexico, Norway, Netherlands, Pakistan, Peru, Poland, Portugal, United Kingdom, Czech Republic, Russia, South Africa, Sweden, Thailand, Taiwan, Turkey, Ukraine, Uruguay, Vietnam
Hoffmann Eitle	Germany, Italy, Netherlands, United Kingdom
Laboratorios Leti	Germany, Portugal
Laminar Pharma	USA
LiberaBio	USA
LifeLenght Laboratories	USA
Mabxciencia	Argentina, Switzerland
Medsavana	Germany, USA, France, United Kingdom
Minoryx Therapeutics	Belgium
Natac Biotech	USA, Singapore
Oryzon	USA
Paralab	Portugal
PV Pharm	Portugal, Czech Republic
Qualitec Farma	USA, United Kingdom
Quibim	USA, United Kingdom
Reig Jofré	Belgium, Monaco, Poland, Portugal, United Kingdom, Czech Republic
Sermes CRO	Belgium, Monaco, Poland, Portugal, United Kingdom, Czech Republic
Técnica de fluidos	Germany, Argentina, Brazil, Bolivia, Slovakia, France, Paraguay, Poland, Portugal, Romania, Switzerland, Uruguay
Telum Therapeutics	USA



Branded Content

Elena Erroba, COO of 3PBIOVIAN and
AseBio Board of Directors member



3PBIOVIAN



3PBIOVIAN: Promoting Biotechnology CDMO in Europe

In February 2024, 3PBIOVIAN was born from the merger of two of the most important CDMO in Europe, Spanish firm 3PBiopharmaceuticals and Finnish firm Biovian. This multiplied our technological and manufacturing capacities, and expanded our geographic presence, consolidating our place as a leading European biotechnology CDMO. With headquarters in **Spain and Finland**, 3PBIOVIAN is a strategic global partner of reference in Europe for developing and manufacturing medicines.

Our vision has always been to grow and consolidate our place in highly competitive international markets. This goal is in line with the priorities established by the **European Commission**, particularly with regard to the biotechnology industry being considered key for the economic and healthcare future of the region, as highlighted in the competitiveness compass, which guides the Commission's work for 2024 to 2029.

Our commitment to Europe is firm and dates back years. In 2017, our CEO Dámaso Molero advised the Commission to establish the European Commission Industrial Strategy 2030. Under the framework of the *High Level Industrial Roundtable: Industry 2030*, he took part in drafting the report titled *A vision for the European industry until 2030*, which proposed how to build a European industry that would lead globally and generate value for society, the economy and the environment, in which biotechnology was already classified as a key industry for the continent's future.

Collaboration to serve biotechnology innovation

Our offering includes a wide range of solutions, including protein development and production platforms **using microbial and mammal cell technologies**. Plus, we have continued expanding our proposal to include highly innovative solutions. One example is our collaboration with German company **Eleva to manufacture** its cutting-edge technology: a **moss-based expression system** that is particularly suited for highly complex molecules that can't be manufactured with other, more common technologies. This advance exemplifies the **transformative potential of partnerships between European companies, promoting innovation and competitiveness**.

From our headquarters in **Finland**, we offer solutions to produce **viral vectors**, including adenovirus and AAV, with our newly launched proprietary manufacturing platform. We also produce DNA plasmids and offer fill and finish services.

Despite being a company with European roots, our sights are firmly set on expanding into the United States, where we already have a sales office in Boston to bolster our presence in the world's most important biotechnology market.

Contributing to the European biotechnology ecosystem

At this decisive moment for biotechnology in Europe, 3PBIOVIAN is playing a crucial role in consolidating the continent as a leader in pharmaceutical biotechnology. Our commitment to quality, innovation and sustainability -core pillars of the European strategy- allows our clients to comply with international regulatory requirements and accelerate commercialisation of new treatments. So, we are helping strengthen the European ecosystem, **generating jobs, driving technological innovation and promoting international collaboration**.

At **3PBIOVIAN**, our footprint is growing every day, thanks to the more than 200 clients that have trusted us and continue trusting in our services. Some of our top milestones include full development of manufacturing for the first Spanish biosimilar, **Pegfilgrastim**, for **Cinfa Biotech**, later acquired by **British pharmaceutical company Mundipharma**, and creation of the first canine leishmaniasis vaccine for **Laboratorios Leti**, making us the only manufacturer of this vaccine in the world. We have also worked with Swedish company **Intervacc** to produce a mumps vaccine for horses, which is now available in several markets. Plus, it is worth noting our project with English company **Calvicis** to manufacture a photoprotein, the first **3P** project to get FDA authorisation to be commercialised, confirming our ability to work in the world's most demanding markets.

3PBIOVIAN is a strategic partner today and will continue consolidating industrial biotechnology, now more than ever, of strategic value to Europe.



Branded Content

Elisa Carbonell,
Chief Executive Officer of ICEX Spain



From Lab to Global Market: How ICEX Is Powering Spanish Biotech Expansion

Spain is currently a global leader in biotechnology science. It ranks ninth worldwide in scientific publications in this field, ahead of countries like France or Italy. And it's not just about quantity—our articles are cited 21% more than the global average. However, this scientific excellence has yet to fully translate into a business ecosystem with the same level of international projection. The data are clear: between 2001 and 2023, 199 biomedical spin-offs emerged in Spain from public research—most of them in biotechnology—but they remain, for the most part, SMEs or microenterprises facing challenges in scaling, valorising their intellectual property, going international, and attracting investment.

The challenge does not lie in the science itself, but in converting knowledge into impact. To achieve this, the ecosystem must overcome several bottlenecks. On one hand, there is a need to improve the commercialisation capacity of the solutions developed. On the other, it is crucial to strengthen financing mechanisms in intermediate stages, where market-based funding is often scarce. At the same time, we must increase investment in intangible assets that boost the international competitiveness and appeal of our companies.

In this context, internationalisation is emerging as a key driver—not only to access new markets, but to connect our companies with global innovation hubs where knowledge is generated, strategic partnerships are built, and investment decisions are made. For many startups, expanding abroad is the pathway to validate their technology, find partners, and grow.

At ICEX Spain Trade and Investment, we are committed to supporting the biotech ecosystem in this journey. Our support has evolved over recent years. In addition to our traditional participation in trade fairs, we now apply a more strategic and collaborative approach—offering open pavilions designed for networking, tailored technical activities, and forums co-created with the sector. We have also adapted to complex contexts through initiatives such as virtual missions during the pandemic and reverse trade delegations at BioSpain. All of this shares one common goal: to generate real international opportunities.

Today, our efforts are focused on two key pillars: helping companies scale by integrating them into global innovation ecosystems and supporting their access to funding by enhancing their international exposure.

Programs like Desafía Boston exemplify the potential of this strategy. This immersion initiative in the world's leading biotech innovation hub has enabled several startups to validate their value proposition, establish key contacts, and explore strategic partnerships in Massachusetts.

This approach is only possible thanks to continuous dialogue with companies and platforms like ASEBIO. It is through these partnerships that we design initiatives truly aligned with sector needs—bridging the gap between science and business impact. Because supporting the internationalisation of Spanish biotech is not merely a matter of trade promotion: it is a commitment to a national model grounded in innovation, global connectivity, and leadership through knowledge.



08. Impact

Introduction	Executive summary	05. Environment	06. Results
10-11	12-17	78-87	88-107
01. R&D investment	02. Funding	07. Collaboration and internationalisation	08. Impact
18-27	28-49	108-119	120-131
03. Talent and diversity	04. Business fabric	Who's who	Methodology
50-63	64-77	132-151	152-158

Impact

- Economic impact
- Impact on employment

Economic impact Impact on GDP

The contribution of biotech firms to the GDP is now 1.1%.

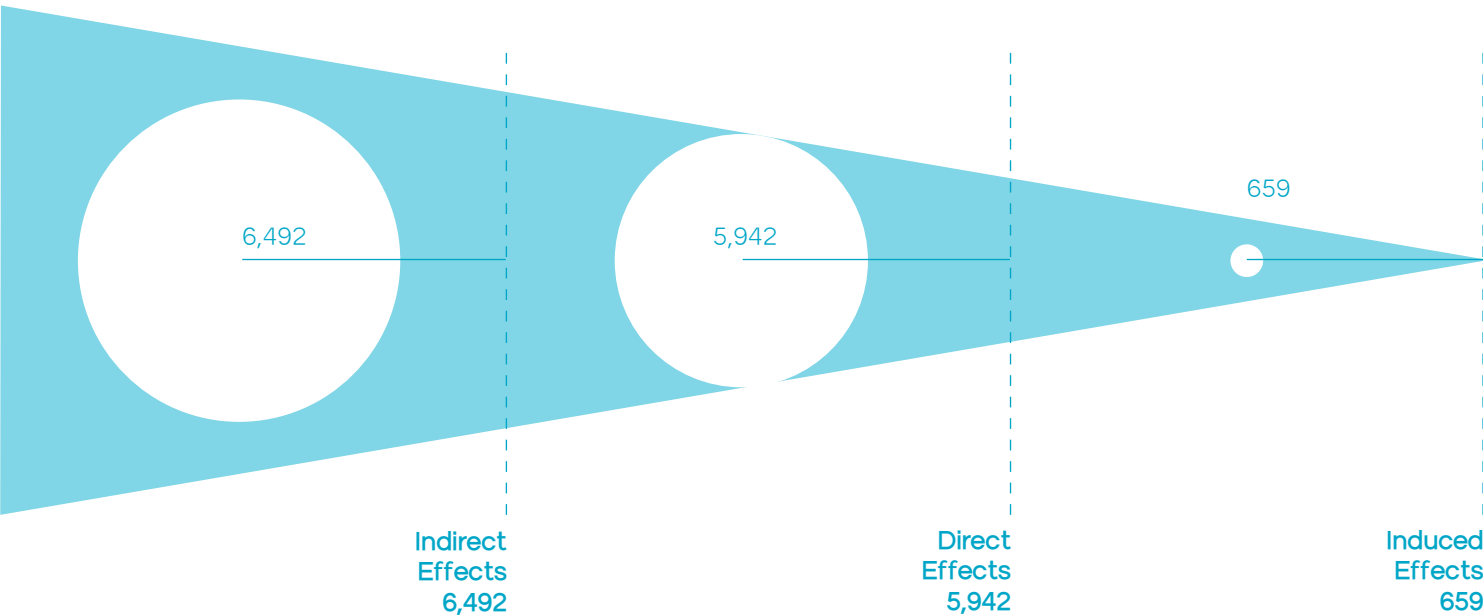
The joint total of direct, indirect and induced effects of the activity of biotech firms throughout the production chain gave us their joint impact on the total gross domestic product (GDP).

In 2023, the activities of these biotech companies generated more than €13.094 billion in income, 1.1% of the national total, mainly through indirect effects caused by flows of intermediary goods and services (graph 8.1).

Impact of biotech companies on the GDP (€ millions of 2023 GDP)

Total impact: 13,094 (1.1% of the GDP)

Graph 8.1. Impact of biotech companies on the GDP (€ millions of 2023 GDP). Source: Compiled internally from the information on companies collected by AseBio.



- Economic impact
- Impact on employment

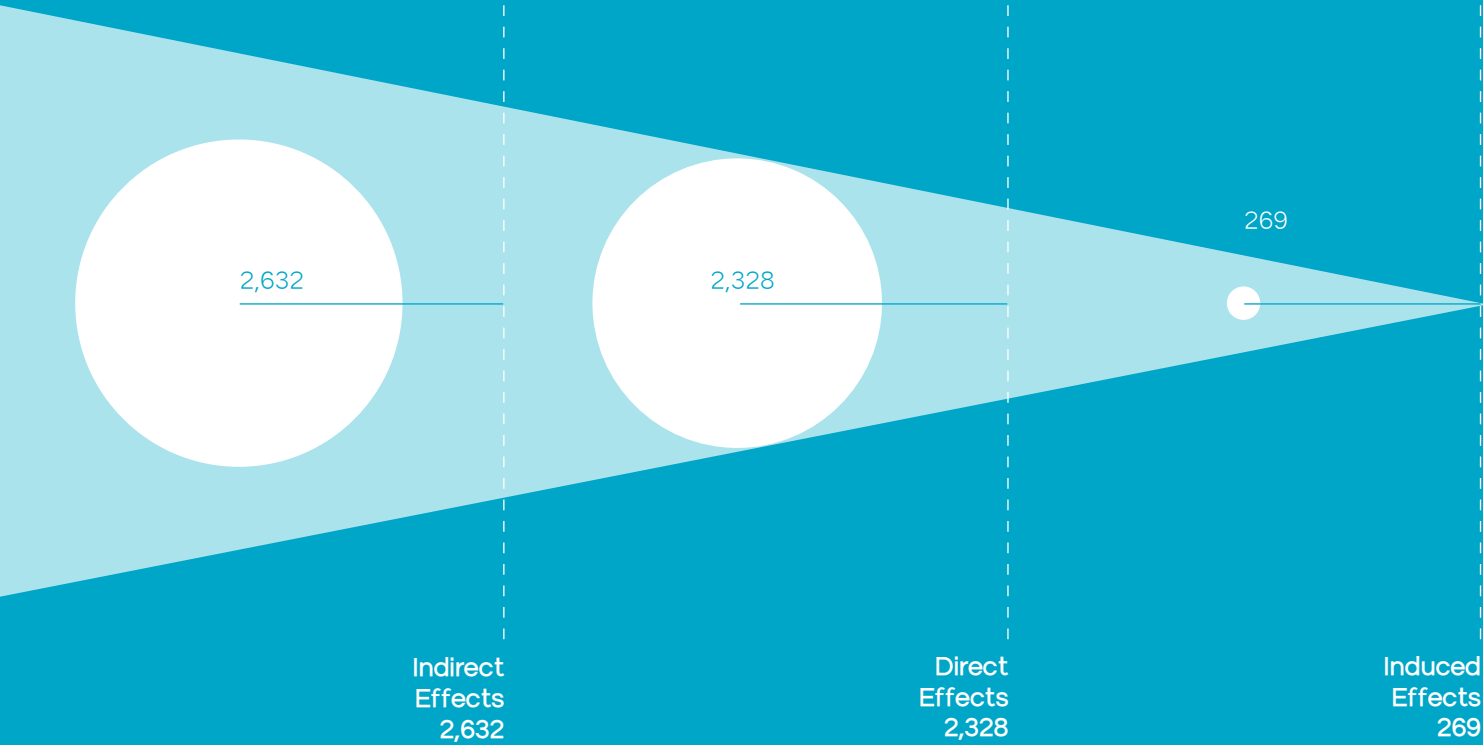
Economic impact

Contribution to the welfare state

Biotech firms contribute 0.4% of the GDP in state taxes.

For 2023, the impact of the tax revenue from biotech companies was €5.229 billion, or roughly 0.4% of the GDP (graph 8.2). The main sources of public income were VAT (32% of the total) and social contributions (31%).

Total impact: 5,229 (0.4% of the GDP)



Graph 8.2. Impact of total tax revenue from biotech companies (€ millions of 2023 tax revenue). Source: Compiled from the information on companies collected by AseBio.

Economic impact

Total production of biotech firms

The joint turnover of biotech companies made up 1% of the GDP in 2023.

In 2023, the turnover of biotech companies underwent a correction after the impact of selling COVID-19 vaccines in 2021 and 2022. The impact was particularly felt in production, which dropped nearly 25% from 2022 to 2023. However, if we look at the figures without turnover from the COVID-19 vaccines, overall turnover remained fairly stable in 2023, down 2% from 2022. So, table 8.1 shows both the volume of production and its growth without taking into account the turnover from Moderna.

In 2023, the joint turnover for biotech companies was 1% of the total GDP. To generate this turnover, the companies had to acquire intermediary goods valued at more than €8.8 billion, which generated €5.942 billion in income. Of this income, €2.629 billion went to employee compensation and €3.313 billion was gross operating surplus and net taxes.

Plus, total employment at biotech firms rose 5.6% to over 38,000 jobs, making up 0.18% of total employment (table 8.1).

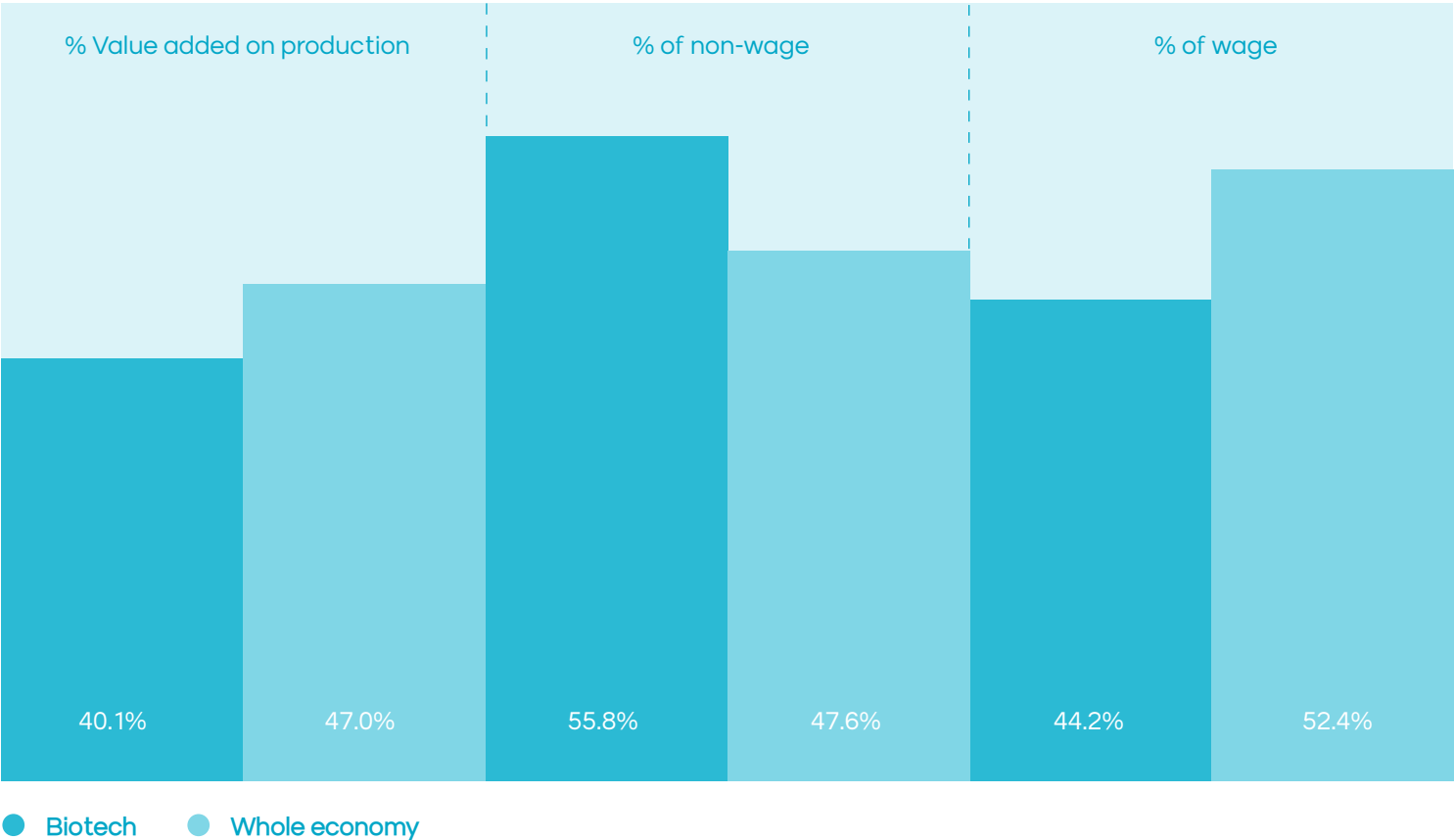
		2023	2022	2021	2020	2019	2018	2017	2016	2015
Production	€ millions	14,813 14,317 (*)	19,676 14,606 (*)	17,993 13,035 (*)	12,089	11,914	9,861	9,315	8,787	8,777
	% gwth	-24.7% -2% (*)	9.4% 12.1% (*)	48.8% 7.8% (*)	1.5%	20.8%	5.9%	6.0%	0.1%	14.5%
	% GDP	1.0%	1.4%	1.5%	1.1%	1.0%	0.8%	0.8%	0.8%	0.8%
Intermediate goods	€ millions	8,871	12,898	11,562	8,301	8,174	7,230	6,433	6,592	6,907
Gross value added		5,942	6,778	6,431	3,788	3,740	2,631	2,882	2,195	1,870
Employee salaries		2,629	2,467	2,198	1,987	1,878	1,759	1,515	1,330	1,244
Sur. Gross margin profit and Net taxes		3,313	4,312	4,233	1,801	1,862	872	1,368	866	626
Employment	N° people	38,287	36,273	34,388	31,287	29,512	27,085	25,029	22,637	21,504
	% gwth	5.6%	5.5%	9.9%	6.0%	9.0%	8.2%	10.6%	5.3%	12.5%
	Total %	0.18%	0.18%	0.17%	0.16%	0.15%	0.14%	0.13%	0.12%	0.12%

Table 8.1. Estimated economic activity of biotech firms. Source: Compiled from the information on companies collected by AseBio. (*) Excluding Moderna turnover.

Productivity per employee at biotech firms is three times the national average and salary per employee is more than double the national average.

There was a considerable decrease in turnover in 2023, directly tied to the drop in commercialisation of the COVID-19 vaccines. Therefore, there seems to be a drop in average productivity of biotech companies. However, as chapter 3 shows (graph 3.3), both productivity levels and average salary remain well above the national average, with productivity being nearly three times higher and salaries double.

Additionally, graph 8.3 gives a more structural view of biotech companies' productivity. On average, they generate somewhat less income per unit invoiced than the economy as a whole, as expenses are higher than the average, and in terms of breakdown of income generated, operating surplus makes up a higher percentage than salaries, unlike what we see in the average of all activities.



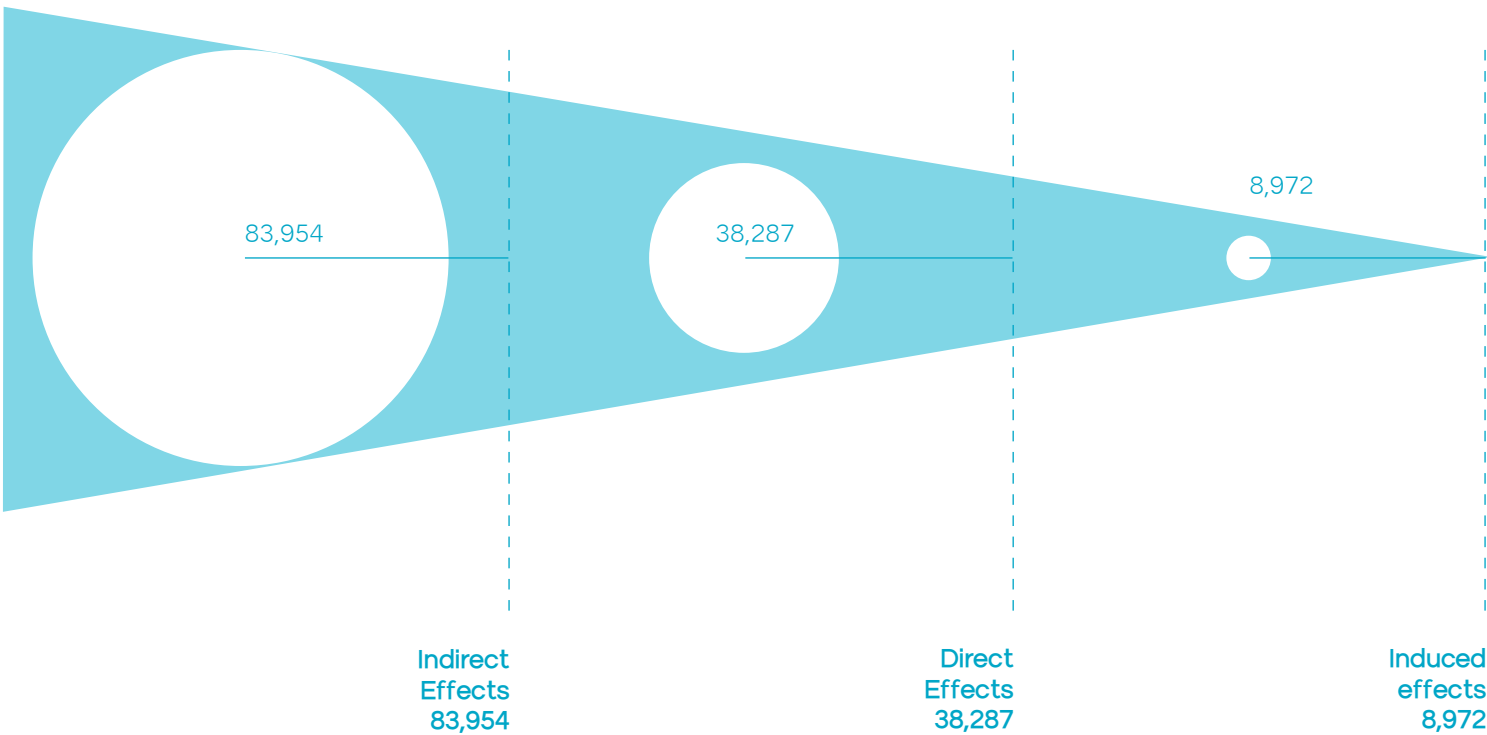
Graph 8.3. Basic productivity ratios for biotech firms and the whole economy. Source: Compiled internally from the information on companies collected by AseBio. 2023.

Spanish biotech companies create 131,214 jobs, 0.67% of total employment nationwide.

As in the case of income, the impact on employment from activities carried out by biotech firms is amplified throughout the production chain. So, for each direct job created, more than three indirect or induced jobs are also generated.

Therefore, these companies that employ more than 38,200 workers directly, are responsible for maintaining just over 131,000 jobs, which is 0.67% of total employment nationwide (graph 8.4).

Total impact: 131,214 (0.67% of employment)



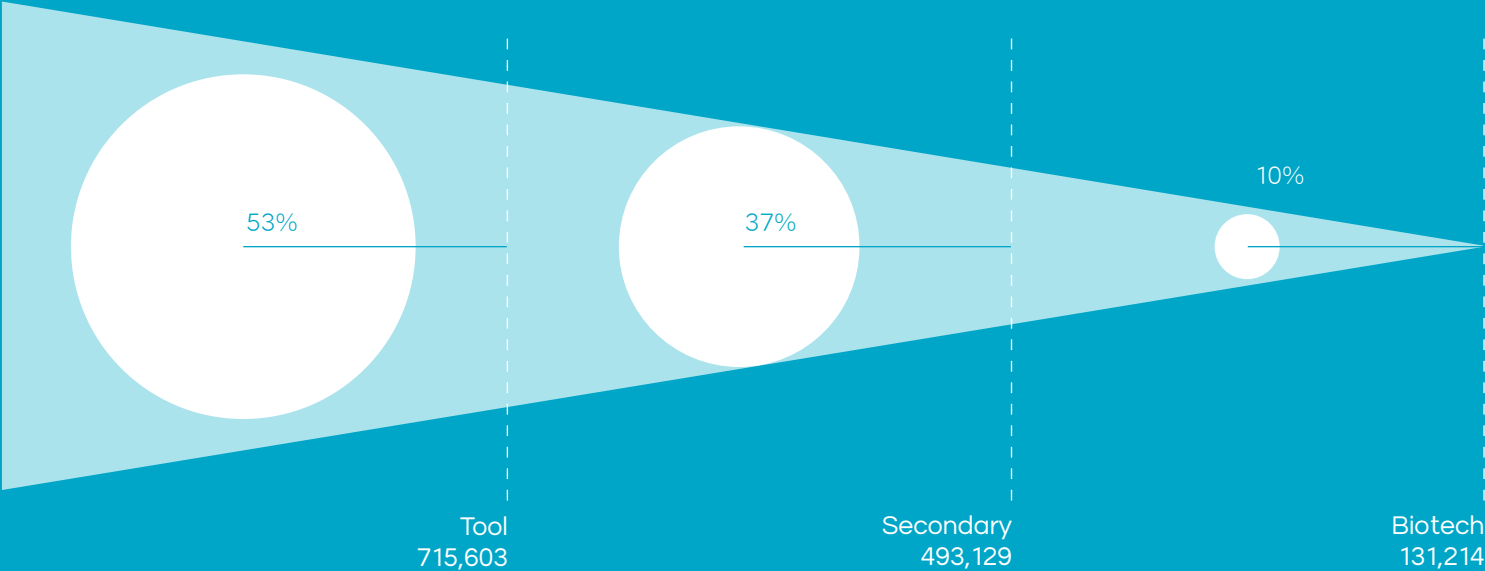
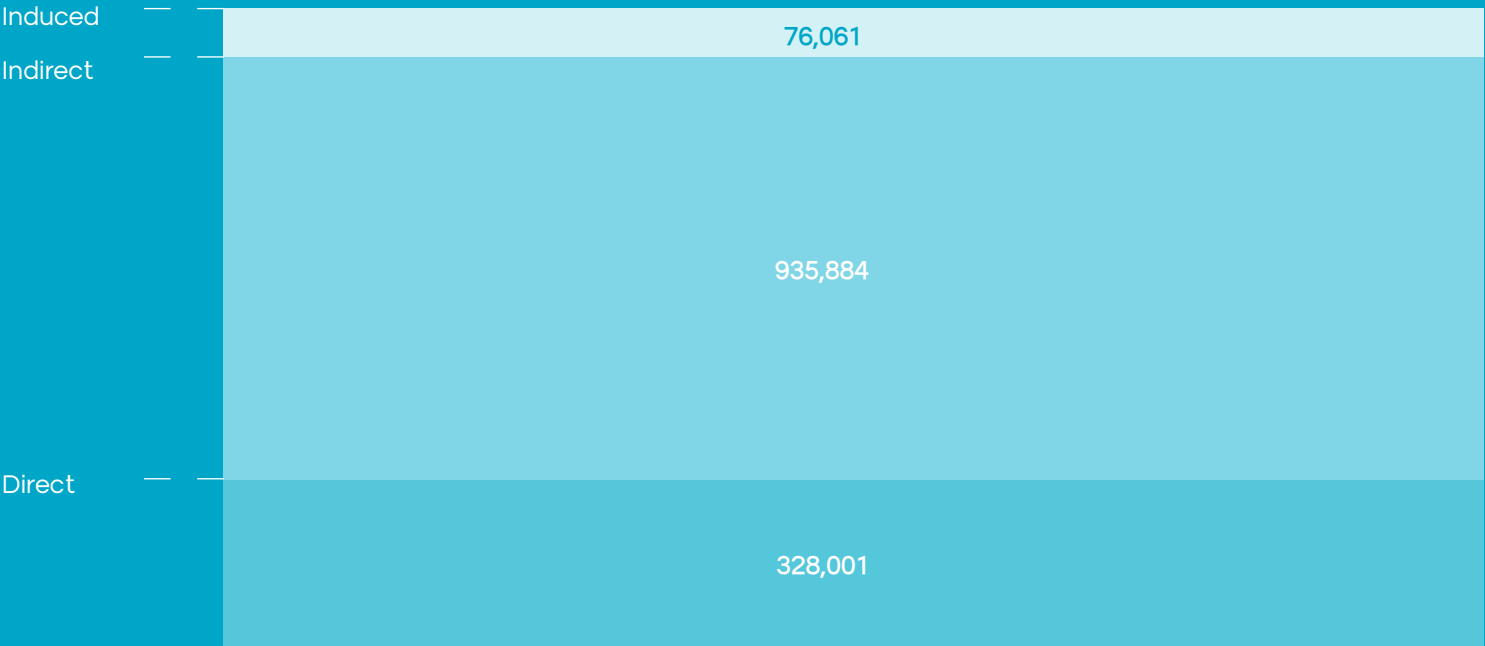
Graph 8.4. Impact on total employment of biotech firms (Total jobs in 2023).
Source: Compiled from a sample of companies collected by AseBio and the Survey on Biotechnology Use. INE.

If we broaden our analysis to look at all companies doing biotechnology activities, the total employment that directly or indirectly depends on the activities carried out by these companies is more than 1,300,000 jobs, or 6.8% of the national total.

Of these, 74% are indirect effects from the consumption of intermediary goods and services and investments made by biotechnology companies.

By type of company, biotech firms account for 10% of this impact, while those with biotechnology as a secondary activity contribute 37% and those that use biotechnology as a production tool, the remaining 53% (graph 8.5).

Total: 1,339,946

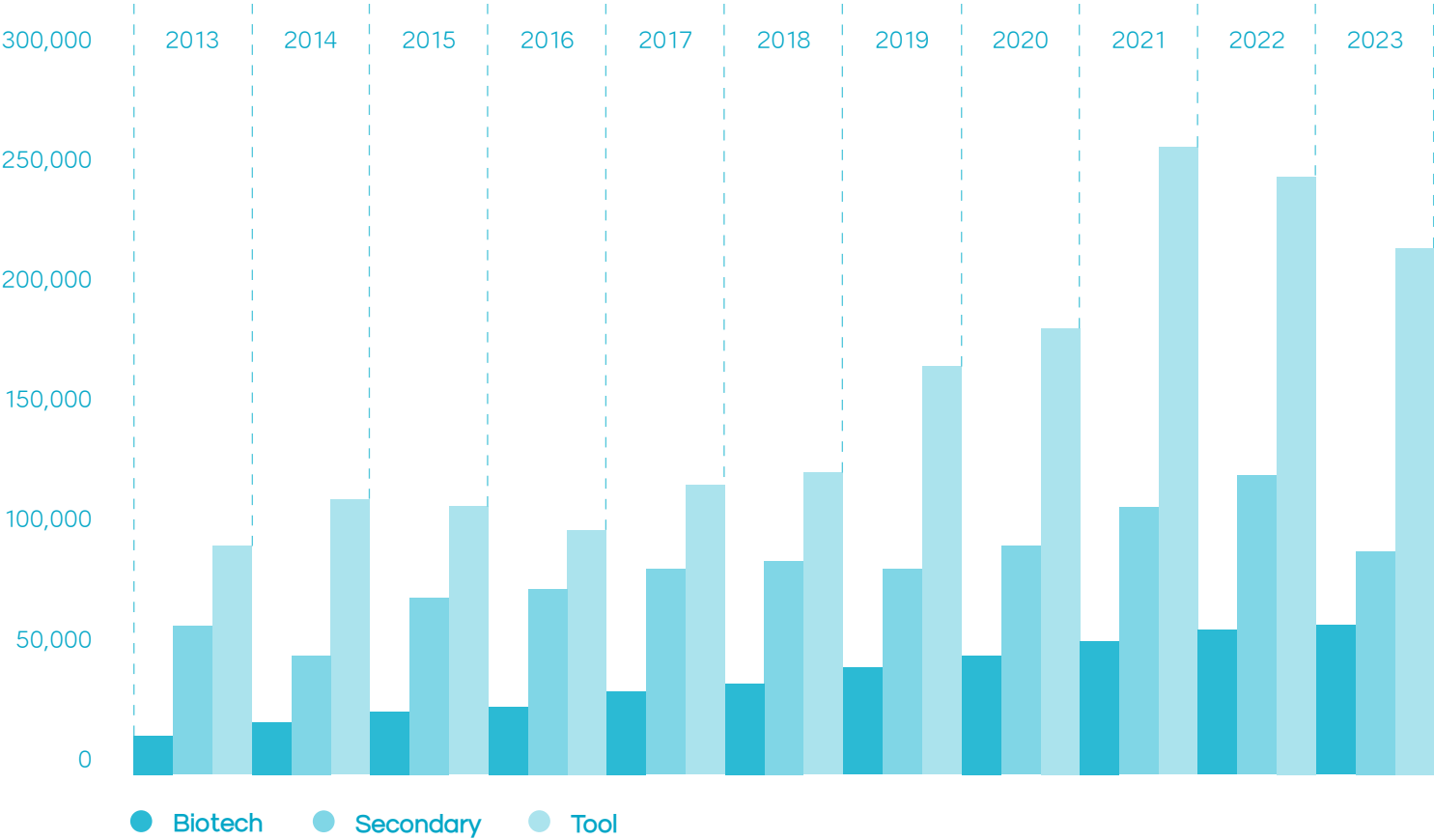


Graph 8.5. Total contribution to employment by companies with biotechnology activity (total jobs in 2023). Source: Compiled from the information on companies collected by AseBio and Survey on Biotechnology Use. INE.

The drop in number of companies carrying out biotechnology activities in the latest INE Survey on Biotechnology Use can also be seen in the total volume of employment, which dropped nearly 13% compared to the overall increase of more than three points for the economy as a whole.

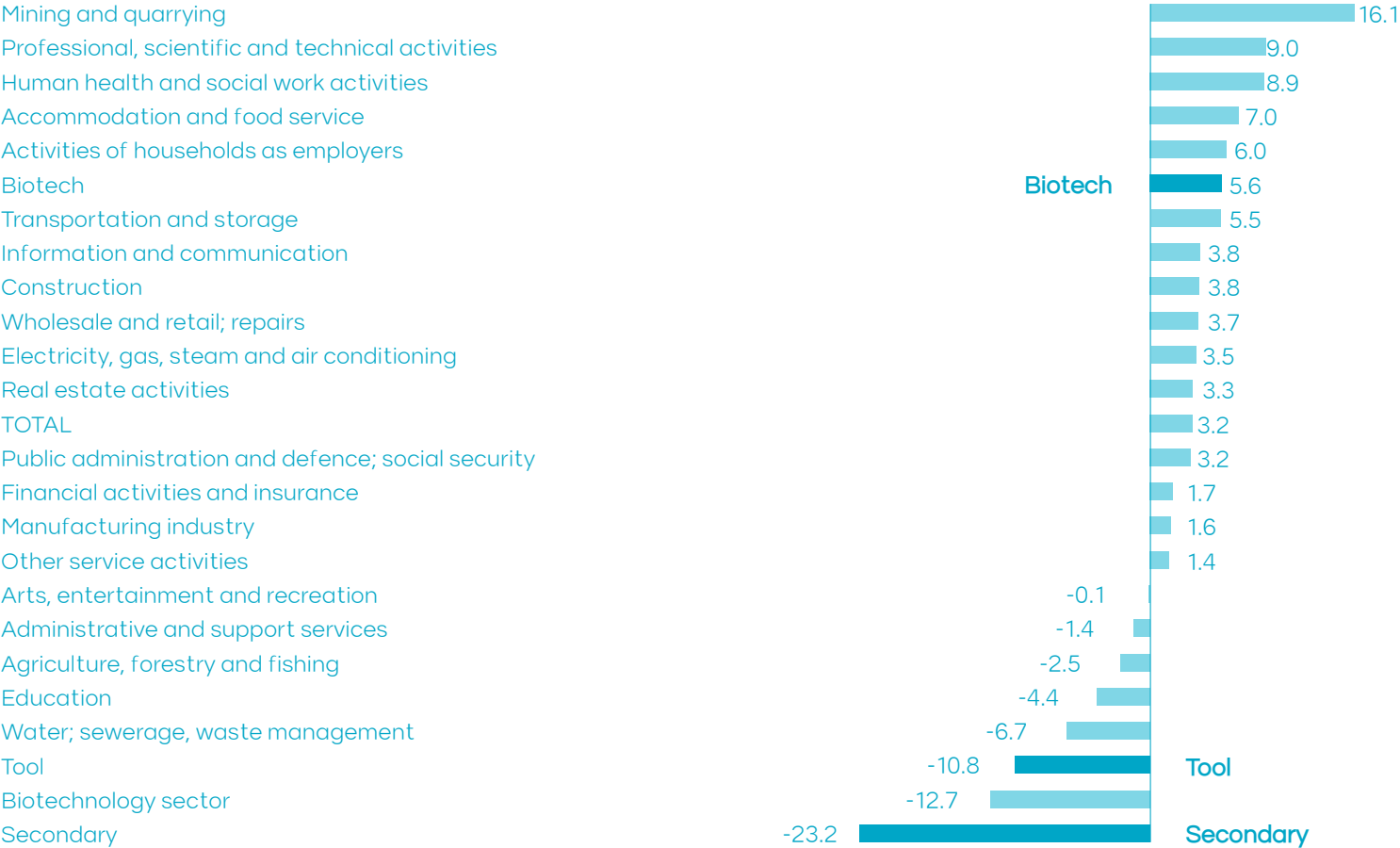
If we look more closely at the evolution of employment, the number of workers at companies that use biotechnology as a tool in their processes dropped 10.8%, while at companies with secondary use it dropped 23.2%. There is no clear explanation for these significant fluctuations, although they could be due to

the methodology used for compiling these INE statistics, which reflect the information the companies report, without standardising the samples year on year, so if companies said they carried out biotechnology activities in previous years, but said the opposite this year, the data can vary substantially. Nevertheless, it is important to highlight that biotech companies as a whole continued to grow their staff, with an average increase in 2023 of 5.6%, meaning nearly double the growth reported for national employment as a whole, which was 3.2%.



Graph 8.6. Evolution of employment in biotechnology companies. Source: Compiled from a sample of companies collected by AseBio and Survey on Biotechnology Use. INE.

In terms of the creation or destruction of jobs in 2023, the results are quite similar to those seen for turnover, with biotechnology activities leading the decrease in employment among sectors of the Spanish economy. However, biotech companies hired more employees at a particularly high rate.



Graph 8.7. Comparative employment growth dynamics of companies with biotechnology activity (Employment growth rates 2023). Source: Compiled internally from the information on companies collected by AseBio and Survey on Biotechnology Use.





Branded Content

Andrea Romero, CSO and co-founder,
Konexio Biotech



Serving healthcare innovation: Konexio Biotech's comprehensive approach

We founded **Konexio Biotech** in 2020 with a clear vision: to become strategic partners for companies developing innovative products in healthcare that needed expert support to overcome regulatory challenges from the research phase through market. Our mission is to offer **360° regulatory consultancy services**, meaning holistic coverage of all regulatory needs, regardless of the phase the product or technology is in.

We have a **team of professionals with over 30 years of experience** in the regulatory, pharmaceutical, biotechnology and healthcare technologies sector. This cumulative experience allows us to offer a streamlined, strategic approach that adapts to each project, from small start-ups to large, consolidated companies. Our desire is to accompany our clients as true partners, aligning our goals with theirs and adding value from day one.

Konexio Biotech was established at a key time for the biomedical ecosystem. In recent years, we have seen health innovation accelerate: new drugs, advanced therapies, medical devices, digital diagnostics and combined solutions that challenge traditional regulatory frameworks. In this context, we identified the growing need for specialised **regulatory advisory services** with a global, strategic vision that allows developers to turn their ideas into real products that are available to and safe for patients.

From the beginning, we have been firmly committed to offering personalised service, which isn't limited to preparing documents or filing reports, but has a **strategic component**: quality issues, clinical trials, product classification analysis, choosing the most efficient regulatory pathway, interacting with agencies such as the EMA and FDA, accompanying clients on the CE marking process under MDR/IVDR, and more.

Plus, we work with a network of **strategic partners** that complement our capacities to tackle every dimension of biomedical development, including manufacturing, monitoring clinical trials, post-commercialisation vigilance and market access. This network allows us to be flexible, decisive and aligned with the demands of the market today.

Our headquarters is in **Madrid**, but our team is spread out in offices around the country, giving us both national and international reach. From there we collaborate with universities, research centres, science parks, start-ups, investment funds and large corporations, with the common goal of **driving health innovation** and helping it get to patients safely, effectively and as quickly as possible.

We are proud to be part of the biomedical and health innovation ecosystem, and to help strengthen the sector through regulatory guidance. We are firm believers that the right regulatory strategy is one of the keys to success in developing any healthcare technology, and at Konexio Biotech we strive to be the partner you trust along that pathway every day.



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Board of Directors

CHAIRWOMAN - AMADIX
Rocío Arroyo



1st VP - ORYZON
Carlos Buesa



2nd VP - MSD
Cristina Nadal



3rd VP - TERBIO
Adriana Casillas



3P BIOVIAN
Dámaso Molero



ABBVIE
Amparo Valladares



ABILITY PHARMA
Carles Domenech



ADL BIOPHARMA
Jörg Lindemann



AMGEN
Fina Lladós



ARRAYS FOR CELL NANODEVICES
Elena Rivas



Members

ATRYS HEALTH
Santiago de Torres



BAYER HISPANIA
Jordi Arnalte



BIOHOPE
Isabel Portero



INVEREADY
Sara Secall



LEITAT
Marc Massa



MOA BIOTECH
Bosco Emparanza



SILO
Antonio López



VIVEBIOTECH
Gurutz Linazasoro



ZECLINICS
Javier Terriente



Committees



Healthcare
Committee

Led by Laura Pellisé (Amgen)

Goals

- 1. To influence regulatory processes that affect the application of biotechnology in healthcare.
- 2. To help develop and improve the national health system, promoting access to biotechnological innovation that is compatible with sustainability.
- 3. To raise awareness of the contributions biotechnology makes to help and further recognition as a sector that generates a lot of value added.
- 4. To lead collaboration and partnership initiatives with stakeholders in the public and private sectors that foster innovation in healthcare and new technology and public policies that valorise R&D throughout the chain.

Workgroups

- Market access. Coordinator: Natividad Calvente (Novartis)
- Personalised medicine and advanced diagnostics. Coordinator: Elena Sánchez (Amadix)
- Drug discovery. Coordinator: Javier Terriente (ZeClinics/ZeCardio)
- Advanced therapies. Coordinator: Gurutz Linazasoro (VIVEbiotech)
- One Health: AMR and emerging infectious diseases. Coordinator: Cristina Nadal (MSD)



Sustainability Committee

Led by Adriana Casillas (Tebrio)



Boost the ecosystem
Committee

Led by Carles Domenech
(Ability Pharma)

Goals

- 1. To carry out actions to improve funding for R&D.
- 2. To make the most of the potential of artificial intelligence and new technologies in biotechnology.
- 3. To reinforce the positioning of specialised private capital as a key tool for driving the biotechnology sector.
- 4. To work to keep biotechnology in the news.
- 5. To promote the internationalisation of the biotechnology sector.
- 6. To promote strategies to make it easier for our members to attract and manage talent.

Workgroups

- R&D incentives. Coordinator: Sara Secall (Inveready)
- Artificial intelligence and new technologies. Coordinator: Jorge Tello (Savana Medical)
- Private capital. Coordinator: Clara Campàs (Asabys Partners)
- Communication. Coordinator: Laia Simón (Oryzon)
- Internationalisation. Coordinator: Carles Domenech (Ability Pharma)
- Talent and diversity. Coordinator: Tomás Alarcón (3PBIOVIAN)

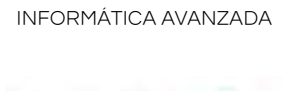
Goals

- 1. To promote an appropriate, stable regulatory framework in Spain and Europe that can facilitate the contributions of biotechnology to agrifood production and environmental conservation, and to encourage research and innovation in industrial biotechnology.
- 2. To continue putting various areas of biotechnology like agrifood, blue biotechnology, industrial biotechnology, etc., on the agenda of public institutions and governments, encouraging measures to promote and support the sector.
- 3. To boost visibility and recognition of biotechnology for its contribution to the circular economy and the role it plays in ensuring safe, sustainable, quality nutrition.

Workgroups

- Sustainable agriculture. Coordinator: Jordi Arnalte (Bayer Hispania)
- Food innovation. Coordinator: Bosco Emparanza (MOA Food Tech)
- Industrial biotechnology. Coordinator: Adriana Casillas (Tebrio)

Business members

			
3PBIOVIAN	4MEDIKS	ABBVIE	ABILITY PHARMA
			
ACKERMANN INTERNATIONAL	ADL BIOPHARMA	ADM	ADMIT THERAPEUTICS
			
ADNTRO	AFARVI	AFFIRMA BIOTECH	AGAROSE BEAD TECHNOLOGIES
			
AGLARIS CELL	AGRENVEC	ALCALIBER	ALGENEX
			
ALIATH BIOVENTURES	ALLINKY BIOPHARMA	ALMIRALL	ALTUM SEQUENCING
			
AMADIX	AMGEN	AMS BIOPHARMA	AMS LAB
			
ANQUOR CORPORATE FINANCE	ANTARES CONSULTING	APLICACIONES EN INFORMÁTICA AVANZADA	APPLIANT
			
APTATARGETS	APTUS BIOTECH	AQUILÓN CYL	ARACLON BIOTECH



ARCHIVEL FARMA



AROSA I+D



ARRAYS FOR CELL
NANODEVICES



ARTHEX BIOTECH



ARTINVET



ASABYS PARTNERS



ASCIL BIOPHARM



ASPARIA



ASPHALION



ASTRAZENECA



ATRYS HEALTH



AYMING



AZUR GLOBAL
NUTRITION EUROPE



BATEA ONCOLOGY



BAYER HISPANIA



BCN HEALTH



BDI BIOTECH



BEXEN MEDICAL



BIOBIDE



BIOCLONAL



BIODURO



BIOFABRI



BIOHERENT



BIOHOPE SCIENTIFIC
SOLUTIONS FOR
HUMAN HEALTH



BIOINGENIUM



BIOINTAXIS



BIOLAN



BIOLAN
HEALTH



BIOMAR



BIOMIXING



BIOMOL



BIONET INGENIERÍA

Business members



BIOREPOS



BIORIZON BIOTECH



BIOSERENTIA



BIOTECHNOLOGY
ASSETS



BIOTECHVANA



BIOTOOLS



BIOXYTOL



BME



BTI BIOTECHNOLOGY
INSTITUTE



CAPITAL CELL



CELAVISTA
MITO-BIOGENESIS



CELLAB



CELLDRIVE 3D



CELTARYS RESEARCH



CENCORA



CERTEST BIOTEC



CESIF



CMG MEDDEV



COBIOMIC
BIOSCIENCES



COCOON BIOSCIENCE



CONNECTA
THERAPEUTICS



COOL CHAIN LOGISTICS



COPAL SCIENTIFIC



CORIFY CARE



CRAZY SCIENCE &
BUSINESS



CRB INVERBIO



CRITERIA BIO VENTURES



CULTIPLY



CURAPATH



CYTES BIOTECHNOLOGIES



DANAGEN



DARWIN BIOPROSPECTING
EXCELLENCE



DEEPLABS



DIVERSA TECHNOLOGIES



DISGENET



DR. HEALTHCARE



DUPONTE INVESTIGACIÓN Y
DESARROLLO SL



ELZABURU



ENZYMLOGIC

EUROGENETICS



EURONEXT



EUROPEAN RESEARCH
BIOLOGICAL CENTER (ERBC)



FLOMICS BIOTECH



GATE2BRAIN



GEA WESTFALIA SEPARATOR
IBERICA S.A.U.



GÉNESIS BIOMED



GENINCODE



GENOMCORE



GILEAD



GOLD STANDARD
DIAGNOSTICS



GOODGUT



GRADOCELL



GRIFOLS



GRIFOLS ENGINEERING



GRUPO NATAC



GSK
(GLAXOSMITHKLINE)



HELIX BIOINFORMATICS
SOLUTIONS



HIFAS INNOVATION HUB



HIPRA



HISTOCELL



HOFFMANN EITLE



IDEEEA THERAPEUTICS



ILLUMINA



IMERETI

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Methodology

Chapter 1 - R&D investment

For this chapter we compiled the results of the Survey on Biotechnology Use and statistics on R&D activities from the National Statistics Institute. 2023

https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176808&menu=resultados&idp=1254735576669

Chapter 2 - Funding

The data in chapter 2 was compiled from information from the National Innovation Company (ENISA), the Centre for the Development of Industrial Technology (CDTI), Capital Cell, Sodená, members and the press.

Chapter 3 - Talent and diversity

To obtain the data on the evolution of the number of students enrolled in university studies in biotechnology, we used data from the Statistics on University Students of the Ministry of Universities <https://www.ciencia.gob.es/Ministerio/Estadisticas/SIU/Estudiantes.html>, and selected data since 2015 for all universities that offer undergraduate or masters studies in biotechnology.

To obtain data on the admissions scores, we consulted the scores posted on the Educaweb website and the websites of public universities in March 2025.

To obtain the data on number of researchers, female researchers and female representation, we used the INE 2023 Survey on Biotechnology Use and INE Statistics about R&D activities.

https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176808&menu=ultiDatos&idp=1254735576669

For the data on the productivity and salaries of employees at biotech firms, we used the sample of companies compiled by AseBio.

To obtain the results on women in executive teams at biotechnology companies, we used data from the Companies House registry and the websites of companies in the sector, as well as data from the INE and the Institute of Women of the Ministry of Equality.

<https://www.inmujeres.gob.es/MujerCifras/Home.htm>

Chapter 4 - Business fabric

To reflect the number of biotechnology companies, and their breakdown by the field they apply biotechnology in, size and geographic location, we compiled data from the INE Survey on Biotechnology Use and the list of biotechnology companies identified by AseBio.

To put together the list of biotechnology companies started in 2024, we requested information from various entities in the main autonomous communities with biotechnology activity.

Chapter 5 - Environment

For the chapter on the political and regulatory environment, we monitored laws, initiatives and public policies that affect the biotechnology sector in Europe and Spain.

The data on perception of the biotechnology sector was obtained from a survey of AseBio members, who were asked to rate several factors on how they had affected the biotechnology sector in 2024.

Chapter 6 - Results of the Biotech Sector

To compile this chapter we obtained information from the following sources:

- In the section on production on scientific knowledge, we included the main indicators for Spanish scientific production in biotechnology, provided by the Spanish Foundation for Science and Technology (FECYT), based on data from the Elsevier SciVal tool, which contains the scientific production from the Scopus database.
- Normalised impact is an indicator that compares similar publications, in terms of year published, category and document type. A NI of 1.0 means the paper is cited as often as the global average. A NI of 2.0 means the paper is cited twice as often as the global average.
- To come up with the number of scientific publications by AseBio members in 2024, we requested information from members on their scientific publications in biotechnology, not including communications or posters at congresses or fairs.
- The data on patents was obtained for AseBio in a study carried out by the Madrid Science Park based on the ClarkeModet database. The information was obtained using the methodology designed by ClarkeModet and the Madrid Science Park, based on OECD definitions for the biotechnology sector. The Clarivate Analytics databases were used. Plus, we checked the public databases of the various offices: Spanish Patent and Trademark Office (OEPM), European Patent Office (EPO), United States Patent and Trademark Office (USPTO), Japan Patent Office (JPO) and the World Intellectual Property Organisation (WIPO).
- The advances in development were compiled from press publications or the websites of AseBio members.
- Both the section on products and services launched in 2024 and their breakdown by areas of activity were put together by consulting AseBio members.

Chapter 7 - Collaboration and internationalisation.

The results on partnerships established by biotech companies were obtained from members, checking grant resolutions for biotech projects in cooperation with CDTI, AEI and the European Union Horizon programme, and by checking press releases from the various organisations.

The information on international presence of AseBio members was compiled from their websites and by consulting them directly.

Chapter 8 - Impact

The data for this chapter was obtained from a sample of companies collected by AseBio and from the Survey on Biotechnology Use conducted by the National Statistics Institute (INE).

We systematically collected and processed registry information for all companies identified as biotech firms, processing their basic financial statements, balance sheets, and profit and loss statements to get a direct measurement of their business activity.

For each of these companies, we quantified their levels of basic production (turnover), employment, intermediate goods (products and services), value added, salaries (personnel expenditure) and investment over the past 10 years (2014-2023) to get the cumulative levels for all biotech firms, extrapolating the results obtained to the overall totals identified by the INE.

Alongside the detailed analysis of the biotech firms, we also moved forward in quantifying the corresponding levels for companies with biotechnology as a secondary activity and those that use biotechnology as a production tool, which along with biotech firms make up what we call the biotechnology sector.

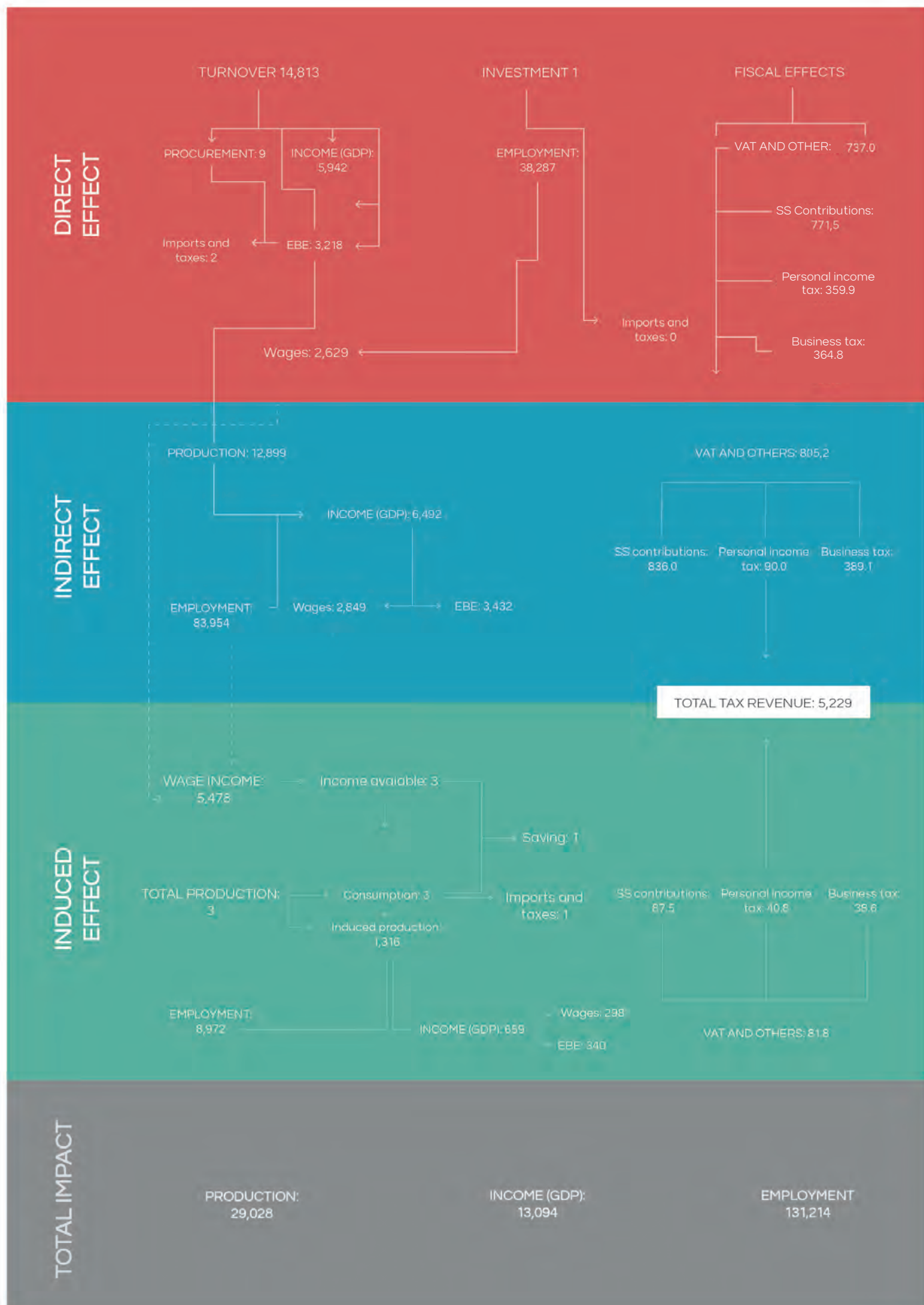
For these companies, we started with the total employment figures in the INE survey and did an indirect estimation of the other benchmark levels, taking into

account both the general ratios in the National Accounting and the specific ones for strictly biotechnology activities calculated previously.

From these figures, we calculated the overall economic impact of the activity carried out by these companies on the Spanish economy as a whole.

This way, using the standard methodology based on input-output tables, we calculated both the direct impact in terms of generating income (GDP), employment and tax revenue, and the indirect impact, generated by companies with biotechnology activity purchasing goods and services from companies with biotechnology activity, plus the induced impact generated by direct and indirect salaries dependent on this activity.

The following figure shows the sequence of calculations for the Impact chapter.





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