PORTUGAL BIOTECH

TRENDS, OPPORTUNITIES AND CHALLENGES OF THE PORTUGUESE BIOTECHNOLOGY SECTOR

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P-BIO is a private non-profit association that brings together companies related to biotechnology and life sciences in Portugal. Since its foundation in 1999, it has contributed as a key element to the development and support of biotechnology in Portugal. P-BIO seeks to develop a favorable environment for the creation and growth of biotech companies and to promote their national and international business development. P-BIO also plays a key role in the interconnection between biotech companies and government bodies, investors, regulatory agencies, and other relevant stakeholders.

Project Coordinator:

BioData.pt is the Portuguese distributed infrastructure for biological data and the Portuguese ELIXIR node. BioData.pt supports the national scientific system through best practices in data management and state of the art data analysis. It interfaces with both academia and industry, making research available for innovation, namely in sectors such as agro-food and forestry, sea, and health.

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EXECUTIVE SUMMARY: MAIN RESULTS

Portuguese Biotechnology industry is a high-priority sector: its ability to innovate and to promote innovation diffusion to other sectors makes it a key driver to the competitiveness of the Portuguese economy.

- The present study aims at characterizing the Portuguese Biotechnology sector, grounded on firm-level information. Its objectives are threefold: to gauge the size of the sector by means of financial and economic indicators (turnover, employment, added-value, returns on equity, among others), to characterize the labour market, and to characterize the innovation performance.
- Biotechnology industry is a high-priority sector, a key driver to the competitiveness of the Portuguese economy. Its high capacity to innovate and to promote innovation diffusion to other sectors is based on its contribution to the economic growth and to technological progress in key sectors such as health, environmental activities and agro-food industries.
- In 2019, in Portugal, the sector turnover was 36.5 million euros, the average turnover per firm was 337.8 thousand euros and the turnover per employee was 56.0 thousand euros. From 2011 to 2019 the sector turnover increased 33% but the average turnover per firm or per employee remain below the average observed in the 28 EU countries. From 2016 to 2020 the turnover of the surveyed companies more than triplicated. Biotechnology products and applications represent 100% of the turnover of 64% of the companies surveyed. For 53% of the companies, exports account for more than 60% of their turnover.

A growing sector in a recessive context.

- In 2019, there were 98 firms in Portugal, which employed 652 workers, with an average size of 6.7 workers per firm, about a third of the European Union average (21.6 workers per firm). From 2011 to 2019, total employment experienced a strong increase, about 134%, above the average increase observed in European countries (129%).
- At the European Union level, five countries concentrate 76% of the employment and 60% of the number of firms: the United Kingdom, Germany, The Netherlands, Belgium, and France. In 28 European Union countries with comparable data, Portugal ranks 14 regarding total employment (0.5% of the total) and ranks 12 in the total number of firms (1.5% of the total).

The human health area and corporate consumers are the main targets for the companies surveyed

- About 44% of the companies surveyed sell their products and services on the market, and needed an average of 4 years to get the products into market.
- The main target markets served are in the areas of human health (36.0%), agri-food (20.0%) and environmental (16.0%). The products and services are mainly sold to corporate consumers (48.0%), final consumers (24.0%) and Universities and Research Centres (16.0%).

Firm size below the European average and in need of strengthening their equity ratios.

- In 2019, in Portugal, the sector turnover was 36.5 million euros, corresponding to 0.12% of the total of the sector at the European level. It represents an increase of 33% compared to the turnover in 2011. The average turnover by firm was 3338 thousand euros, much lower that the European average of 10.415 million euros. The average turnover by worker was 16.1% of the European average.
- The equity ratio of Portuguese firms (median) has been about 44%, whereas in other European countries the indicator is about 57%.

The investment rate is higher than European average, but the investment per person employed is lower.

- In 2018, the investment rate (investment/value added at factors cost) is 24%, higher than European average (18%). However, the investment per person employed is 5.8 thousand Euro, below the European average of 11 thousand Euro.

Knowledge intensive sector, creating highly skilled jobs and paying above-average wages.

- About 86% of the sector workforce has at least a Bachelor's diploma. Namely, 19% of the workers have a PhD, 26% completed a Master's degree, and 41% have a Bachelor's diploma. In the companies surveyed, 61% of the CEO's have a PhD, 27% have a Master's degree and 12% have a Bachelor's degree.
- In 2017, the average gross wage (base wage plus overpayments) was 1637 euros, about 577 euros above the national private sector average. Employees with a PhD earned 2,407 euros, on average, 855 euros above the wage of an employee with a Master degree.

One half of the human resources aged less than 35 years old, and the sector employs proportionally more women than men.

- The average workers' age is below the national mean: 51% aged less than 35 years old, comparing with 32% at the national level. 59% of the workers are women.
- 41% of the workers have a permanent contract and almost all people work full-time. 61% of the employees have a job tenure (the length of time an employee has been employed by his current employer) lower than 2 years.

More than 80% of all the patents published by Portuguese biotech firms were in the last ten years. In Portugal, the biotechnology ranks 5 in the 35 technological classifications regarding patent publications.

- The number of patent publications by Portuguese biotech firms between 2000 and 2018 is 355, with 82% published between 2009 and 2018.
- From 2008 to 2017, there were 446 patent publications in biotechnology, by both companies and research centers (0.4% of the total for the UE-28). In the same period, there were 143 grants. Those patent publications represent 4.9% of the total publications in Portugal, and puts Biotechnology in fifth place among the 35 areas of the patent classification.

More than half of the respondent firms do not generate biological data, but the majority have employees with skills in biological data management or outsource this function.

- More than half (56%) of the respondent firms do not generate biological data. The others generate primary and secondary data (19%) and one quarter specialized data. The majority of the firms have employees with skills in biological data management or outsource this function.

Access to funding, lack of private investors, market size, regulations and the underdevelopment of the biotechnology ecosystem are the main factors that hinder the growth of their companies.

- CEOs refer more often to factors related to organizational capabilities (43%), followed by marketing issues and market conditions (26%) as the factors that they believe are critical for the development of their company.

- The importance of the availability of investment funds was also mentioned as necessary to boost the sector, particularly specialized investment, as biotechnology presents different financial challenges from other areas.
- Internationalization is a critical for their own business development. Other important factors are the availability of specialized services, to support funding access and Intellectual Property protection applications, the need to be and stay innovative and having access to well-prepared human resources, not only in terms of biotechnology competence but also business competence are also critical to business growth.
- The factors that have been limiting the growth of their companies are the difficulty to access funding in general, or to the lack of private investors. Market size, regulations and the underdevelopment of the biotechnology ecosystem is limiting the growth of their companies.

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1. FOREWARD

In 2020, we faced a worldwide pandemic that highlighted the importance of biotechnology and life sciences in meeting the challenges of today and tomorrow. Bioindustries and biotechnology, which were once vague concepts for the general public, are today a priority for sustainable and resilient economies to be able to address global goals in terms of health, environment, and sustainability. Societies around the globe are seeking healthier lifestyles, with lower carbon footprint and more resilient to climate change and global warming. New sustainable economic growth models are being developed at high speed, creating countless opportunities for biotech companies that contribute to a knowledge-based economy.

The COVID-19 pandemic also highlighted how essential investment in science is, as a true engine of technological and societal development. Portugal is, therefore, facing a unique opportunity to improve the competitiveness of its economy, by boosting the investment in science over the past decades, promoting a closer link between research and scientific entrepreneurship and fostering the creation of new businesses based on technologies developed locally and with global ambitions. A strong biotechnology sector can make the country resilient to future crisis and be a robust social and economic development engine, based on a long-term sustainable technological competitive differentiation.

In 2016, P-BIO promoted a first study on the Portuguese Biotechnology Industry, in terms of firms, labour market and innovation indicators, which acknowledged that the *"Portuguese Biotechnology industry is a high-priority sector: its ability to innovate and to promote innovation diffusion to other sectors makes it a key driver to the competitiveness of the Portuguese economy*". The present study provides a broader, more complete and updated analysis of the Portuguese sector, with the aim of characterizing the trends, opportunities and challenges of the Portuguese biotechnology sector, to be used as an instrument to support the growth and development of this sector and to guide policy development. The study, including the databases on which the study analysis is supported, was coordinated by P-BIO with the support of BioData.pt, the Portuguese Infrastructure for Biological Data and the Portuguese node of ELIXIR, and will be used to assist BioData.pt in developing a strategy to engage with the biotech industry and to promote the big data use and valorization by biotech companies. The study was financially supported by FCT – the Portuguese Foundation for Science and Technology - through the project grant 22231/AAC 01/SAICT/2016 from the operational programs CRESC Algarve 2020, Lisboa2020 and COMPETE 2020, and produced by TecMinho.

Privacy rules of the companies considered in this study were respected, guaranteeing the security and confidentiality of the information collected. Data access and processing are only authorized by P-BIO, with the security and confidentiality required by the legal framework relating to the application of the General Data Protection Regulation (GPDR), EU Regulation 2016/679, applicable from 25 May of 2018. For more information, please contact: sec.geral@p-bio.org.

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2. INTRODUCTION

Biotechnology is considered internationally as a critical contributor to economic and employment growth, (Carlson, 2016)[1]. The European Commission, recognises the contribution of biotechnology and life sciences the modernisation of European industry, through their applications in a variety of industrial and primary sectors such as healthcare and pharmaceuticals, animal health, textiles, chemicals, plastic, paper, fuel, food, and feed processing. The biotechnology sector helps the EU economy grow and provides new jobs, while also supporting sustainable development, public health, and environmental protection. Therefore, biotechnology is one of the Key Enabling Technologies (KET), a group of six technologies [2] that increase industrial innovation to address societal challenges and creating advanced and sustainable economies.

Within this broader context, biotechnology plays an important role to sustain innovation and competitiveness. The analysis of the global trends and the existing studies of the business activity within the area points to a promising future, full of growth opportunities for biotechnology companies, from which the emerging Portuguese biotechnology cluster can also benefit.

Hence, the scope of this report is to measure the biotechnology sector in Portugal in terms of firm activity and employment characteristics. A survey on a representative sample of Portuguese biotechnology firms complement the data gathered from secondary sources and provided useful insights concerning the critical factors to growth and the barriers that limit the company or sector development.

The report is organized as follows: Section 3 presents the methodology and the data collection process, Section 4, Section 5 and Section 6 present sector demographics, employment characterization and some financial and operating performance indicators. Investment and innovation indicators are analysed in Section 7 and Section 8 concludes with the analysis of the incentives and barriers to firm and sector growth.

[1] Carlson, R. (2016). Estimating the biotech sector's contribution to the US economy. Nature biotechnology, 34(3), 247-255.

[2] Micro and nanoelectronics, nanotechnology, industrial biotechnology, advanced materials, photonics, and advanced manufacturing technologies.

3. MEASURING THE BIOTECHNOLOGY SECTOR IN PORTUGAL: METHODOLOGICAL OPTIONS

The characterization and measurement of the performance of biotechnology as an economic activity require two main conditions: i) an operational definition of biotechnology that allows delimiting the area; ii) the selection of appropriate and relevant key indicators to describe the biotechnology companies. The options made in the context of the current report are presented and justified below.

3.1 The biotechnology definition

Defining biotechnology is not straightforward, and for that reason, different studies may use different criteria to select the companies considered as biotechnology players hindering the comparability of the data. One commonly accepted definition is the one proposed by OECD (2005)[3], composed by a single definition, and a list-based definition of biotechnology techniques. More recently, the statistical definition of biotechnology was revised to consider the latest advances in the field. It describes broadly biotechnology as "*The application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services*" (Friedrichs & van Beuzekom, 2018, p. 8)4. The list-based definition was also updated. Any company applying the listed technologies in their activities could be considered a biotechnology firm.

The identification of the companies that correspond to these definitions would require a nationwide survey in which every company should declare whether or not they apply any of the listed technologies and in what extent, which is not feasible within the scope of this study. Thus, for the purpose of this report, a more operational criterion was used to select the firms, following a debate with a committee composed of industry players. In this context, biotechnology companies were defined as those that are classified under the classification of economic activities (CAE Rev.3 / NACE Rev.2) as performing **Research and experimental development on biotechnology (Class 7211**). The Class 7211, as primary code, was used to construct the primary population list. Companies having Class 7211 as secondary code were also included in some of the indicators presented in this report. This document fully acknowledges that biotechnology is a key enabling technology, which is able to steer innovations in many different sectors (Friedrichs & van Beuzekom, 2018)[2]. The use of the industrial classification, with all its limitations, allows: i) to have an objective method to select the firms, permitting proper comparisons, both at the national and international level; ii) to retrieve information from several different databases, enrichening the description of the biotechnology firms.

The main disadvantages of using industrial classification are: i) some companies may perform biotechnology activities but that are not classified under the 7211 code; b) some companies may be classified under this code but are not currently active in this area. To mitigate these problems, the list of companies selected using the industrial classification criterion was submitted to the scrutiny of the P-BIO – Portugal's Biotechnology Industry Organization – and crosschecked with other sources such as the P-BIO members' database and the Portugal Ventures database, in order to minimize the number of wrongly identified cases. Following this curatorship, some companies were removed, and others added to the final list.

3.2 Relevant key sector indicators and data sources

Taking into account the recommendation provided by the OECD's *Framework for Biotechnology Statistics* (OECD, 2005), the past experience in sectorial characterization, and the indications provided by the members of P-BIO's Steering Committee for the study, the following indicators were considered as relevant (Table 1):

[3] OECD (2005). *A Framework for Biotechnology Statistics*. Paris: Organisation for Economic Co-operation and Development.

[4] Friedrichs, S. & B. van Beuzekom (2018), "Revised proposal for the revision of the statistical definitions of biotechnology and nanotechnology", *OECD Science, Technology and Industry Working Papers,* No. 2018/01, OECD Publishing, Paris, https://doi.org/10.1787/085e0151-en.

Table 1 - Performance indicators of biotechnology firms and sector

Theme	Indicators	Relevance	Sources of data
THE BIOTECH INDUSTRY: DEMOGRAPHICS AND ACTIVITY	- Number of firms per country - Area of activity - Products/solutions developed - Purpose of creating the company - Products in the market - Time to market - Target customers - End markets served	It provides a statistical picture of the demographics of companies performing biotechnology activities and their economic and financial performance; shows trends in recent years and, compares with the performance of the sector at European level.	**Secondary data - *ORBIS Database*** with detailed information of around 48 million companies across Europe, including financial reports. The database consists of a large number of listed and unlisted companies in Europe. **Primary data – P-BIO survey**
EMPLOYMENT AND HUMAN RESOURCES	- Total employment by country - Employment trends - Number of employees - Education level of HRs - Age of the workforce - Previous experience of the CEO - Wages - Employment composition	It characterizes human resources engaged in biotechnology activities, presents their evolution over the last years and compares it with the employment data of other sectors at national level.	**Secondary data - *Quadros de Pessoal*** Data about the company and their employees submitted to the Ministry of Labour and Social Solidarity. Data at the individual level. **Primary data – P-BIO survey**
TURNOVER AND RETURNS	- Sector turnover by firm - Sector turnover by employee - Trends in industry sales - Turnover in Biotech - Turnover – Exports - Added value - Returns on equity - Equity ratio	These indicators measure operational and financial performance of the firms, comparing with the performance at the European level.	**Secondary data - *ORBIS*** Database with detailed information of around 21 million companies across Europe, including financial reports. The database consists of a large number of listed and unlisted companies in Europe. **Primary data – P-BIO survey**

INNOVATION AND INVESTMENT	- Investment rate - Financing sources - Patent publications - Geographic coverage of published patent applications - Return from patents - Ownership of the protected knowledge - Investment per person employed - Financing sources - Biotechnology patents vs. other areas - Intellectual property protection modalities - Return from patents - Ownership of the protected knowledge - Biotechnology patents in Portugal vs Europe	It assesses the evolution of inventive activity of biotechnology companies in recent years, as well as the relative importance of the sector to innovation.	**Secondary data - WIPO - World Intellectual Property Organization and WIPO Patentscope** Data on intellectual property worldwide collected from several sources. **Secondary data -Eurostat** Data on investment per person employed **Primary data – P-BIO survey**
INCENTIVES AND BARRIERS TO GROWTH	- Critical factors in promoting the development / growth of the company - Critical factors in promoting the development / growth of the biotechnology sector - Critical aspects limiting the company's development - Critical aspects limiting the biotechnology sector in general	It analyses from the perspective of companies the main drivers and barriers to the growth of their business and the biotechnology sector in general	**Primary data – P-BIO survey**

3.3 Data sources

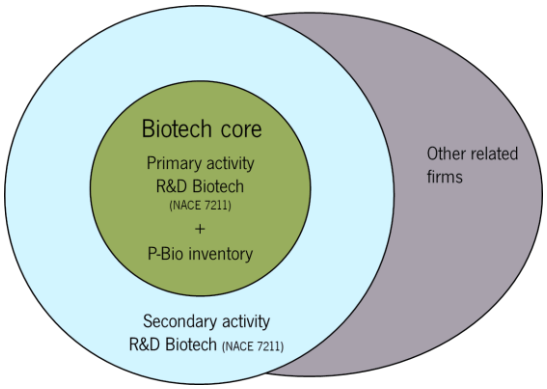
Primary data - sample

Primary data were collected through a questionnaire organized in five sections: i) demographics and activity; ii) employment and human resources; iii) turnover; iv) innovation and investment; v) incentives and barriers to growth.

The questionnaire was administrated through personalized email to an inventory of 222 companies created by research team and P-BIO – Portugal Biotechnology Industry Organization. The list was organized according to the defined operational criterion: 102 companies with their core activity in biotechnology; 110 companies with their secondary activity in Biotechnology, and 10 companies based on the Biocant Park (Figure 1).

The survey was available between 3rd and 23rd of July 2020 and three follow-up reminders participation were sent. Thirty-four responses were considered valid for analysis, corresponding to a response rate of 15.3%.

Figure 1 – Survey population



Secondary data

Secondary data was gathered from three main databases:

i. **ORBIS:** Database from the Bureau van Dijk company, with information on more than 400 million companies and entities across the globe – 48 million of these are located in European Union Countries. Bureau van Dijk collects the information from over 170 different providers and states and presents the information on companies in comparable formats.

ii. **Quadros de Pessoal:** is a compulsory survey of all firms conducted annually, in October, for purposes of monitoring compliance with labour law provisions by the Ministry of Labour and Social Solidarity. The dataset contains information on every wage earner in the Portuguese economy, with the exception of civil servants and independent workers, as well as on their employers (firm-level and establishment-level). Data cover information on each establishment and firm, such as size, location, economic activity, and employment, as well as information on each employee, such as gender, age, education, skills, occupation, tenure, monthly wages, and hours worked.

iii. **WIPO - World Intellectual Property Organization and WIPO Patentscope**: Data on intellectual property worldwide collected from several sources, namely International Patent Applications under the PCT Regional and national patent collections from all participating countries.

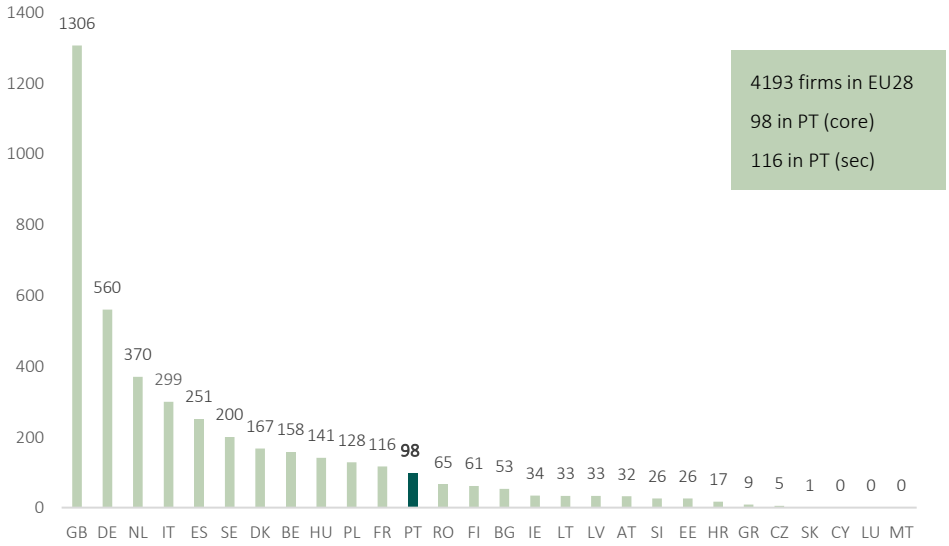
4. THE BIOTECH INDUSTRY DEMOGRAPHICS AND ACTIVITY

4.1 Number of firms and area of activity

The ORBIS dataset (Bureau Van Dijk) provides information for the characterization of the firms in the biotech sector regarding its number, size and employment. As explained earlier, only firms in the sector "Sector 7211 Research and Development in Biotechnology" were considered. For Portugal, in addition to the firms declaring the 7211 as its primary or secondary activity, all the firms from P-BIO inventory have been included.

In 2019, there were 98 firms[5] in Portugal with sector 7211 as primary activity, and 116 as secondary activity (Figure 2).

Figure 2 - Number of firms by country, 2019

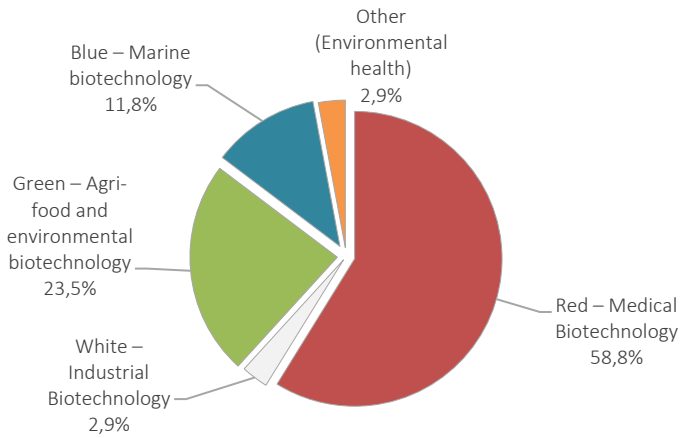


Source: Computations based on ORBIS dataset (Bureau Van Dijk),
Sector 7211 Research and Development in Biotechnology.

Considering the P-BIO survey, around two thirds of the companies develop their activity in the field of Red or Medical biotechnology applications (58.8%), followed by Green or Agri-food and Environment (23.5%), Blue or Marine (11.8%) and White or Industrial areas (2.9%) (Figure 3).

[5] Firms with one employee at least.

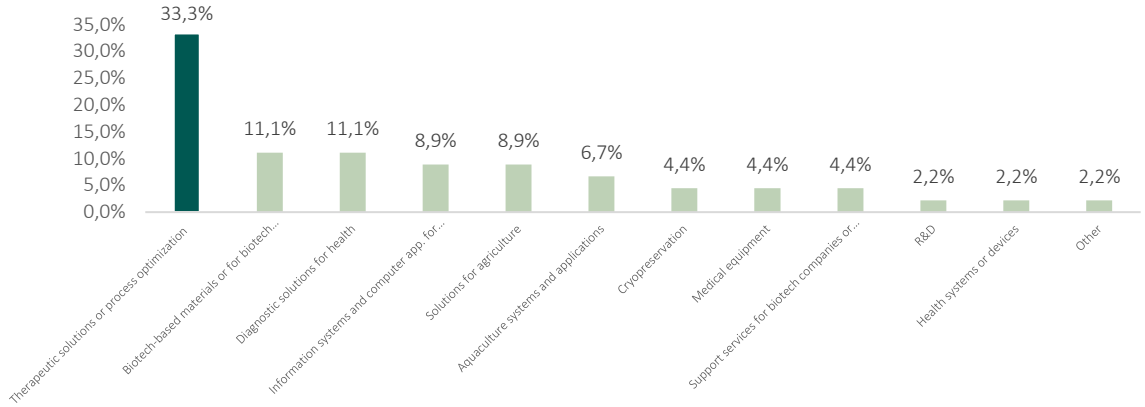
Figure 3 - Area of activity (%, n=34)



Source: P-BIO Survey

Almost two thirds (64.3%) of the products developed by these companies are for medical applications, including therapeutic solutions or for therapeutic processes optimization (33.3%), biotechnology-based materials or for biotechnology applications (11.1%); diagnostic solutions for health (11.1%); and Information systems and computer applications for health (8.9%) (Figure 4).

Figure 4 - Products and solutions developed (%, n=45)

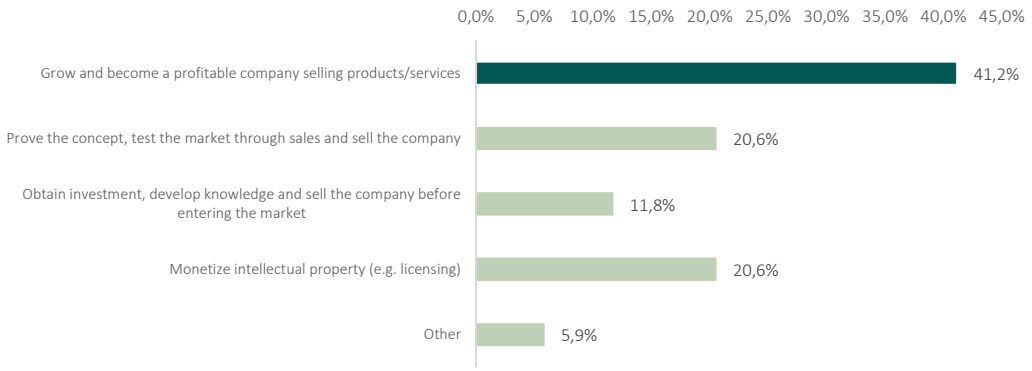


Source: P-BIO Survey

4.2 Purpose of creating the company and sales activity

The majority of the P-BIO survey participants indicate that the main long-term purpose for creating the company was to grow and become profitable by selling products or services on the market (41.2%). Additionally, 20.6% of the respondents say that they created the firm to prove the concept, test the market through sales and sell the company, and an equal proportion refers to monetising the intellectual property (20.6%). Only 11.8% of the companies admit that their objective was to obtain investment, develop knowledge, and to sell the company before entering the market (Figure 5).

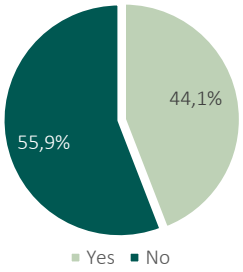
Figure 5 - Purpose of creating the company (medium-long term) (% n=34)



Source: P-BIO Survey

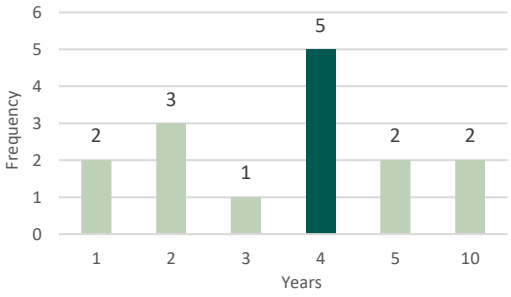
Despite the original market orientation of most companies, only 44.1% currently have their products for sale on the market (Figure 6), and they needed an average of 4 years to market the products since its inception. It is noteworthy that two of the inquired companies needed 10 years to put their products on the market (Figure 7).

Figure 6 - Products in the market (%, n=34)



Source: P-BIO survey

Figure 7 - Time to market (years) (n=15)



Source: P-BIO survey

Almost three-quarters of the companies that sell products on the market (73.3%) were created between 2010 and 2015. In contrast, 57.9% of the companies that have not yet reached the market were established as business entities between 2005 and 2015 (Table 2).

Table 2 - Year of the formal constitution of the company and products on the market

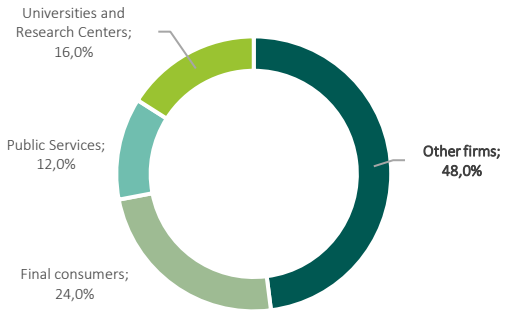
	Sell products on the market			
	yes		no	
Year	n	%	n	%
2005 -2009	1	6,7%	2	10,5%
2010-2015	11	73,3%	9	47,4%
2016-2019	3	20,0%	8	42,1%
Total	15	100%	19	100%

Source: P-BIO Survey

The vast majority of the target customers for the main product sold on the market are organizational consumers, in particular, corporate consumers (48.0%), universities and research centers (16.0%) and public services (12.0%). Only a quarter of the target customers are final consumers (24.0%) (Figure 8).

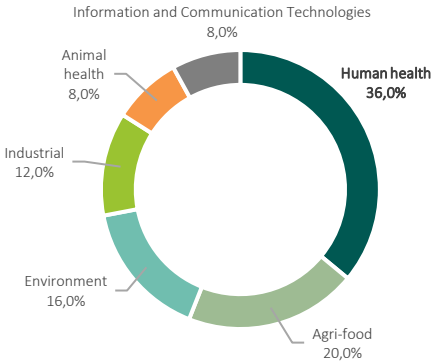
The main target markets served are positioned in the areas of human health (36.0%), agri-food (20.0%) and environmental (16.0%), industrial (2.0%) and animal health (8.0%). Together, these markets represent the Red biotechnology applications (44.0%), followed by Green (36.0%) and White (15.0%) biotechnology applications (Figure 9).

Figure 8 - Target customers - main product/service (%, n=25)



Source: P-BIO Survey

Figure 9 - End Markets Served (%, n=25)



Source: *P-BIO* Survey

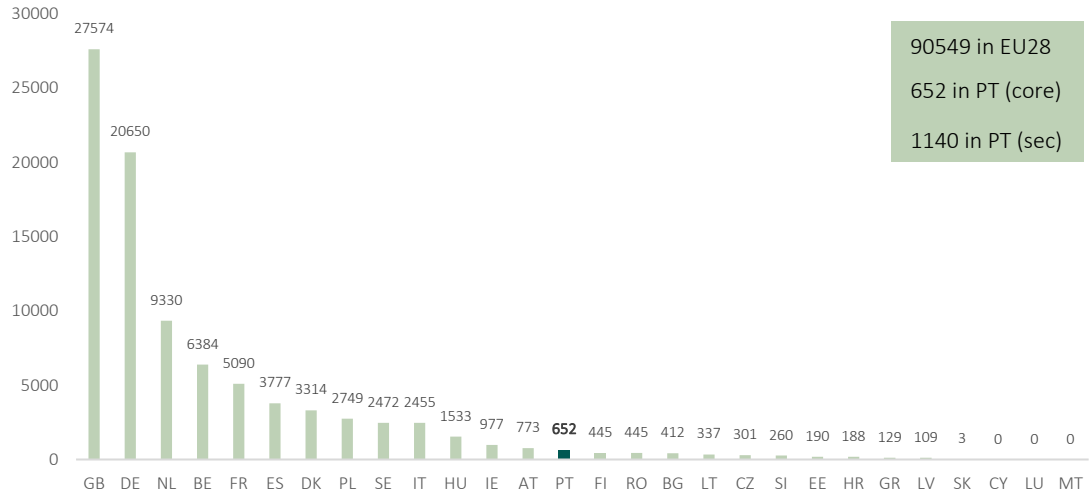
5. EMPLOYMENT AND HUMAN RESOURCES

By aiming at characterizing the employment in the sector regarding qualifications and wages, a set of indicators are presented. Merging the ORBIS database with the information available in the *Quadros de Pessoal* dataset, there have been identified 50 firms in 2017 whose main activity sector is the Sector 7211 - Research and Development in Biotechnology.

5.1 Employment

The 98 firms identified in Portugal, with sector 7211 as primary activity, employed 652 workers, which results on an average size of 6.7 workers/firm. The other 116 firms with R&D in biotechnology as secondary activity employed 1140 workers with an average larger size (9.8 workers/firm) than de core group of firms (Figure 10).

Figure 10 - Total Employment by country (2019)

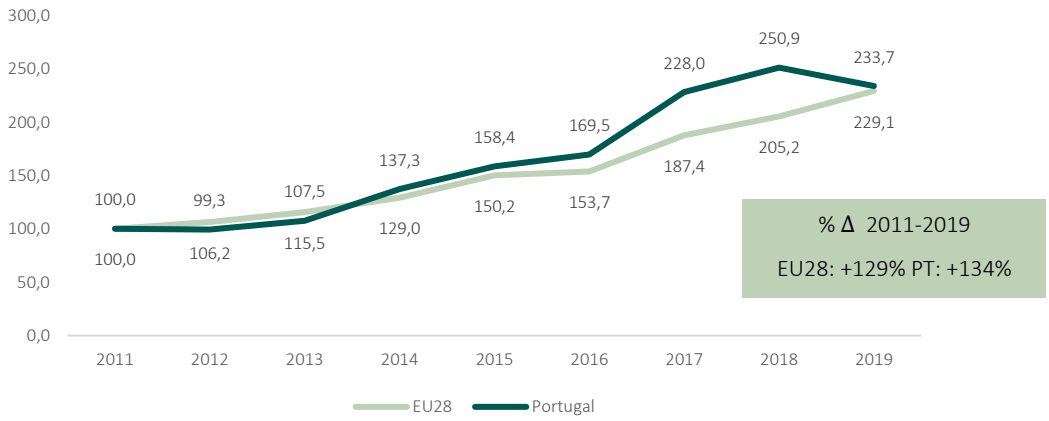


Source: Computations based on Amadeus dataset (Bureau Van Dijk),
Sector 7211 Research and Development in Biotechnology.

At the European level, 76% of the total employment and 60% of the number of firms were concentrated in five countries: The United Kingdom, Germany, The Netherlands, France, and Belgium. Portugal ranks 14th and 12th in 28 countries, regarding total employment and number of firms, taking 0.5% of the total employment and 1.5% of the number of firms (Figure 10).

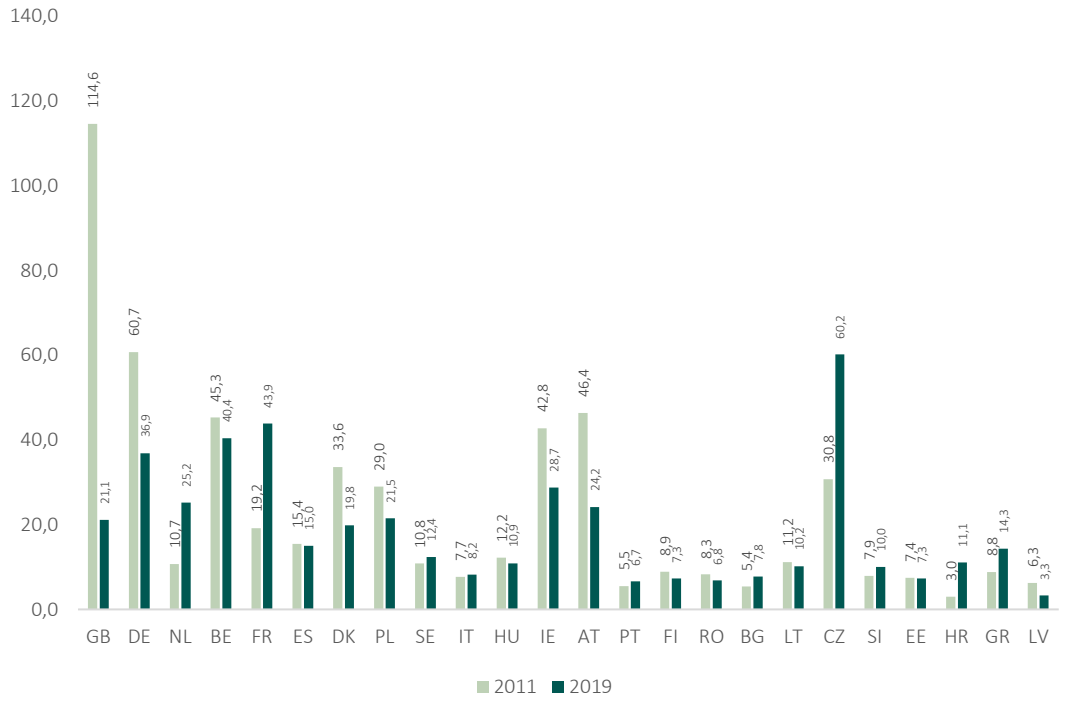
Employment has been growing faster in Portugal than in other European Countries. From 2011, when the international sovereign debt crisis hit the country, to 2019, sector employment grew in Portugal by 133.7%, while in Europe the growth was 129% (Figure 11). Nevertheless, although employment is growing, firms remain small: average size of 6.7 workers while country European average size is 21.6 workers per firm (Figure 12).

Figure 11 - Employment trends (2011=100)



Source: Computations based on ORBIS dataset (Bureau Van Dijk), Sector 7211 Research and Development in Biotechnology.

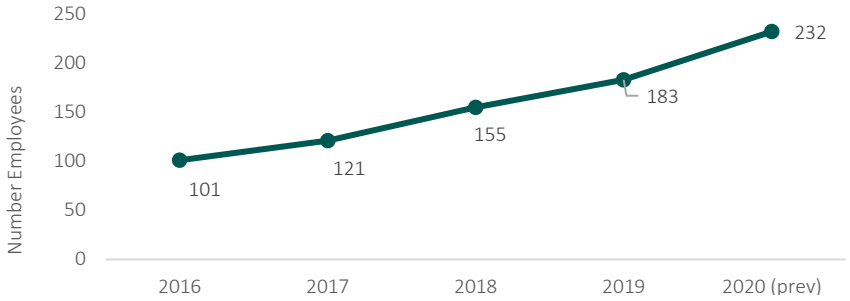
Figure 12 - Firm average size (employees by firm), 2011 and 2019



Source: Computations based on ORBIS dataset (Bureau Van Dijk), Sector 7211 Research and Development in Biotechnology.

Evidence of employment growth in more recent years can be observed for the 34 companies surveyed. Employment more than doubled in the period 2016-2020 (forecast). In addition, there is a consistent double-digit growth in employment between 2017 and 2020 (forecast), in particular in the years 2018 and 2020 (forecast) with annual increases of 28% and 27% respectively (Figure 13).

Figure 13 - Number of Employees, firms surveyed – 2016-2020 (forecast)



Source: P-BIO Survey

5.2 Education level, age and experience

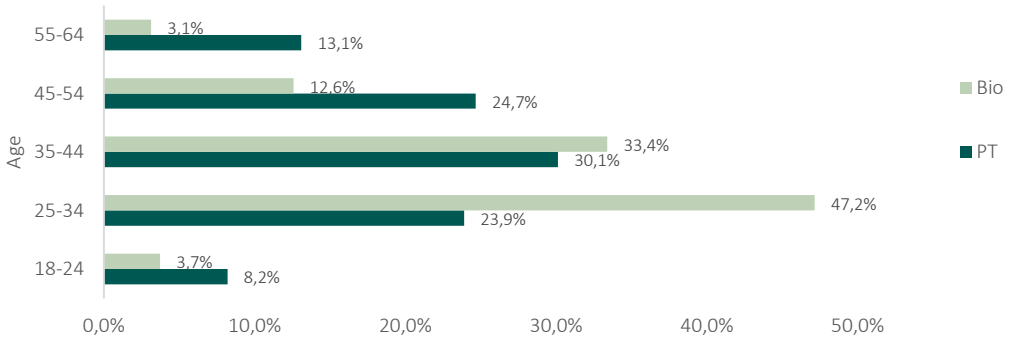
As shown by Table 3, the share of workers with higher education diplomas (Bachelor or above) is 66 percentage points higher than the observed share for the whole economy (private sector). The share is about 87% (that is, 41.3% own a Bachelor's or Licentiate's degree, 26% have a Master's diploma and 19% have a PhD). The more educated labour force is related with a younger workforce, with 51% of the employees aged less than 35 years old, 19 percentage points more than the same ratio of the workforce in private sector (Figure 14).

Table 3 - Employees distribution by education level (%), 2017

	Biotech R&D firms	Portugal (Private sector)
Lower Secondary or Primary	5.0%	51.6%
Upper Secondary	9.0%	27.9%
Bachelor / Licentiate	41.3%	18.2%
Master	26.1%	2.0%
PhD	18.7%	0.2%

Source: Computations based on Quadros de Pessoal dataset, Sector 7211 Research and Development in Biotechnology.

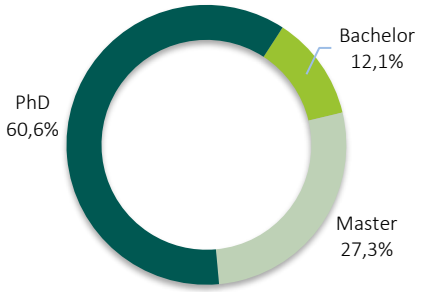
Figure 14 - Age of the workforce (2017)



Source: Computations based on Quadros de Pessoal dataset, Sector 7211 Research and Development in Biotechnology.

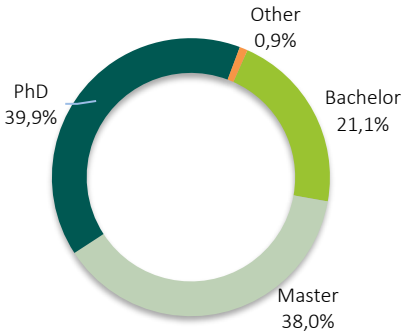
The sample of companies surveyed confirms the high education level of the human resources. All the 34 CEOs have a high education diploma (Figure 15). Almost two-thirds of the CEOs have a PhD (60.6%), of which 50,0% in the Biology field, 27,3% have a Master's degree or equivalent, and 12,1% have a Bachelor's degree. Of the 213 employees referred, 39.9% have a PhD, 38.0% have a Master, and 21.1% have Bachelor's/ Licentiate's degree. Only 2 employees (0.9%) do not have a higher education degree (Figure 16).

Figure 15 - CEOs' Education level (%, n=34)



Source: P-BIO Survey

Figure 16 - Employees' Education level (%, n=213)

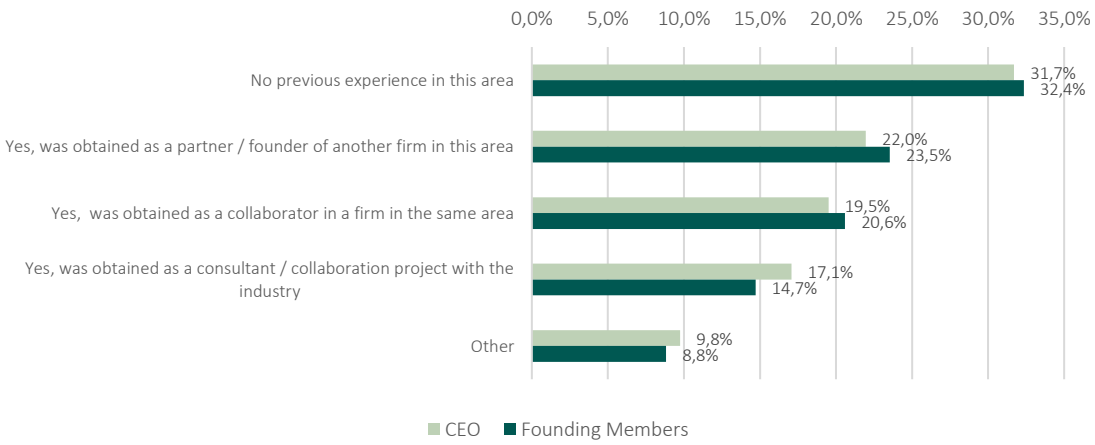


Source: P-BIO Survey

The majority of the CEOs and other founding members had a previous professional experience or knowledge of the business in the biotechnology sector when the company was founded (CEOs 68.3%; Founding Members 67.6%). This expertise was obtained as a founding partner (CEOs 22.0%; Founding Members 23.5%) or as a employee (CEOs19.5%; Founding Members 20.6%) in companies of the same or similar sector. A minor share of the CEOs obtained a previous experience working as a consultant or in collaborative projects with the sector (CEO 17.1%; Founding Members 14.7%). One third of the CEOs did not have experience or knowledge in the operational area of their firms at the moment of its creation (CEOs 31.7%; Founding Members 32.4%) (Figure 17).

The average age of the CEOs is 45 years old (Standard Deviation = 10,874). The youngest CEO has 32 years old and the oldest 76 years old. More than half of CEOs are under 44 (51,5%) and about a quarter are under 37 years old.

Figure 17 - Previous Experience in the firm's operating area (%, CEO n=41; Founding Members n=34)



Source: P-BIO Survey

5.3 Wages

Concerning wages, workers in biotechnology sectors earn an average wage of 1,637 euros (base wage plus regular and non-regular payments), 54% higher than the average for the other workers. It is noteworthy that only 10% of the workers earn less than 840 euros, a value above the median wage of the Portuguese private sector. The share of those earning more than 2860 euros is 10% (Table 4). Such difference is possibly related with the already referred differences in the average education, which is one of the most important determinants of the wage level.

Table 4 - Gross wage distribution (Euros), 2017

	Biotech R&D firms Monthly wage	Portugal (Private sector) Monthly wage
Average	1637.0	1060.1
Standard error	916.5	1212.3
10th Percentile	839.6	557.0
50th Percentile	1343.9	778.5
90th Percentile	2857.1	1823.1
95th Percentile	3351.8	2523.7

Source: Computations based on Quadros de Pessoal dataset,
Sector 7211 Research and Development in Biotechnology.

5.4 Employment composition

On average, firms in the biotech R&D sector employ a higher proportion of women (59% vs 46%) and a higher share of full-time workers (96% vs 93%), working four hours more by month than the Portuguese private sector average. On the other hand, firms in the biotechnology sector are smaller and younger than the average, and therefore, these firms employ proportionally more of workers with tenure up to two years (61% vs 41%) and a lower share of employees with long-term contracts (41% vs 67%) (Table 5).

Table 5 - Employment composition

	Biotech R&D firms	Portugal (Private sector)
% Women	58.80%	45.70%
% Foreign	4.30%	4.70%
% Long-term contracts	41.3%	66.50%
% Full-time	96.00%	93.20%
% Tenure <= 2 years	60.60%	41.40%
Hours (month October)	168	163.9

Source: Computations based on Quadros de Pessoal dataset,
Sector 7211 Research and Development in Biotechnology.

6. TURNOVER, ADDED-VALUE AND RETURNS

6.1 Turnover

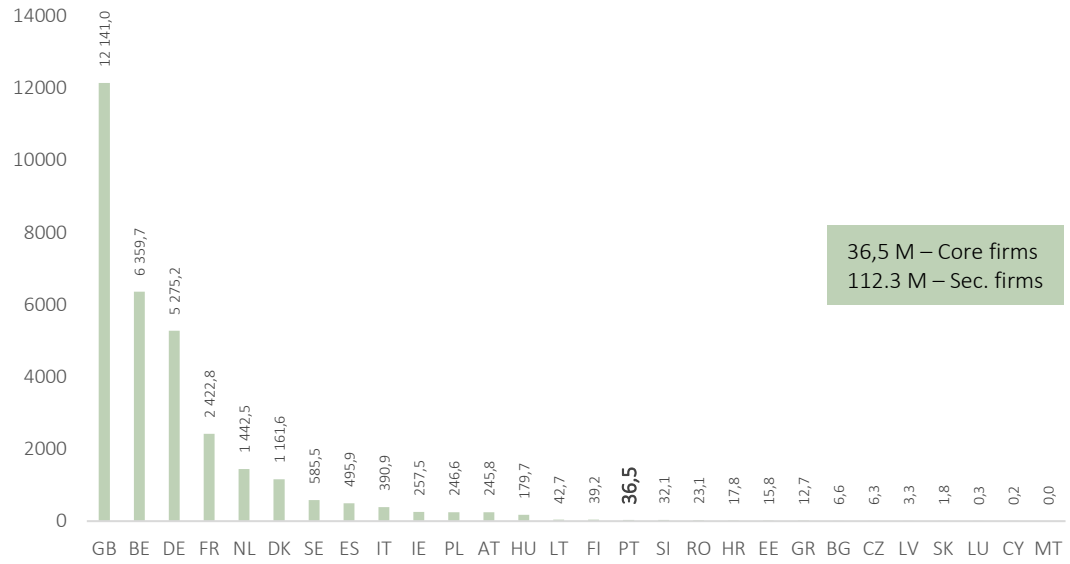
In 2019, in Portugal, the sector turnover was 36.5 million euros, equal to 0.12% of the total of the sector in European Union, which was about four times the turnover in 2011 (Table 6). It represents an increase of 33% compared to the turnover in 2011 Figure 19). The average turnover by firm was 337.8 thousand euros, much lower than the European average (10.415 million euros). In the same line, the average turnover by employee was 16.1% of the European average (Table 6).

Table 6 - Turnover by firm and by employee

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Turnover (million Euros)									
EU (28)	7 488,8	8 365,3	9 607,5	13 499,0	17 014,4	17 063,2	22 370,3	24 800,6	31 442,9
Portugal (B)	27,4	18,3	19,7	25,0	24,8	25,9	43,1	46,2	36,5
(B)/(A) X 100	0,37%	0,22%	0,21%	0,19%	0,15%	0,15%	0,19%	0,19%	0,12%
Average turnover by firm (thousand Euros)									
EU (28)	4 172,0	4 261,5	4 491,6	6 031,7	6 987,4	6 675,8	7 865,8	8 314,0	10 415,0
Portugal (23)	527,0	280,8	303,6	357,6	321,9	272,6	431,2	423,6	337,8
(B)/(A) X 100	12,63%	6,59%	6,76%	5,93%	4,61%	4,08%	5,48%	5,10%	3,24%
Average turnover by employee (thousand Euros)									
EU (28)	189,4	199,4	210,5	264,7	286,6	280,9	301,9	305,7	347,2
Portugal (B)	98,2	65,9	65,8	65,4	56,1	54,7	67,8	66,0	56,0
(B)/(A) X 100	51,84%	33,05%	31,26%	24,69%	19,57%	19,49%	22,46%	21,58%	16,11%

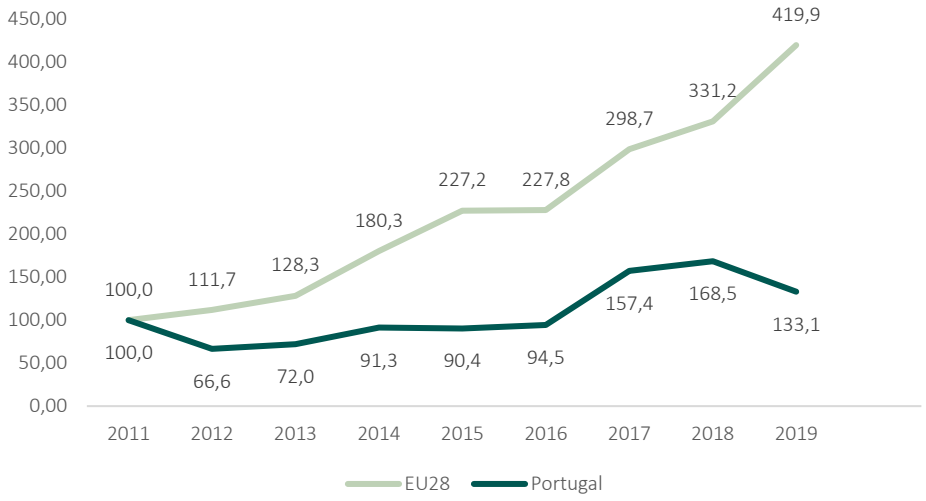
Source: Computations based on ORBIS dataset (Bureau Van Dijk),
Sector 7211 Research and Development in Biotechnology.

Figure 18 - Turnover in EU countries, 1000 EUR, 2019



Source: Computations based on ORBIS dataset (Bureau Van Dijk),
Sector 7211 Research and Development in Biotechnology.

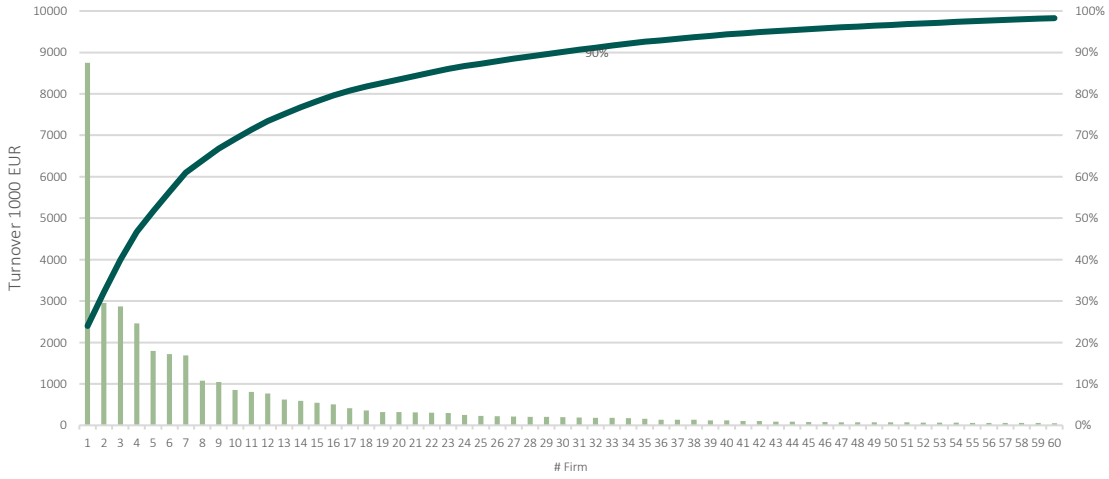
Figure 19 - Trends in industry sales (2011=100)



Source: Computations based on ORBIS dataset (Bureau Van Dijk),
Sector 7211 Research and Development in Biotechnology.

One third of the firms represents 90% of the sector turnover and only nine sell more than one million Euros (Figure 20).

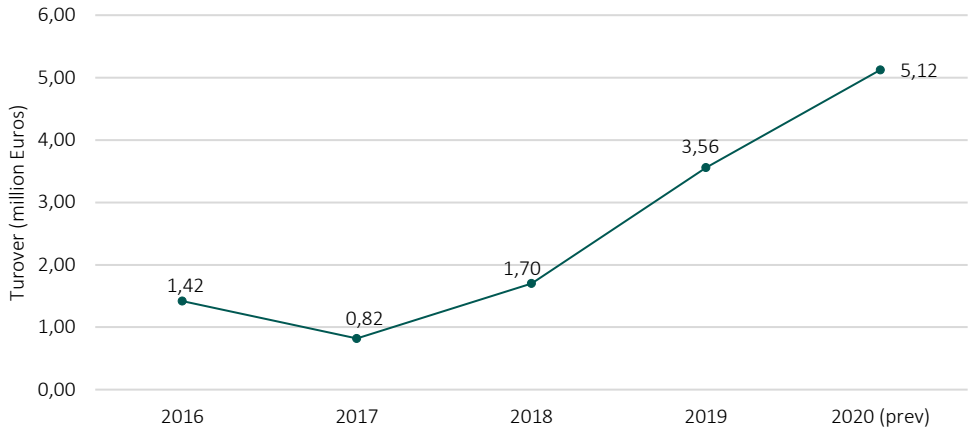
Figure 20 - Turnover by firm



Source: Computations on ORBIS dataset (Bureau Van Dijk),
Sector 7211 Research and Development in Biotechnology.

In 2019, the turnover of the companies surveyed was 3.56 million euros and the predicted turnover for 2020 (forecast) is 5.12 million euros (Figure 21). From 2017 to 2019, the turnover duplicates annually, with growth rates of 107,4% in 2018 and 109,1% in 2019. For 2020, it is expected a turnover growth around 44,1%. Between 2016 and 2017 there was a decrease in the turnover of -42,1%. However, this value must be carefully analysed as there is a company with a significant turnover (around 900 thousand euros) that is responsible for a significant decrease in 2017 compared to 2016 (-76,8%). If this company is excluded, we observe a 17.9% growth in turnover in this period.

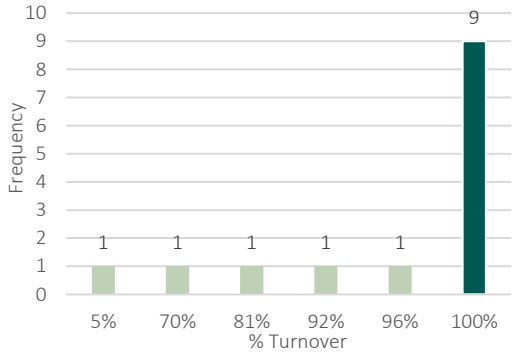
Figure 21 - Turnover (Total, n=34)



Source: P-BIO Survey

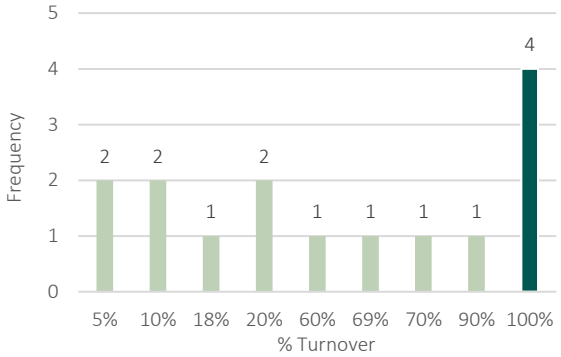
Biotechnology products and applications are primarily responsible for the turnover, representing the totality of the turnover for 64,3% of the sample of companies and 70,0% or more for 98,3% (Figure 22). Considering the geography of the business, for four companies (26.7%), 100% of the turnover results from the export of their products and services. For more than half of the sample (55.6%), exports represent 60% or more of their turnover (Figure 23).

Figure 22 - % Turnover - Biotechnology (n=14)



Source: P-BIO Survey

Figure 23 - % Turnover - Exports (n=15)



Source: P-BIO Survey

6.2 Added value, returns on equity and equity ratio

The median added value by firm was 1.2 thousand euros, in 2019, and one quarter (corresponding to the 75th percentile) has an added value greater than 36.6 thousand euros. The median returns on equity, before taxes, for Portugal has been smaller than the one for Europe.

The firms' equity ratio was 44.1% for Portugal, lower than the 56.7% observed in the other European countries (Table 7).

Table 7 - Added value, returns on equity and equity ratio

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Added value by firm (thousand euros)									
EU (28) (P75)	712,0	640,2	558,9	614,7	606,7	606,0	517,7	502,5	514,5
Portugal (P75)	81,9	45,5	73,0	96,4	44,4	39,9	52,1	63,3	36,6
EU (28) (P50)	138,7	112,5	114,7	100,6	93,4	92,5	55,6	55,7	63,4
Portugal (P50)	-0,4	0,9	-0,0	2,6	-0,0	3,5	1,0	3,3	1,2
Returns on equity (ROE), before taxes (%)									
EU (28) (P75)	31,18	30,65	30,11	30,08	32,42	29,62	30,62	27,89	28,82
Portugal (P75)	14,21	14,72	10,10	20,06	31,03	17,02	15,47	13,60	12,35
EU (28) (P50)	1,40	1,69	2,00	1,92	2,38	1,58	2,52	1,55	1,62
Portugal (P50)	-8,14	-3,37	-5,57	-1,93	-3,44	-2,71	-2,92	-3,06	-4,91
Equity ratio (Equity / Assets) (median)									
EU (28) (P75)	82,1%	81,6%	81,9%	84,0%	85,5%	87,0%	88,4%	88,5%	89,0%
Portugal (P75)	67,5%	61,3%	75,0%	77,1%	82,4%	74,6%	81,5%	86,1%	79,3%
EU (28) (P50)	44,7%	45,4%	43,7%	46,1%	48,6%	49,8%	52,3%	53,6%	56,7%
Portugal (P50)	36,2%	31,2%	28,4%	45,2%	44,8%	41,9%	46,1%	51,1%	44,1%

Source: Computations based on ORBIS dataset (Bureau Van Dijk),
Sector 7211 Research and Development in Biotechnology.

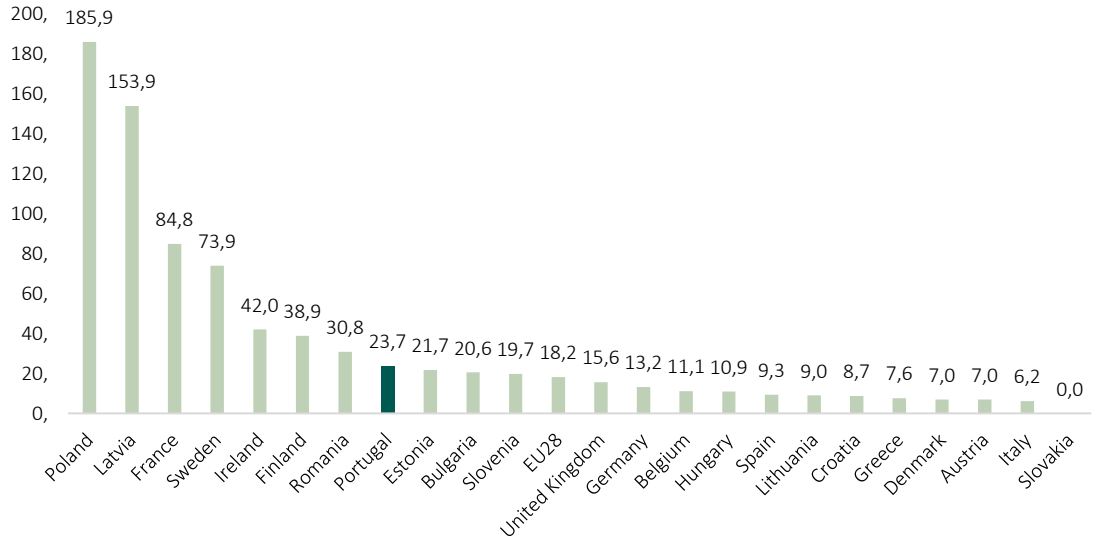
7. INVESTMENT, INNOVATION AND GENERATION OF BIOLOGICAL DATA

7.1 Investment and funding

Portuguese firms invest a significant share of their Value Added (23.7%), larger than the ratio for the EU28 (18.2%) (Figure 24), but the investment by employee is lower than European average (

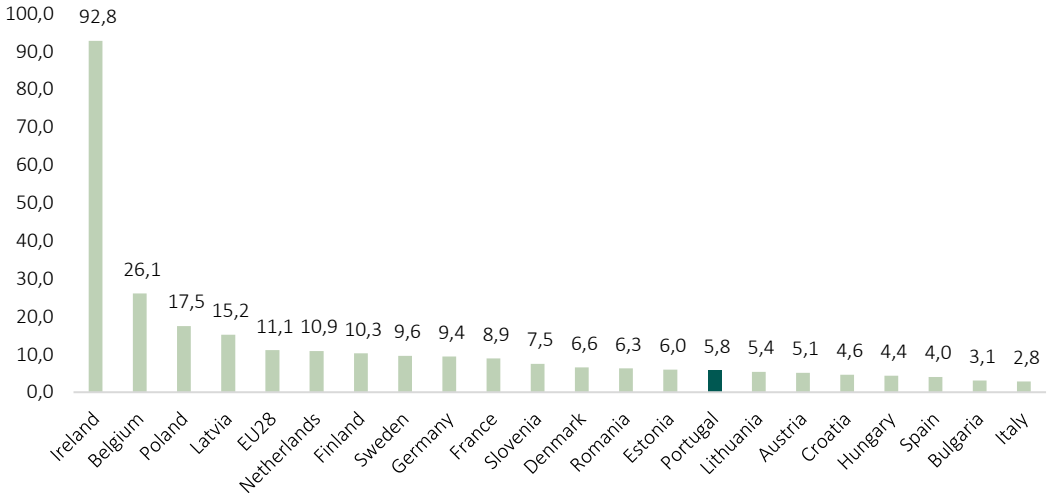
Figure *25*), which is a sign of the barriers faced by Portuguese companies to funding. This result is in line with the survey results: 38% of the firms did not have a funding round (Figure 26) and the "own resources" is the main financing source (Figure 27).

Figure 24 - Investment rate (Investment / Value Added), 2018



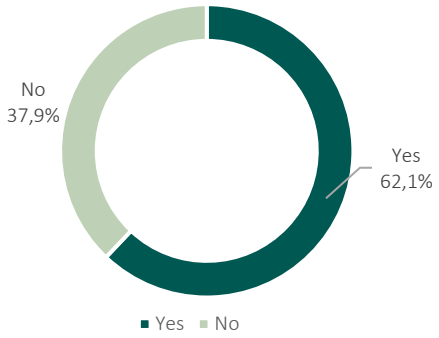
Source: EUROSTAT, Annual detailed enterprise statistics for services.

Figure 25 - Investment per person employed, 1000 EUR, 2018)



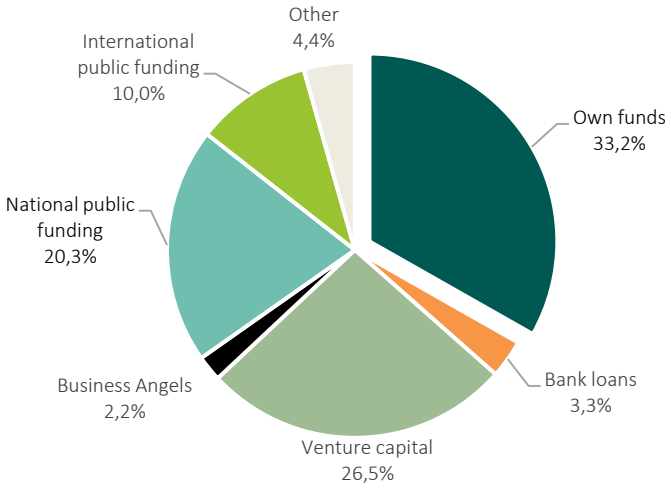
Source: EUROSTAT, Annual detailed enterprise statistics for services.

Figure 26 - Did your company have a funding round?



Source: P-BIO Survey

Figure 27 - Firm's financing sources (n=33)



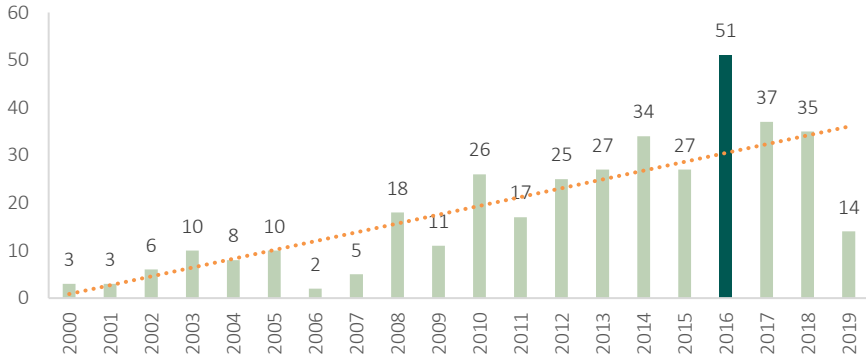
Source: P-BIO Survey

7.2 Innovation - Patent publications by Portuguese biotechnology firms

The inventive activity of 85 Portuguese companies declaring "Sector 7211 Research and Development in Biotechnology" as their main industry was analysed using published patents as indicator, regardless of whether or not they were granted. Also, the analysis does not include an examination of the classifications of the patents, which means that patent publications of several technological areas may be included.

The records of each of these companies were searched in the Patentscope (WIPO) database. In total, 369 patents published between 2000 and 2019 had these companies associated, either as applicants or inventors (Figure 28). There is a clear upward trend in the number of published patent applications, although this may also be associated with the growth in the number of companies in the sector over the last few years.

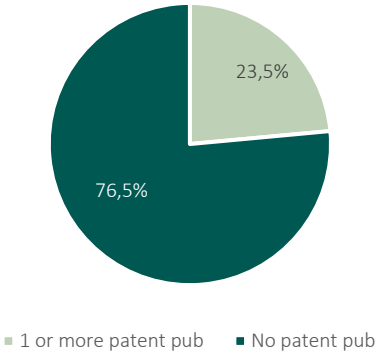
Figure 28 - Distribution of published patent of Portuguese biotechnology companies by year of publication (n=369)



Source: Computations based on WIPO's Patentscope database,
Sector 7211 Research and Development in Biotechnology

Data show that 20 (24%) out of the total companies considered in the analysis have one or more published patents and 65 (76%) do not have any patent publications (Figure 29). However, it should be noted that it is possible that, in some cases, patents may be submitted by the individual entrepreneur and not by the company to which the inventor may be related, to ensure control over the ownership of the invention.

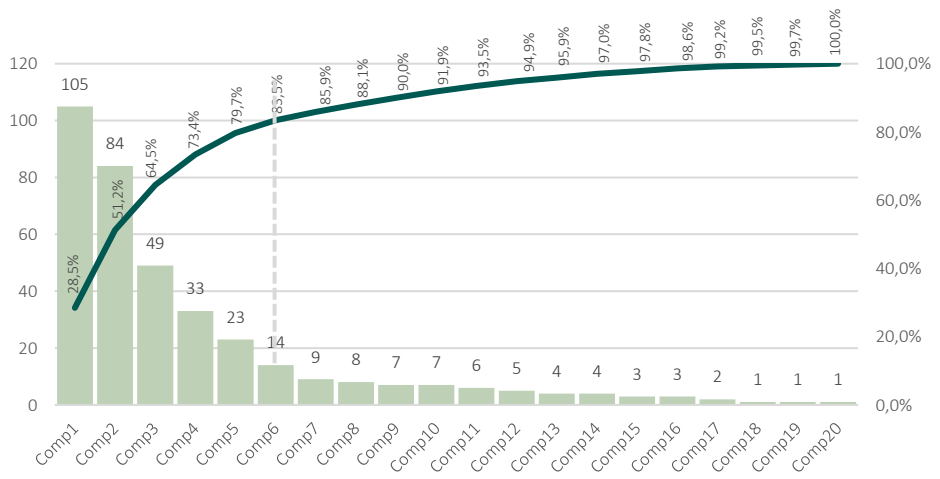
Figure 29 - Proportion of companies with and without patent publications (n=85)



Source: Computations based on WIPO's Patentscope database,
Sector 7211 Research and Development in Biotechnology

A large number of patents are concentrated in a small group of companies. Of the 20 companies with published patents, five (25%) hold about 80% of the total records identified in the search. These five companies represent about 6% of the total companies analysed (Figure 30).

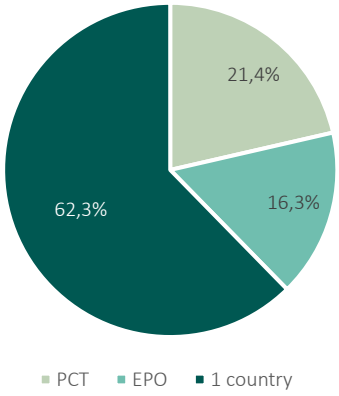
Figure 30 - Distribution of total number of published patents by companies with patent records (n=20)



Source: Computations based on WIPO's Patentscope database,
Sector 7211 Research and Development in Biotechnology

The geographical extent of requests for intellectual property protection was also analysed. Of the 369 published patents, 230 (62.3%) were filed for a single country, 79 (21.4%) are international patents, filed through the PCT[6] (The Patent Cooperation Treaty) and 60 (16,3%) are European patents - EPO[7] (11).

Figure 31 - Geographic coverage of published patent applications (n=369)



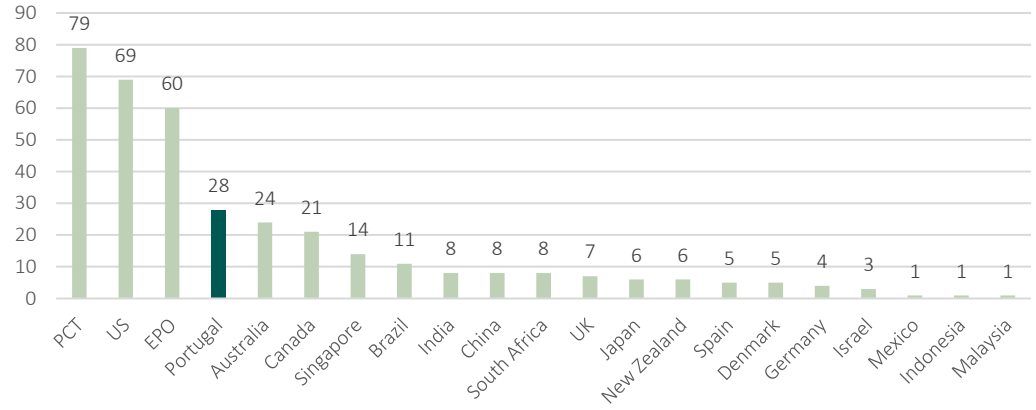
Source: Computations based on WIPO's Patentscope database.
Sector 7211 Research and Development in Biotechnology

[6] The PCT allows the application for protection of the invention to be filed simultaneously in the 152 signatory countries of the treaty. This application does not result in a patent being granted, but guarantees a priority date in all treaty countries and a longer deadline for decision on submission in different countries.

[7] Applications submitted through the EPO are valid simultaneously in any of the 38 European Patent Convention signatory countries. The European Patent granted is a set of a number of national patents.

The US stands out among the submissions to a single country, exceeding the submissions to European countries (Figure 32), which reveals the high internationalization potential of this sector when seeking protection in a highly competitive innovative country.

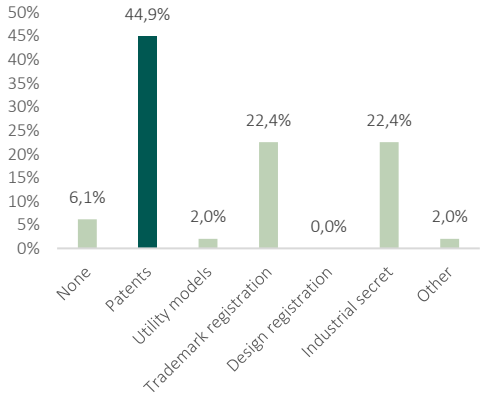
Figure 32 - Distribution of published patent applications by country and country group



Source: Computations based on WIPO's Patentscope database.
Sector 7211 Research and Development in Biotechnology

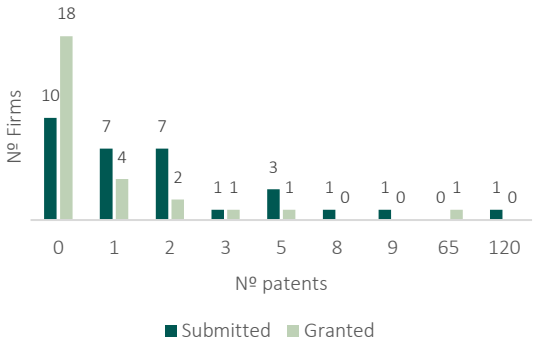
As for the modalities used to protect intellectual property, the majority of the surveyed companies (45%) patent their inventions, but other prefer the industrial secret (22%) and only have their trademark registered (22%) (Figure 33 and Figure 34). However, the majority do not have patents granted.

Figure 33 - Intellectual property protection modalities used by the firm (%, n=49)



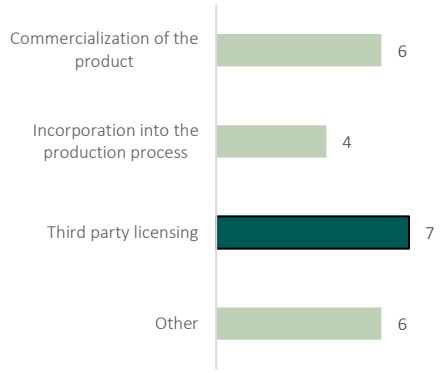
Source: P-BIO Survey

Figure 34 - Number of submitted and granted patents to the firm (N=49)



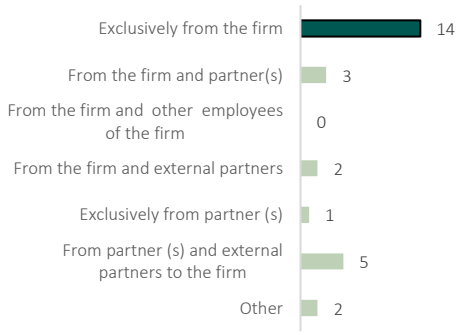
Source *P-BIO* Survey

Figure 35 - Return from patents (n= 23)



Source: P-BIO Survey

Figure 36 - Ownership of the protected knowledge (n=27)



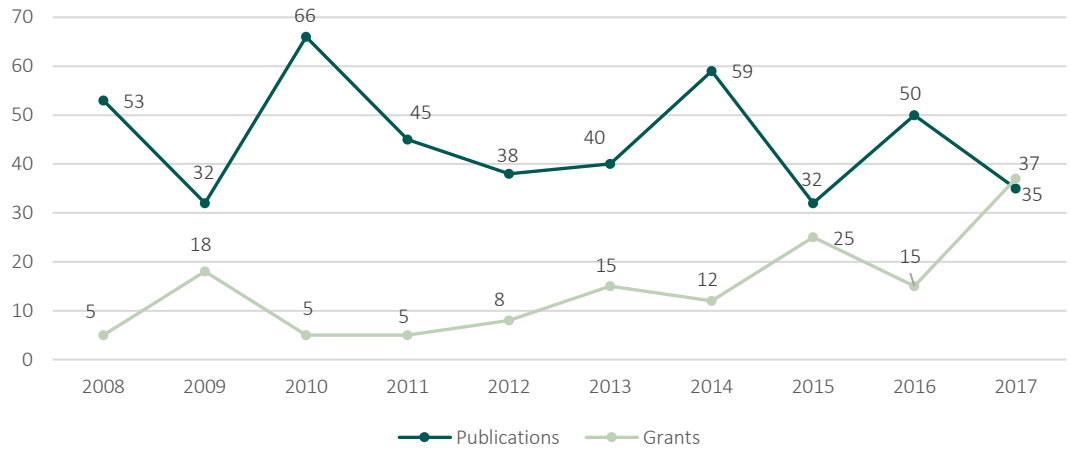
Source: P-BIO Survey

7.3 Biotechnology Patents - Portugal and Europe

This analysis includes all the patents submitted in the technology area of biotechnology, as classified by WIPO. It does not discriminate whether they are submissions from research centres or companies or from companies included in this study or others from different areas.

The total number of Portuguese biotechnology patent applications published during the period from 2008 to 2017 was 450, while the total number of patents granted in the same period was 145. (Figure 37). While the number of published patents has been declining slightly, the opposite trend is true for patents granted. More than half of the number of patents granted in the analysed period has been registered in the last three years.

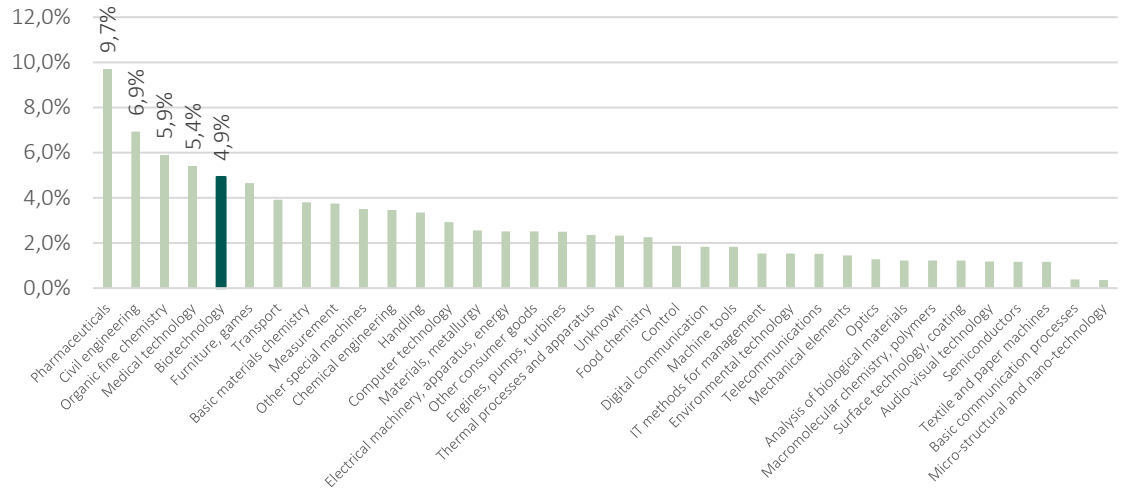
Figure 37- Portuguese biotechnology patents published and granted (2008-2017)



Source: Computations based on WIPO data

The 446 patent applications published in the biotechnology area from 2008 to 2017 represent 4.9% of the applications submitted in all areas by Portuguese applicants, totalling 9 063. This figure places biotechnology in fifth place among the 35 technological areas in which patents are classified, i.e. in the first third of the distribution (Figure 38).

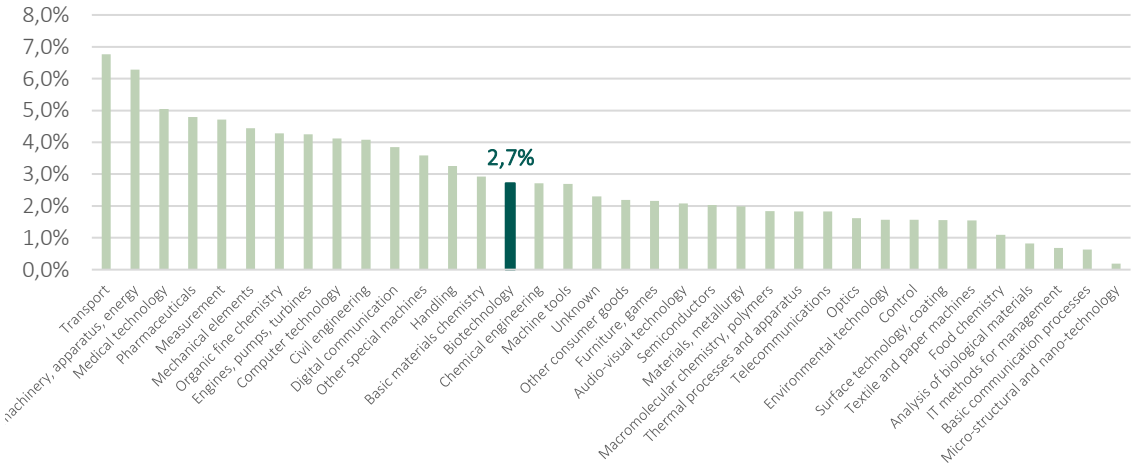
Figure 38 - Relative distribution of Portuguese total patents published in the period 2008-2017 by technology (n=9 063)



Source: Computations based on WIPO data

This position of biotechnology is, in Portugal, more prominent than in Europe (28 countries), where the area contributes only with 2.7% of the total patents published between 2008 and 2017. Out of 4 225 488 patents published during that period in 35 different technological areas, biotechnology has a total of 114 658, ranking 15th on the list (Figure 39 -).

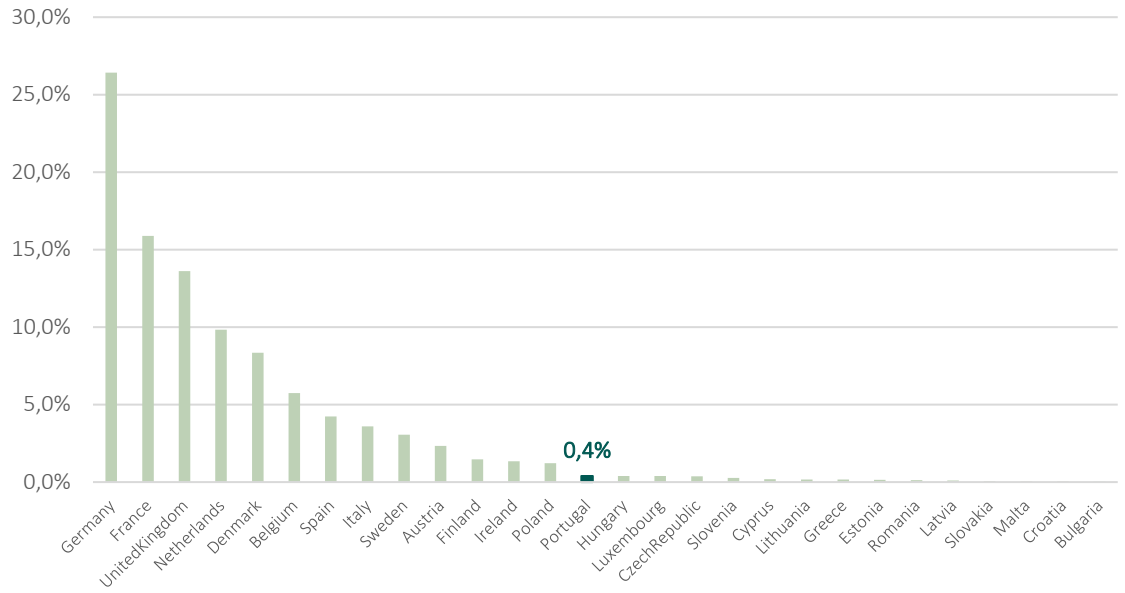
Figure 39 - Relative distribution of patents published in EU28, 2008-2017 by technology (n=4 225 488)



Source: Computations based on WIPO data

Germany, France and the United Kingdom are the top three countries in biotechnology patents, accounting for more than half (55.9%) of total patents published in Europe. Portugal is the first country in the second half of the table, ranking 14th in the European Union and contributing with 0.4% of the total patents published in this area in the European Union (Figure 40).

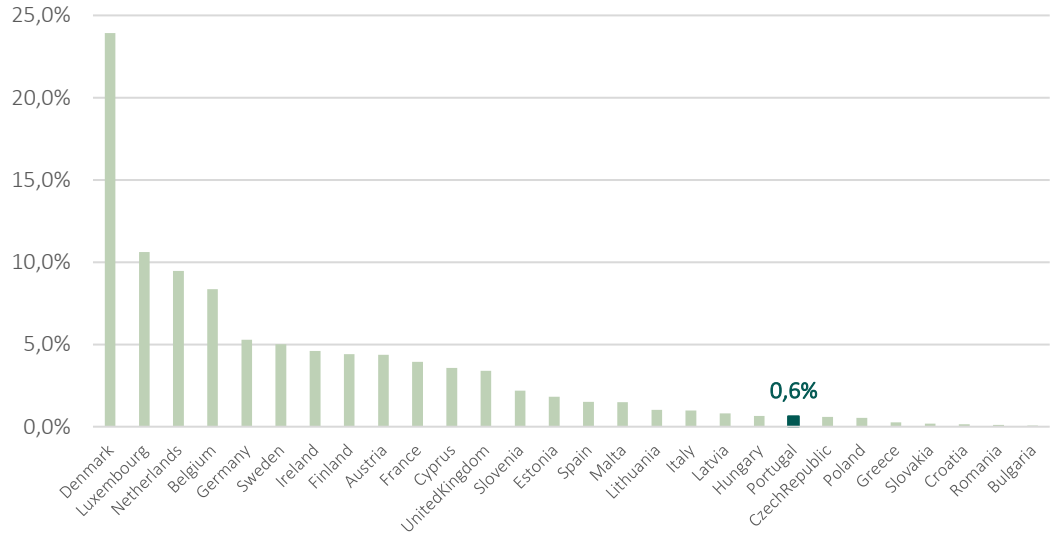
Figure 40 - Percentage by country of total biotechnology patent publications in the EU28 over the period 2008-2017



Source: Computations based on WIPO data

However, when considering the size of the country, using the population as an indicator, Portugal is down to 21st place, with 43.7 patents published per million inhabitants, while other smaller countries such as Denmark (1 655.9 per million) and Luxembourg (743.2 per million), outperform leaders in absolute numbers. However, the Portuguese relative contribution increases from 0.4% to 0.6% (Figure 41).

Figure 41 - Proportion of country biotechnology patent publications in the period 2008-2017 per 1 million inhabitants (population 2018)

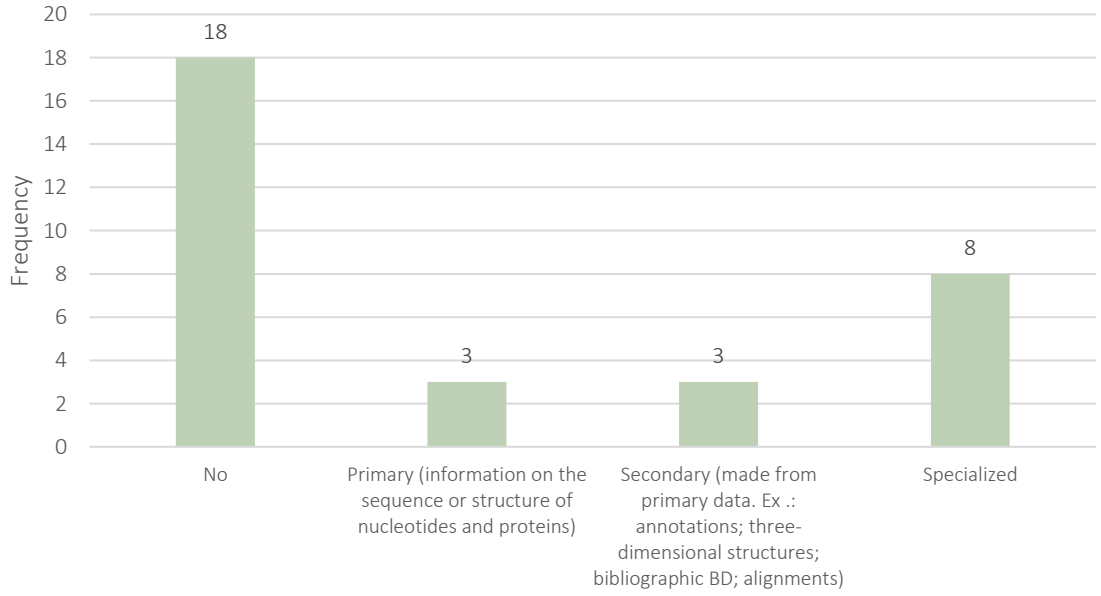


Source: Computations based on WIPO data

7.4 Generation of biological data

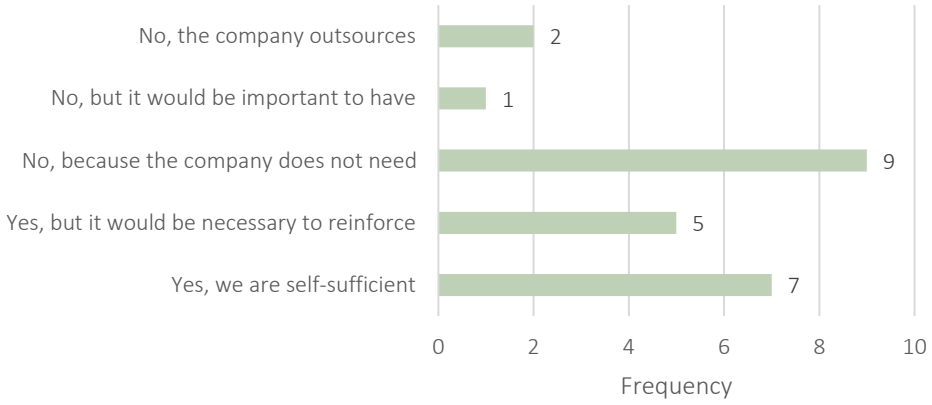
More than half (56%) of the respondent firms do not generate biological data. The others generate primary and secondary data (19%) and one quarter specialized data (Figure 42). One half of the firms (12 out of 24) have employees with skills in biological data management, and 5 of these 12 report that it would be necessary to reinforce these skills. Two firms outsource these function and 9 do need that (Figure 43).

Figure 42 - Does it generate biological data? If so what kind of biological data does it generate?



Source: P-BIO Survey

Figure 43 - Do your employees have skills in biological data management?

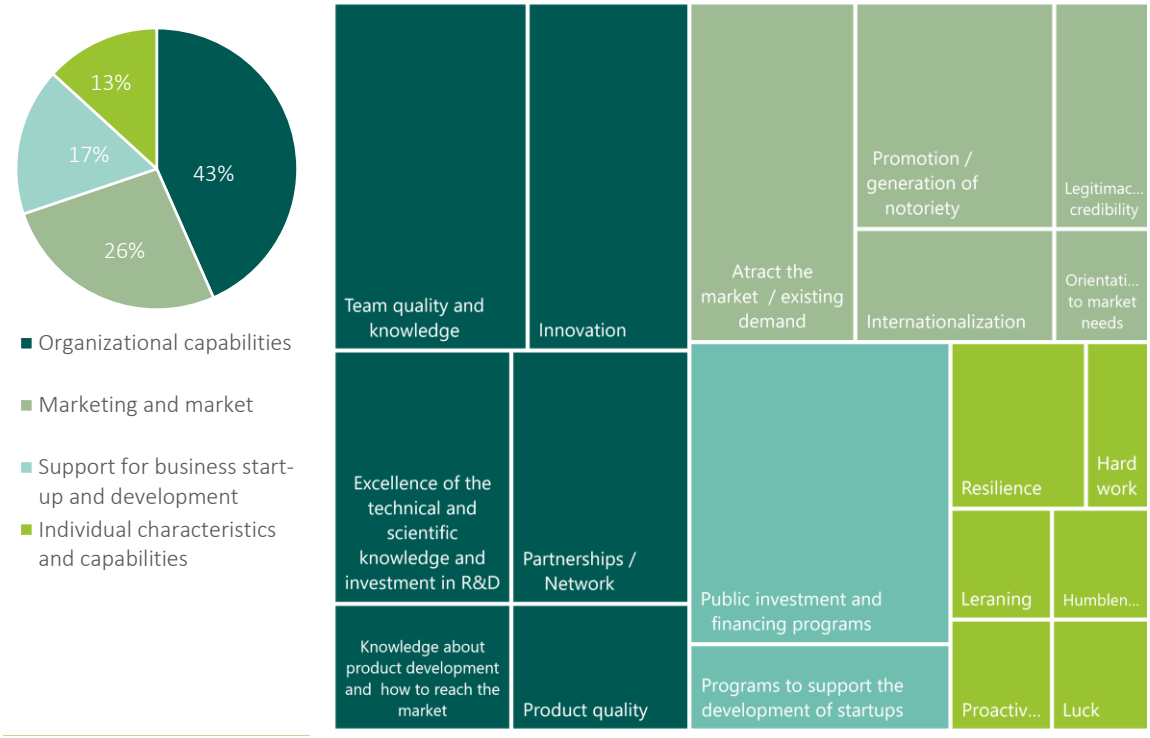


Source: P-BIO Survey

8. INCENTIVES AND BARRIERS TO GROWTH

The survey included an open-ended question where the participants were asked about the factors that they believe are critical for the development of their company, in particular, and to the development of the biotechnology in Portugal, as a whole. As to their companies, the participant CEOs refer more often to factors related to organizational capabilities (43%), followed by marketing issues and market conditions (26%). The support received by programs that support technological entrepreneurship and their own personal characteristics were also deemed important, in their opinion (Figure 44).

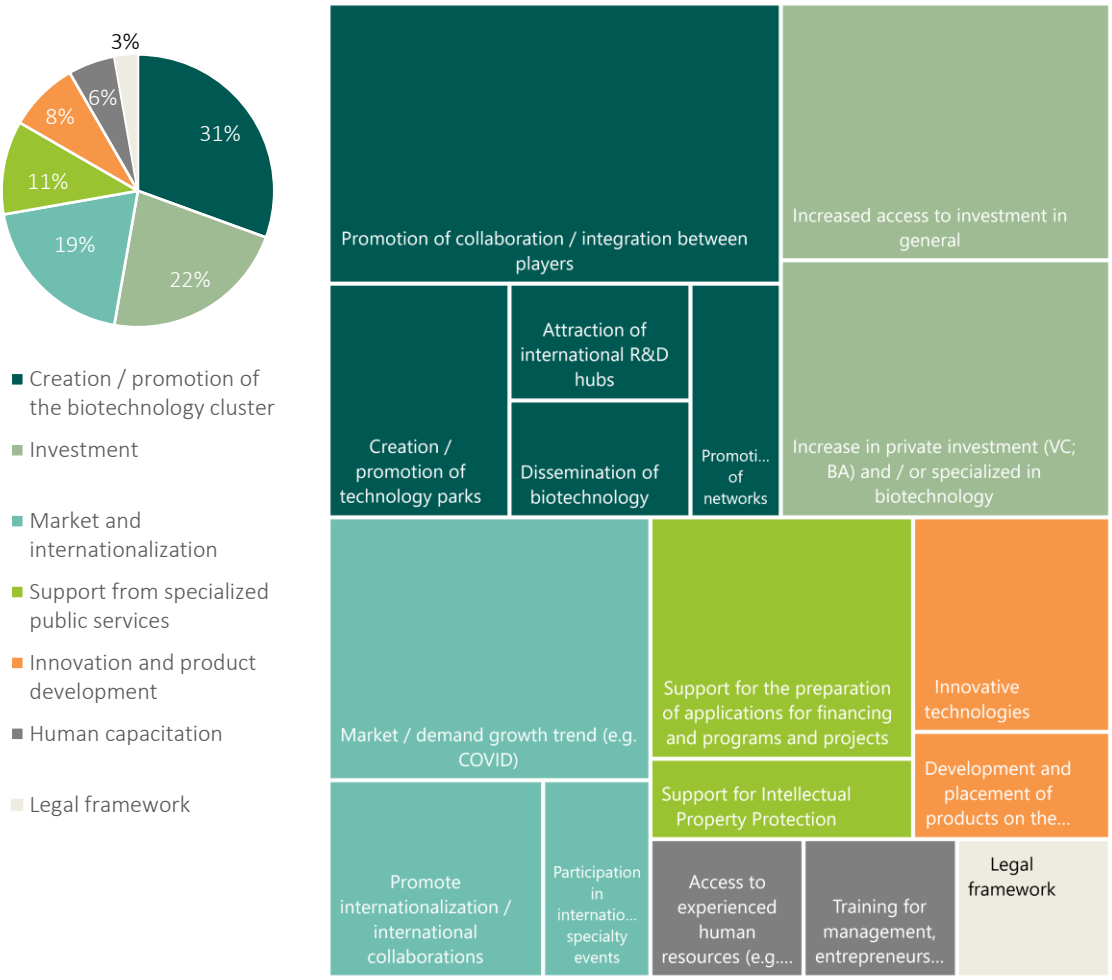
Figure 44 - Critical factors in promoting the development / growth of the company (n=53)



Source: P-BIO Survey

Regarding the critical factors to develop the biotechnology sector in Portugal (Figure 45), the respondents identify more dimensions, with higher emphasis on the need to create a biotechnology cluster that promotes collaboration and integration between complementary players, for example. The importance of the availability of investment funds was also mentioned as necessary to boost the sector, particularly specialized investment, as biotechnology presents different financial challenges from other areas. Similarly, to the critical factors for the development of their own business, the biotechnology CEOs consider that the market conditions, particularly the growth demand for biotechnology solutions related to the Covid19 19 pandemics, are also essential to develop the sector. The importance of internationalization is also mentioned as critical for such development. Other factors such as the availability of specialized services to support these companies, that offer support in preparing funding and Intellectual Property protection applications are also considered important. The need to be and stay innovative and having access to well-prepared human resources, not only in terms of biotechnology competence but also business competence, would also help developing the sector, according to the participants.

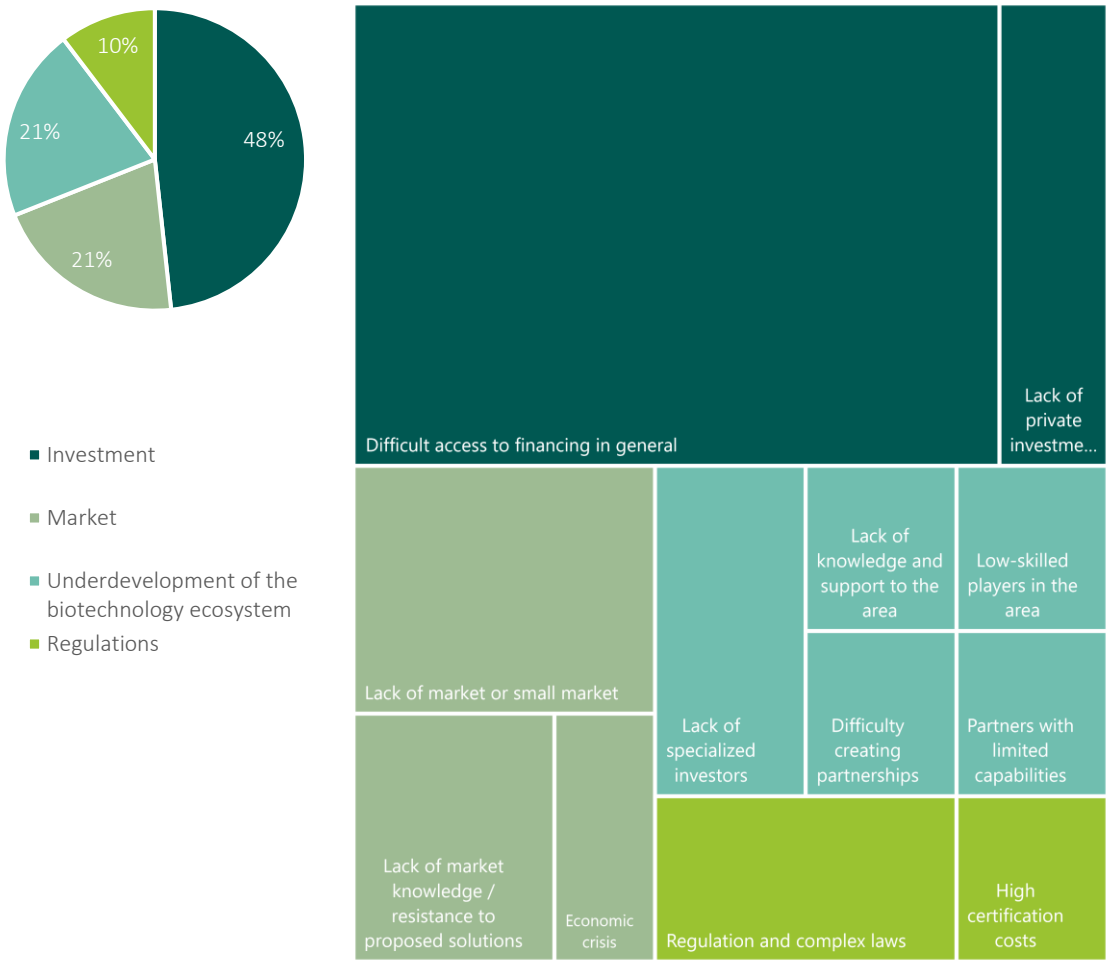
Figure 45 - Critical factors in promoting the development / growth of the biotechnology sector (n=36)



Source: P-BIO Survey

Concerning the factors that have been limiting the growth of their companies, respondents tend to highlight the importance of funding issues (Figure 46). 48% of the factors mentioned by the respondents are related to, either the difficulty to access funding in general, or to the lack of private investors, who understand the particularities of the sector. The respondents also indicate that the market is small and is not always aware of the need that the solutions provided by biotechnology solve. Respondents also believe that the underdevelopment of the biotechnology ecosystem s limiting the growth of their companies, which is related to the need of developing a biotechnology cluster, mentioned above. The regulations are also mentioned as barriers that companies overcome with difficulty.

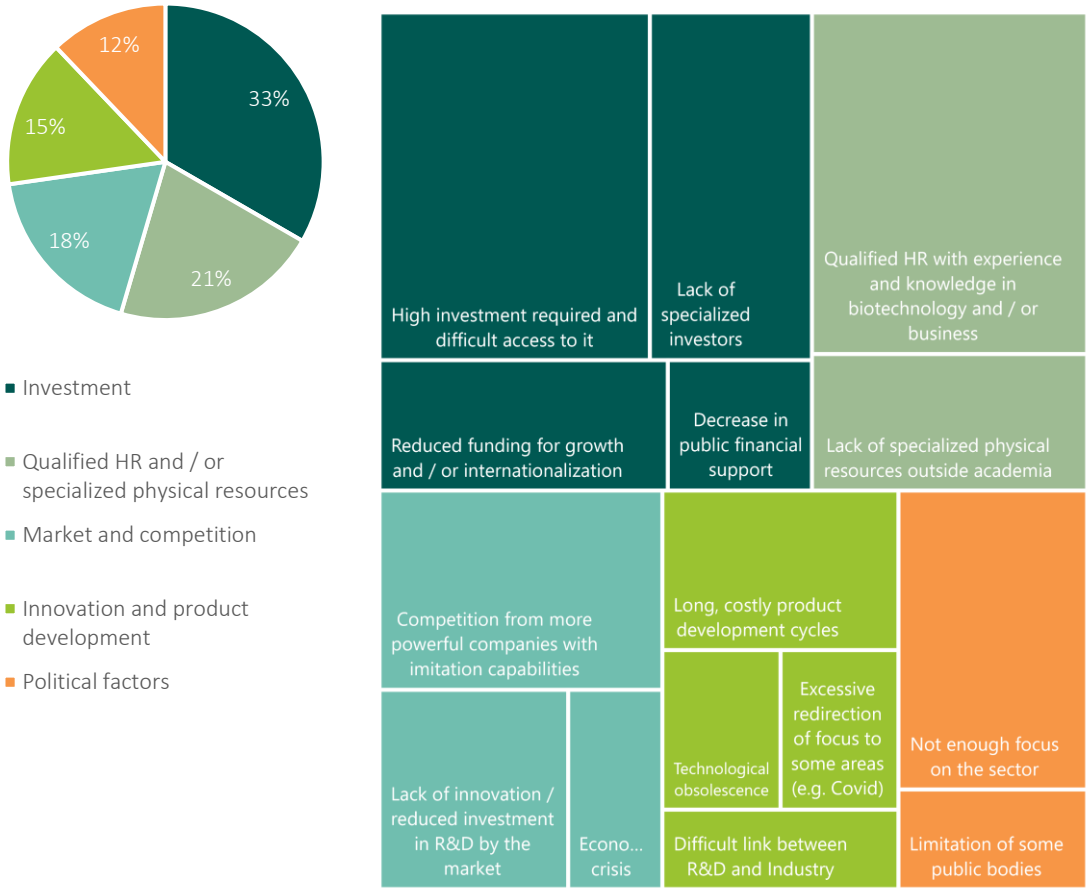
Figure 46 - Critical aspects limiting the company's development (n=29)



Source: P-BIO Survey

In terms of the factors that the respondents consider that are limiting the development of biotechnology in Portugal, once again, the investment is mentioned as one of the top limitations (Figure 47). Another important resource that is considered insufficient to the sector needs is qualified people, particularly with experience, i.e., senior resources, but also qualified to understand and run a business. The participants also indicate that the market is not investing sufficiently in innovation that could come from biotechnology solutions and the competition from bigger and more powerful companies can be a threat to the small Portuguese biotechnology firms, that have difficulty in protecting their innovations and see them copied by these bigger companies. Additionally, technologies take a long time to be developed but become obsolete very fast, making it difficult to generate a reasonable return on the investment. Another problem of the sector is the long development cycle that has high costs, which are difficult to support without seed funding. Also, sometimes R&D inventions are not translated into innovations due to the Research-Market gap. Finally, and aligned with the previously mentioned need to create a biotechnology cluster and develop de biotechnology ecosystem, the participants indicate that there is a lack of political support and a weak focus on this promising area.

Figure 47 - Critical aspects limiting the biotechnology sector in general (n=33)



Source: P-BIO Survey

ANNEX I – LIST OF COMPANIES WITH R&D IN BIOTECHNOLOGY AS PRIMARY ACTIVITY

#	Company name	Inactive	Last avail. year
1	A VIDA ACONTECE - , LDA	No	2019
2	A4F, ALGA FUEL, S.A.	No	2019
3	ABDART DIAGNOSTICS, LDA	No	2019
4	AMATE - AMAZE MACRO ADVANCE TECHNOLOGY EVOLUTION, INVESTIGACAO E DESENVOLVIMENTO, LDA	No	2019
5	AMYRIS BIO PRODUCTS PORTUGAL, UNIPESSOAL, LDA	No	2019
6	ANCOSYST, LDA	No	2012
7	ANDRORIA - CENTRO DE ESTUDOS DE ANDROLOGIA DE AVEIRO, LDA	No	2019
8	AZORES LIFE SCIENCE, LDA	No	2019
9	BCTECHNOLOGIES, LDA	No	2019
10	BESTHEALTH4U, LDA	No	2019
11	BIGANCESTORS - SERVICOS FARMACEUTICOS E NUTRICAO, UNIPESSOAL, LDA	No	2017
12	BIOALVO - SERVICOS, INVESTIGACAO E DESENVOLVIMENTO EM BIOTECNOLOGIA, S.A.	No	2012
13	BIOBASEDFUTUREMATERIALS, LDA	No	2018
14	BIOCANT LABS, LDA	No	2019
15	BIOCERAMED - CERAMICOS PARA APLICACOES MEDICAS, S.A.	No	2019
16	BIOCHIMIETEK, LDA	No	2019
17	BIOCHROMOGENE, UNIPESSOAL, LDA	No	2019
18	BIOFABICS, LDA	No	2019
19	BIOGROOVE, UNIPESSOAL, LDA	No	2019
20	BIOINF2BIO, LDA	No	2019
21	BIOINGENIUM, UNIPESSOAL, LDA	No	2019
22	BIOMIMETX, S.A.	No	2018
23	BIOSANI - AGRICULTURA BIOLOGICA E PROTECCAO INTEGRADA, LDA	No	2019
24	BIOSCALE, LDA	No	2019
25	BIOSCKIN, MOLECULAR AND CELL THERAPIES, S.A.	No	2019
26	BIOSTRIKE, UNIPESSOAL, LDA	No	2019
27	BIOSURFIT, S.A.	No	2019
28	BIOTECNOL - SERVICOS E DESENVOLVIMENTO, S.A.	No	2017
29	BIOTREND - INOVACAO E ENGENHARIA EM BIOTECNOLOGIA, S.A.	No	2019
30	BIX CITIZEN - BUSINESS INTELLIGENCE EXPERIENCE, LDA	No	2018
31	BLEND2B, LDA	No	2014
32	BPMR - PRODUCAO E DESENVOLVIMENTO, UNIPESSOAL, LDA	No	2019
33	BRAINEYES - SOLUCOES DE DIAGNOSTICO E REABILITACAO, LDA	No	2019
34	BRT BLOOD REPROGRAMMING TECHNOLOGIES, LDA	No	2019
35	BSIM THERAPEUTICS, S.A.	No	2019
36	BYSPECTRA, LDA	No	2019
37	CARBOCODE COSMETICS INDUSTRIES, LDA	No	2019
38	CARBOCODE, S.A.	No	2019
39	CARBOCODEPHARMA - ACTIVIDADES FARMACEUTICAS, LDA	No	2019
40	CARDIO-ON, LDA	No	2019
41	CAVORIS CLINIC, LDA	No	2019
42	CBRA GENOMICS, S.A.	No	2019
43	CELLMABS, S.A.	No	2019
44	CF&H CONSULT, SOCIEDADE UNIPESSOAL, LDA	No	2019
45	CFER - CENTRE FOR FOOD EDUCATION AND RESEARCH, LDA	No	2019
46	CLINLINC, LDA	No	2018
47	CONCEPT BEER, LDA	No	2019
48	CORTE VELADA - INVESTIGACAO, SOCIEDADE UNIPESSOAL, LDA	No	2019
49	CRIAMKNOWLEDGE, LDA	No	2019
50	DES SOLUTIO - SOLUCOES E CONSULTORIA CIENTIFICA, LDA	No	2019
51	DESPERTAFOLIA, LDA	No	2019
52	DIVERSTOCK INVESTMENTS, S.A.	No	2019
53	DNATECH - INVESTIGACAO CIENTIFICA E ANALISES MOLECULARES, LDA	No	2019
54	ECOMINHOCAS - SOLUCOES DE RECICLAGEM DE RESIDUOS ORGANICOS, LDA	No	2019
55	ENDOBIOS, UNIPESSOAL, LDA	No	2019
56	EONGENETICS - LABORATORIO DE INOVACAO E SERVICOS EM GENETICA, LDA	No	2019
57	EQUIGERMINAL, S.A.	No	2019
58	EXMCEUTICALS PORTUGAL, LDA	No	2019
59	EXOGENUS THERAPEUTICS, S.A.	No	2019
60	EXTREMOCHEM, LDA	No	2019
61	FASTCOMPCHEM, LDA	No	2019
62	FERRAZ SCIENCIS - HEALTHCARE ADVANCED SOLUTIONS, S.A.	No	2019
63	FUNTASTIKPEOPLE, LDA	No	2018
64	GENE PREDIT, S.A.	No	2016
65	GENETEST - PRESTACAO DE SERVICOS DE TESTES DE DIAGNOSTICO GENETICO, S.A.	No	2018
66	GI - GASIFICATION INTERNATIONAL, S.A.	No	2019
67	GLYCO4CLINICS, LDA	No	2019
68	GLYCOMATTERS BIOTECH, LDA	No	2019
69	GO LIMPETS, LDA	No	2018
70	GOIA CIENTIFICA, UNIPESSOAL, LDA	No	2019

71	GREEN AQUA MICROFARMERS, S.A.	No	2019
72	GUSTAVO BARREIRA - INVESTIGACAO E DESENVOLVIMENTO EM BIOTECNOLOGIA, UNIPESSOAL, LDA	No	2019
73	HEARTGENETICS GENETICS AND BIOTECHNOLOGY, S.A.	No	2019
74	HIGH WELFARE AND HEALTH, LDA	No	2019
75	HITAG - BIOTECHNOLOGY, LDA	No	2019
76	HOVIONE TECNOLOGIA PORTUGAL, UNIPESSOAL, LDA	No	2019
77	HPRD - HEALTH PRODUCTS RESEARCH AND DEVELOPMENT, LDA	No	2019
78	HYDRUSTENT, S.A.	No	2019
79	ICAREDX PORTUGAL, UNIPESSOAL, LDA	No	2019
80	IMMUNETHEP, S.A.	No	2018
81	IMPACTEST - ESTUDOS PARA A PROTECCAO DAS CULTURAS AGRICOLAS, UNIPESSOAL, LDA	No	2019
82	INFOGENE, LDA	No	2019
83	INNOPHAGE, LDA	No	2018
84	INOVE GENE - INVESTIGACAO, DESENVOLVIMENTO E SERVICOS EM BIOTECNOLOGIA, LDA	No	2019
85	INSECT BIOMATRIX, UNIPESSOAL, LDA	No	2019
86	INSERTEL - BIOECONOMY, I&D, LDA	No	2019
87	INSTITUTO DE BIOLOGIA EXPERIMENTAL E TECNOLOGICA (IBET)	No	2018
88	KLON - INNOVATIVE TECHONOLOGIES FROM CLONING, S.A.	No	2017
89	LIFETAG, LDA	No	2019
90	LIMM THERAPEUTICS, S.A.	No	2019
91	LOF - INTELLIGENT LAB ON FIBER, UNIPESSOAL, LDA	No	2019
92	LOPO JOSE LOPO CARVALHO - SOCIEDADE DE INVESTIGACAO E DESENVOLVIMENTO, LDA	No	2019
93	LUZITIN, S.A.	No	2019
94	LYMPHACT - LYMPHOCYTE ACTIVATION TECHNOLOGIES, S.A.	No	2019
95	MATERA, LDA	No	2019
96	METATISSUE - BIOSOLUTIONS, LDA	No	2019
97	MICOAZORICA, LDA	No	2019
98	MICROVENTURES, LDA	No	2019
99	MITOTAG, LDA	No	2019
100	MORELATOLAB PORTUGAL - FARMACEUTICA, LDA	No	2019
101	MORINHA LAB - LABORATORIO DE BIODIVERSIDADE E GENETICA MOLECULAR, UNIPESSOAL, LDA	No	2019
102	MTS MEDICAL TECHNOLOGIES, LDA (ZONA FRANCA DA MADEIRA)	No	2019
103	MUXIMA BIO PT, UNIPESSOAL, LDA	No	2017
104	MYCOTEC, LDA	No	2019
105	MYOSOTISPIRIT SERVICOS FARMACEUTICOS E NUTRICAO, UNIPESSOAL, LDA	No	2019
106	NANO4 GLOBAL, LDA	No	2019
107	NANODELIVERY - I & D EM BIONANOTECNOLOGIA, LDA	No	2012
108	NANOLABEL - NANOPARTICULAS BIOCOMPATIVEIS, LDA	No	2019
109	NANOSMART FIELD, LDA	No	2018
110	NZYTECH, LDA	No	2019
111	OCEANO FRESCO, S.A.	No	2019
112	OOZE NANOTECH, LDA	No	2019
113	PAGARETE, MICROALGAE SOLUTIONS, SOCIEDADE UNIPESSOAL, LDA	No	2019
114	PANACEA, LDA	No	2019
115	PEEK HEALTH, S.A.	No	2019
116	PHAGE THERAPIES, S.A.	No	2019
117	PHARMA73, LDA	No	2019
118	PHYTOALGAE, LDA	No	2019
119	PHYZAT BIOPHARMACEUTICALS, LDA	No	2019
120	PLANETA AZUL - TECNOLOGIAS DO AMBIENTE, LDA	No	2014
121	PLANETODISSEIA, LDA	No	2016
122	PRO2B - CONSULTORIA E GESTAO DE PROJETOS, LDA	No	2019
123	RDN SERVICOS DE BIOTECNOLOGIA, UNIPESSOAL, LDA	No	2019
124	ROPLAVAC, LDA	No	2019
125	SEA4US - BIOTECNOLOGIA E RECURSOS MARINHOS, LDA	No	2019
126	SEAZYME, UNIPESSOAL, LDA	No	2019
127	SETENTA E TRES MIL E CEM, LDA	No	2019
128	SGS MOLECULAR - INOVACAO E SERVICOS EM BIOTECNOLOGIA, S.A.	No	2019
129	SICGEN - INVESTIGACAO E DESENVOLVIMENTO EM BIOTECNOLOGIA, LDA	No	2019
130	SILICOLIFE, LDA	No	2019
131	SINGULARIS ALPHA BIOTECHNOLOGY, LDA	No	2018
132	SMARTFREEZ, LDA	No	2018
133	SOILVITAE, LDA	No	2019
134	SOLFARCOS - SOLUCOES FARMACEUTICAS E COSMETICAS, LDA	No	2019
135	SOMORELATE PROTEINS, LDA	No	2019
136	SOPHISTICATI PORTUGAL, UNIPESSOAL, LDA	No	2019
137	STAB VIDA - INVESTIGACAO E SERVICOS EM CIENCIAS BIOLOGICAS, LDA	No	2019
138	STAND CLEAR, LDA	No	2019
139	STELLA MARIS MEDICAL, ALERTS, LDA	No	2019
140	STEMMATTERS - BIOTECNOLOGIA E MEDICINA REGENERATIVA, S.A.	No	2019
141	TALENTMOLECULE, LDA	No	2017
142	TARGTEX, S.A.	No	2019
143	TECHNOPHAGE - INVESTIGACAO E DESENVOLVIMENTO EM BIOTECNOLOGIA, S.A.	No	2019
144	THELIAL TECHNOLOGIES, S.A.	No	2019
145	TONIC APP, S.A.	No	2019
146	TOXFINDER, LDA	No	2019

147	U - MONITOR, LDA	No	2019
148	UBQ - UNIDADE BIOQUIMICA, UNIPESSOAL, LDA	No	2019
149	UBQ II, LDA	No	2019
150	VETHERAPY - INVESTIGACAO E DESENVOLVIMENTO EM BIOTECNOLOGIA, LDA	No	2019
151	WILD AT EASE, LDA	No	2019
152	18CELLS BIOTECH, LDA	No	n.a.
153	ANTERE SENSING, LDA	No	n.a.
154	AQUALEHA REPRESENTACAO EM PORTUGAL	No	n.a.
155	ARBOREABIOFOODS, LDA	No	n.a.
156	ASSOCIACAO BLC3 - CAMPUS DE TECNOLOGIA E INOVACAO	No	n.a.
157	ASSOCIACAO CBPBI - CENTRO DE BIOTECNOLOGIA DE PLANTAS DA BEIRA INTERIOR	No	n.a.
158	ASSOCIACAO CODIGO DA VIDA	No	n.a.
159	ASSOCIACAO OCEANO VERDE- LABORATORIO COLABORATIVO PARA O DESENVOLVIMENTO DE TECNOLOGIAS E PRODUTOS VERDES DO OCEANO	No	n.a.
160	ASSOCIATION FOR THE ADVANCEMENT OF TISSUE ENGINEERING AND CELL BASED TECHNOLOGIES & THERAPIES (A4TEC) - ASSOCIACAO	No	n.a.
161	BETTERY, S.A.	No	n.a.
162	BIOWORLD - SOCIAL IMPACT, LDA	No	n.a.
163	CAMPELLUS INNOVATIO, LDA	No	n.a.
164	CENTRO DE BIOTECNOLOGIA AGRICOLA E AGRO-ALIMENTAR DO ALENTEJO - CEBAL	No	n.a.
165	CHEMPRECISE - CONSULTORIA, BIOTECNOLOGIA, PRODUTOS FARMACEUTICOS E IMOBILIARIO, LDA	No	n.a.
166	CIDRO - CENTRO DE INVESTIGACAO & DESENVOLVIMENTO DE RECURSOS ORTOPEDICOS, LDA	No	n.a.
167	DIGESTAID - ARTIFICIAL INTELLIGENCE DEVELOPMENT, LDA	No	n.a.
168	FASTPRINCIPLE, LDA	No	n.a.
169	FETALDISC, LDA	No	n.a.
170	FLAMINGO ESPONTANEO - INDUSTRIA DE BIOMEDICINA, UNIPESSOAL, LDA	No	n.a.
171	FRACTAL BIOTECH - ESTUDOS E PROJETOS BIOTECNOLOGICOS, LDA	No	n.a.
172	FYKIA BIOTECH, LDA	No	n.a.
173	GENOGAL - GENOMA PORTUGAL, LDA	No	n.a.
174	GREEN DETERMINATION, LDA	No	n.a.
175	HEMATOS - SAUDE E TECNOLOGIA LDA	No	n.a.
176	ICMICROBIOME, LDA	No	n.a.
177	INFLAMMATIX PORTUGAL, UNIPESSOAL, LDA	No	n.a.
178	INNOVPLANTPROTECT - ASSOCIACAO	No	n.a.
179	INSTITUTO DE BIOTECNOLOGIA E BIOMEDICINA DOS ACORES	No	n.a.
180	JDL, UNIPESSOAL, LDA	No	n.a.
181	MAIA & MULLER - BIOTECH, LDA	No	n.a.
182	MEDINUP ASSOCIACAO - CENTER FOR DRUG DISCOVERY AND INNOVATIVE MEDICINES	No	n.a.
183	MEDRONHO & CANELA - INOVACAO ALIMENTAR E NUTRICIONAL, UNIPESSOAL, LDA	No	n.a.
184	MERIDIAN BIOTECH R&D, LDA	No	n.a.
185	MOLECULE MESSAGE, UNIPESSOAL, LDA	No	n.a.
186	NANO PATENTED TECHNOLOGIES, LDA	No	n.a.
187	NASUMTECH, LDA	No	n.a.
188	NPROTEIN, LDA	No	n.a.
189	NUTRASILIC, LDA	No	n.a.
190	ORANGEMODEL - INVESTIGACAO E SERVICOS EM CIENCIAS BIOMEDICAS, LDA	No	n.a.
191	PARTICULA DILIGENTE, LDA	No	n.a.
192	PERSPECTUM, UNIPESSOAL, LDA	No	n.a.
193	PRIMERGEN, LDA	No	n.a.
194	PRODUCTS & FEATURES - BIOCOLLAGEN, LDA	No	n.a.
195	QBEE - ACCELERATOR, UNIPESSOAL, LDA	No	n.a.
196	QUADRANTE CARDINAL, UNIPESSOAL, LDA	No	n.a.
197	S2 AQUA - LABORATORIO COLABORATIVO, ASSOCIACAO PARA UMA AQUACULTURA SUSTENTAVEL E INTELIGENTE	No	n.a.
198	SAFETYDIVERSITY, LDA	No	n.a.
199	SKOPOBIOTA, LDA	No	n.a.
200	SOCIEDADE PORTUGUESA DE HIDATIDOLOGIA	No	n.a.
201	SOMETHING IN HANDS - INVESTIGACAO CIENTIFICA, LDA	No	n.a.
202	STAR GENOMICS, LDA	No	n.a.
203	SUSTAINUTILITY, LDA	No	n.a.
204	V4H - ASSOCIACAO PARA A INVESTIGACAO EM VALOR E INOVACAO TECNOLOGICA EM SAUDE	No	n.a.
205	VECTOR B2B - DRUG DEVELOPING - ASSOCIACAO PARA INVESTIGACAO EM BIOTECNOLOGIA	No	n.a.
206	VIRIDE IN VITRO, LDA	No	n.a.
207	COSMOSRESOLUCAO, UNIPESSOAL, LDA	Yes	2019
208	DOCTORGUMMY EUROPE, S.A.	Yes	2019
209	LOGICSEARCH - BIOTECNOLOGIA, LDA	Yes	2019
210	MAGNOMICS, S.A.	Yes	2019
211	OCEANPRIORITY, LDA	Yes	2019
212	PRODIGY BUBBLE, LDA	Yes	2019
213	PSI BIO - BIOREACTORES, IMPLANTES E SENSORES PERSONALIZADOS, LDA	Yes	2019
214	SPM NANOSOLUTIONS, LDA	Yes	2019
215	SUMTHINK, LDA	Yes	2019
216	TISMOO PORTUGAL LABORATORIO, UNIPESSOAL, LDA	Yes	2019
217	VITACONTROL, LDA	Yes	2019
218	BIOMODE - BIOMOLECULAR DETERMINATION, S.A.	Yes	2018
219	BIOPALE, SOCIEDADE UNIPESSOAL, LDA	Yes	2018
220	CELL2B - ADVANCED THERAPEUTICS, S.A.	Yes	2018

221	EXPATBIOTICS, LDA	Yes	2018
222	FORMULA DA AVO, LDA	Yes	2018
223	GUIDE US, LDA	Yes	2018
224	IRREVERENTMOLECULE, UNIPESSOAL, LDA	Yes	2018
225	CUREMAT TECHNOLOGIES, LDA	Yes	2017
226	HIMMEL PHARMACEUTICALS, LDA	Yes	2017
227	INMUNAL, UNIPESSOAL, LDA	Yes	2017
228	MANOBRAS E PERIPECIAS, LDA	Yes	2017
229	SIMATIX, UNIPESSOAL, LDA	Yes	2017
230	SIMPO TECH, LDA	Yes	2017
231	BCATALYST - PROJECTS & PRODUCTS, LDA	Yes	2016
232	GROWTECH - PRODUCAO, INVESTIGACAO E DESENVOLVIMENTO, LDA	Yes	2016
233	TECHZYMES - SOLUCOES DE BIOTECNOLOGIA, LDA	Yes	2016
234	TUTTNAUER PORTUGAL, LDA	Yes	2016
235	COLLOID U COIMBRA, LDA	Yes	2015
236	FUNCTIONAL ENVIROMICS TECHNOLOGIES, S.A.	Yes	2015
237	INCEPTION - LIFE SCIENCES RESEARCH AND DEVELOPMENT, LDA	Yes	2015
238	INTERACTOME, LDA	Yes	2015
239	RIDAXIS LABS, LDA	Yes	2015
240	CYNARA, LDA	Yes	2014
241	GENEBOX - DESENVOLVIMENTO E PRODUCAO DE TESTES DE DIAGNOSTICO, SOCIEDADE UNIPESSOAL, LDA	Yes	2014
242	HEART PLEX, LDA	Yes	2014
243	MAGUS - MEDICAL DEVICES, LDA	Yes	2014
244	UNOIBERIA, UNIPESSOAL, LDA	Yes	2014
245	ABLYNX, S.A.	Yes	2013
246	ACELLERA THERAPEUTICS, LDA	Yes	2013
247	ARBORVALUE - VALORIZACAO DO PATRIMONIO VEGETAL, LDA	Yes	2013
248	BIOROTEIRO, UNIPESSOAL, LDA	Yes	2013
249	BIOSTRUMENT - CONSULTORIA DE DESENVOLVIMENTO DE PROJECTOS BIOQUIMICOS, S.A.	Yes	2013
250	MICROALGAE - INVESTIGACAO E DESENVOLVIMENTO, LDA	Yes	2013
251	MUNDO ECOLOGICO, SOLUCOES AMBIENTAIS, LDA	Yes	2013
252	SCREENPROFIND, LDA	Yes	2013
253	2CTECH, LDA	Yes	2012
254	BIOSOURCE - SAUDE E TECNOLOGIA, LDA	Yes	2012
255	SPECIALSHARE - GREEN TECHNOLOGIES, UNIPESSOAL, LDA	Yes	2011
256	G-ALG, GENES E ALGORITMOS, LDA	Yes	2010
257	GENETIMPULSO - UNIPESSOAL, LDA	Yes	2010
258	TRUTHSEARCH, UNIPESSOAL, LDA	Yes	2010
259	BIOGROUND, UNIPESSOAL, LDA	Yes	2009
260	BMM - BIOMEDICAL MODELING, UNIPESSOAL, LDA	Yes	2009
261	CLAMITEC - MYCO SOLUTIONS, LDA - EM LIQUIDACAO	Yes	2009
262	IBERGENE - INOVACAO E SERVICOS EM GENETICA, S.A.	Yes	2009
263	LISOGENE, LDA	Yes	2009
264	NEURONIOS ESPECIAIS, LDA	Yes	2009
265	ABLYNX SUCURSAL EM PORTUGAL	Yes	2006
266	SENZER LIMITED - SUCURSAL EM PORTUGAL	Yes	n.a.

ANNEX II – LIST OF COMPANIES WITH R&D IN BIOTECHNOLOGY AS SECONDARY ACTIVITY

#	Company name	Inactive	Last avail. year
1	4 BIO INOVA, LDA	No	2016
2	4NISI - IMOBILIARIA, UNIPESSOAL, LDA	No	2019
3	4TUNE ENGINEERING, LDA	No	2019
4	ACIPENSER, SOCIEDADE PORTUGUESA DE PRODUCAO DE CAVIAR, LDA	No	2019
5	ADMIRABLOCEAN, LDA	No	2019
6	ADORNI & ADORNI - PARTICIPACOES, LDA	No	2019
7	ADVANCANT - TECNOLOGIA, LDA	No	2019
8	AEI24 PHARMA EXPORT, LDA	No	2019
9	AI4MEDIMAGING - MEDICAL SOLUTIONS, S.A.	No	2019
10	AIRES COUTINHO - INVESTIGACAO E DESENVOLVIMENTO TECNOLOGICO, LDA	No	2017
11	ALGA 2 O, LDA	No	2019
12	ALGICEL - BIOTECNOLOGIA E INVESTIGACAO, LDA	No	2019
13	ALPHA WORDWIDE, UNIPESSOAL, LDA	No	2016
14	ALS LIFE SCIENCES PORTUGAL, S.A.	No	2019
15	ALVA SOLOS, LDA	No	2017
16	AMBICONSULT - ANALISES FISICO-QUIMICAS E MICROBIOLOGICAS, LDA	No	2019
17	ANA CATARINA ALMEIDA, LDA	No	2019
18	ARCHIVCOMPACT - CENTRO DE ENSAIOS, UNIPESSOAL, LDA	No	2019
19	ARSAL ENERGIA - SOLUCOES ENERGETICAS E ECO-GESTAO, LDA	No	2016
20	BALANCE & PRECISION, LDA	No	2019
21	BEATO COELHO & GARCIA ROSADO, LDA	No	2019
22	BETTING ON FUTURE, UNIPESSOAL LDA	No	2019
23	BIO4LIFE4YOU, LDA	No	2019
24	BIOCANT PARK, S.A.	No	2019
25	BIORAH, LDA	No	2019
26	BIOVOLUTION, LDA	No	2015
27	BLC3 EVOLUTION, LDA	No	2019
28	BLUE ANALYTICS, LDA	No	2019
29	BRIGADA METRICA, UNIPESSOAL, LDA	No	2019
30	BTS - BIOTECHNOLOGY AND SENSING FOR FOOD SAFETY AND HEALTH, LDA	No	2019
31	BUGGYPOWER (PORTUGAL) - GESTAO E PRODUCAO DE BIOMASSA, LDA	No	2019
32	BUGGYPOWER SHARED SERVICES, UNIPESSOAL, LDA	No	2019
33	CALDEIRA & VON AMANN, LDA	No	2019
34	CARBOCODEFOOD - ACTIVIDADES ALIMENTARES, LDA	No	2019
35	CARBOCODEINDUSTRY - ACTIVIDADES INDUSTRIAIS, LDA	No	2019
36	CARBOFYLT, LDA	No	2019
37	CARDI9 - PRESTACAO DE SERVICOS DE SAUDE, LDA	No	2019
38	CAVIALL - SOCIEDADE DE INVESTIMENTOS EM AQUACULTURA, LDA	No	2017
39	CELULA PECULIAR, UNIPESSOAL, LDA	No	2019
40	CENARIO DE SUCESSO, LDA	No	2019
41	CGC CENTRO DE GENETICA CLINICA E PATALOGIA, S.A.	No	2018
42	CHEM4PHARMA, LDA	No	2019
43	CHEMICAL NATURE, LDA	No	2019
44	CIPAN - COMPANHIA INDUSTRIAL PRODUTORA DE ANTIBIOTICOS, S.A.	No	2019
45	CLANI VENTURES, LDA	No	2019
46	CLARIFY ANALYTICAL, LDA	No	2018
47	CLINICA VETERINARIA DE ESTREMOZ, LDA	No	2019
48	CLINIFATIMA - SERVICOS MEDICOS, S.A.	No	2019
49	COHERENT CHOICE - SOLUCOES TECNOLOGICAS, LDA	No	2019
50	CONVENIENT FLAVOUR, LDA	No	2018
51	COPA7, SOCIEDADE UNIPESSOAL, LDA	No	2017
52	CORTE VELADA - INVESTIMENTOS, LDA	No	2019
53	COSMIKBALANCE, LDA	No	2019
54	CREAT2INSPIRE MEDIA, LDA	No	2016
55	CURIOUSFLOWER, LDA	No	2019
56	CYCLOTECH - ADVANCED TECNOLOGIES AND SOLUTIONS, UNIPESSOAL, LDA	No	2019
57	DAVOLI RAMOS, LDA	No	2018
58	DECKSPOT - SERVICOS DE ENGENHARIA, CONSULTORIA E GESTAO, LDA	No	2019
59	DEFENDFORMULA, LDA	No	2018
60	DEIFIL TECHNOLOGY, LDA	No	2019
61	DUAS SIGLAS - FORMACAO E INVESTIGACAO, UNIPESSOAL, LDA	No	2019
62	ECOAPIS, UNIPESSOAL, LDA	No	2019
63	ENDOPURE, UNIPESSOAL, LDA	No	2019
64	ENLIGHTENMENT, LDA	No	2019
65	ENTOGENEX EUROPE, LDA	No	2019
66	ENZIMORBITA - FABRICACAO E TRANSFORMACAO DE ADITIVOS AGROALIMENTARES, LDA	No	2019
67	ESTACA 0 - PUBLICIDADE E MARKETING, LDA	No	2018
68	ESTADO NOVO - DESTILARIA E TALHO, LDA	No	2019
69	FACE2CEPH, MEDICAL TECHNOLOGIES, LDA	No	2019
70	FAIRJOURNEY BIOLOGICS, S.A.	No	2019
71	FALCON EMPIRE, LDA	No	2019
72	FASTINOV, S.A.	No	2019

73	FINAO BIOTECH, LDA	No	2019
74	FISHMETRICS, LDA	No	2019
75	FLEMSLASH HEALTH SOFTWARE, LDA	No	2018
76	FOODFARMBIZ, LDA	No	2019
77	FORMULA IMPERATIVA, LDA	No	2019
78	FUNDACAO CALOUSTE GULBENKIAN	No	2017
79	GARRIDO & MERGULHAO, LDA	No	2019
80	GENE EXPRESS - SERVICOS GENOMICOS PARA DIAGNOSTICO E INVESTIGACAO, LDA	No	2019
81	GENOMED - DIAGNOSTICOS DE MEDICINA MOLECULAR, S.A.	No	2019
82	GLYCO4CLINICS, LDA	No	2019
83	GOPSIS, LDA	No	2019
84	GREEN AQUA POMBAL, LDA	No	2019
85	GREEN AQUA VAGOS, LDA	No	2019
86	GREENSHELL BIOGENETICS, LDA	No	2018
87	GRISP, LDA	No	2019
88	GROWING PARTICLE, LDA	No	2019
89	HBT - SAUDE E BIOTECNOLOGIA, LDA	No	2019
90	HEIBERG MADEIRA, UNIPESSOAL, LDA	No	2019
91	HELDER DUARTE PEREIRA - ORTOPEDIA E INVESTIGACAO, LDA	No	2019
92	HERDADE DONA DALIA - PRODUTOS HORTICOLAS, LDA	No	2019
93	I.T.B. - INVESTIGACAO E TRANSFERENCIA DE BIOTECNOLOGIA, LDA	No	2019
94	IDEARPHARMA - INVESTIGACAO E DESENVOLVIMENTO, UNIPESSOAL, LDA	No	2019
95	IMPROVINGSKALE, LDA (ZONA FRANCA DA MADEIRA)	No	2019
96	INDUSE - DESIGN INDUSTRIAL, LDA	No	2018
97	INEYE PHARMA, LDA	No	2019
98	INGR - SAUDE, UNIPESSOAL, LDA	No	2019
99	INOVPOL - INNOVATIVE POLYMER TECHNOLOGIES, LDA	No	2019
100	INPROPLANT - INVESTIGACAO E PROPAGACAO DE PLANTAS, LDA	No	2019
101	INSIDEVET - ECOGRAFIA VETERINARIA MOVEL, LDA	No	2019
102	INVICTUS SCIENCES, SOCIEDADE UNIPESSOAL, LDA	No	2019
103	INVISIBLE MEANING, LDA	No	2019
104	IRRITEJO - TECNICAS AGRICOLAS, LDA	No	2019
105	ISS INCLITA SEAWEED SOLUTIONS, LDA	No	2018
106	IV MDEV, UNIPESSOAL, LDA	No	2019
107	JBCPV, LDA	No	2019
108	JOSE GRACA & TELMO FERNANDES - SERVICOS VETERINARIOS, LDA	No	2019
109	JOSE MARIA PINHEIRO TORRES, LDA	No	2019
110	JQL - SERVICOS MEDICOS, LDA	No	2019
111	KIMIHEALTH - ADVANCING THERAPEUTICS, LDA	No	2019
112	KYMIAQUEST, S.A.	No	2019
113	LA - PRODUTOS LACTEOS, UNIPESSOAL, LDA	No	2019
114	LABCOCO, LDA	No	2019
115	LDMV - LABORATORIO DE DIAGNOSTICO MOLECULAR VETERINARIO, LDA	No	2019
116	LEADER PROPOSALS, LDA	No	2018
117	LIKE WISE - PROPERTIES, CONSULTING AND ENGINEER, LDA	No	2019
118	LIPE MEDICAL, LDA	No	2019
119	LUSALGAE, LDA	No	2019
120	LYNXIRIS, LDA	No	2019
121	MADEBIOTECH - C R & D, S.A. (ZONA FRANCA DA MADEIRA)	No	2019
122	MAGELLAN - BIOLOGICS & CONSULTING, LDA	No	2019
123	MARCOS & MORGADO BIOTECHNOLOGY, LDA	No	2019
124	MARINNOVA - MARINE AND ENVIRONMENTAL INNOVATION, TECHNOLOGY AND SERVICES, UNIPESSOAL, LDA	No	2015
125	MEALHA GUERREIRO - SERVICOS MEDICOS, LDA	No	2019
126	MEDICEUS DADOS DE SAUDE, S.A.	No	2019
127	MEDSIMLAB, LDA	No	2019
128	MINDPROBER, S.A.	No	2019
129	MIRABILIS - AQUACULTURA SUSTENTAVEL, LDA	No	2019
130	MOLECULA DILIGENTE, UNIPESSOAL, LDA	No	2018
131	MOLECULA FRENETICA, UNIPESSOAL, LDA	No	2019
132	MORGADO, SERVICOS MEDICOS, LDA	No	2019
133	MS&T, LDA	No	2019
134	MSO MEDICAL SOLUTIONS, LDA	No	2019
135	NATIVA LAND, LDA	No	2019
136	NATUREXTRACTS, S.A. (ZONA FRANCA DA MADEIRA)	No	2019
137	NELSON FILIPE CORREIA MATOS MELO SIMAS - SEGURANCA E QUALIDADE ALIMENTAR, LDA	No	2019
138	NEUROSILAM, LDA	No	2019
139	NEXT GENERATION CHEMESTRY, UNIPESSOAL, LDA	No	2019
140	NOGRID RESOURCES RECOVERY CONSULTING, LDA	No	2019
141	NR NATURE - NATURAL RESOURCES MANAGEMENT, LDA	No	2018
142	NTPE - INVESTIGACAO, DESENVOLVIMENTO E COMERCIALIZACAO DE TRANSISTORES E DE BIOSSENSORES ELETRONICOS DE PAPEL, LDA	No	2019
143	NUTRIGENETIK, LDA	No	2019
144	OLEVRA, LDA	No	2018
145	OPHIOMICS - INVESTIGACAO E DESENVOLVIMENTO EM BIOTECNOLOGIA, S.A.	No	2019
146	OSSMED - REGENERATION TECHNOLOGY, S.A.	No	2019
147	PASSWORKS, S.A.	No	2018

148	PAULO LAZARO MENDES, LDA	No	2018
149	PERFECT MERIDIAN, LDA	No	2019
150	PERFECTENZYME, LDA	No	2018
151	PERFECTSWIMMING, UNIPESSOAL, LDA	No	2016
152	PETRVS - INDUSTRIA DE SUCOS TROPICAIS, UNIPESSOAL, LDA	No	2017
153	PHARMIS II INDUSTRIA E INOVACAO, UNIPESSOAL, LDA	No	2019
154	PLANTALEGRE A.J.B.P. - PRODUCAO E COMERCIO DE PLANTAS, UNIPESSOAL, LDA	No	2019
155	PORTUS PHARMA, LDA	No	2019
156	PROMOPARQUES - PROMOCAO E GESTAO DE PARQUES DE ESTACIONAMENTO, S.A.	No	2019
157	PROR - SERVICOS MEDICOS, LDA	No	2019
158	PROZIS.TECH, S.A.	No	2019
159	QINA CONSULTING, UNIPESSOAL, LDA	No	2019
160	QUEIJOS MATIAS, LDA	No	2018
161	RENATA IWAMIZU, UNIPESSOAL, LDA	No	2019
162	RESDEVMED, LDA	No	2019
163	RF&LF - DENTISTRY DESIGN STUDIO, LDA	No	2019
164	RIANDA RESEARCH - CENTRO DE INVESTIGACAO EM ENERGIA, SAUDE E AMBIENTE, LDA	No	2019
165	RODRIGUES VALE & ALMEIDA, UNIPESSOAL, LDA	No	2019
166	SABER ARTICULADO, LDA	No	2017
167	SALTINHOS E PULINHOS, UNIPESSOAL, LDA	No	2019
168	SANTOS CARRILHO & PINTO - SERVICOS DE SAUDE, LDA	No	2019
169	SAUDE VIAVEL, S.A.	No	2019
170	SCDCI - CULTURA, DESENVOLVIMENTO E COOPERACAO INTERNACIONAL, LDA	No	2019
171	SELDON, UNIPESSOAL, LDA	No	2019
172	SFQI - PRODUTOS ALIMENTARES, UNIPESSOAL, LDA	No	2017
173	SMART SEPARATIONS PORTUGAL, UNIPESSOAL, LDA	No	2019
174	SOCIEDADE AGRICOLA CASA DO FOLAO, LDA	No	2019
175	SPAWNFOAM, LDA	No	2019
176	SPRING DEFENDER, UNIPESSOAL, LDA	No	2019
177	STEMLAB, S.A.	No	2019
178	SUPRA MASA, S.A. (ZONA FRANCA DA MADEIRA)	No	2019
179	TALENTOS COERENTES, LDA	No	2018
180	TORPEDO DE IDEIAS CABELEIREIROS E ESTETICA, LDA	No	2019
181	UNIVERSIDADE DE AVEIRO	No	2005
182	VELVET SMILE, LDA	No	2018
183	VERISSIMO, OLIVEIRA & CASTRO, LDA	No	2014
184	VIRIDIMED, LDA	No	2019
185	VITAL GREEN - CULTURA, DESENVOLVIMENTO E INVESTIGACAO, S.A.	No	2011
186	VMRT FOOD SERVICES, LDA	No	2018
187	WATERTECH - SOCIEDADE AGRICOLA, LDA	No	2019
188	XAVIER YON CONSULTING, UNIPESSOAL, LDA	No	2019
189	Y FARMA, S.A.	No	2019
190	ZEMIR PHARMA - CONSULTING, LDA	No	2019
191	ZEYTON NUTRACEUTICALS, LDA	No	2019
192	Z-MASTER BIOTECHNOLOGY PHARMA, LDA	No	2019
193	ZODIDUS, UNIPESSOAL, LDA	No	2019
194	ABSTRACTWAVES, LDA	No	n.a.
195	AFONSO - GENETICA HUMANA E GENOMICA, SOCIEDADE UNIPESSOAL, LDA	No	n.a.
196	AG - INNOV COE, A.C.E.	No	n.a.
197	AGRO2OIL - INDUSTRY, LDA	No	n.a.
198	AGRO2OILGES II, LDA	No	n.a.
199	AIRTON MORENO & MARIO MIRANDA, LDA	No	n.a.
200	AK-BIOTASE - RESEARCH INNOVATION, UNIPESSOAL, LDA	No	n.a.
201	ALGIKEY, ALGAE BASED SOLUTIONS, S.A.	No	n.a.
202	ANH - INNOVATION, UNIPESSOAL, LDA	No	n.a.
203	APAA, ASSOCIACAO PORTUGUESA DE ALGOLOGIA APLICADA	No	n.a.
204	APB-ASSOCIACAO PORTUGUESA DE BIOFABRICACAO	No	n.a.
205	APOGEE INVESTMENT PARTNERS, LDA	No	n.a.
206	AQUAINSILICO, LDA	No	n.a.
207	ASSOCIACAO BIOPOLIS	No	n.a.
208	ASSOCIACAO BIP4DAB	No	n.a.
209	ASSOCIACAO EMPREENDERCIENCIA - ASSOCIATION ENTERPRISINGSCIENCE R&D - RESEARCH AND DEVELOPMENT	No	n.a.
210	ASSOCIACAO PARA O DESENVOLVIMENTO DE DEPARTAMENTO DE FISICA	No	n.a.
211	ASSOCIACAO PARA O DESENVOLVIMENTO E PROMOCAO DO EMPREENDEDORISMO EM PORTUGAL-ADPEP	No	n.a.
212	ASSOCIACAO THEKIDSFELLOWS-RESEARCH GROUP IN ANTHROZOOLOGY	No	n.a.
213	AT MICROPROTECT, UNIPESSOAL, LDA	No	n.a.
214	AXODYNAMIC, LDA	No	n.a.
215	BAC3GEL, LDA	No	n.a.
216	BBA - ASSOCIACAO NACIONAL PARA OS BIORECURSOS MARINHOS E BIOTECNOLOGIA AZUL	No	n.a.
217	BIAL - R&D INVESTMENTS, S.A.	No	n.a.
218	BIO BUREAU BIOTECHNOLOGY, LDA	No	n.a.
219	BROWATZKICONSULT, UNIPESSOAL, LDA	No	n.a.
220	CANNTHYRSO MEDICAL CANNABIS CULTIVATION, LDA	No	n.a.
221	CASEX EUROPA INTERNACIONAL, LDA	No	n.a.
222	CATAA - ASSOCIACAO CENTRO DE APOIO TECNOLOGICO AGRO-ALIMENTAR DE CASTELO BRANCO	No	n.a.
223	CENTRO DE NEUROCIENCIAS E BIOLOGIA CELULAR	No	n.a.

224	CHRYSEA LABS, LDA	No	n.a.
225	COMPATIBLELEGANCE, UNIPESSOAL, LDA	No	n.a.
226	COMPATIBLENEURON, LDA	No	n.a.
227	CORTEXXUS, LDA	No	n.a.
228	DOUBLE OH IMPACT, UNIPESSOAL, LDA	No	n.a.
229	FLECTIREFLECTE, LDA	No	n.a.
230	FOLHAS PANORAMICAS, LDA	No	n.a.
231	FOOD4SUSTAINABILITY - ASSOCIACAO PARA A INOVACAO NO ALIMENTO SUSTENTAVEL	No	n.a.
232	GRASIELLE ESPOSITO, UNIPESSOAL, LDA	No	n.a.
233	GREEN BEHAVIOUR, UNIPESSOAL, LDA	No	n.a.
234	GROWINGFORMULA, LDA	No	n.a.
235	HNC INTERNATIONAL MANAGEMENT, LDA	No	n.a.
236	ICTE - INSTITUTO DE CIENCIAS DA TERRA E DO ESPACO	No	n.a.
237	IN2TECHS CONSULTING, UNIPESSOAL, LDA	No	n.a.
238	INSTITUTO DE MEDICINA MOLECULAR JOAO LOBO ANTUNES	No	n.a.
239	INSTITUTO NACIONAL DE SAUDE DOUTOR RICARDO JORGE, I.P.	No	n.a.
240	INSTITUTO POLITECNICO DE LEIRIA	No	n.a.
241	IR3T REGENERATIVE THERAPIES, LDA	No	n.a.
242	JOSE SERAFIM - MEDICINA DENTARIA, UNIPESSOAL, LDA	No	n.a.
243	LABORATORIOS BRAGARD, UNIPESSOAL, LDA	No	n.a.
244	LANDRATECH, LDA	No	n.a.
245	MASSIVEPERSPECTIVE - ASSOCIACAO	No	n.a.
246	MATERA INDUSTRY, UNIPESSOAL, LDA	No	n.a.
247	MED COMMUNICATIONS INTERNATIONAL S.A.R.L. SUCURSAL EM PORTUGAL	No	n.a.
248	MEDMIRRES , LDA	No	n.a.
249	METHODS AND DISCOVERIES - ASSOCIACAO DE RECURSOS SUSTENTAVEIS	No	n.a.
250	MICRO LIFE - BIOFABRICA DE PLANTAS, LDA	No	n.a.
251	MIRPURI FOUNDATION	No	n.a.
252	MOLECULAS SOBERBAS, LDA	No	n.a.
253	NATIVEWEB, UNIPESSOAL, LDA	No	n.a.
254	NAVIA TECH, LDA	No	n.a.
255	NM BIOSERVICES, LDA	No	n.a.
256	OCEAN TECH HUB, LDA	No	n.a.
257	OURHIP, LDA	No	n.a.
258	PSIX, LDA	No	n.a.
259	PTSCIENCE, UNIPESSOAL, LDA	No	n.a.
260	RHOGEN, LDA	No	n.a.
261	RPC - COGUMELOS BIOTECH, UNIPESSOAL, LDA	No	n.a.
262	RYAPURTECH, LDA	No	n.a.
263	S.F.S. - SENSORIAL FOOD SCIENCES, LDA	No	n.a.
264	SECRETARIA REGIONAL DE MAR E PESCAS	No	n.a.
265	SENSIMETER - HEALTHCARE & TECHNOLOGY SOLUTIONS, LDA	No	n.a.
266	SENTIDO FUNDAMENTAL, UNIPESSOAL, LDA	No	n.a.
267	SILVESTRE SAUDE, LDA	No	n.a.
268	SOCIEDADE DE CIENCIAS AGRARIAS DE PORTUGAL	No	n.a.
269	SOCIEDADE PORTUGUESA DE CELULAS ESTAMINAIS E TERAPIA CELULAR	No	n.a.
270	SWANSPOTENTIAL, LDA	No	n.a.
271	TECHNIFY CONSULTORIA E SAUDE, LDA	No	n.a.
272	TREE FLOWERS SOLUTIONS, LDA	No	n.a.
273	UNIVERSIDADE ABERTA	No	n.a.
274	UNIVERSIDADE DO MINHO	No	n.a.
275	VELLSAM, LDA	No	n.a.
276	VISSAIUM XXI - ASSOCIACAO PARA O DESENVOLVIMENTO DE VISEU	No	n.a.
277	WBF PORTUGAL, SOCIEDADE UNIPESSOAL, LDA	No	n.a.
278	BETECHIN, LDA	Yes	2019
279	DOURO SKINCARE, LDA	Yes	2019
280	IDVANCE CONSULTING, LDA	Yes	2019
281	IMPROVEAT, LDA	Yes	2019
282	KEMIN PHARMACEUTICA, UNIPESSOAL, LDA	Yes	2019
283	MARISA SOUSA RIBEIRINHO, UNIPESSOAL, LDA	Yes	2019
284	OCEANGLAMOUR, LDA	Yes	2019
285	RAPOSO PRETO, UNIPESSOAL, LDA	Yes	2019
286	TRIPLE HELIX TECHNOLOGIES, LDA	Yes	2019
287	CERDEIRA & VAZ BRAVO, LDA	Yes	2018
288	EXPERTUS CAM ASSAYS, LDA	Yes	2018
289	GUSTAVO CARONA - PRATICA MEDICA E INVESTIGACAO, LDA	Yes	2018
290	IDVET - LABORATORIOS E SERVICOS VETERINARIOS ESPECIALIZADOS, LDA	Yes	2018
291	NEW 4HEALTH SOLUTIONS, LDA	Yes	2018
292	BOOSTPHARMA - ADVANCED THERAPIES, LDA	Yes	2017
293	DENTEDUCO - MODELOS DENTARIOS, UNIPESSOAL, LDA - EM LIQUIDACAO	Yes	2017
294	PORTELINHA & CORREIA, LDA	Yes	2017
295	SUSTENDIARIO - UNIPESSOAL, LDA	Yes	2017
296	FROMVETS.FORVETS - SERVICOS PARA MEDICOS VETERINARIOS, LDA	Yes	2016
297	INSIGHTOMICS, LDA	Yes	2016
298	MY.SKINMIX - PRODUTOS E SERVICOS PERSONALIZADOS, LDA	Yes	2016
299	RPSP - RESEARCH PHARMACEUTICAL SERVICES PORTUGAL, UNIPESSOAL, LDA	Yes	2016

300	VANESSA RALHA, UNIPESSOAL, LDA	Yes	2016
301	BIOLIFEMAR - BIOECONOMY, LDA	Yes	2015
302	DR. JOAQUIM NUNES - MEDICINA E FORMACAO, UNIPESSOAL, LDA	Yes	2015
303	ORBITCAPACITY, UNIPESSOAL, LDA	Yes	2015
304	WHOLE SCREENING - SAUDE, UNIPESSOAL, LDA	Yes	2015
305	EXCLUSIVET, LDA	Yes	2014
306	GENEWIN, LDA	Yes	2014
307	IDV - INVESTIGACAO E SERVICOS ESPECIALIZADOS, LDA	Yes	2014
308	LEMONSHADOW, UNIPESSOAL, LDA	Yes	2014
309	MEXALGAR - COMERCIO, INDUSTRIA, INVESTIGACAO E DESENVOLVIMENTO, LDA	Yes	2014
310	LABKITCHEN, LDA	Yes	2013
311	MACSOL - ENGENHARIA E EQUIPAMENTOS SOLARES, LDA	Yes	2013
312	MEDSIMLAB INOV, LDA	Yes	2013
313	TERESA TIMOTEO, UNIPESSOAL, LDA	Yes	2013
314	GENNOSTICS XXI, LDA	Yes	2012
315	NORMA & PARADIGMA, LDA	Yes	2012
316	RAQUEL MACHADO - SERVICOS DE SAUDE, LDA	Yes	2012
317	CELBIO - COMPANHIA PORTUGUESA DE BIOTECNOLOGIA, S.A.	Yes	2009
318	GEOTECNICA DA RIA, LDA	Yes	2009
319	BESENSI, LDA	Yes	2007