# Catalonia Life Sciences Report 2011

ERNST & YOUNG
*Quality In Everything We Do*

biocat

# Contents

"The commitment to innovation should be the best corporate insurance to overcome the crisis"

# Chapter 1

# Preface

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# An increasingly demanding market

In the last years the biotechnology market has been constantly increasing at the expense of traditional chemistry. Additionally, the growth of biotechnology has become the ultimate pillar for international pharmaceutical research to spread. In turn, small biotechs' aspiration is for big pharma companies to adopt their molecules as soon as possible, since development is expensive and it is impossible for them to face future on their own. This objective seems more elusive with the crisis: labs do not want to take risks and prefer to wait until success is ensured.

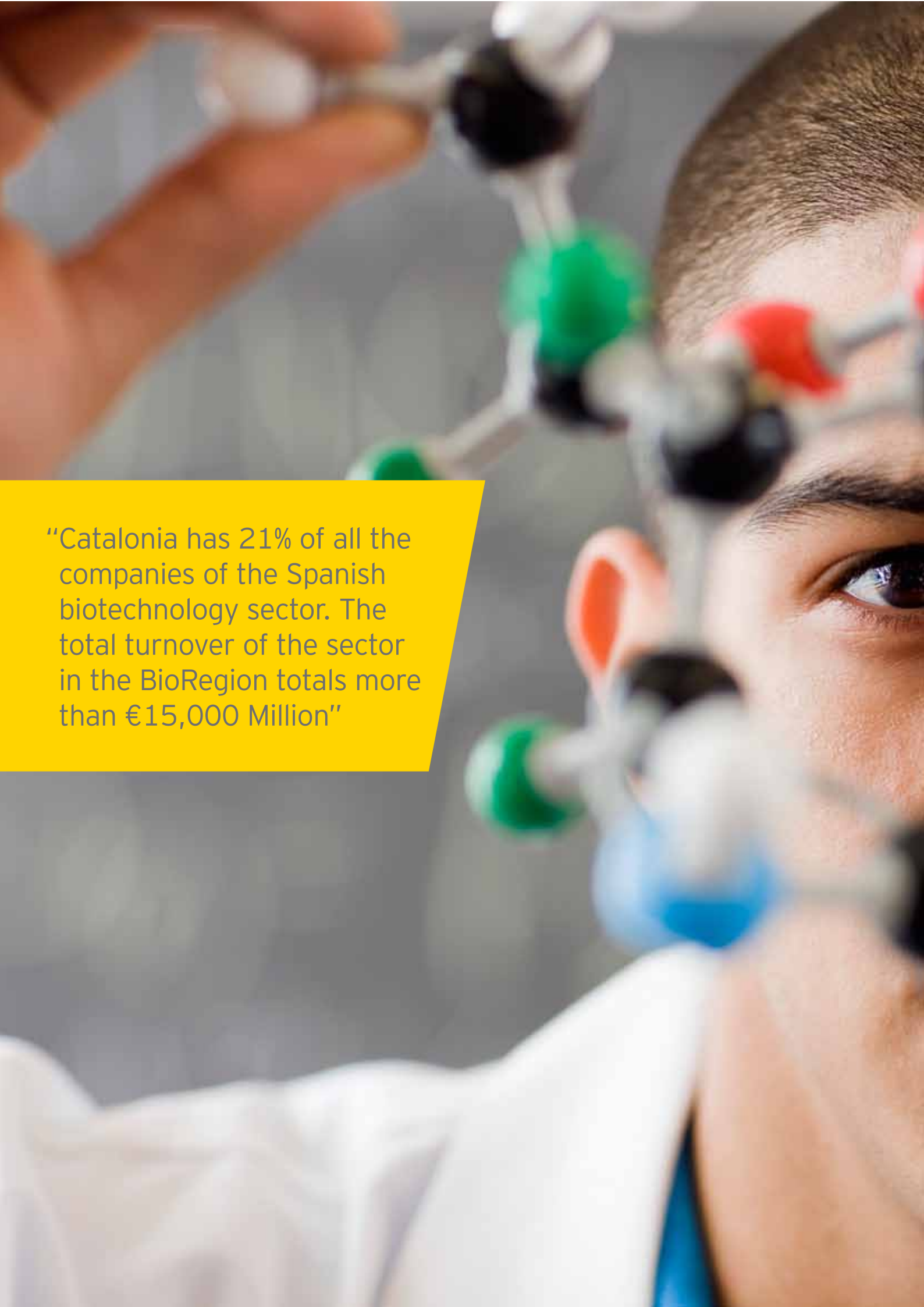
Indeed, biotechnology is the great hope and, in figures, around 200 compounds in the late stages of research could generate 150,000 millions a year. But good intentions are not enough, and in this increasingly demanding market an efficient strategy is called for. The present is asking us to be more dynamic, to take new business paths and lean on partners to achieve goals. In Catalonia and at global level, investments in innovation are growing exponentially in order to satisfy ever more informed patients, with growing decision-making power, and a health system which is increasingly focused on improving its management cost. In this regard, the role of the companies in this industry goes far beyond mere development and manufacture of products. This evolution is being prompted by fast developments in information technology, lack of solvency and difficulties in health system sustainability at global level.

Opportunities generated in this new scenario are attracting a growing number of new non-traditional players in the healthcare area.

At Catalan level, biotechnology is a powerful although industry. On the other hand the pharma industry, which represent one of the most profit-generating industry is well established in Catalonia. That is why synergies between Biotech and pharma companies should be deeply fostered in order to cooperate in joint projects for advancing on biotechnological research and innovation.

In order to carry out these developments, Governments and companies should opt for business models that are better managed, more efficient and whose future feasibility is guaranteed. They should not avoid the challenges laying ahead within an ever-changing environment deeply affected by the financial crisis.

In conclusion, we are aware that the commitment to innovation should be the best corporate insurance to overcome the crisis. Prospects for the coming years are not good. Traditionally, the pharma industry links its R&D investments to turnover evolution, even under the current scenario where companies' turnover is decreasing.



"Catalonia has 21% of all the companies of the Spanish biotechnology sector. The total turnover of the sector in the BioRegion totals more than €15,000 Million"

**Montserrat Vendrell**
CEO, Biocat

# Accelerating opportunities for the BioRegion of Catalonia

Over the past 10 years, Catalonia has seen an unprecedented level of growth in its research capacities, putting it among the most dynamic and productive regions in Europe in terms of knowledge generation. While Catalonia accounts for 1.5 % of Europe's population, it contributes to 1.69 % of its GDP, 2.98 % of scientific production and boasts 3.48 % of ERC grants (2011), two fold the European average, only after Switzerland, Israel, UK and Belgium. Furthermore, joint efforts of both the Catalan and Spanish governments, have allowed for the construction of key scientific facilities such as the National Genome Analysis Center (CNAG), the Alba-CELLS Synchrotron, or the Barcelona Supercomputer Mare Nostrum. Catalonia has 80 bioscience research centers some of which are international benchmarks in genomics (CRG), photonics (ICFO) or oncology (IRB).

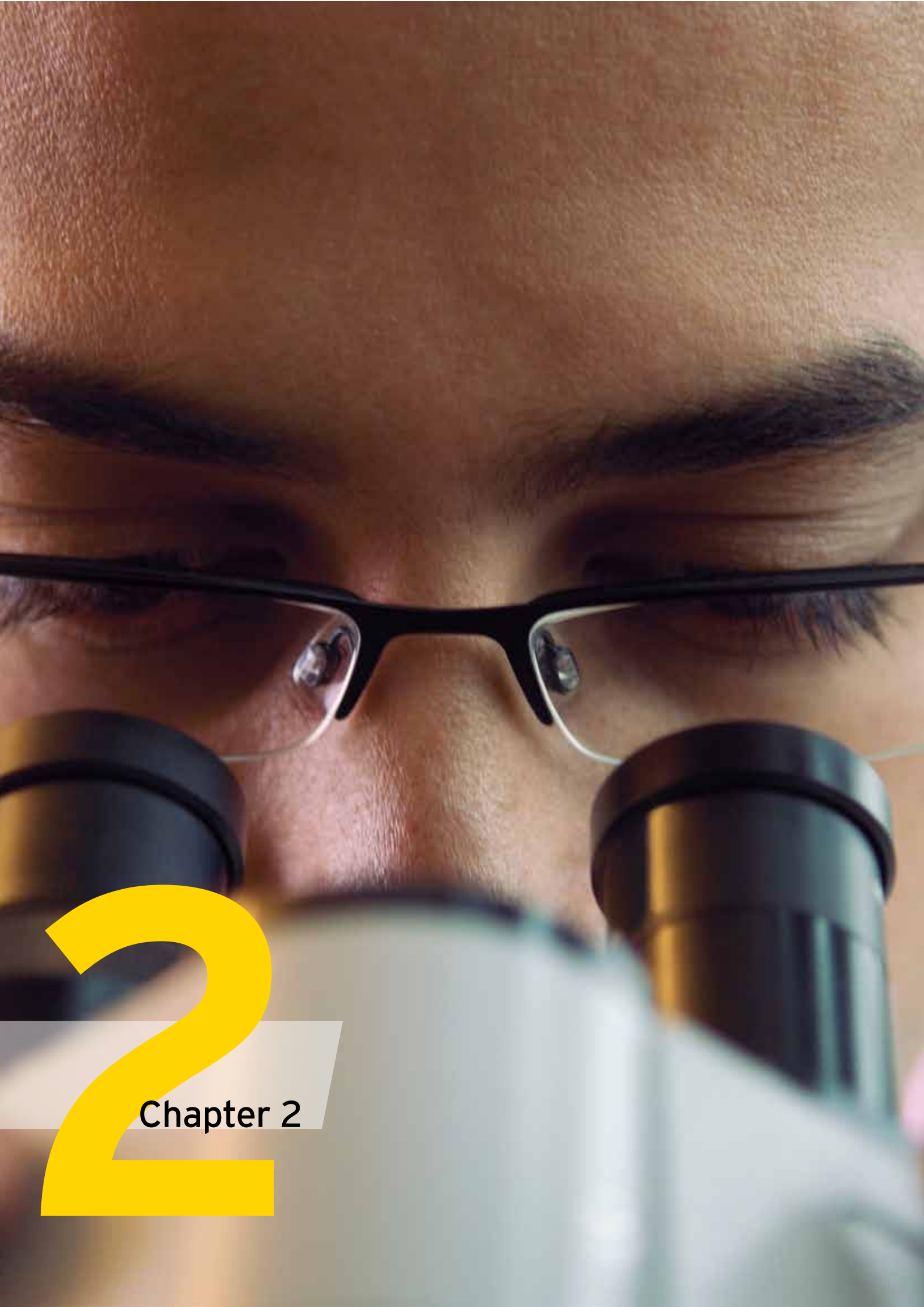
Alongside this scientific development, the business sector has experienced unstoppable growth since 2000 —at a rate of 15% to 30% per year— and is now made up of 480 companies, including biotechnology, pharmaceutical, medical technology and sector-services firms. This business activity is concentrated (85% of the organizations in the sector) mainly around Barcelona, which is also home to most of the 20 science parks in the region. Although the majority of these companies (65%) are SMEs and despite the adverse economic conditions they have had to deal with over the past two years, the comparative analysis Biocat carried out for the 2009 and 2011 fiscal years shows a positive evolution both in economic terms and in research capacities.

Catalonia has 21% of all the companies in the Spanish biotechnology sector. The total turnover of the sector in the BioRegion totals more than €15,000 millions, with more than €2,300 millions in capitalization, which —more importantly— tripled in the 2009-2011 time period. The increase in investment —92% of which is private— has been accompanied by a significant increase in research capacities in the clinical phases and has allowed these companies to have a pipeline of 270 new therapeutic products and more than 300 new medical technologies.

Biocat was created in 2006 by the Catalan Government, the Barcelona City Council, universities, hospitals, research centers and companies to boost a strong BioRegion, competitive at international level. This report sums up the assets this concerted public/private effort has achieved at present, which have made Catalonia a benchmark in clinical innovation and advanced therapies with a number of top-notch projects in the pipeline at our companies and research centers.

New diagnostic tools to detect cancer or a predisposition to cardiovascular disease, genetic tests to discover a patient's sensitivity to specific medicines, a new vaccine for tuberculosis and one for malaria in the final clinical phases, new probiotic foods, agrifood pathogen detectors, surgical biomaterials, new biological or nanotechnological methods for drug encapsulation and delivery, new components for the cosmetics industry. These are just some examples of the products Catalan biotechnology firms have already put on the market or are developing at the moment. They are also an example of the sector's potential, which is the result of the ongoing effort Catalonia has made over the past 15 years to drive research and a knowledge-based economy.

Naturally, in order to make the most of its potential, Catalonia must collaborate with other clusters such as Massachusetts, Maryland, California and more. We hope this report will be a tool to drive this cooperation in order to fuel a sector that is key to tackling the large-scale challenges currently facing the world while, at the same time, guaranteeing economic growth and social wellbeing.



# 2 Chapter 2

# Scope of the report

Catalonia is the region that makes the biggest contribution to the Spanish economy, producing the 18.6% of the country's GDP. Its traditional business dynamism and its entrepreneurship culture, along with the political will of the autonomous government, have allowed the development, during the last ten years, of a strong R&D system and a huge number of innovative companies in knowledge-based sectors as life sciences. Although the negative impact of the global economic crisis on R&D investments, both public and private, the biotechnology industry in Catalonia is still on an upward trend and indicators show positive evolution.

The purpose of the Catalan edition of the Life Sciences Report issued by Ernst & Young, in collaboration with Biocat*, is to offer an in-depth analysis of the industry: on one hand, to show the main figures, analyzing the current status of biotechnology, biomedicine and medical technologies in Catalonia, within a global economic instability environment; on the other hand, to see the evolution of the industry in recent years and identify new challenges, strategies and future prospects.

In the preparation of this report, we have taken into account the content of Biocat Report 2011, based on data gathered from an extensive survey sent to both public and private entities that perform their work and research activities within biotechnology, biomedicine and medical technology, which together constitute Catalonia's BioRegion.

The survey was sent out in December 2010 to 435 research groups and to 450 companies in the BioRegion, 49.5% of which responded. This high level of survey participation (438 organizations) has allowed a consistent analysis of Catalan life sciences companies and research institutions, including some estimates for the sector as a whole. All other consulted sources are explicitly identified where appropriate.

Thus, the final objective is to highlight the relevance of the biotechnology, biomedicine and medical technologies in Catalonia that could become the driving force of Catalan economy and innovation, identifying the strengths, pending challenges and the appropriateness of establishing long-term policies.

*Biocat is the entity responsible for boosting and fostering the BioRegion in Catalonia. For further information please visit www.biocat.cat

# Chapter 3

# Introduction to the Catalonia Life Sciences Sector

With more than 1,100 registered entities, including research institutions and companies, Catalonia is the leading biocluster in Spain and a reference hub in Southern Europe. The steady increase of the number of companies and several initiatives to foster research and innovation prove the BioRegion's dynamism.

The entities that constitute Catalonia Life Sciences sector are grouped in one of the major biotechnological clusters in Spain: the BioRegion.

The BioRegion is Catalonia's biotechnology, biomedicine and medical technologies cluster. It comprises biotechnology, pharma and medical technology companies, as well as universities, hospitals and research centers. It also includes structures and networks supporting transfer of knowledge and innovation.

According to data gathered in the Biocat directory in June 2011 the BioRegion consists of 1,156 entities, which cover strongly interconnected activities (figure 3.1).

As shown in figure 3.2, the main group in Biocat directory is integrated by companies (481) and it also includes 80 research centers on life sciences, 15 hospitals and 12 universities. These three types of organizations account for 435 research groups (56.1% in universities, 33% in research centers, and 7.4% in hospitals) that are also registered in the Biocat directory.

Figure 3.1

Biotechnology and biomedicine subsectors

| | | |
|---|---|---|
| **Green Biotech** | Green biotechnology deals with the use of environmentally-friendly solutions as an alternative to traditional agriculture, horticulture, and animal breeding processes. An example is the designing of transgenic plants that are modified for improved flavor, for increased resistance to pests and diseases, or for enhanced growth in adverse weather conditions | |
| **White Biotech** | White biotechnology, or industrial biotechnology, as it is also known, refers to the use of living cells and/or their enzymes to create industrial products that are more easily degradable, require less energy, create less waste during production and sometimes perform better than products created using traditional chemical processes | |
| **Biomedicine** | **Red Biotech** | Red biotechnology refers to the use of organisms for the improvement of medical processes. It includes the designing of organisms to manufacture pharmaceutical products like antibiotics and vaccines, the engineering of genetic cures through genomic manipulation, and its use in forensics through DNA profiling |
| | **Pharma activites** | Pharma develops, produces, and markets drugs licensed for use as medications. Pharmaceutical companies are allowed to deal in generic and/or brand medications and medical devices. They are subject to a variety of laws and regulations regarding the patenting, testing and ensuring safety and efficacy and marketing of drugs |
| | **Medical technology** | Medical Technology encompasses a wide range of healthcare products and is used to diagnose, monitor or treat diseases or medical conditions affecting humans. Such technologies (applications of medical science) are intended to improve the quality of healthcare delivered through earlier diagnosis, less invasive treatment options and reductions in hospital stays and rehabilitation times. Recent advances in medical technology have also focused on cost reduction |

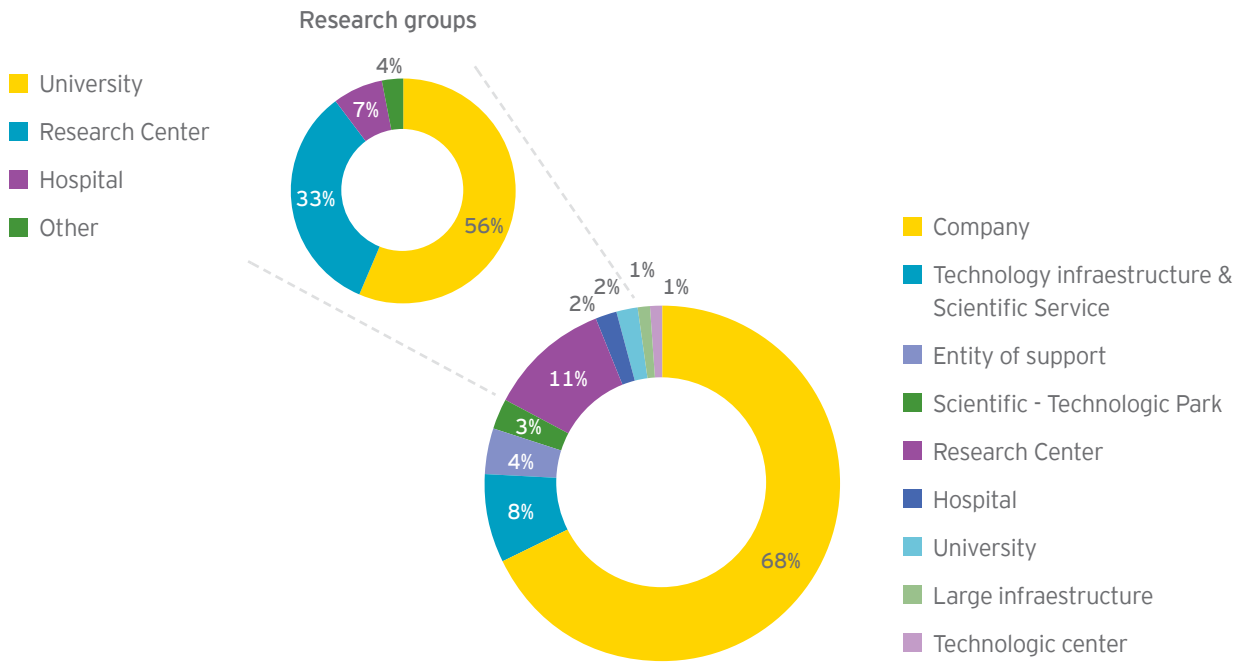
*'Catalonia's BioRegion is one of the most dynamic bioclusters in Europe'*

Catalonia's BioRegion is one of the more dynamic bioclusters in Europe. It has a majority of young and small start-up between its companies but it has also an increasing capacity of research and manufacturing of innovative products both in the private sector and in public institutions. Catalonia also outstands among other bioregions for the creation of new biotech companies, with a steady increase of 15% per year in 2010 and 2011.

Other European clusters (figure 3.3) have remained stable in size or are stagnated economically and financially in recent years. Others, such as BioTOP Berlin or Oxford biocluster (OBN), have also shown notable growth in the last two years. Both cases are linked to the traditional dynamism of the industry in these areas and the economic power of both regions.

Figure 3.2

**Distribution of different types of organizations in the BioRegion (2011)**

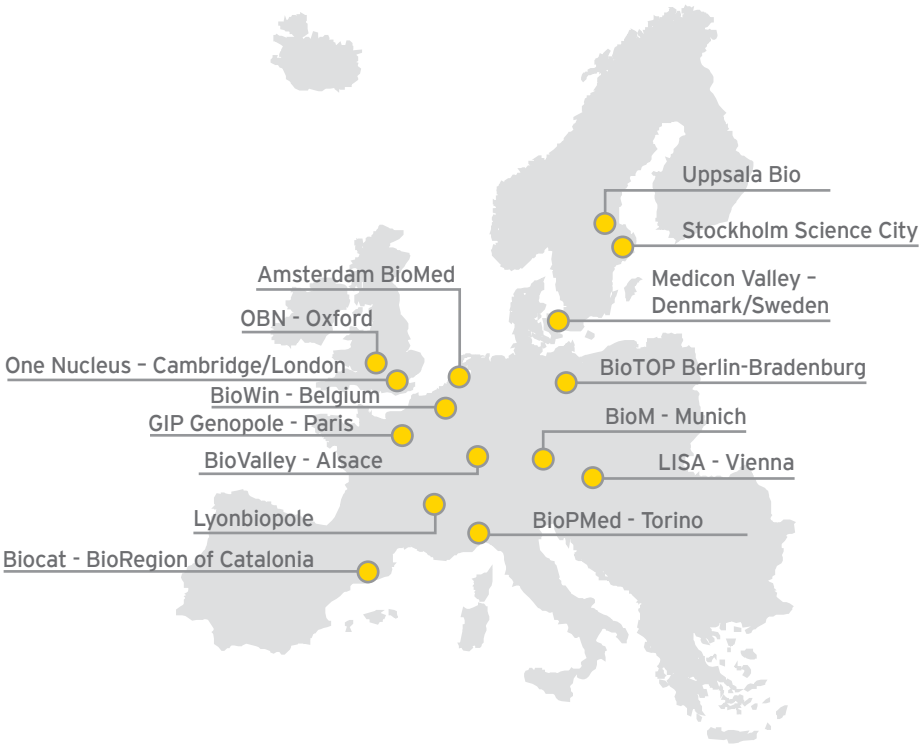


Taking into account the pressure of the economic context and the internal maturation process of BioRegion, it is likely that the set-up of new companies will tend to stabilize, while other indicators related to consolidation stages are expected to increase, i.e. the companies' turnover, volume of hired personnel, internationalization or the number of new products launched into the market.

Although Chapter 5 offers a comprehensive panorama about R&D in Catalonia it is worth mentioning in this introduction some new initiatives and processes that have reinforced the capacities of the BioRegion both in research and in technology transfer.

Figure 3.3

Main European clusters




## Health research centers

In March 2011, Sant Pau Institute of Biomedical Research (IIB Sant Pau) was accredited by Spanish Science Ministry (through the Carlos III Health Institute, ISCIII) as a Health Research Institute. It was the fifth Catalan hospital research center receiving this recognition, that only 16 hospital institutes all over Spain have.

IDIBAPS (August Pi i Sunyer Biomedical Research Institute), linked to Hospital Clinic; IDIBELL (Bellvitge Biomedical Research Institute), from Hospital de Bellvitge; VHIR (Vall d'Hebron Research Institute), related with Hospital Vall d'Hebron; and IGTP (Health Sciences Research Institute of the "Germans Trias i Pujol" Foundation), from Hospital Germans Trias I Pujol, all of them placed in Barcelona area, were the first four accredited institutes in Spain in 2009.

The objective of ISCIII initiative is to promote hospitals as research centers, providing the necessary equipment to create healthcare and teaching environments and high-quality research.

These institutes are a key piece of the Catalan research system that reinforces the region's capacities on translational research.

## Major infrastructures

From 2005 to 2011, three major scientific infrastructures have been established in Catalonia, thanks to political and economic regional efforts. All of them are reference centers no only in Spain, but at European level.

The Alba Synchrotron is operative since 2011. There are 49 synchrotrons in the world and Alba is the first installation of its kind in Spain. 201 million euros have been invested in this project since 2003, financed fifty-fifty by the Catalan and Spanish Governments.

The Alba Synchrotron can have up to 33 beamlines and receive more than 1,000 researchers every year.

The National Centre for Genomic Analysis (CNAG) was created in 2009 with the support of the Spanish and Catalan Governments and started operating in March 2010.

CNAG's purpose is to carry out large scale DNA sequencing projects. The centre is located within Barcelona Science Park and on 1,200 square meters. Its sequencing power is one of the largest in Europe.

The Barcelona Supercomputing Center (BSC), Spain's National Supercomputing Center, plays host to the Mare Nostrum supercomputer, one of the most powerful in Europe. BSC provides High Performance Computing (HPC) services for Spanish researchers and is a member of PRACE (Partnership for Advanced Computing in Europe), a joint initiative of 24 countries that allows to offer pan-European HPC services to academia and industry.

## Campuses of excellence

Campus of excellence is an initiative of the former Spanish Ministry of Education to foster research, technology transfer and innovation around university campuses, and acknowledges joint private-public efforts to achieve these goals. Catalonia has six campuses of excellence.

CoE promote strategic links and interactions between research centers, science & technology parks, production environments and other players, in order to develop ecosystems that link education, knowledge, research and innovation.

The six Catalan campuses of excellence received 41 million euros out of 182 invested by Spanish Government in this initiative in 2009 and 2010. The six existing Catalan campuses are:

- BKC - Barcelona Knowledge Campus of Universitat de Barcelona (UB) and Universitat Politècnica de Catalunya (UPC)
- UAB CEI: Promoting knowledge, encouraging innovation of Universitat Autònoma de Barcelona (UAB)
- UPC Energy Campus – Energy for Excellence of Universitat Politècnica de Catalunya (UPC)
- HUBc - Health Universitat de Barcelona Campus of Universitat de Barcelona (UB)
- Icaria CEI of Universitat Pompeu Fabra (UPF)
- CEICS - Campus of International Excellence Southern Catalonia of Universitat Rovira i Virgili (URV)

# Focus on Catalonia Life Sciences Companies

The Catalan business network has a significant number of start-ups, SMEs and consolidated pharma companies. Innovation and internationalization are at the core of their business strategy, being biomedicine the main field of activity. Additionally, Catalan biotech companies are responsible for 85% of registered patents.

Despite global crisis and investment difficulties, Catalonia continues to be the Spanish leader in innovation related to the set-up of new biotechnology companies. 11 biotechnology companies were created in Catalonia only in 2010, representing 23% of all the new companies established in Spain.

Most Catalan biotechnology companies have been created after 2000, which accounts for the big boom seen during the first decade of the 21st century. The establishment of incubators and science parks, along with government grants to helps creation of companies (CIDEM-ACC1Ó), have contributed to this growth.

The increase in new biotech companies in Catalonia has remained constant during the last years, with about 12-14 new firms per year (figure 3.4).The figures of 2011 (12 new companies) show that entrepreneurs in Catalonia continue to be active despite the economic crisis and the difficult context.

77.4% of new companies in the BioRegion arise from private initiatives, either as start-ups from another company or as a particular entrepreneur action. However, if we only consider companies engaged in research and exclude service or support companies, the weight of public initiative in the set-up of company increases significantly (figure 3.5).

84.1% of the companies are of Catalan origin while 15.9% are subsidiaries of international companies (figure 3.6).

It should be highlighted that 58% of the companies in the BioRegion undertake R&D activities while the rest are services providers. Most of the figures in the following sections distinguish the performance of R&D companies from the rest.

Figure 3.4

Establishment year of the BioRegion companies

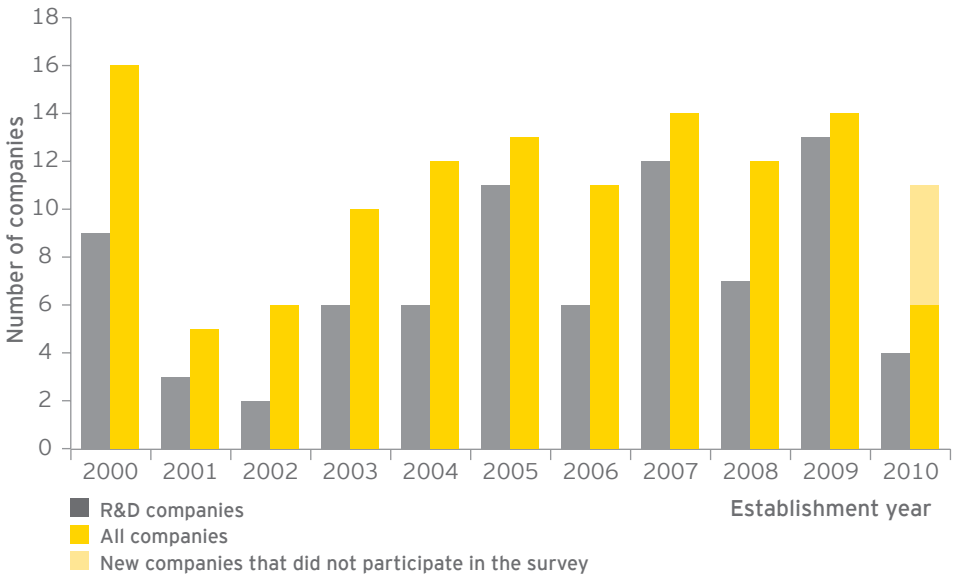



Figure 3.5

Origin of the company according to the driving entity

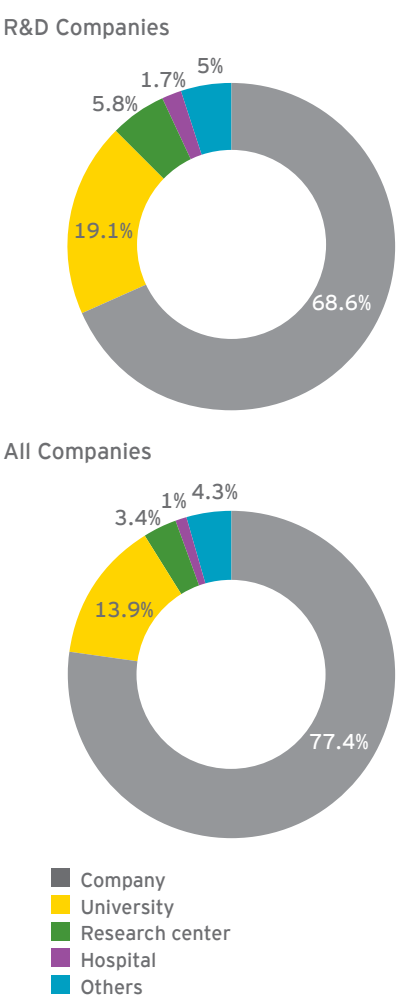
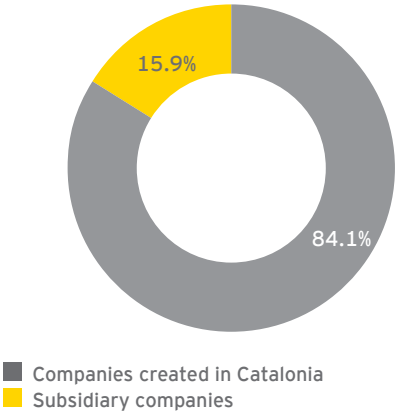



Figure 3.6

Total number of Catalan origin companies



*'Catalan Life Sciences industry employs 22,000 people, half of which work on R&D activities'*

## Activity environment

Barcelona and its metropolitan area concentrate 85% of life sciences companies located in Catalonia. However, as shown in figure 3.7, there are research companies all over the BioRegion.

81% of the companies have a single work center and they choose to set up mainly in an industrial environment – industrial parks or technology centers, where 44% of the companies are located – and in urban areas (34%), followed by science and technology parks (29%).

Most of R&D start-ups are located in knowledge-driven environments: up to 38.8% in science and technology parks and 17% in universities and hospitals. Chapter 5 of this report highlights the importance of parks as a meeting point for research and business and its role in the creation and consolidation of the BioRegion.

Figure 3.7

Geographic distribution of the companies in the BioRegion

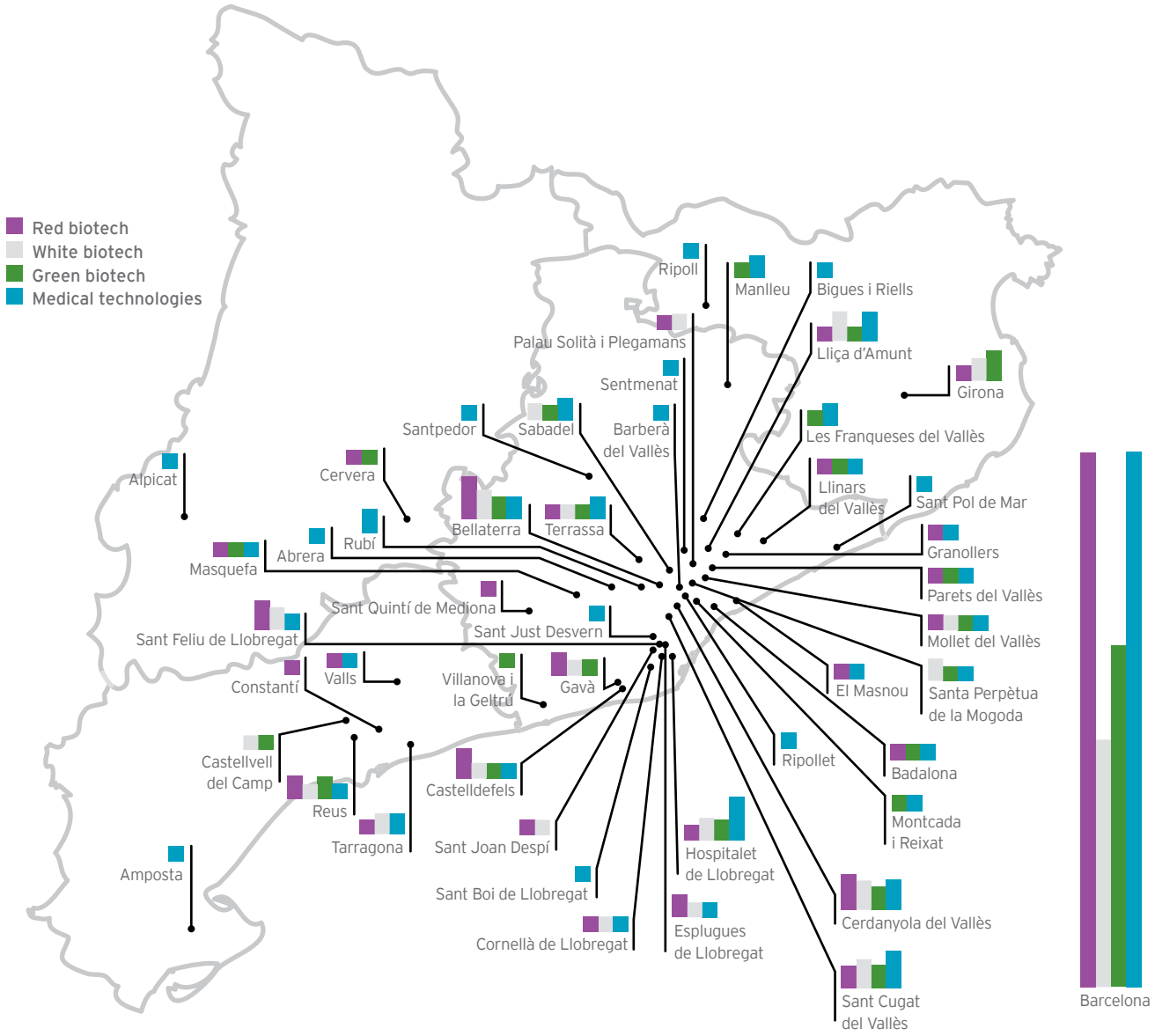


Figure 3.8

Main activities of the BioRegion companies

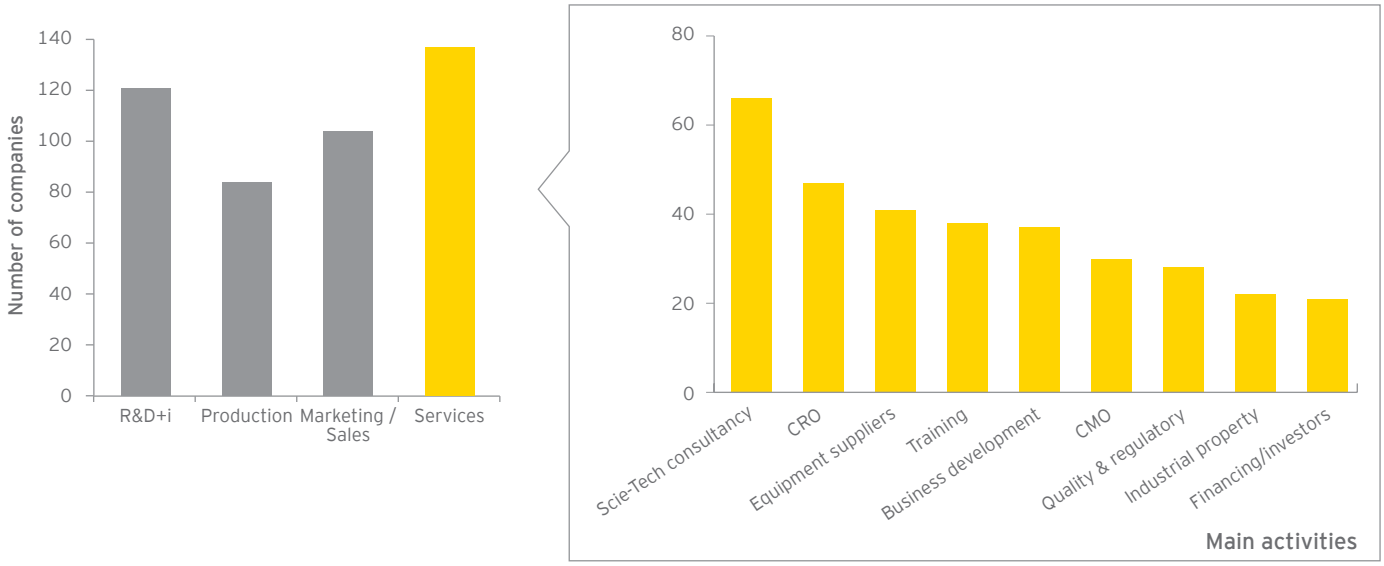
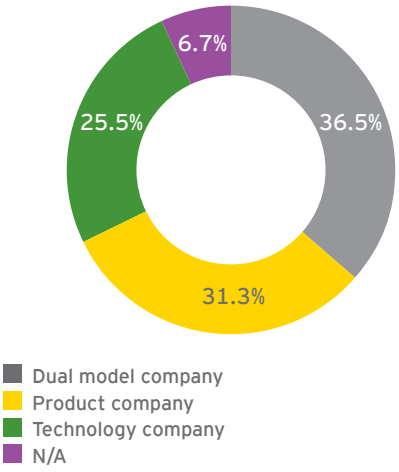



Figure 3.9

BioRegion companies' business model




## Business model

Nearly half of companies (48.8%) have activities along two or three different phases of the value chain. This is a highly technological and focused industry, with great added value: 58.2% of the companies are engaged in R&D activities and 40.3% in manufacturing. Only 18.2% of R&D companies carry out activities throughout the whole value chain, from discovery to market.

50% of the companies conduct marketing and sales activities and most of them (61.5%) choose to use their own marketing channels, whereas 46.2% sign distribution agreements. Many companies, though, combine both marketing options, depending on the product or the market.

The percentage of service companies has significantly increased, whether they render those services as a core activity or to supplement their R&D activities. This increase is partly due to the fact that the market has grown as a result of the outsourcing trend. The different activities of service companies are detailed in figure 3.8.

The companies in the BioRegion choose mainly a dual business model, which combines own product development and services offered to third parties (figure 3.9). This dual model stands as the best option, as the search for liquidity becomes a priority for the companies in a difficult financial environment.

## Activity fields

Biomedicine is the main area of activity of the Bioregion companies. As shown in figure 3.10, 47.1% of firms work in red biotech (58.7% of R&D companies) and 52.4% work in medical technologies (45.5% of R&D segment).

The figures are smaller for green and white biotech, even though 2010 Biocat's survey showed higher companies performance in these subsectors compared to 2009. 32.7% of all companies work in green biotech (28.1% of R&D companies) while they were only 16.7% in 2009.

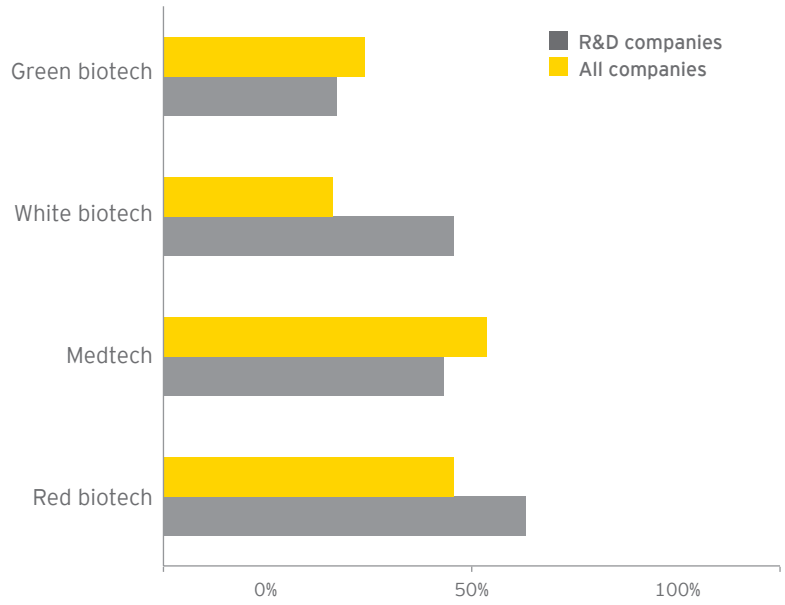
On the other hand, 47% of R&D companies work in white biotech, but this subsector occupies only 27.4% of the whole business network, with very few service companies working in this field. In any case, the figure has increased substantially since 2009 when white biotech occupied 17.6% of companies in the BioRegion.

Regarding application areas (figure 3.11) it is interesting to highlight that 18% of all companies are engaged in cosmetics, that is a significant activity for small pharma companies, especially in the OTC and dermopharmacy lines.

Most companies, especially those engaged in offering services and advisory activities, are working in different application areas of diverse subsectors of activity. Only 31% of companies focus on a single application area.

Figure 3.10

Subsectors of activity of the BioRegion companies



## 1. Biomedicine

Human health accounts for 73.3% of the activity of companies engaged in biomedicine, whereas 16.7% of them focus on animal health. These percentages remain quite the same when talking about R&D companies: 76% work on human health and 19.8% on animal health.

Human health predominance in the Catalan biotech industry is due to interaction of several factors: an excellent network of hospital research institutes, which carry out outstanding translational research; public investments in recent years in these fields; and business and research activities of several pharma companies with notable weight in the industry.

Even so, the biomedicine subsector focused on animal health offers great potential to Catalonia. A good example of this is that in 2011 Pfizer moved to Catalonia a substantial part of its animal health research activities to a plant located in Olot (Girona).

Business efforts put into biomedical research are mainly aimed at developing new therapeutic and biological products (66.3%), medical devices (46.3%), in vitro diagnostic (32.6%) and, to a lesser degree, electromedicine (e-health) and diagnostic imaging (14.7% each), as shown in figure 3.11.

Main therapeutic areas of R&D companies are central nervous system (CNS) and oncology (ranging close to 27%), followed by cardiovascular diseases, immunology and dermatology (close to 19%) and infectious diseases (16.5%) mainly done by start-ups which could cover a niche often discarded by big corporations. Some differences were recorded when comparing R&D to commercialization activities. In this latter, cardiovascular, oncology and dermatology continue to be leading areas, whereas CNS decreases to 13%. (figure 3.12).

Figure 3.11

Application areas in subsectors of activity

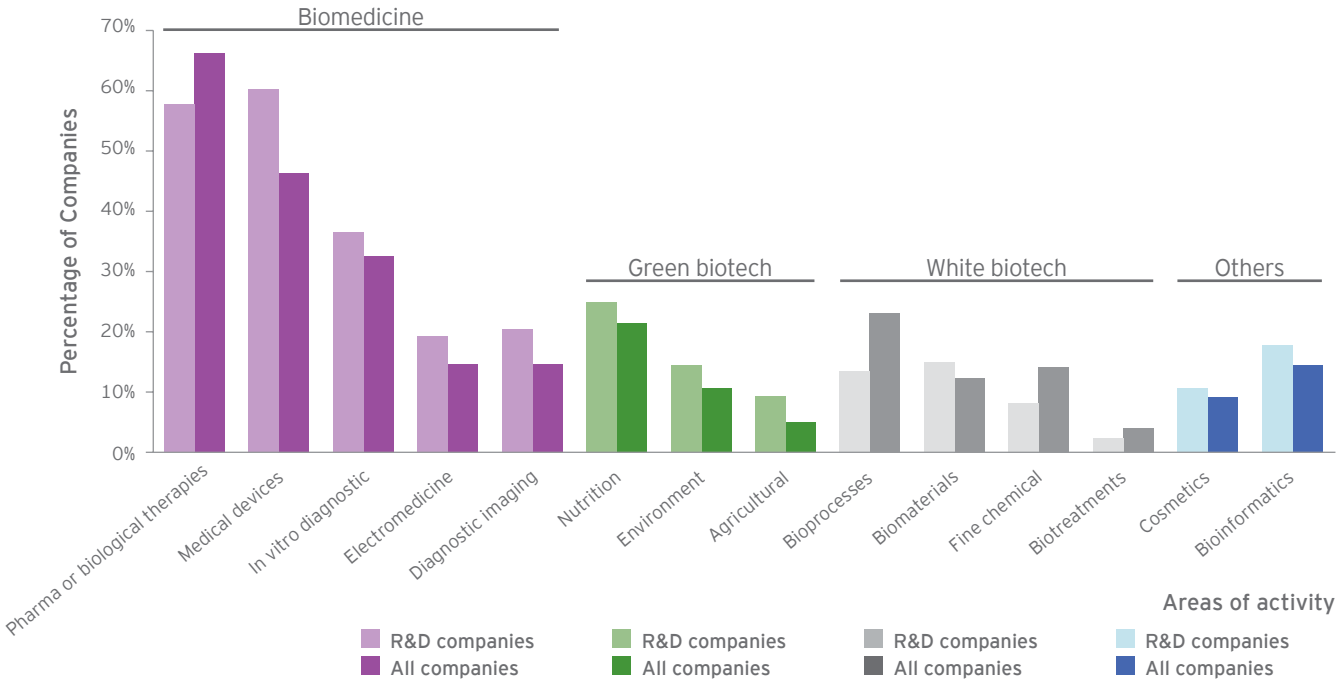
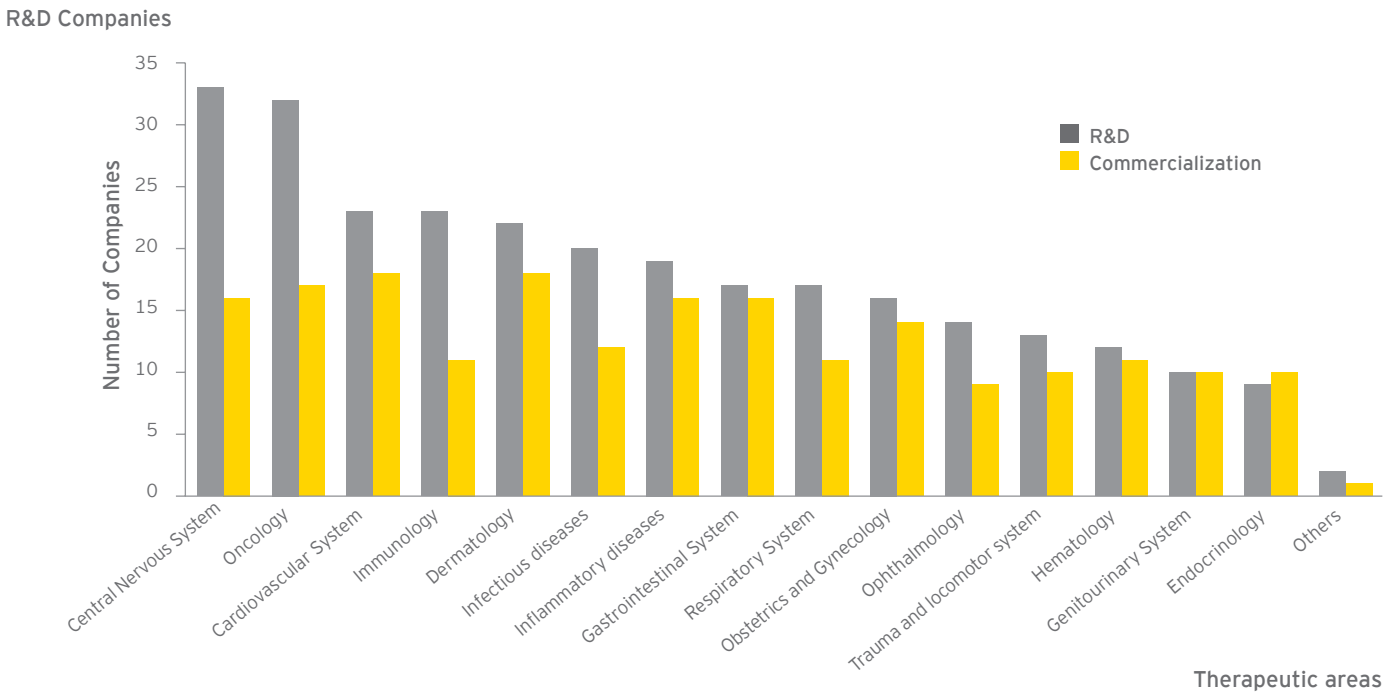
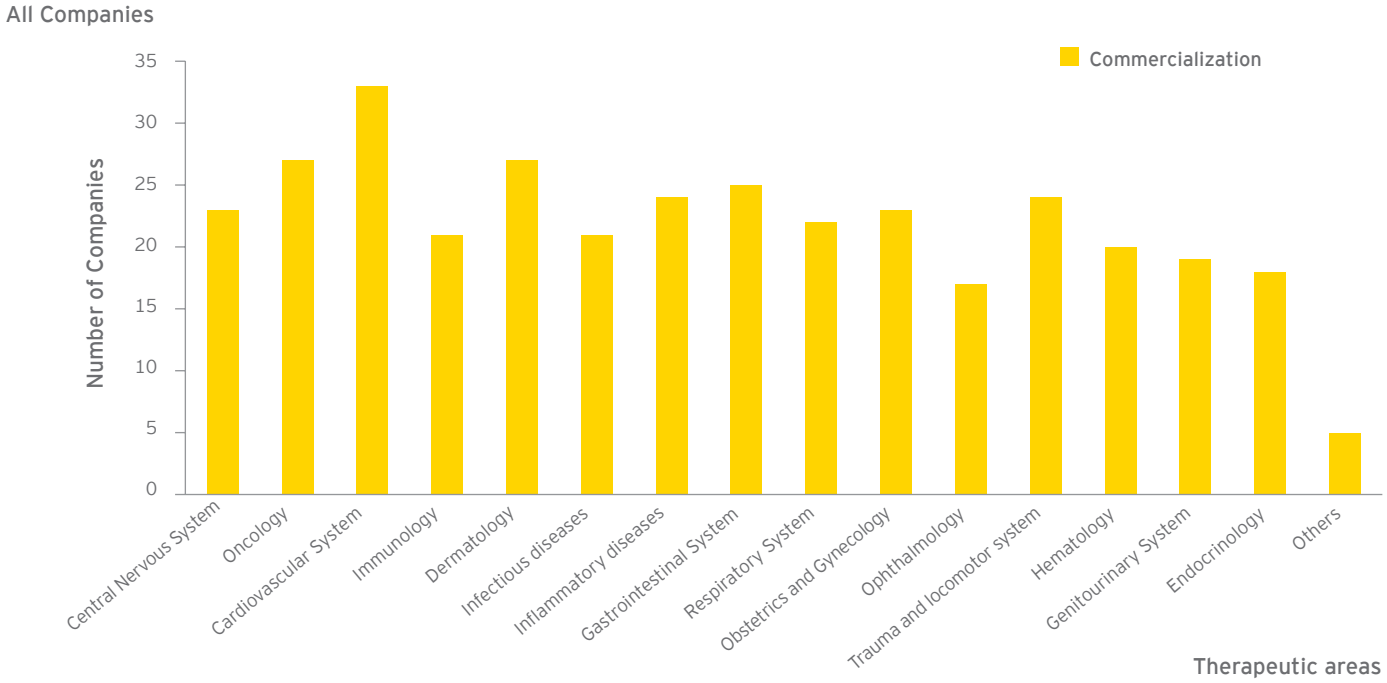


Figure 3.12

Therapeutic areas in research and commercialization of the BioRegion companies



# The transition of Almirall to a global company

**Jorge Beleta**
Director of Discovery Strategy
and Alliances of Almirall

**Q: Is Catalonia becoming a Biotech Hub?**

A: Catalonia has more presence in the Biotech sector than other Spanish regions as a result of the following:

1. During the last 10-15 years, excellence Research Centers have been created across Catalonia, such as PCB (Parc Científic de Barcelona), CRG (Centre de Regulació Genòmica) and several others.

2. Catalonia counts on a strong Public Hospital network, such as Hospital Clinic, Hospital Vall d'Hebron, and many others.

Nevertheless, an important effort would have to done to become a global reference Biotech Hub; such as the Boston or San Diego ones; which represent good role models for Catalonia. Catalonia should aim at eventually becoming "the Southern Europe Biotech Hub". On this purpose, companies like Almirall very committed to R&D can be of help. In fact, we devoted almost 20% of our sales and our workforce as per 2011 figures. Our contribution means 3% of the whole Spanish pharmaceutical industry and we rank 6 among all sector Spanish companies in R&D.

**Q: What are the main challenges/ opportunities currently faced by Companies within the Biotech sector and within the Life Sciences sector in general?**

A: The traditional Pharmaceutical model is currently under revision: The "long hanging fruits" have already been picked up and the blockbuster model does not apply anymore; the Regulatory Authorities are putting higher regulatory pressure; and premium prices for drugs are extremely scarce nowadays.

A: As a result of this scenario, Pharmaceutical Companies need to set up collaborations with new players, opening new opportunities for the Biotech Sector.

**Q: How does Almirall take advantage of the opportunities offered by the local Life Sicences sector?**

A: We collaborate with Pharma and Biotech companies, as well as CROs and academic centers in the area following different models for interaction. These range from simple services agreements to more sophisticated public-private partnerships, where we share with our partners the value of the assets generated. We are using the experience gained through these collaborations to establish even better interactions with our local environment, where more value is generated for all the parties involved.

**Q: Almirall has 12 affiliates and its medicines are commercialized in over 70 countries in the 5 continents. Can you enumerate the key elements that have supported Almirall have such a successful international expansion?**

A: Three main reasons have contributed to this:

1. Continued top research level with the right resources and based on the right criteria for selecting targets and drugs.

2. Clear envision of the internationalization as a key aspect for the Company's future growth.

3. A good product to offer nowadays and in the future.

In 2011, the international sales represented around 50% of the overall sales, and are expected to represent more than 70% from 2014 onwards.

Almirall is an example of a productive model based on both R&D and internationalization as key to success. We will keep committed to this model in order to be able to help provide better therapeutic solutions to people all over the world.

Figure 3.13

Capacities along the value chain of BioRegion R&D companies

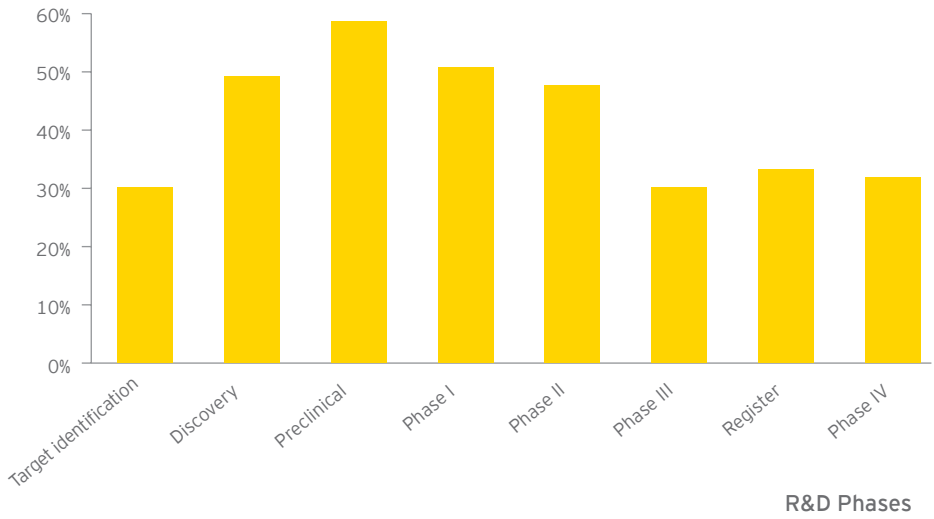
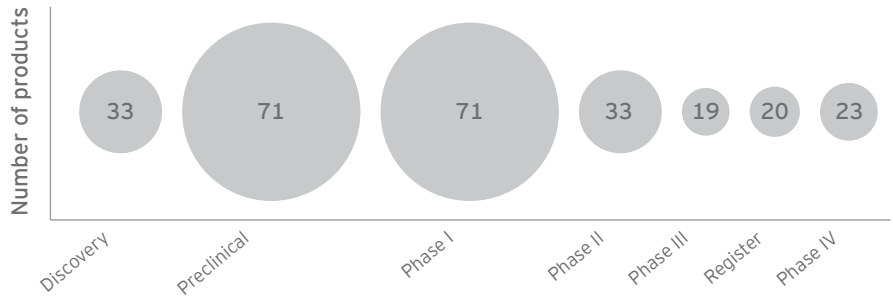



Figure 3.14

Number of therapeutic and biological products under development in the Bioregion (2011)




## 1.1 Therapeutic or biological products

The total number of compounds under development up to the pre-register phase in the Bioregion is currently 227, whereas there are 270 compounds up to phase IV (figure 3.14). Nevertheless, the new compounds portfolio per company is still limited. Most biotech companies run the development of only one or two compounds, being the pharma and diagnostic companies which can declare up to six under development.

Main capabilities are concentrated at discovery, preclinical development and initial clinical phases (I and II) (figure 3.13). Figures show an interesting evolution since 2009, when capacities of most companies were limited to discovery.

Internal expenditure in R&D by biopharma companies decreased by 1.7% in 2010. This drop was strongly influenced by government cuts in health care spending and accumulated payment delays by public bodies. This effect adds up to the economic impact of patents expiration and the increasingly stronger competition of generic drugs.

In fact, Catalonia holds 26% of the Spanish generic drugs market and a 35% increase is expected. Since July 2011 current consumption of generic drugs has been boosted by law with doctors being required to prescribe the drug's active principle and chemists to deliver the cheapest alternative option.

## 1.2 Medtech

Figure 3.15

Capacities of the R&D companies in Medtech

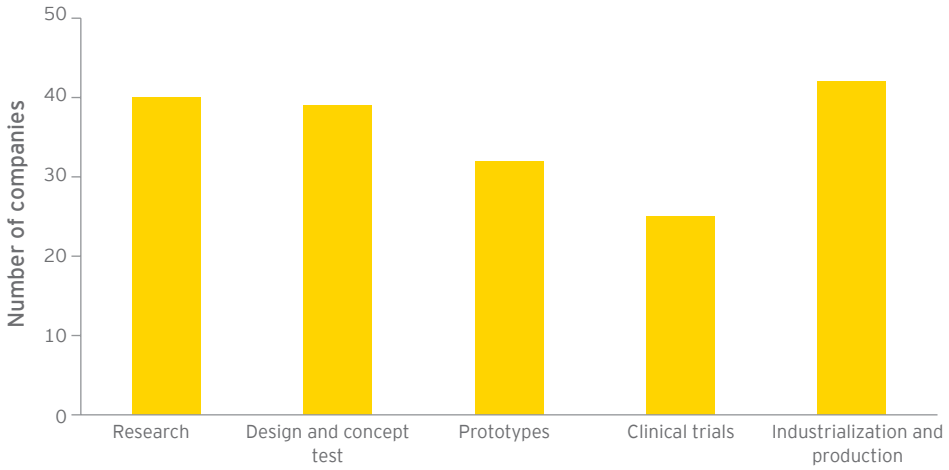
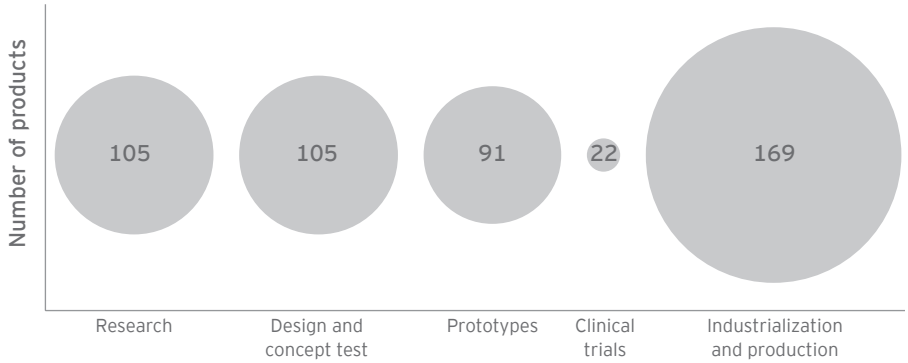



Figure 3.16

Number of medtech products under development in the BioRegion




The capacities of R&D companies in medtech, like in therapeutic products, are to be found at the beginning and the end of the chain, that is, in research and manufacturing. This indicates that two kinds of company dominate: on the one hand, start-ups, and, on the other, some big driving firms that are also engaged in production. Only 12.7% of big companies cover all the phases of the value chain (figure 3.15).

There are 323 products under development up to the clinical phase and 169 up to the industrialization phase. Companies usually have two to four products in each phase, except for companies manufacturing diagnostic kits, which usually have some more (figure 3.16).

Catalan companies developing health products focus mainly on surgical equipment, homecare and prosthesis. As explained in Pulse of the Industry. Medical Technology Report 2010 by Ernst & Young, medtech companies have great business potential thanks to their innovation capacity and the advantages they entail compared to pharmacological developments:

1. R&D cycles of health products are shorter and require smaller investments
2. The probability of success is higher because innovation focuses on the client's needs
3. Risk perception is lower and, therefore, the power to attract risk capital is higher than for drugs

However, cuts in health expenditure and accumulated payment delays from public administrations have also a negative effect on the evolution of medtech companies. Despite this, Catalonia's budget for health technologies has increased by 3% in 2010 compared to 2009, accounting for 59.8% of all Spain.

## 2. Green Biotech

68 companies are engaged in green biotech in the BioRegion, - 32.7% of the total-, among which the ones focusing on food stand out (21.5%). In this regard, research focuses on functional food, nutrition supplements and nutrigenomics. These priorities are similar to those expressed by green biotech research groups(chapter 5). Environmental activities (10.7%) and agrofarming (5%) are less present.

Capacities of green biotech research companies are equally distributed along the value chain. Thus, 38.2% of them have developed research capacities, with a similar weight on design and production (35.3% each), followed by those at the prototype phase (32.4% of the companies). On the contrary, only 19.1% of them have capacities in clinical trials (it's relevant to highlight the difficulties that arise from the uncertainty of the European regulatory framework for functional food) (figure 3.17).

Finally, 144 products are currently in different phases of development (figure 3.18). This figure includes food products and excludes biotech agrofarming, since the low number of companies and the particular characteristics of products led to errors in the quantifications.

Figure 3.17

Activities developed by Green Biotech companies

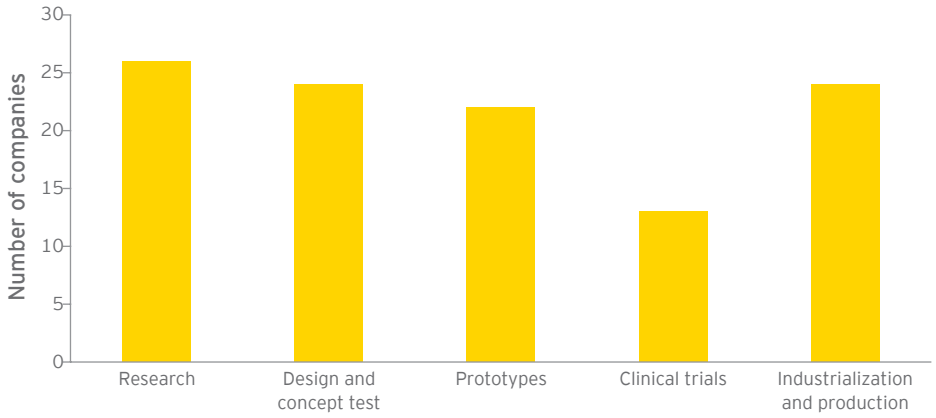
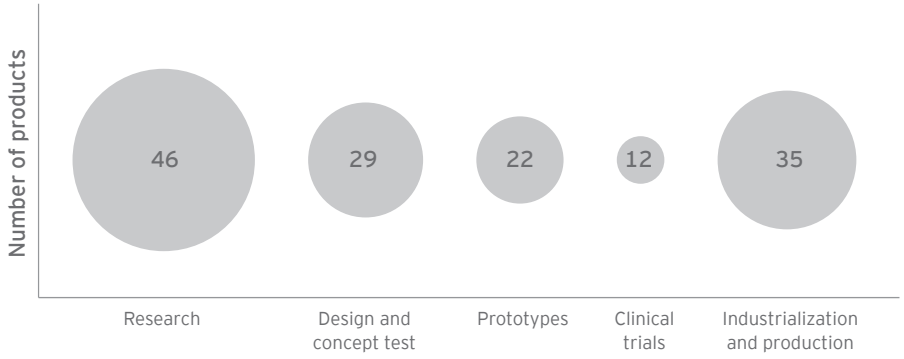



Figure 3.18

Number of products under development by Green biotech companies



## 3. White Biotech

White biotech represents 27.4% of biotech industry's activity in Catalonia and gathers 47.1% of research companies.

Activity in bioprocesses has increased over the last two years, accounting for 23.1% of the business activity, almost three times higher than in 2009. This growth is partly due to the increase in manufacturing of biological products and the number of CMOs created in Catalonia.

The production of biomaterials represents 8.2%, whereas bioremediation and biotreatments (0.4%) are still minor fields in the business activity. Most of the companies are engineering firms that carry out a significant consulting activity, often in the environmental area.

Half of the white biotech companies declare that they have the capacity to carry out up to four activities of the value chain. In fact, unlike other subsectors, 62.1% of the white biotech companies cover the whole value chain, though research is their main activity (figure 3.19).

There are 330 products under development in the pipeline of white biotech companies (figure 3.20). However, although in the research phase there is an average of 12 products per company, this figure decreases dramatically in the following phases, for which each company has two to four products.

Figure 3.19

Activities developed by White Biotech companies

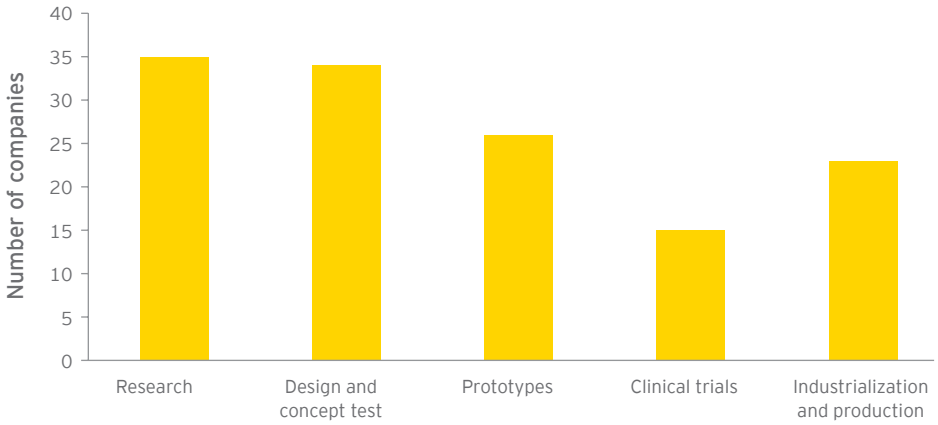
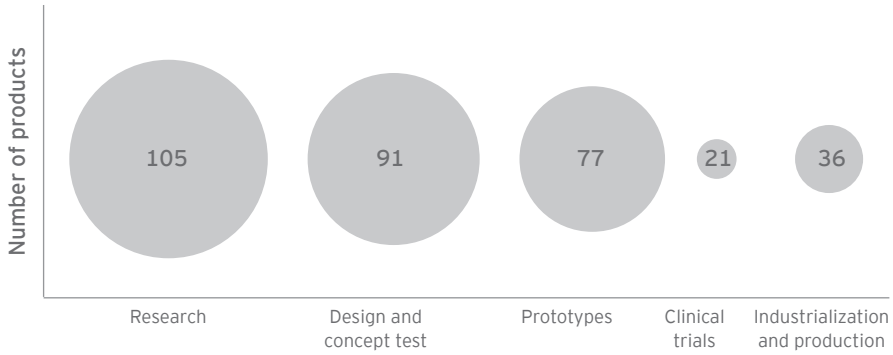



Figure 3.20

Number of products under development by White biotech companies



## Collaborations and internationalization

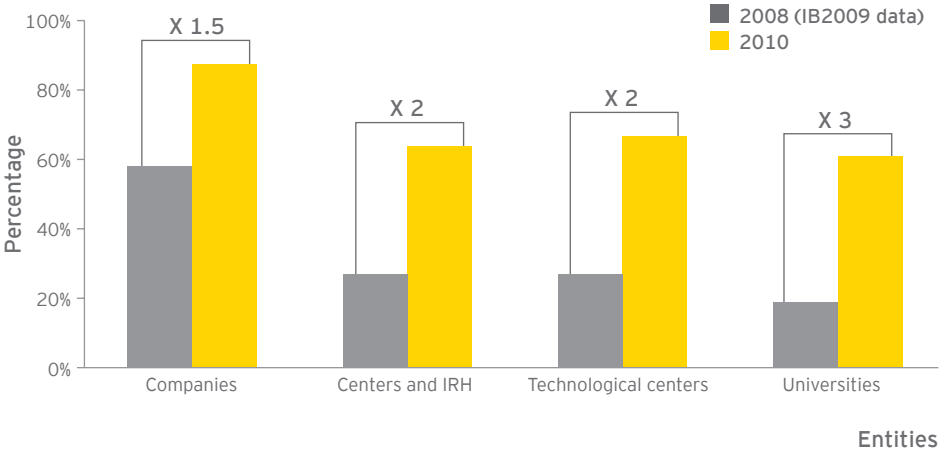
Most of R&D companies (85.1%) work in collaborative research projects, mainly with other research companies (87.3%), usually from the same country. Public-private collaborations increased significantly in 2010, in some cases up to threefold (figure 3.21).

Among the kind of collaborations declared, it is worth highlighting that only 5.8% of them are carried out in Europe, within the Framework Program.

Internationalization, a clear priority for BioRegion companies, has shown a positive evolution in recent years. The trade volume of Catalan companies in the US market, the market par excellence for health and therapeutic products, is 10.3% of their global markets activity, and increasing steadily.

Figure 3.21

Increase of collaborations and consortiums of the BioRegion R&D companies

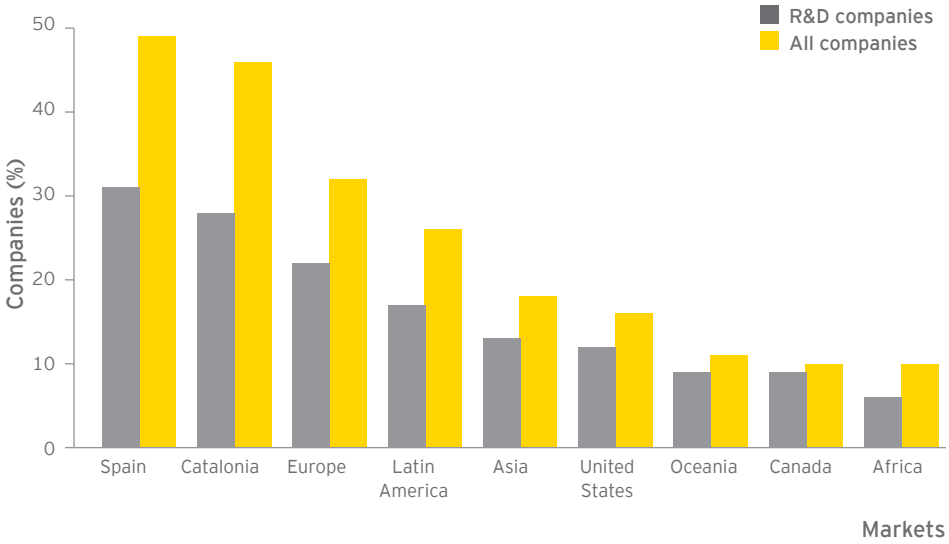


The major markets for Catalan companies are Spain (31.4%), Catalonia (29.5%) and Europe (20.5%), followed by Latin America (16.7%), where Catalan pharma companies have signed many distribution agreements (figure 3.22).

Geographical preference in commercialization is highly in line with the preferences regarding research collaborations. Thus, when establishing research collaborations and consortiums the partners are mainly Spanish (86.4%), Catalan (75.7%) and European (53.4%). On the contrary, partners from the US represent only 24.3% and Latin American partners are almost nonexistent (6.8%).

Figure 3.22

Markets of the BioRegion companies



## Analysis of the patent portfolio

The number of new inventions has increased significantly in the last decade in Catalonia. 19,531 patents belonging to 3,014 families in the areas of therapeutics, diagnostics, medical devices and functional food have been registered over this period at the four following offices: Spanish Patent and Trademark Office (SPTO); European Patent Office (EPO); United States Patent and Trademark Office (USPTO), and World Intellectual Property Organization (WIPO).

Global economic crisis has limited the resources earmarked for R&D world wide, and has had an impact in the number of issued patents. However, according to the survey performed by Biocat in December 2010, 506 new patent applications – 432 from companies and 74 from research groups – were submitted by the BioRegion stakeholders during the 2009-2010 period.

Companies have generated 85% of the recorded patents. SMEs (75% of them), submitted less than five patents per company, whereas larger pharmaceutical firms such as Esteve, Almirall and Ferrer – which only represent 1% of the applicants – have generated more than 100 patents each.

Universities and research centers represent 10% of the applications, which usually correspond to products in early stages of development and, therefore, it will take longer for them to be launched into the market (figure 3.24).

Peptides, antibodies and antigens related inventions for genetic therapies, therapeutics for CNS pathologies, oncology and obesity treatments and medical technologies – valves and electromedicine related devices – were the most submitted applications in the analyzed period, whereas emerging lines include also functional food as well.

Figure 3.23

Temporal evolution of the inventions created in the BioRegion

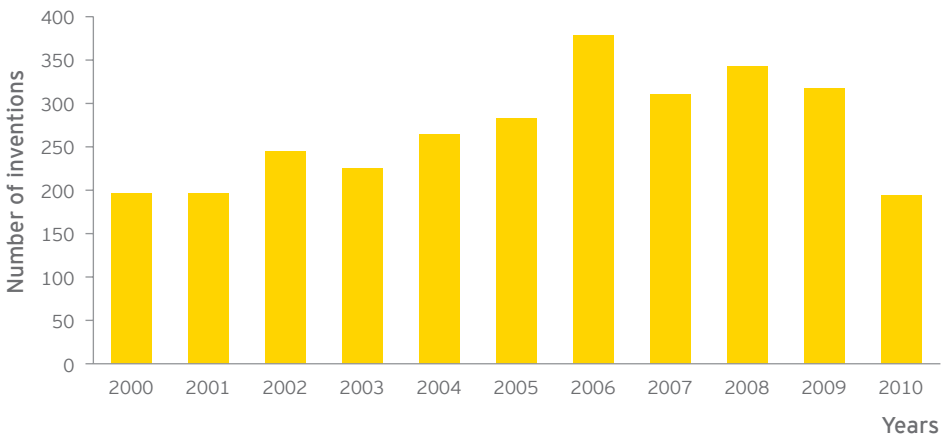
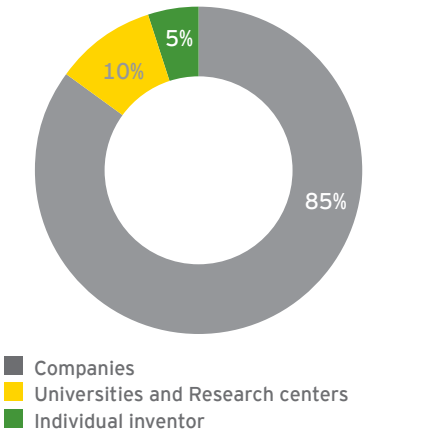



Figure 3.24

Origin of the applicants (1991-2010)



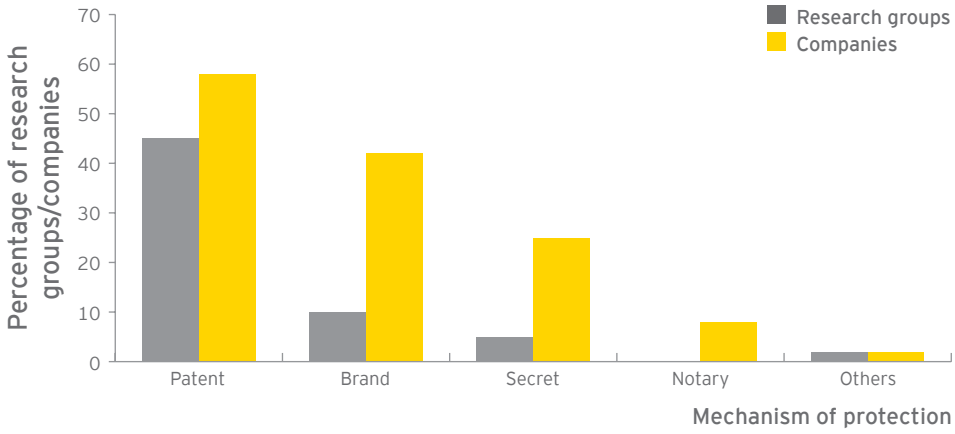
The BioRegion shows a greater internationalization in IP protection than other regions in Spain: while 40% of Catalan patents have been issued through SPTO, the Spanish office is the preferred application way for 55-60% of the companies of other regions. WIPO is the second option for Catalan entities, with 31% of patents issued, followed by USPTO (18%) and EPO (15.2%), while the international way only represents 18% for other Spanish regions.

Concerning the patent extension way selected by the Catalan stakeholders, the World Intellectual Property Organization and the Spanish Patent and Trademark Office are the most active bodies, closely followed by the European Patent Office and, to a lesser degree, the United States Patent and Trademark Office. The rest of the countries chosen separately as application ways for Catalan patents are headed by Canada, Mexico, Australia and Japan.

Finally, it should be noted that patents are the most commonly used protection mechanism by groups and companies (92% and 80%, respectively), but not the only one. Trademarks are used as an IP protection measure by 22.1% of the groups and 58.4% of the companies, whereas the use of the trade secret and notary's register is symbolic.

Figure 3.25

Mechanisms for the intellectual property protection



# Chapter 4

# National and International Benchmarking

Catalonia invested 3,320 million euros in R&D, which represents 1.68% of its GDP, a slightly higher figure than the national average (1.38%) in 2009. However, R&D investment in Spain is currently lower than the European average and decreased in 2009 for the first time, in comparison with the prior year.

A look at the international scenario of biotech industry and its evolution through the last years until the current global environment provides a necessary frame to better understand the status of the industry at the national level.

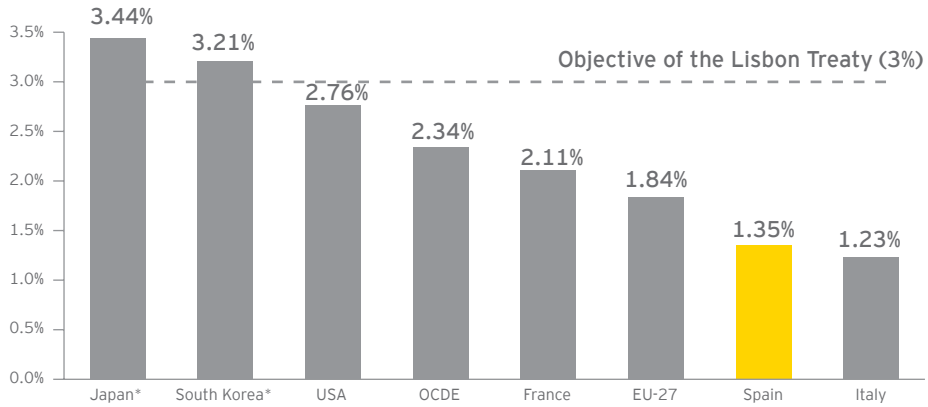
Therefore, we present some figures and magnitudes to offer a global vision of the impact of biotechnology, biomedicine and medtech in Catalonia and Spain, as well as at global level considering contributions from both public administrations and private companies.

## R&D investment

Between 2003 and 2008, R&D investment in EU-27 increased by 3.3%, up to 237,000 million euros in 2008. Although it increased to 1.90% of the GDP, it is still far below US, Japan and South Korea percentages and the 3% objective set by the Lisbon Treaty (figure 4.1).

Figure 4.1

**GDP share of R&D expenditure in OCDE countries and Europe (2008)**
***(Source: Cotec 2011)***




*2007 data

*'Catalonia concentrates 27% of Spanish R&D expenditure in biotech'*

At Spanish level, R&D expenditure is lower than in many EU and OECD countries. In 2008 Spain's R&D expenditure was 1.35% of its GDP, slightly over Italy's (1.23% of GDP), but below the European average (1.84%), and almost three times lower than Japan's, whose R&D expenditure amounts to 3.4% of its GDP and represents the greatest effort made by an OECD country.

Although the trend in Spain has been to increase expenditure year after year, it decreased for the first time in 2009. Total R&D expenditure, which amounted to 14,582 million euros, dropped by 0.8% compared to the prior year. The Spanish government is cutting health care spending and requiring doctors to prescribe generics, which is yielding a 10% annual drop in sales in pharmaceutical companies for a 2nd year in a row. These measures have had an impact on the companies' R&D investment, which has decreased by 2.4% compared to 2009.

It is also important to note that in 2008 Spain's expenditure represented 6.95% of the total EU-27 R&D expenditure, some 2.5 points below its weight in the GDP.

The public administrations funded 47.1% of Spain's R&D in 2009 and the private sector, 43.4%.

## Catalonia's R&D investment

Catalan R&D investment in 2009 represents 1.68% of its GDP, slightly higher than the national average (1.38%). In fact, with 3,320 million euros, Catalonia is the fourth Autonomous Community in R&D expenditure (figure 4.4).

Taking into account Catalonia's contribution to Spain's R&D expenditure in the last years, we can state that it has remained almost constant (22%) from 2000 to 2008, whereas in other communities it has slightly increased.

Finally, the Catalan Government's budget for 2011 earmarked 459.3 millions euros for public investment in order to consolidate the current R&D system.

Figure 4.2

Resources available per researchers (1,000 $)
*(Source: Cotec 2011)*

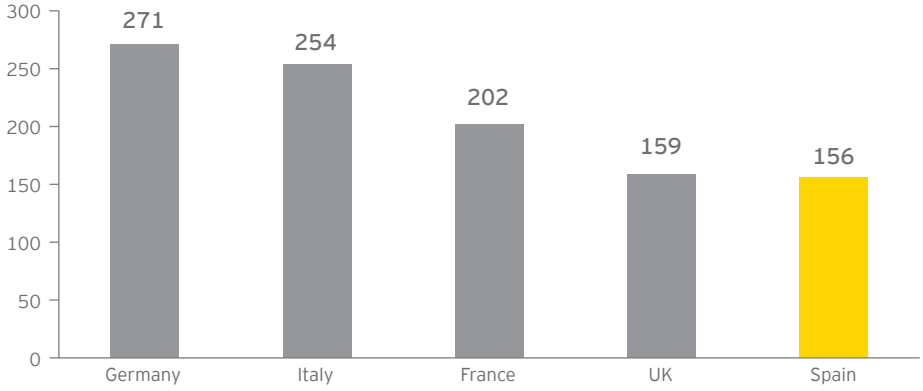


Figure 4.3

R&D expenditure per capita in 2008 ($)
*(Source: Cotec 2011)*

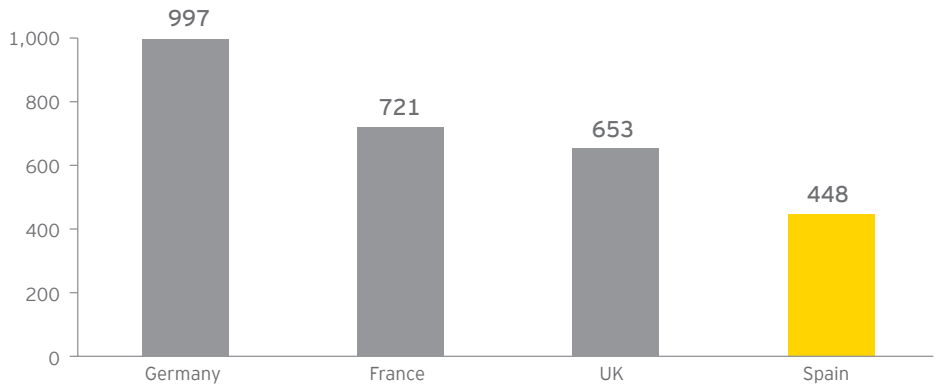



Figure 4.4

R&D expenditure in Autonomous Communities in 2011 (% of GDP )
*(Source: Cotec 2011)*

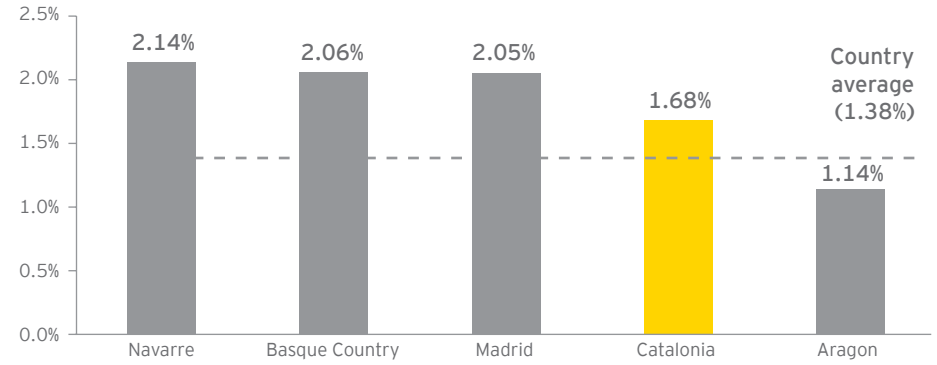
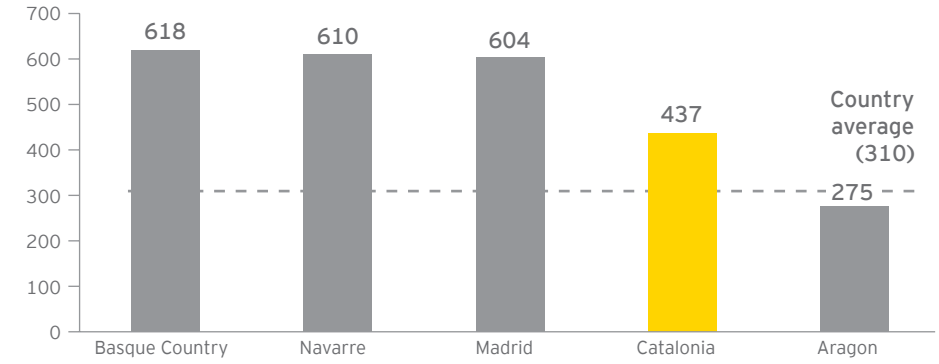



Figure 4.5

Investment in research per capita in 2009 (€)
*(Source: Cotec 2011)*



# European Biotech sector at a glance

European biotech companies demonstrated considerable resilience in the 2009's economic downturn. The number of public companies decreased by only 4%, and revenues of publicly traded European companies grew from €11 billion in 2008 to €11.9 billion in 2009 – an 8% increase that was well below the 17% growth seen in 2008.

The R&D expenditures failed to keep pace with revenue growth. European public companies' R&D expenditures were essentially flat, posting a modest 2% decrease in 2009. This was driven not by a few large companies, but rather by R&D cutbacks across much of the industry.

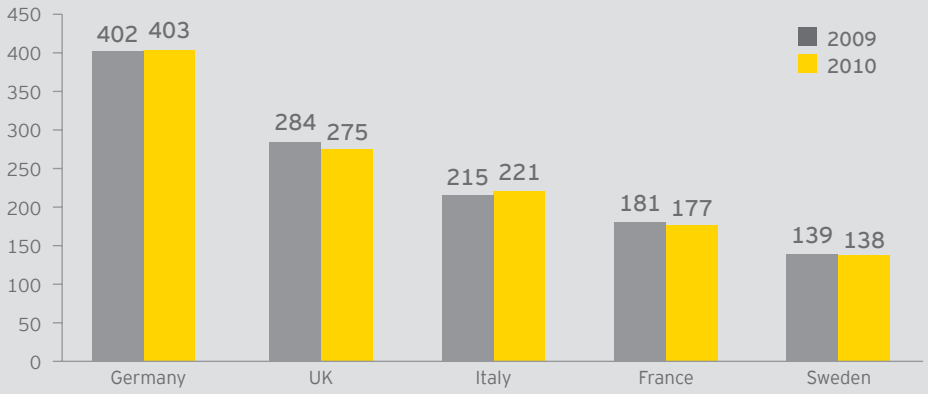
Currently, the European regions with a greatest presence of biotech companies are Germany, United Kingdom, Italy, France and Sweden (figure 4.6).

In terms of financing, it is interesting to highlight that there has been a decrease in venture capital investing, but it did not affect all countries equally. Switzerland actually achieved a 57% increase in VC investment, whereas France and the Netherlands suffered significant declines (figure 4.7).

Source: *Beyond borders,* Ernst & Young

Figure 4.6

Top 5 European countries with highest number of pure biotech* companies *(Source: Ernst & Young)*




*pure biotech: companies whose core business is exclusively related to biotechnology.

Figure 4.7

Capital raised through VC financing by pure biotech companies in the main European countries *(Source: Ernst & Young)*

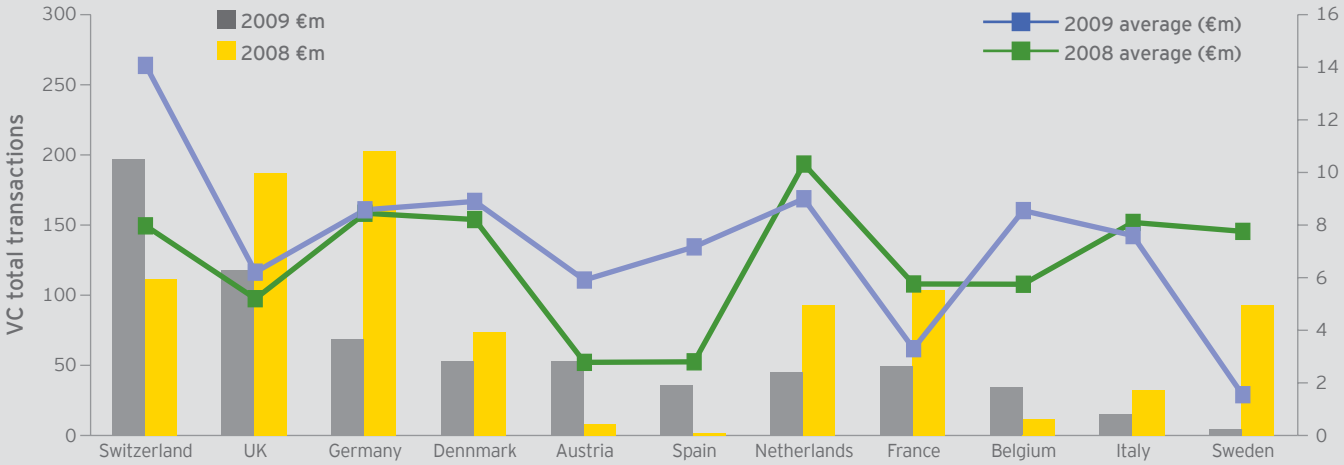
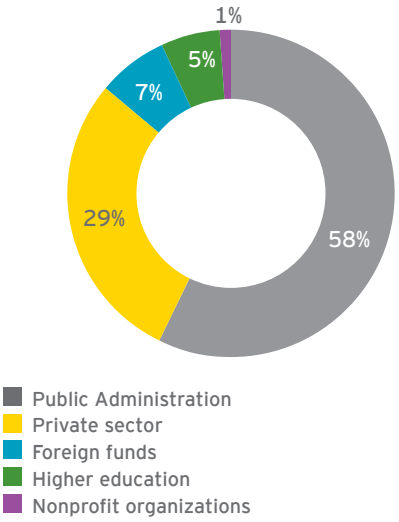


Figure 4.8

Financing of biotech R+D activities in Spain (2009)




## Spanish biotech sector

In 2009 Spanish R&D expenditure related to biotech amounted to 1,414 million euros, which represents 9.7% of the total national R&D expenditure. Catalonia was the second Spanish community in R&D expenditure, concentrating 27%, with 384,9 million Euros (1.68% of GDP).

Public administrations were responsible for subsidizing 58% of these activities at national level, whereas the rest was funded by the private sector and other financing sources (figure 4.8).

The business volume generated by the companies in the industry amounted to 53,152 million Euros in 2009, 10.4% of which corresponded to the activity of small and medium-sized enterprises.

In fact, it is estimated that 1,095 Spanish companies carried out biotech-related activities in 2009, 399 of which admit that biotechnology is their main or only activity.

Finally, it should be highlighted that in Spain, biotech products are mainly used in human health (44%) and food (41%).

## Catalan biotech sector

Catalonia's BioRegion has 481 companies, 91 of which are biotechs, representing 20.6% of Spain's biotech innovative companies.

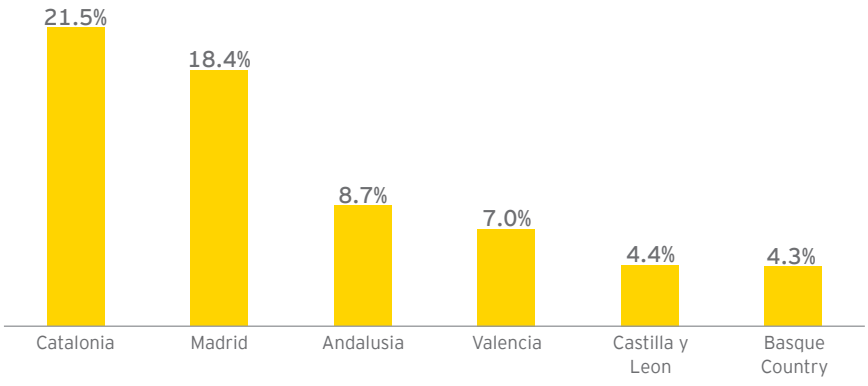
On the other hand, Catalonia also concentrates a large number of medtech companies, which generate 50% of the industry's turnover. 92% of these companies are SMEs.

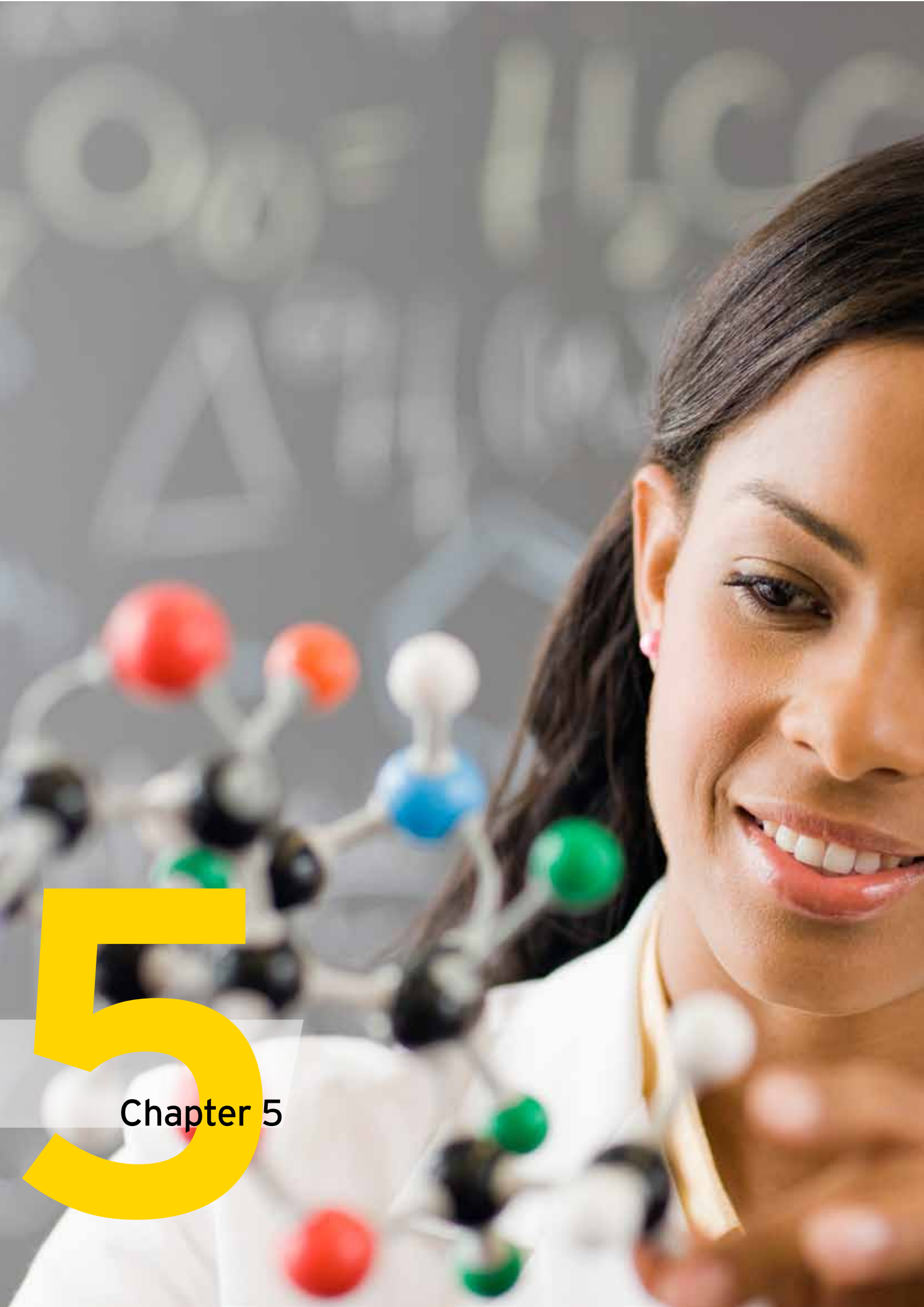
Lastly, we should mention that currently 22,000 people work in the BioRegion companies, half of which are involved in R&D tasks. On the other hand, research groups engaged in life sciences research in Catalonia have currently 7,981 employees, 92% of them are involved in research.

Catalonia has the highest proportion of employees in the Spanish biotech sector, with 21.5% of the total (figure 4.9).

Figure 4.9

Employees in Spanish biotech sector
*(Source: INE 2009)*





# 5

## Chapter 5

# R&D in Catalonia

Life sciences research has experienced an outstanding development in Catalonia since 2000, thanks to a remarkable effort of autonomous Government. R&D investment has risen from 1.28% of GDP in 2002 to 1.63% in 2010. Catalonia has created a prominent network of research centers, accounts for 2.98% of European scientific articles, achieved 1.94% of FP7 funds and Catalan research groups were awarded 68 ERC grants.

The Catalan Government effort in research has been oriented to reinforce specially three aspects: scientific talent recruitment, creation of research centers and building of large scientific facilities.

The ICREA program, focused in attracting and recruiting scientists from all over, has recruited 236 researchers and professors coming from more than 20 different countries to work in Catalonia, 30.1% of which in life sciences and health. Currently, the BioRegion has 80 research institutes working on life sciences (52.1% of the total). The key role of large infrastructures like CNAG, Alba Synchrotron and BSC in R&D Catalan system has been mentioned in chapter 3.

**Barcelona Biomedical Research Park (PRBB)**
Initiative of the Government of Catalonia, the City Council of Barcelona and the Pompeu Fabra University (UPF)

*'Biomedicine is also the main activity field in public research'*

## Research Groups

Research groups are the basic research and knowledge generation units analyzed in this chapter from the data gathered in Biocat's survey. The BioRegion has 435 groups working on life sciences mainly affiliated to universities (56.1%), research centers (33%) or hospital research institutes (7.4%) (figure 5.1).

Almost half of these research groups (46.8%) were created after 2000, with a significant peak in 2005, when 23 new groups were established, coinciding with the official announcement of government grants to support research group activities in Catalonia. As mentioned in chapter 3, this period also coincides with the set-up of many of the BioRegion's biotech companies.

As it happens with life sciences companies, research groups are mainly located in Barcelona area, where they work in all life science subsectors: red, white and green biotech and medical technologies (figure 5.2).

Figure 5.1

Affiliation of research groups

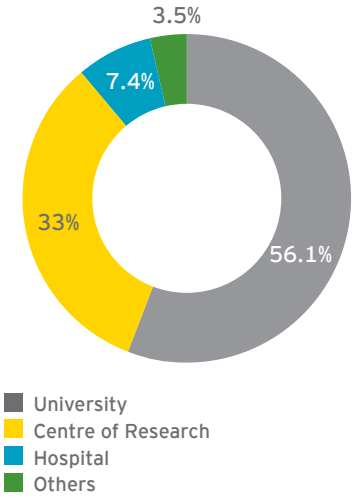
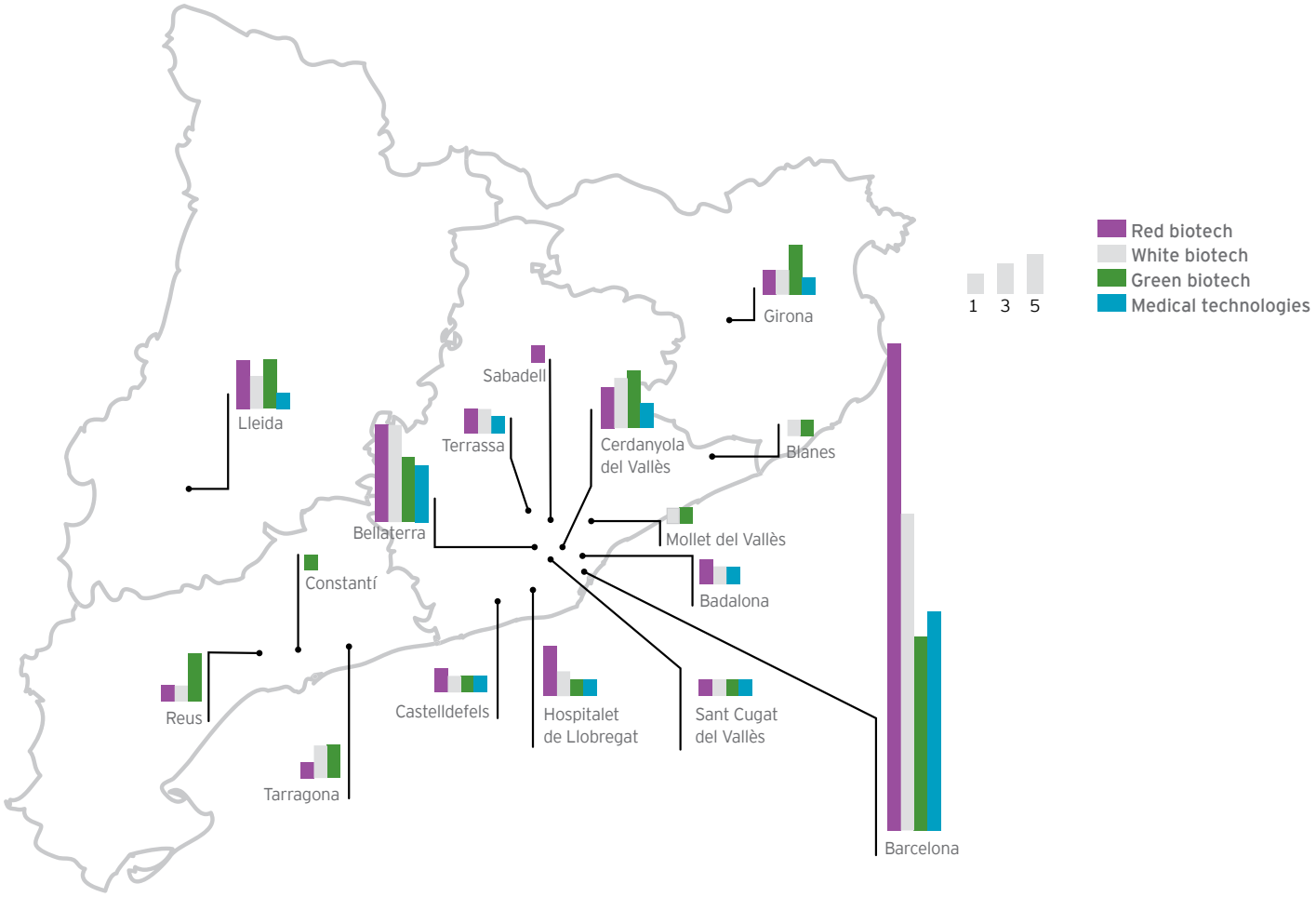



Figure 5.2

Geographic distribution of the Research Groups in the BioRegion



## Biotechnology & biomedicine subsectors

Red biotech is the main focus (54.3%), while medical technologies account for 22.6% of research activities. Research on white biotech shows a significantly upward evolution compared to two years ago (39.1% vs 27.5% in 2009), whereas green biotech accounts for the research of 32.6% of groups. New therapies and diagnostic techniques are the main application areas of their research (figure 5.3).

Close to 70% of the groups are engaged in complementary activities other than research. 59% of groups offer services to third parties, mainly selling of research activities (78.5%), scientific assessment (55.6%) and training (51%).

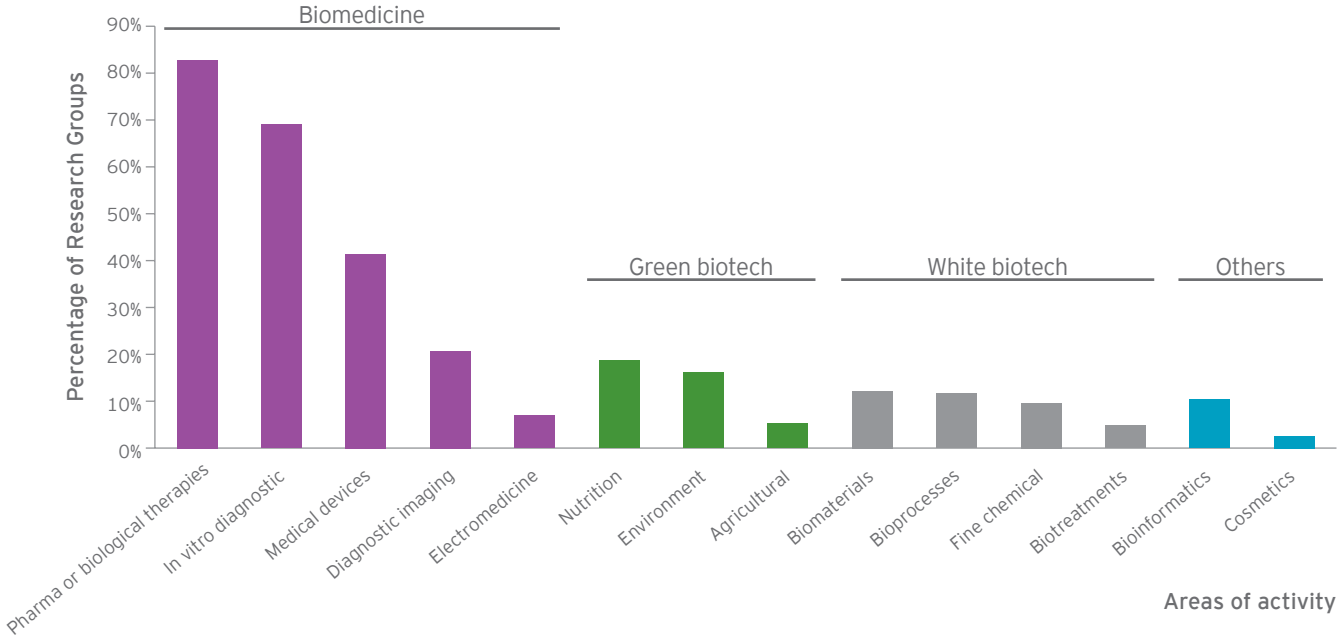
## 1. Biomedicine

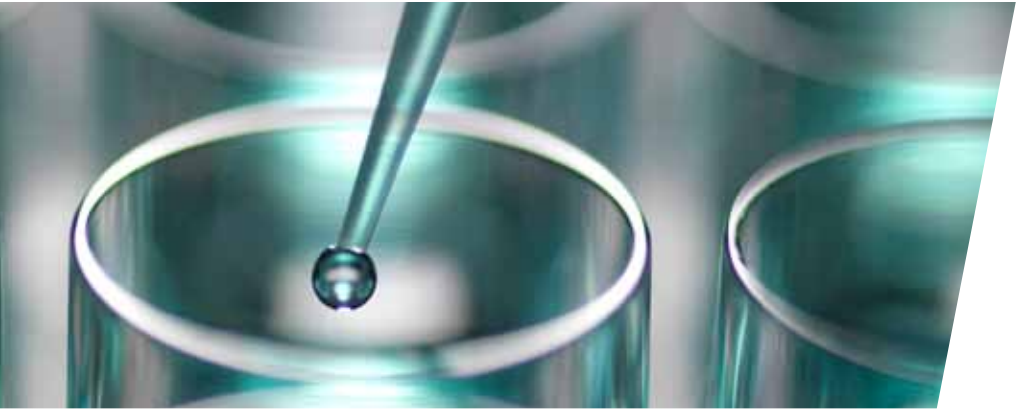
There is an increased interest in the discovery of biomarkers of new pathologies. This knowledge allows both the design of new therapies (focus of 83% of the groups) and new diagnostic techniques (41% of the groups) that make possible to identify risk populations and patient segmentation in advance and therefore move forward a predictive and personalized medicine. Those groups working in biomedicine concentrate mostly their work in human health, as only 11% work on animal health projects.

59.4% of research groups conduct research in more than one therapeutic area, the main ones being the central nervous system (27.5%) and oncology (26.7%), followed by infectious and inflammatory diseases (18.3% each) (figure 5.4).

Figure 5.3

Areas of activity of the BioRegion's Research Groups





The two main research areas coincide with the companies' two top priority areas, but research groups, though, work much less on the cardiovascular system and dermatology, which are areas to which companies do give priority due to the market opportunities they offer (market-driven research).

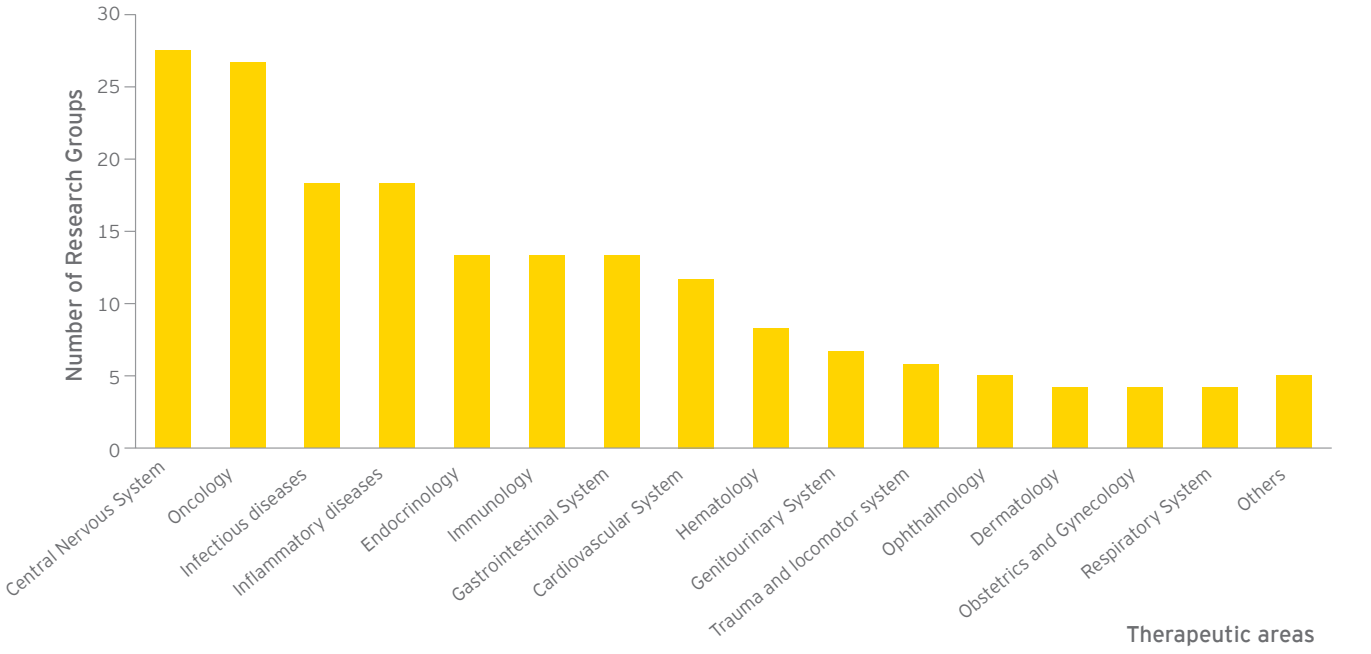
Oncology is one of the leading areas for both research groups and companies, being Catalonia a leading bioregion in this field.

Therapeutic research efforts are focused in basic research and new pathways (66.7%), target identification (51.7%) and drug discovery (30%), as shown in figure 5.5. The development phase is practically out of research groups' reach, except for some groups linked to hospitals engaged in clinical research. These groups mainly focus on phase III (18%) and phase IV (19%), in studies that are mostly funded by the pharma industry.

The total number of ongoing developments from target identification up to the pre-register in the BioRegion groups is currently of 174. In general, most therapeutic and biological products which already are in the clinical research phase, are mainly owned by biopharmaceutical companies, whereas most of developments in the target identification or preclinical studies phases are usually owned by the groups or the institutions to which they belong, being a source of potential licenses and collaborations, 22.6% of research groups are engaged in medical technologies. The products that stand out the most are implants and prothesis, which represent 43.3%. Surgical material (20%) and healthcare technologies (13.3%) have less weight on research groups' priorities than among companies'.

Figure 5.4

Therapeutic areas of the Research Groups



## 2. Green Biotech

Green biotech represents 32.6% of research groups' activity. Food outstands as the main field of interest (18.7%), mostly due to its interaction with health (functional food, nutrition supplements and nutrigenomics).

Environmental research is the second most important activity of green biotech, with 16.1% of research groups. 5.2% of the surveyed research groups work on biotech applications to agriculture.

Groups working in green biotech have 93 products in research phase, 47 in design and proof-of-concept phase, 40 in prototyping but only 16 in manufacturing. Products in clinical trial phase (16) are basically agro-food rather than environment-related products.

## 3. White Biotech

White biotech represents 39.4% of research groups' activities. Bioprocesses account for 11.7% of the activity and chemistry, up to 9.6%. It is noteworthy that bioprocesses attract less than half of the attention of the companies working in this subsector, despite the importance that research on new methods or new strains of microorganisms has for subsequent industrial development. It is also important to emphasize the importance of research on new biomaterials (12.2%), closely related to developments in nanobiomedicine, diagnosis and medical devices.

Figure 5.5

Capacities throughout the development process of the BioRegion Research Groups

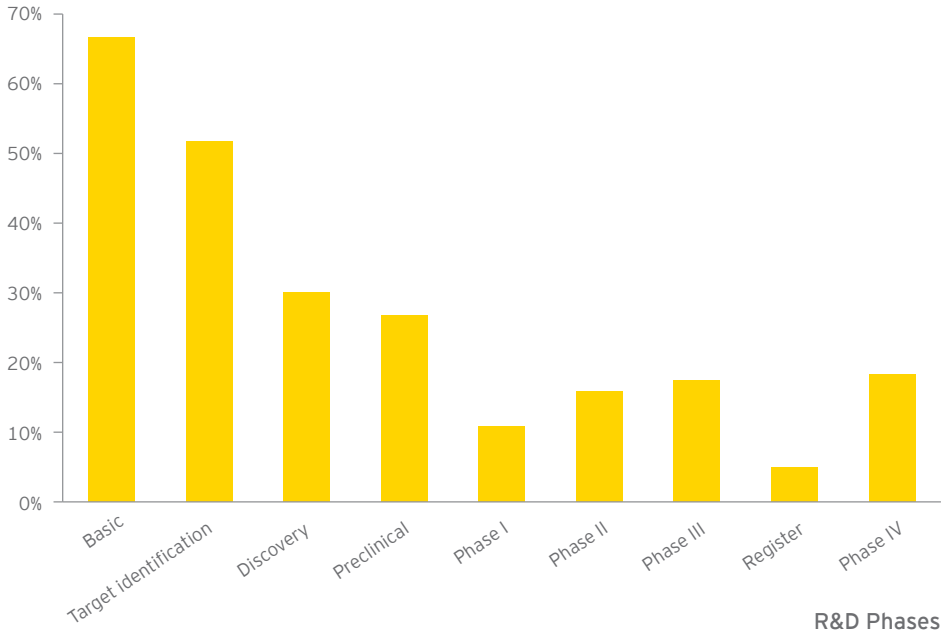


Figure 5.6

Number of companies in main Science & Technology Parks
*(Source: data from XPCAT 2009)*

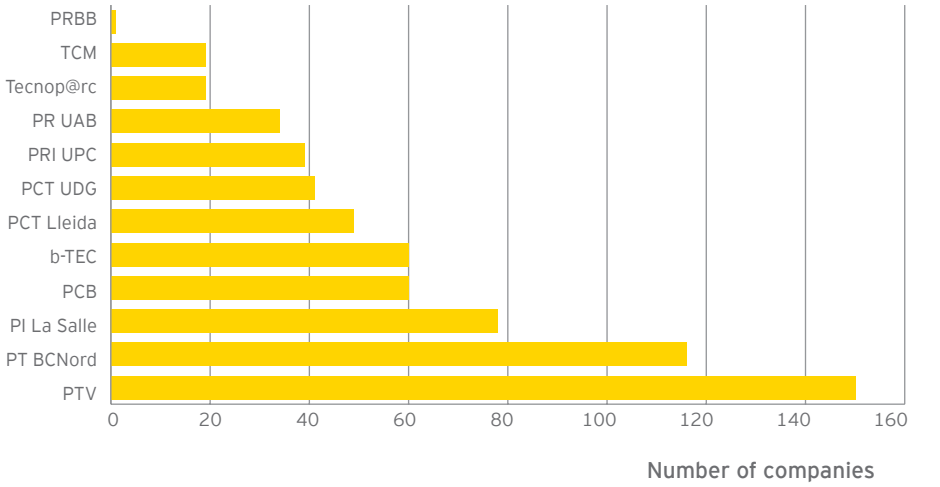
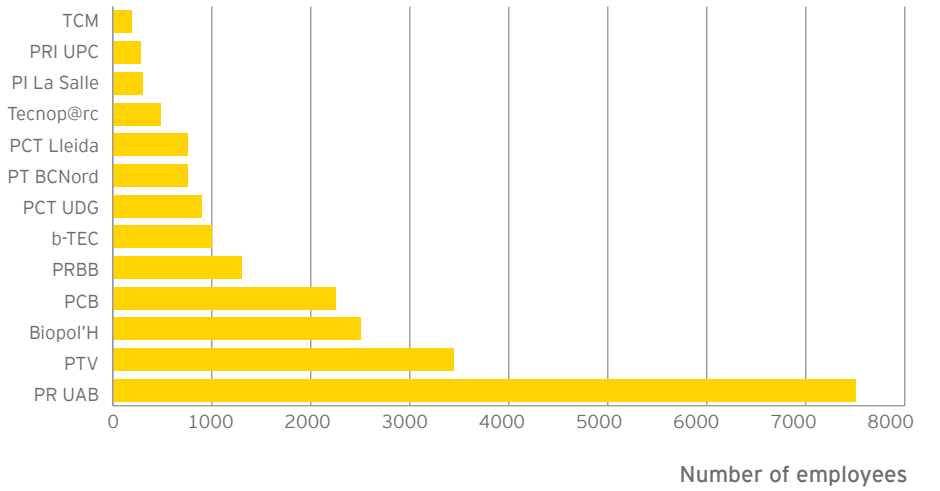



Figure 5.7

Number of employees in main Science & Technology parks
*(Source: data from XPCAT 2009)*




## Science & Technology parks

There are 24 science and technology parks (S&T parks) in the Network of Science and Technology Parks of Catalonia (XPCAT), an associate member of the International Association of Science Parks (IASP).

Currently, Catalan S&T parks offer close to 2,760,140 square meters of incubators, labs and offices where around 64,000 people work, 55% of whom carry out R&D activities (figure 5.7). In 2010, parks had an overall budget of 50 million euros, contributed by public entities and financial institutions.

19 out of these 24 Catalan parks are focused on life sciences activities, being an essential part of biosciences value chain.

S&T parks and their bioincubators promote clusterization, acting as ecosystems of innovation through: 1) bringing together stakeholders – research centers, start-ups and multinational companies – to reduce transaction costs and facilitate collaboration and sharing learning experiences; 2) providing specialized facilities and technological platforms; 3) fostering technology transfer and commercialization of the technology; 4) promoting networking with private investors and entrepreneurial culture at local and international level.

Biotechnology and biomedicine, ICT and energy are the main fields of activity of Catalan S&T parks. Up to 40% of new technological star-ups are located in these parks, a ratio equivalent to that found in United Kingdom. Most of these parks are multidisciplinary, offering a wide range of core activities.

## 3.0 Parks

Everything seems to indicate that a phase of strong expansion and growth is coming to an end in Catalonia for parks, and that a new period is starting in which priority will be given to quality, specialization and efficiency in the services offered by the parks, both at local level and in order to attract international companies wanting to establish their headquarters or temporary offices in Catalonia.

A new period begins when parks' main mission will no longer be to manage spaces, offices and labs. Their essential purpose will be to promote and manage innovation ecosystems arisen in the region. The best parks will be those that help bring results to the market as quickly as possible.

As Pere Condom, general manager of University of Girona's Science and Technology Park and Secretary of the XPCAT, said 'parks, like all mechanisms that have to influence innovation, technology and economy, must adapt to the needs of the moment. Therefore, in 20 years, science parks' main mission will no longer be to manage spaces, offices and labs. Their essential purpose will be to promote and manage innovation ecosystems arisen in the region. They will connect several players and foster activity between them. Thus, the best parks will be the ones that help to bring the results from R&D projects to the market as quickly as possible'.

Additionally, in this scenario, it is accepted that the current economic crisis will prompt change in the global pharma industry, so big companies will more receptive to small biotechs. In fact, they are already creating capital funds to invest in them, and spaces for big corporations and small companies to work jointly are gaining importance. An effect can already be observed: the pharma and biotechnology industries are moving closer together.

# Chapter 6

# Financing

The current total capital of the BioRegion's companies is estimated in 2,357 million euros, 92% of which is of private origin. In the case of small companies, however, government grants may represent up to 40% of their capitalization. Overall turnover of biotech companies in Catalonia amounts to 15,600 million euros, which represents 29.4% of Spain. It should also be highlighted that 25% of the companies earmark 75% of their budget for research and development.

## Companies' economic resources in Catalonia

The overall capitalization of life science companies in Catalonia amounts to 2,357 million euros. In most cases, it comes from private contributions (an average percentage of 92.3% of the total capital). Founders are the major contributors (51%), especially in start-ups.

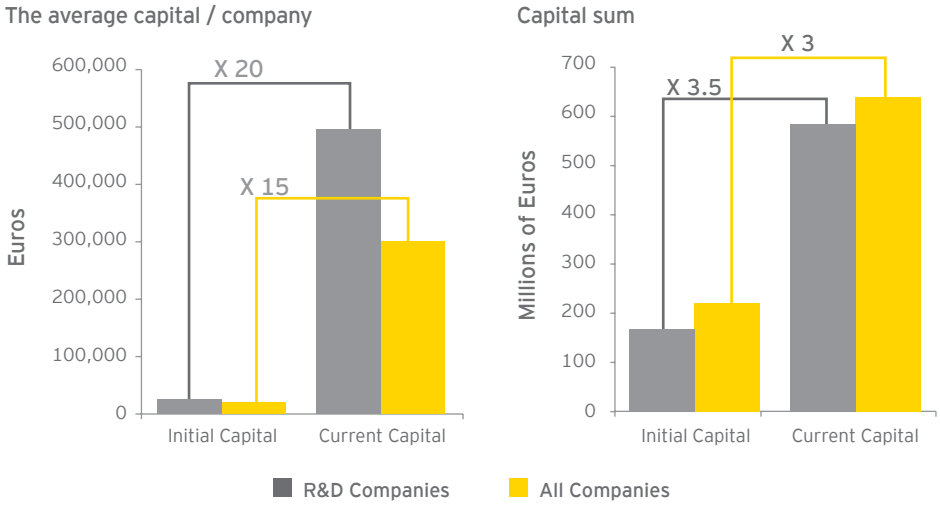
According to the Spanish Venture Capital Association (ASCRI), venture capital and private equity investment in Spain amounted to 3,435 million euros in 2010, which resulted in 904 operations, of which 9.3% were carried out in the biotechnology sector. However, the capital invested in the sector only represented 0.8% (27.4 millions), with 300,000 euros per operation on average.

Catalonia accounted for more than 48% of the VC funds invested in Spain in 2010 across all the sectors. According the data gathered by Biocat, this percentage rises to 64% in life science sector, reaching 17.8 million euros, near to the 20 million euros of 2009 VC operations registered in Catalonia.

There are a few publicly traded life science companies in Catalonia. The pharma company Almirall (ALM) is listed in Stock Exchanges of Barcelona, Madrid, Bilbao and Valencia, but also in Frankfurt and Berlin (E2Z). Grifols (GRF), the biopharmaceutical company specialized in plasma derivatives, trades also in the four Spanish Stock Markets but its shares are also listed in NASDAQ, NYES and AMEX.

Figure 6.1

Capital's variation in BioRegion companies



*'Companies' turnover has increased significantly between 2009 and 2011'*

The alternative investment market (AIM) begins to be considered a way to capitalize biotech companies. AB-Biotics entered the Spanish AIM in July 2010 and some other companies are currently studying this possibility.

Other sources, such as bank foundations, are increasingly contributing to the funding of new companies A good example is the project by Fundación Botín, which plans to invest 40 million euros in 20 companies over the next five years within its program Mind the Gap.

Government funds are one of the main sources of funding, particularly for early-stage companies, accounting for 26% to 40% of its resources. These funds are mainly used to recruit R&D employees (24.5% of the grants) and to support research collaborations (92.2%). It is worth nothing that many of these government grants are currently awarded as loans at preferential terms and conditions rather than as direct subsidies.

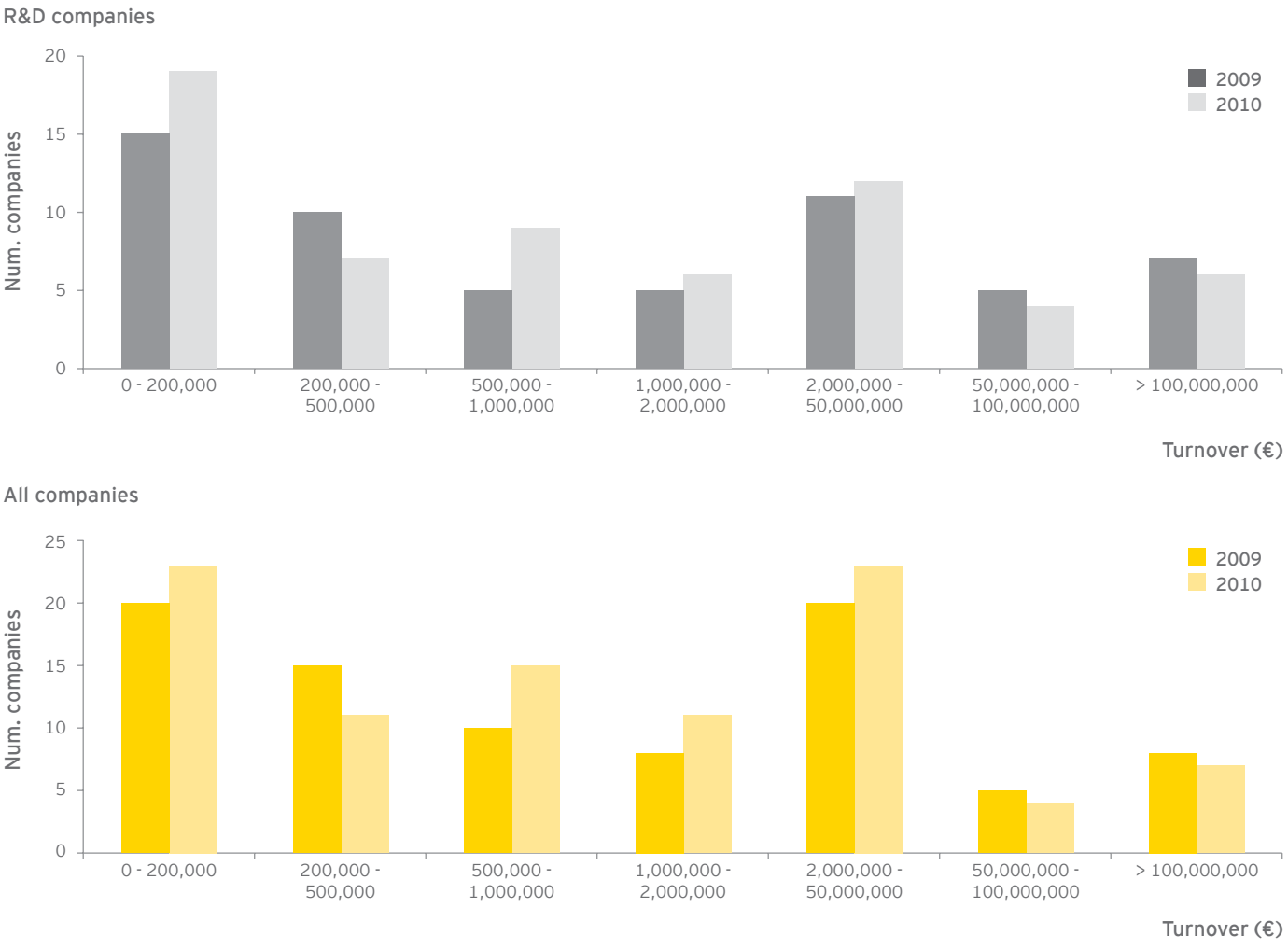
## Companies' turnover and profit

In the last two years, companies have managed to significantly increase their turnover. Thus, in 2010, the average turnover amounted to 1 million euros. Additionally, the number of companies with less than 500,000 euros turnover has decreased (figure 6.2).

It is estimated that the total turnover of life sciences sector in Catalonia amounts to 15,600 million euros.

Figure 6.2

BioRegion companies' turnover



30.3% of the companies declared income below 2 million euros in 2010, of which 17.1% did not reach 500,000 euros. It should be taken into account that these results are declared by companies that work according to a dual business model and, therefore, they also invoice for services.

15% of the companies state not having had any profit, whereas 21% declare less than 100,000 euros profit. Only 6.7% say that they have had more than 1 million euros profit (figure 6.3).

These percentages vary substantially when analyzing R&D companies separately, since 21% of them state not having had any profit, whereas 10% declare more than 1 million euros profit. The latter includes big pharma companies and some medical technology firms.

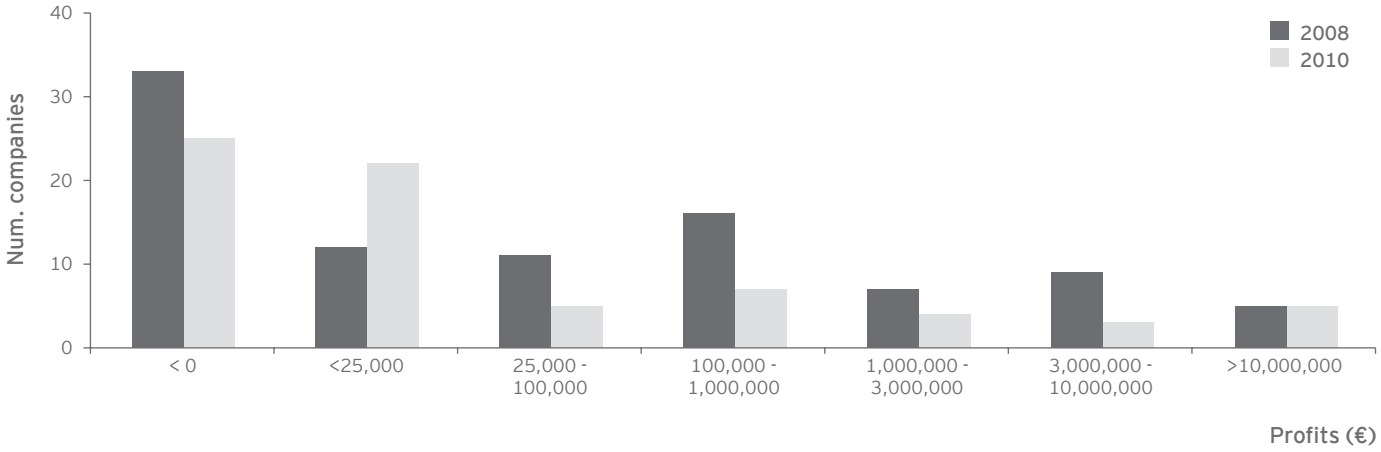
The number of companies without any profit has been reduced by half compared to 2008 figures.

25% of the companies, mainly smaller ones, allocate more than 75% of their income to research, while this percentage of investment decreases to 12% in larger companies, such as pharma corporations.

Figure 6.3

BioRegion companies' profits

R&D companies (2008 and 2010)




All companies (2010)

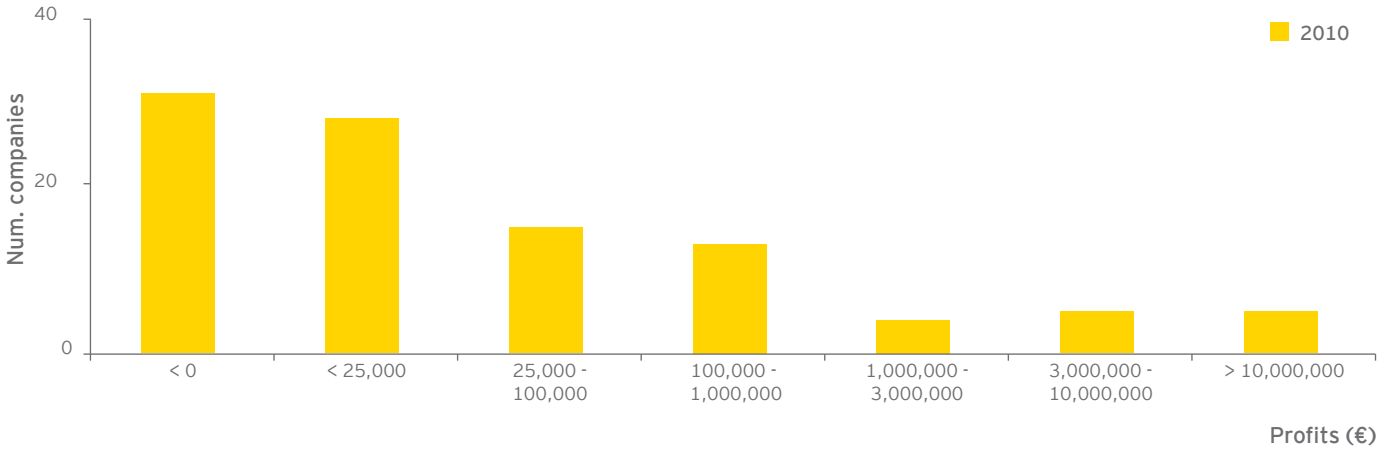


Figure 6.4

Economic data from BioRegion companies (2009-2011)

*(Source: news published in the Catalan and Spanish press, the ASCRI yearbook and corporate websites)*

| | |
|---|---|
| AB-Biotics | 2010 (July): MAB flotation. Starting share price: 2.53 €/share; Closing share price: 2.65 €/share. Value's increase: 4.7% (€14.5 millions)<br>2010 (outcomes): turnover of €2.1M; profits of €17,658; €3.6M in revenues; 74% annual increase<br>2010: Opening of the financing period in order to obtain €2.6M<br>2010: €2.6M of capital increase for the acquisition of Quantum Experimental |
| Advancell | 2011 (January): €4M (AIE with Neurotec Pharma and Aromics) |
| Almirall | 2010: €676.5M of sales in the first semester (3.5% less than in 2009) |
| Archivel | 2010: €2.5M of capital increase (€1M from INNOCASH + €1.45M invested by Reig Jofré and Grup Inversions Valor Afegit) |
| Arquebio | 2010: €150,000 of incentives |
| Bionure | 2010: €1.5M of capital increase by Reig Jofré, Uriach family and others. |
| ERA Biotech | 2009: €1M loan by ACC1Ó<br>2010: €1.5M of financing for the Eurostars' project |
| Esteve | 2010: €956M in revenues (a 1.3% increase) |
| Ferrer Internacional | 2010: turnover of €758M (a 11% increase relative to 2009) |
| Gebro Pharma | 2010: €38M in revenues |
| Grifols | 2010: net profit of €115.5M (21.9% less than in 2009)<br>2011: €840M bond issue<br>2011: €3,300M for the acquisition of Talecris Biotherapeutics<br>2011: €20M invested in the new production plant in Parets del Vallès |
| GPPharm | 2009: €20M of capital increase<br>2010: €10.5M in revenues (a 75% increase relative to 2009) |
| Hipra | 2010: turnover of €110M; 9% invested in R&D |
| Infinitec Activos | 2009: turnover of €700,000<br>2010: deposit of €300,000 for BCNEmpren's disinvestment |
| Inibisa | 2010: €7M for the sale of the OTCs division to Omega |
| IUCT | 2010: €1M loan by ENISA; €200,000 of capital increase; turnover of €4.3M |
| Janus Developments | 2009: €470,000 of capital increase by Grupo Ferrer, Enantia, Caixa Manresa and partners<br>2009: turnover of €270,000<br>2010: estimated turnover of €400,000 |
| Kern Pharma | 2009: turnover of €129M (a 16% increase relative to 2008)<br>2010: estimated turnover of €136.5M (sales increase of 5.2%) |
| Matachana | 2010: €65M of sales<br>2011: €7M of planned investment in a new production plant |
| Neos Surgery | 2009: turnover of €110,000<br>2010: estimated turnover of €500,000 |
| Neurotec Pharma | 2010: €3.3M (selling 34% of capital to Inveready Seed Capital and Caja Navarra) |
| Omnia Molecular | 2010: €2.8M in the second round of financing (€2.1M by Caixa Capital Risc and ENISA + €700,000 by the team) |
| Oryzon Genomics | 2009: €7.1M of incomes (€3.1M of sales)<br>2010: €300,000 grant disbursed by the Alzheimer Drug Discovery<br>2010: agreements with Proteonic and Dyax |
| Palo Biofarma | 2010: €2M of capital increase by Inveready Seed Capital and several business angels, such as Oryzon Genomics' co-founders |
| Plasmia Biotech | 2010: IUCT's Spin-out, created in 2010 (IUCT holds 30% of the capital) |
| Reig Jofré | 2009: acquisition of the Swedish Bioglan<br>2010: turnover of €103M |
| SabirMedical | 2010: €5M of capital increase by Ysios Capital Partners and Caixa Capital Risc<br>2011 (January): €1M of capital increase by ICO |
| Sepmag Technologies | 2010: €300,000 of incentives |
| Transbiomed | 2011 (February): €1.2M of capital increase by Inveready |
| TTC Ela Biotech | 2010: €1.5M investment in an AIE, constituted by Janus Develpoments, Bioingenium and Grupo Ferrer |
| X-Ray Imatek | 2009: €250,000 of incentives |

## Future progression

According to Biocat's survey, 61.2% of the companies expect to increase their capital in the near future, through contributions by founders and VC investments in first (18.2%) and second (16.5%) rounds.

The increasing number and volume of VC operations in Catalonia – some of them highlighted in figure 6.6 –, as well as the creation of new specialized funds make VC the more feasible financial source for the sector growth in coming years.

Figure 6.5

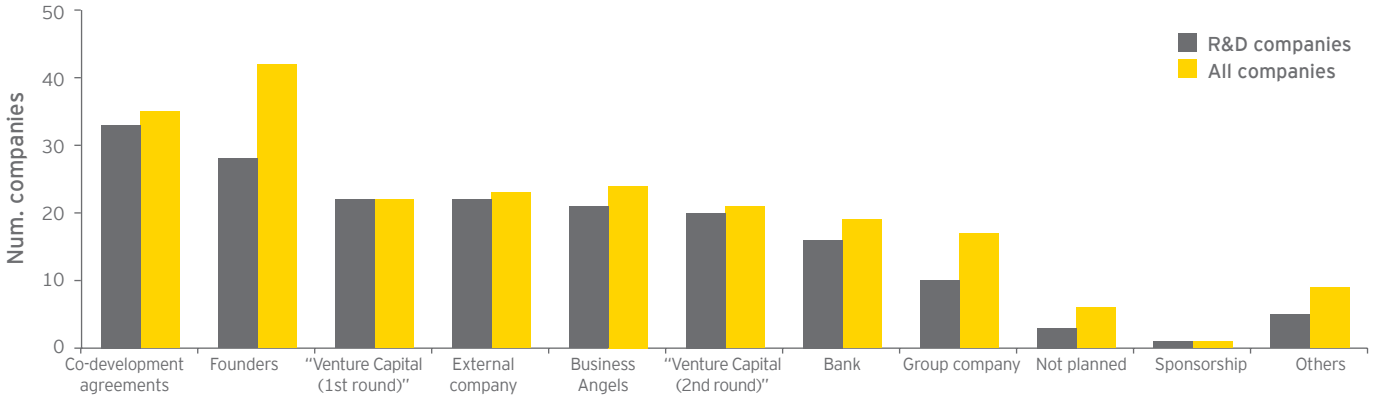


Figure 6.6

| Partners | Operation | Magnitude | Date |
|---|---|---|---|
| YSIOS | **MEDLUMICS:** The capital increase is aimed at boosting the development of diagnostic imaging products based on MEDLUMICS technology and completing the technical and managing teams. | **3.5 M** euros (partial involvement together with La Caixa) | 01/12/11 |
| | **AM-PHARMA:** Development of a protein for the treatment of severe inflammatory diseases, such as acute renal insufficiency, for which there is no efficient treatment. | **29.2 M** euros (partial involvement together with Abbott, Shire, BBBiotech Ventures and Idinvest Partners) | 13/09/11 |
| | **STAT DIAGNOSTICA:** The capital increase will finance the initial phase of development of the diagnostic platform Point of Care by STAT Diagnostica, as well as the hiring of necessary personnel. | **2 M** euros (partial involvement together with ICO and FESpyme FCR) | 15/06/11 |
| | **SABIRMEDICAL:** The capital increase is aimed at finalizing the development of the blood pressure estimator. | **5 M** euros (partial involvement together with La Caixa) | 15/09/10 |
| | **CARDOZ AB:** Speeding up the clinical development of the first drug to treat abdominal aortic aneurysm. | **10 M** euros (partial involvement together with Forbion Capital Partners and Health Cap) | 10/05/10 |
| CAIXA CAPITAL RISC | **MEDLUMICS:** The capital increase is aimed at boosting the development of diagnostic imaging products based on MEDLUMICS technology and completing the technical and managing teams. | **3.5 M** euros (partial involvement together with Ysios) | 01/12/11 |
| | **SABIRMEDICAL:** The capital increase is aimed at finalizing the development of the blood pressure estimator. | **5 M** euros (partial involvement together with Ysios) | 15/09/10 |
| | **OMNIA MOLECULAR:** Fostering the development of new antibiotics against hospital-acquired infections difficult to treat. | **2.1 M** euros (partial involvement together with Enisa) | 09/11/10 |
| ACC1Ó | **YSIOS:** It contributes this amount with the objective that Ysios contributes capital to 10 to 12 biotech companies. | **2 M** euros | 02/09/09 |
| INVEREADY | **PRORETINA THERAPEUTICS:** The investment will be used to complete the phase of preclinical development of its first molecule, centered in the field of acute heart failure. | **2.2 M** euros (partial involvement together with Sociedad de Desarrollo de Navarra SA [SODENA]; Caja Navarra Inversiones Societarias SCR, de Régimen Simplificado, SA; Real de Vellon, SCR, SA) | June 2009 |
| | Several operations with **PALOBIOFARMA, GRUPO NATAC, BIONANOPLUS, VERIDENTIA** and **NEUROTEC PHARMA.** | **1.9 M** euros | 2010 |
| | **TRANSBIOMED:** The investment to clinical trial in over 10 hospitals of a new diagnostic test of prostate cancer. | **0.25 M** euros | February 2011 |
| | **ADVANCED MARKER DISCOVERY:** The investment is aimed to identify therapeutic targets for developing new drug compounds. | **0.3 M** euros (partial involvement with Translational Cancer Drugs Pharma, TCD) | November 2011 |

| Partners | Description |
|---|---|
| YSIOS | Ysios Capital Partners is an independent venture capital firm registered at Spanish Securities and Exchange Commission (CNMV).<br>Ysios Capital Partners has its main office in Barcelona and invests in businesses focusing on human healthcare innovations (Life Science & Healthcare). Currently, Ysios Capital Partners manages Ysios BioFund I, a 69 million euros fund. |
| CAIXA CAPITAL RISC | Caixa Capital Risc is La Caixa's management corporation of risk capital companies that invests in newly created Spanish companies that are led by experienced and committed teams and with high growth potential. |
| ACC1Ó | ACC1Ó is the agency set up to make Catalan enterprise more competitive throughout the world. It specializes in fostering innovation and business internationalization and has a network of 34 business promotion centers around the world, strategically located. ACC1Ó works to achieve the following objectives:<br>1. Increase Catalan companies' productivity and innovation, technology and talent efficiency<br>2. Improve Catalan product and service positioning in international markets<br>3. Increase the number of Catalan companies and products internationally |
| INVEREADY | Inveready Technology Investment Group is the first Spanish investment bank focused on innovative companies in their early stages of life. It has two investment vehicles managed with resources which are close to €21 million with 75 investors. Inveready carried out a total of 32 investment transactions since inception.<br>Additionally, Inveready Group's corporate division for innovative companies has brokered more than €120 million between capital and public funding for over 140 clients during the last 4 years of activity. |

# The Venture Capital funding process for a Biotech company located in Catalonia

**Carlos Buesa**
CEO of Oryzon Genomics

**Q: Is Catalonia becoming a biotech hub?**

A: Since year 2000 an important effort has been done by the Catalonia Region in order to promote the creation of new Life Sciences companies. Now, twelve years afterwards, it is a good time to reflect how effective this effort has been in regards to positioning Catalonia as a reference:

- From the Academic point of view (Research Centers and Hospitals) there is no doubt Catalonia has become a key player.
- From the Industrial perspective, although several companies have been set up we still need to make sure they mature and become successful.

BIOCAT has done a big effort positioning Catalonia as a reference, and eventually, Catalonia could become a key player in Southern Europe.

**Q: How is the economic downturn affecting the Biotech sector in Catalonia? What are the main challenges / opportunities?**

A: Access to financing sources is extremely difficult nowadays. Governments (Central and Local) are limiting the access to subsidies, banks do not offer as many loans as they used to, and private investors are risk averse. We still need to see what will happen during the next two years.

**Q: What types of incentives do Catalan Biotech Companies receive in order to grow and cooperate internationally?**

A: There are many initiatives promoted by different players: BIOCAT (Catalonia Biotech Agency), COPCA (Catalonia Commercial Promotion Agency), ICEX (Spanish Agency for the External Commerce), in order to make sure companies from Catalonia are able to set up collaboration agreements with international players.

**Q: Oryzon Genomics took part in a major merger between two Spanish Biotech companies (Crystax and Oryzon). What new opportunities did this bring to Oryzon?**

A: Crystax and Oryzon were very complimentary and, as a result, this merger allowed creating value in a more effective manner than through organic growth.

**Q: Oryzon Genomics has gone through several rounds of Venture Capital (VC) funding. What are the major pros and cons of this type of funding?**

A: Oryzon has raised 14 M euros during 5 different rounds along 10 years. The relationship with the VC funds has been positive in general, improving the company's positioning and degree of professionalization.

**Q: How do you think VC funding could be promoted during the upcoming years?**

A: Several VC funds have contributed significantly with the Life Sciences sector in Spain, namely Najeti and Corsabe.

It remains extremely difficult for a Biotech company to grow without the support of VC funding. Unless Biotech companies incorporate a Services branch among their offers, they need VC funds in order to grow.

For companies trying to raise 10-15 M Euros, the difficulty to raise VC funds is extremely high in Catalonia, given that VC funds in general are willing to invest smaller amounts of money.

**Q: Can you share three elements you consider as crucial for ensuring a successful VC fund raising for a Biotech company?**

A: 1. Top quality in R&D and solid Intellectual Property

2. Realistic Business Plan

3. Top team players (eager to work and with a pragmatic mindset)

# The experience of YSIOS as one of the first independent Venture Capital (VC) firms in Spain focused in healthcare

Joël Jean-Mairet
Partner of YSIOS

**Q: What is the role that an independent venture capital firm like YSIOS plays in the capitalization of the biotech sector in Catalonia?**

A: The existence of VC firms is necessary across all phases of the development of a biotech company development. Catalonia like in many other geographies needs to capitalize those promising companies in the need of capital, nowadays more sought than ever. Ysios typically invests in companies that range from early stage projects to mature and established private companies. In Catalonia there has been traditionally a significant activity in the life sciences, likely to be a result of homing top research institutes like CRG (Genomic Research Center) and IRB (Institute for Research in Biomedicine) Barcelona, a well-founded entrepreneurial spirit and accounting for 60% of all biopharmaceutical activity in Spain. This of course yields a good quality deal flow.

**Q: Since you started your operations in Catalonia, have you seen a trend towards an increased interest in the Catalonia Life Sciences sector from the Venture Capital Funds?**

A: YSIOS started operations in 2008 and fortunately since then we have been enjoying an increasingly good quality deal flow. The quality of the science behind the business ideas has always been good, though the entrepreneurs come now with much better thought through projects than 4 years ago. The role of YSIOS for these Companies remains key because they do not generate revenues, and have difficulties accessing public funds.

**Q: Looking at the historical investments already made by YSIOS, which % of companies were based in Catalonia?**

A: Since YSIOS established itself in Catalonia there has been some activity in the field: further players have appeared, and this has allowed syndicated investments. Most of our investment opportunities are generated in Catalonia (41%), Madrid (26%) or Basc Country (11%). Since 2008, YSIOS has assessed over 550 opportunities (1/3 from Spain, 2/3 from abroad – mainly coming from USA, UK, Switzerland, The Netherlands, Nordic countries, Germany and France).

**Q: In regards to the target Companies in which YSIOS invests, is there a preference towards red, white or green biotech?**

A: YSIOS makes most of its investments in Therapeutics (60%) and Medical Devices & Diagnostics (40%) and does not invest in Clean Tech/Green Technologies.

**Q: What is the current situation of Venture Capital funding for the Biotech sector in Catalonia in comparison to the rest of Spain and to other European countries?**

A: YSIOS has perceived an increased interest of other specialized investors (from other European countries) in investing in Spanish Companies. Companies must understand they are competing with other European biotech companies for the same funds and therefore have to present an appealing investment case for VCs in order to be successful and raise the required funds.

In regards to good role models, UK, The Netherlands, France, Switzerland and Nordic countries should be taken into consideration, they clearly have a critical mass of Biotechnology focused VC funds.

**Q: For small Companies, public subsidies can represent up to 40% of the capitalization. How do you think the cutbacks in public funds will affect the financing sector?**

A: Public funding is extremely relevant for the Biotech sector, but it should only fund young early stage companies and not companies with 5-10 years of age.

Public funds should cover those phases that are not covered by Venture Capital.

**Q: From your point of view is the Catalonia Life Sciences sector increasing its visibility?**

A: Catalonia is definitely gaining visibility and Biocat has acted as a catalyzer during this process. We typically encourage our portfolio companies to attend pan-European biotech conferences in order to get exposed to foreign VCs, large pharma companies and potential business partners. In the past years we continuously receive enquiries from other international VCs regarding investment opportunities. I am convinced Catalonia's biotech scene is now certainly in the radar screen of many stakeholders of the biotech industry.

**Q: From your point of view does the Alternative Stock Market (Mercado Alternativo Bursátil, MAB) represent a good alternative for Biotech companies trying to grow and expand? Why do you think Catalan Biotech Companies are not using the MAB more often?**

A: Although the MAB represents an interesting funding source for biotech companies, the main reason why companies do not use more often this alternative is perhaps because of its limited liquidity. Having said the companies which have go public in the MAB are doing quite well and do enjoy interesting visibility.

# Appendix – Selection of Catalonia Research Centers and large facilities

| | |
|---|---|
| Catalan Institute of Cardiovascular Sciences (ICCC) | ICCC is located in the Hospital de la Santa Creu I Sant Pau in Barcelona, and it conducts research on cardiovascular and heart disease, competing at the highest international level. The center has been highly successful at transferring research into therapeutic developments and diagnostics. |
| Center of Genomic Regulation (CRG) | One of the main areas of excellence that Barcelona boasts in research is related to this center. At CRG they carry out basic research in biomedicine, especially in the areas of genomics and proteomics. Its researchers and group leaders are recruited and evaluated internationally, ensuring the highest scientific levels. |
| Center for International Health Research (CRESIB) | CRESIB researches issues related to the new international health challenges we face in the twenty-first century. Since May 2010, CRESIB has been part of the Barcelona Global Health Institute (ISGLOBAL). |
| Center for Regenerative Medicine in Barcelona (CRM) | CRM is located in the Barcelona Biomedical Research Park (PRBB) and principally researches human embryonic stem cells to understand their basic development mechanisms and work on applications for these cells in the treatment of degenerative diseases. |
| Catalonian Institute of Bioengineering (IBEC) | IBEC carries out research into bioengineering all the way from its most basic level up to medical applications; it has become an international benchmark in this field. Its location in the Barcelona Science Park (PCB) means it can keep up with this highly dynamic area of lice sciences. |
| Institute of Biomedical Research (IRB) | Founded in 2005 and located in Barcelona's Science Park (PCB), IRB is dedicated to basic and applied biomedical research. Highly dynamic and working the highest international levels of excellence, some of its mains achievements have been in the area of cancer research. |
| Institute for AIDS Research (IrsiCaixa) | It works to develop knowledge, prevention and treatment of HIV infection and AIDS, with the ultimate goal of eradicating this disease. Located in the University Hospital Germans Trias I Pujol in Badalona, it conducts research in partnership with Barcelona's Hospital Clínic. |
| August Pi i Sunyer Biomedical Research Institute (IDIBAPS) | IDIBAPS' research focuses on six main investigation lines and it aims to integrate quality clinical research with high quality basic research through its 60-or-so research teams. |
| Bellvitge Biomedical Research Institute (IDIBELL) | IDIBELL is a stem cell medical research center, including the participation of the University Hospital of Bellvitge, the Catalan Institute of Oncology, the University of Barcelona and the Institute of Diagnostic Imaging. The Institute is part of Hospitalet's Biopol'H health care research park. |
| Health Sciences Research Institute of the Germans Trias i Pujol Foundation (IGTP) | The mission of the Health Sciences Research Institute of the Germans Trias i Pujol Foundation (IGTP) is to generate, preserve, disseminate and increase multidisciplinary and translational knowledge, as well as technological development in biomedical sciences, by means of a dynamic, efficient and effective organization. It carries out research in areas like immunology and inflammatory diseases; cancer; technology applied to biomedicine (biotechnology, bioengineering, bioinformatics); public health and clinical and molecular epidemiology; and clinical innovation and healthcare services. |
| The Sant Pau Biomedical Research Institute (IIB Sant Pau) | The Sant Pau Institute for Biomedical Research carries out medical research into basic, clinical, and epidemiological health care issues, and their investigation lines come together in the 10 of the highest quality research entities. Occupying 6,000 m2 of space, the shared research facilities play host to more than 400 basic scientists and clinicians grouped in 7 areas of research. |
| Vall d'Hebron Research Institute (VHIR) | VHIR is a biomedical research center working in the fields of diagnostics, therapeutics and the treatment of problems related to healthcare issues. Besides this, the Institute is highly committed to supporting entrepreneurial business ventures that arise from their research programmes. |
| ALBA Synchrotron | Alba is a new generation synchrotron located near the Autonomous University of Barcelona. The synchrotron and the nearby new Parc de l'Alba facilities have been equipped to host researchers from around the world that use X-ray analysis on their samples. |
| Barcelona Supercomputing Center (BSC) | Located in the emblematic Torre Girona building in Barcelona, the BSC-CNS (Barcelona Supercomputing Center) is Spain's National Supercomputing Center that plays host to the Mare Nostrum supercomputer, one of the most powerful in Europe. |
| National Center for Genome Analysis (CNAG) | This center is dedicated to the study of sequencing, analysis and interpretation of information contained in organisms' genomes. 10 years after the publication of the first human genome sequence after decades of research, CNAG can now sequence in just a day. |

# Appendix – Selection of S & T Parks

| | |
|---|---|
| Barcelona Science Park (PCB) | Barcelona Science Park is a pioneering structure in the I&D&i system, set up by the University of Barcelona. It is currently a reference model where innovation is a reality. Located at Diagonal Campus, the PCB has 1,400 professionals, 30 companies, one incubator of biotech companies, 3 institutes, 50 research groups and a broad offer of research supporting technology, which develop their activities in emerging areas of chemical, pharma, biotech and nanobioengineering research. |
| Barcelona Biomedical Research Park (PRBB) | The PRBB, an initiative of the Government of Catalonia, the City Council of Barcelona and the Pompeu Fabra University (UPF), is a large scientific infrastructure that is physically connected to the 'Hospital del Mar de Barcelona' and that gathers together six public research centers closely coordinated amongst them. |
| Research Park University of Barcelona (PRUAB) | In the last years a large number of research centers and institutes with special characteristics have set up in Bellaterra campus. They meet specific needs in highly interesting fields for the socioeconomic environment of the University. This process has given rise to the development of a unique scientific environment in Catalonia. UAB's research park (PRUAB) reflects the will of its promoters (UAB, CSIC and IRTA) to coordinate the resources and knowledge already invested in research centers and institutes within Bellaterra campus, and synergies developed between their activities, the University's and its economic and social environment's. |
| UPC Research and Technology Park (PRIUPC) | UPC Park is an attractive innovation environment, due to the concentration of knowledge, spaces and technological infrastructures and its capacity to contribute added value services. The UPC Park is organized around several technological poles: 1) Mediterranean Technology Park, 2) Barcelona Technology Park, 3) Terrassa science and technology pole, and 4) Vilanova i la Geltrú science and technology pole. |
| North Barcelona Technology Park (PT BCNord) | Barcelona Nord Technology Park is a Barcelona Activa 10,000 m2-installation with advanced infrastructures to support the consolidation and growth of innovative small firms and micro-companies and spread new technologies. Barcelona Nord Technology Park offers innovation-oriented technology-base small firms and micro-companies a set of advanced services to support company innovation, development, consolidation and growth. |
| La Salle Innovation Park (PI La Salle) | La Salle Innovation Park's mission is to implement La Salle's commitment to people, organizations and society, a commitment that La Salle fulfills through the transfer of knowledge, technology, people and companies. The Park becomes an innovative environment in which research groups, technology centers, innovation groups and new companies find the best synergies, where the latest developments and technological innovations are proved. |
| b-Tec | It reflects the concept of "knowledge city". A place to live and work, characterized by the interdisciplinarity of its activities, the specialization in strategic knowledge fields, connections between universities, research centers and companies, and international and local networking. Its mission: turning an urban space into an area for the creation and transfer of knowledge and innovation. Its vision: becoming one of the reference international areas in the new knowledge society. Knowledge vector: Energy, water, mobility, architecture and sustainable building. |
| Science and Technology Park (PCT Lleida) | The main objective of the Agro-food Science and Technology Park (PCiTAL) is to add value to agro-food specialization and integrate scientific, technological and production systems of its environment. With this objective in mind, the park manages information, knowledge and technology, boosts the set-up and growth of innovative companies, provides added value services, as well as top-quality spaces and installations. |
| UDG Science and Technology Park (PCT UDG) | UdG's Science and Technology Park is a space for innovation fostered by the University of Girona. It promotes the transfer of knowledge and research results from the university to the production environment. The Park concentrates resources and activities at the service of researchers, students and companies, creating synergies between them as mixed university-company R&D centers and new business initiatives. |
| Tecnoparc | With Tecnoparc, Reus honors its tradition of great agro-food production and distribution center (oil, dried fruits ...) and evolves towards design, development and production of high added value food with beneficial properties for the consumers' health. But it is not just that. Parc Tecnològic del Camp will offer technological services ranging from functional food design to the studies necessary for its launching into the market. |
| Vallès Technology Park (PTV) | Vallès Technology Park is a place designed to meet the specific needs of new technology companies. Its mission is to provide an accessible environment full of resources, where companies can broaden their activities, where young companies can develop their potential and where new initiatives arise. |
| TecnoCampus Mataró-Maresme (TCM) | TecnoCampus Mataró-Maresme is a science and innovation park in the town of Mataró, in the comarca (district) of El Maresme (Catalonia, Spain). With its sights set on becoming a national and international project, TecnoCampus Mataró-Maresme (TCM) is the territory's main prospect for making a decisive contribution to the area's economic and social transformation. |

# Glossary of Terms

| Term | Description |
|---|---|
| **ISCIII** | Carlos III Health Institute (ISCIII) is an autonomous public body that has the status of Research Public Body (RPB), engaged in highly competitive biomedical research of excellence and renders scientific and technical services. |
| **CDTI** | The Centre for Industrial Technological Development (CDTI) is a business public entity dependent on the Spanish Ministry of Science and Innovation. Its mission is to contribute to the change of the economic model by supporting companies to develop technologies to create new processes, products and services, or improve existing ones. Its vocation is to offer comprehensive support to innovative companies, in terms of financing, internationalization and other added value services. |
| **CRO** | Contract Research Organizations. Service company specializing in one or more research activities for third parties. It can be research on discovery, preclinical or clinical phases. Some CROs offer all the services and others focus on some specialty. |
| **IVD** | Set of techniques used on tissue samples or human or animal biological fluids to diagnose diseases or alterations in the organism. |
| **TTO** | Interface structure whose purpose is to boost and foster relationships between science and the business sector so that the latter can benefit from the capacities and results of research. |

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Life sciences companies — from emerging to multinational — are facing challenging times as access to health care takes on new importance. Stakeholder expectations are shifting, the costs and risks of product development are increasing, alternative business models are manifesting, and collaborations are becoming more complex. At the same time, players from other sectors are entering the field, contributing to a new ecosystem for delivering health care. New measures of success are also emerging as the sector begins to focus on improving a patient's "health outcome," and not just on units of a product sold. Our Global Life Sciences Center brings together a worldwide network of over 7,000 sector-focused assurance, tax, transaction and advisory professionals to anticipate trends, identify implications and develop points of view on how to respond to the critical sector issues. We can help you navigate your way forward and achieve success in the new health ecosystem.



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### Biocat

Biocat is the organization that coordinates and promotes the biotechnology, biomedicine and medical technology sector in the BioRegion of Catalonia. Its mission is to boost stakeholders interactions in this area and to foster their initiatives in order to build a strong research system and promote active transfer of knowledge, entrepreneurship and business development. The final objective is the sector to become a driving force for the country's economy and contribute to the wellbeing of society as a whole.

Created in 2006 at the behest of the Government of Catalonia and the Barcelona City Council, Biocat is a foundation that brings together representatives from all areas of the biomedicine and biotechnology sector: Public administration, universities, research centers, companies and support bodies.

Biocat promotes collaboration among biocluster stakeholders and several organizations both in Catalonia and on a national and international level. It designs and leads programs on tech transfer, finance, internationalization, talent recruitment and specialized training in order to increase the sector competitiveness.