www.bioall.eu

D 1.2

State of play and good practices in BIOHealth: a review of Italian, Portuguese and Spanish cases

Bio-All

March, 2020

Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
Project n° 600936-EPP-1-2018-1-PT-EPPKA2-KA

Bio-All

Contents

1. Introduction

1.1. Aims and context

The Thematic Report Entrepreneurship Education and the Future of Learning (2013), pointed the following challenges to be addressed: how to scale up good practice small scale/pilots to implementation on a broad scale; overcome the insufficient involvement of stakeholders (particularly business/community); monitor programs and methods; overcome the lack of data for alumni/start-ups; impact assessment to guide policymakers; assessment not suitable to methods/outcomes; and lack of interest.

Entrepreneurship education is being largely promoted by the European Commission focusing on policy guidance and project funding. 'Entrepreneurship and a sense of initiative' is one of eight key competences for lifelong learning according to the European reference framework, as fostering entrepreneurship education lead to more business creation, innovation and aspirations for self-employment. As such, there is a need to make this challenge trans-sectoral and promoted at the EU level through a collaborative approach in the areas of employment, enterprise, research and education (EC, COM, Skills Agenda, 2016). In this vein, schools and educational institutions must re-think the set of competences and knowledge their students and staff need to succeed as well as the needed support systems for dealing with the 21st century's challenges.

The Eurobarometer survey on entrepreneurship (2012) declared that despite the attraction of young population for entrepreneurship, there are many discrepancies between the EU Member States concerning its integration in the education programs. While some countries have specific strategies for entrepreneurship education, others follow a broader strategy on education or economic policies (Eurydice, Entrepreneurship education at school in Europe, 2016).

The countries represented in the consortium have already set in place programs to increase skills and aptitudes in the field of entrepreneurship, and in fact, an increase in the number of entrepreneurship courses acceleration programmes is noticed, as well as a tendency for the creation of incubators. Nevertheless, there is a gap in what concerns the design of these supporting mechanisms targeting specific sectors, such as the BIO and HEALTH ones. In these sectors, there is still a need to address specific entrepreneurial and acceleration programs as these fields present different settings and specificities, very different from the general areas involving entrepreneurial skills learning.

Some of the partners involved in this alliance are already involved in the design and implementation of specific strategies to promote entrepreneurship and innovation in these specific sectors and will thus led the way for the project implementation. The Bio and Health areas are strongly relevant for the EU market and economic development because of its ability to innovate and to promote innovation diffusion to other sectors, making them a key driver to the competitiveness of the European economy.

In Italy, Portugal and Spain, the BIOHEALTH sector is already representing a relevant productive sector, lacking however highly effective programs to accelerate knowledge commercialization, and educational programs adjusted to the sector in the field of entrepreneurial skills and competences and commercialization activities of the BIOHEALTH industry.

This means that in these countries, the sector is rapidly evolving and denoting a competitive and profitable branch of the economy (Currently, the UK, France or Germany are leading the way in this sector in Europe). In Portugal, Italy and Spain, these learning models for increasing skills and competences and thus value and profitability of knowledge produced in the BIOHEALTH area through innovative tools and solutions, still need to be designed and developed.

To respond to this important challenge, it is fundamental to intervene on the education level, increasing the knowledge and the expertise of new graduates and young professionals in the field, but also supporting very recently established but very promising high-tech ventures to reach faster and more effectively their maturation stage throughout the commercialization stage.

Much progress has been made in reforming higher education systems in the EU Member States and beyond, but regular EU reports have highlighted that the process is far from being completed. One of the bottlenecks to achieve better health and wellbeing on a large scale is represented by a lack of cooperation between higher education and business. Health care is a national competence but cannot be separated from research. **Investments in research and development must parallel a cross-talk with higher education institutions** to ensure higher education provision is better aligned with the needs of the labour market and avoid dispersal of resources. The EU Supporting growth and jobs document: "An agenda for the modernization of Europe's higher education systems", presents among its main focuses the need to implement student mobility as a means to support their skills development, as well as staff and researcher mobility as a means to promote internationalization and boost quality. The target goal of the proposed regulations is to create effective links between education, research and business. Key issues in this area include stimulating entrepreneurial, creative and innovation skills, promoting partnership and cooperation with business and the creation of regional hubs to support enhanced specialization.

The contribution of higher education to jobs and growth, and its international attractiveness, can be enhanced through close, effective links between education, research and business – the three sides of the 'knowledge triangle'. The Bio-All project stems from the need to fill the gap specific skill gap in the bio-health entrepreneurship supporting systems and in the higher education curricula offers.

The need for more sustainable societies has triggered the demand for the BIOHEALTH sector requiring closer and stronger relationships between Academia (Higher Education Institutions) and Business/Industry, in both ways commercially and educationally. Market requires multidisciplinary human resources, with technical but more importantly t-skills and entrepreneurial mind-sets that allow them to respond to the fast pacing technological and societal demands and explore the innovative potential of the BIOHEALTH sector.

Carrying out with the development of our BIO-ALL project, and to achieve its core objective, which is to strengthen the higher education system to meet the needs of entrepreneurs in the bio-health sector, we need to undertake preparatory measures that will provide a solid backbone and useful guidelines for further activities.

To get it, we need to create a BIOHEALTH roadmap developed together with key actors and end-users that, based on an exhaustive mapping of the current landscapes, trends and lessons learned (state-of-play and good practices) will present possible evolution

scenarios, related strategies and actions and provide recommendations for a brighter future of University-Business Cooperation and entrepreneurial and innovative processes within the sector.

To collect these good practices identified in the European partners' countries (Italy, Portugal and Spain), to benchmark and showcase international good practices, a survey was elaborated (D 1.2) and 60 interviews/questionnaires were carried out in the 3 countries to interlocutors belonging to the following sectors: academia, incubators/accelerators and bio-health businesses. The information obtained stemmed from the analysis of data collected in Italy, Portugal and Spain to produce a report covering 30 good practices.

Moreover, it is our target to encourage and support further engagement of key actors in collaborative actions, as well as to integrate lessons learned in current practices, fostering entrepreneurship and innovation in the BIOHEALTH sector.

1.2. Methodology and data collection

The aims of the present analysis are to:

- Benchmark and showcase of international good practices to encourage and support the further engagement of key actors in collaborative actions, in general, and within the BIO-ALL project as well as the integration of lessons learned in current practices, fostering entrepreneurship and innovation in the BIOHEALTH sector;
- Reinforce the cooperation schemes and routines between and within key actors (Academia, Business and Incubators/ Accelerators).

We intend to encourage stakeholders to engage in the project activities and to establish and sustain a solid collaborative alliance of BIOHEALTH entrepreneurs and innovators and boosters/supporters, as well as disseminate and integrate useful lessons learned into the sector and emerging pathways towards successful business creation and development processes supported and led by HEIs.

The methodology used comprised the collection of 30 good practices identified in the 3 European countries, made possible through a set of 60 interviews to key players involved (Academia, Business and Incubators/ Accelerators). Partners had, thus, collected 10 good examples in each of these categories and each one was supported by 2 interviews (meaning that partners carried out 60 interviews with key-actors).

To develop this deliverable, the evaluative model has the following structure.

Partner	Academy	Business	IncubAcce	Stakeholder
P1	2+4 Inter	2+4 Inter	4+8 Inter	2+4 Inter
P2	2+4 Inter	2+4 Inter	4+8 Inter	2+4 Inter
P3	1+2 Inter	1+2 Inter	2+4 Inter	1+2 Inter
P4	1+2 Inter	1+2 Inter	2+4 Inter	1+2 Inter
Total	6+12 Int	6+12 Inter	12+24 Inter	6+12 Inter
			30 Good Practices	
			60 Interviews	

Fig. 1 Structure of the evaluative model

In this study we worked with a quasi-experimental model whose structure is as follows.

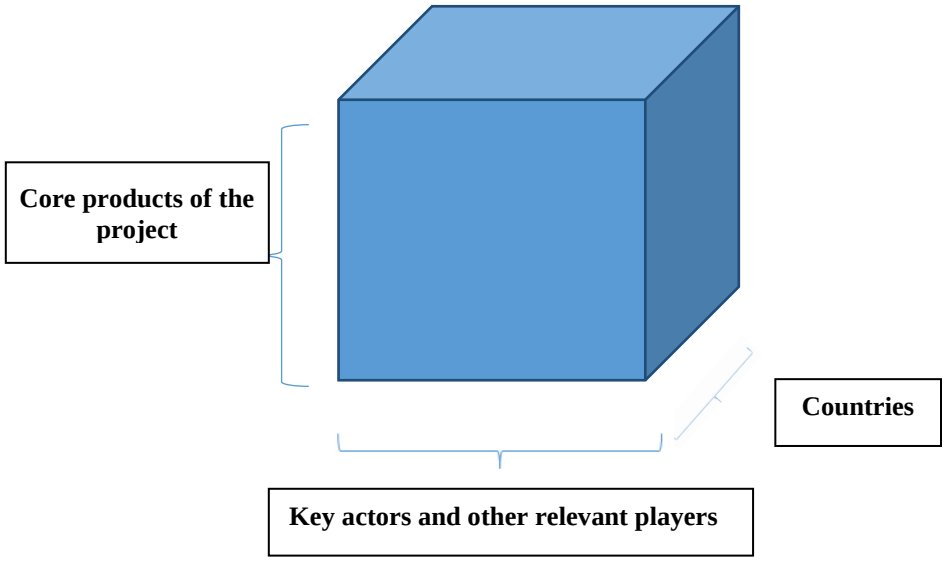

Fig. 2 Structure of the quasi-experimental model

These practices are supposed to be linked with the core products of the project, covering examples of:

i) Advanced studies on innovation or/and entrepreneurship that already have some, extended or exclusively focus on BIOHEALTH sector or that even not having a sectorial approach are referenced as good practices of HEIs educative offer for promoting entrepreneurial competences and processes;

ii) Acceleration programmes with a sectorial focus, preferably linked with high tech businesses in BIO areas or events not having a sectorial approach are referenced as good practices of start-up incubators/accelerators;

iii) University-Business cooperation schemes to foster entrepreneurship and innovation in the BIOHEALTH sector.

To collect these good practices and carry out the interviews we have developed "Supporting Tools". They got us to implement in an efficient and effective way the research process.

These tools are:

- Questionnaire (Appendix A);
- Letter of project presentation to respondents (Appendix B);
- Table for data and info collection (Appendix C).

The objective of the questionnaire was to compile a set of good practices to be benchmarked.

As already mentioned our target groups were key actors in Academia, Business and Incubators/Accelerators – in each country – Italy, Portugal and Spain – plus other

relevant players, including public authorities, innovation agencies, business angels and venture associations, etc.

Partners carried out the interviews to different respondents using "face to face" approach, by phone, via skype call, having the possibility to record via audio or to take notes. There are three different questionnaires, one for each key actors, i.e., Incubators/Accelerators, Academia and Business. The process comprised two steps, firstly, partners could send the questionnaires by e-mail but later it was necessary to make the interviews ("face to face", phone, skype call) to get the most information as possible.

The questionnaire was anonymous and confidential, serving only for data collection and subsequent analysis and action design. This questionnaire has open and closed questions. Only the complete questionnaires were considered. The interviews were performed in the last quarter of 2019.

1.3. Organisation of report

D1.2 BENCHMARKING OF GOOD PRACTICES

The report will be structured in 4 main sections, including (i) introduction (presenting aims and context, methodology and data collection), (ii) the compilation of international good practices to be benchmarked: a review of Italian, Portuguese and Spanish cases (presenting good practices on advanced studies on innovation or/and entrepreneurship in the BIOHEALTH sector, good practices on acceleration programmes in the BIOHEALTH sector and good practices on University-Business cooperation schemes to foster entrepreneurship and innovation in the BIOHEALTH sector), a (iii) summary of lessons learnt and at last the (iv) set of conclusions, limitations and recommendations.

Furthermore, for each of the major sub-parts comprising the advanced studies, the acceleration programmes and the University-Business cooperation schemes, we will present the main features of the practice, identify the units of analysis of the case study, point the perspectives of the key actors involved and summarize the set of lessons learned.

2. Compilation of international good practices to be benchmarked: a review of Italian, Portuguese and Spanish cases

2.1 Process and units characterization

This section will present and discuss the results obtained from the empirical evidence collected from the survey. The content analysis will be presented in three subsections:

i) Good practices on advanced studies on innovation or/and entrepreneurship that already have some, extended or exclusively focus on BIOHEALTH sector;

ii) Acceleration programmes with a sectorial focus, preferably linked with high tech businesses in BIO areas;

iii) University-Business cooperation schemes to foster entrepreneurship and innovation in the BIOHEALTH sector.

In total, we interviewed 60 people, to obtain 30 good practices in the 3 European countries of the project, selecting 10 from each, divided between Academia, Incubators/ Accelerators and Business.

In the next three figures a geographical distribution of the organizations interviewed can be seen; Italy in Fig. 3, Portugal in Fig. 4 and Spain in Fig. 5.

The units of analysis (interviewed) are displayed in the next table (I1 to I10 from Italy; I11 to I20 from Portugal and I21 to I30 from Spain). The choice on the persons to be interviewed was based on their capacity to provide valuable information on the topics covered.

Fig. 3 Geographical distribution of case studies in Italy

Fig. 4 Geographical distribution of case studies in Portugal

Fig. 5 Geographical distribution of case studies in Spain

Identification of the units of analysis of the case study					
Stakeholder	**Unit of analysis**	**Country**	**Organization**	**Role in the organization**	**Organization's profile**
Academia	I1	ITALY	UNIVPM	Professor	UNIVPM is a young university, with professional teaching staff and close to the students for all necessities. A modern didactic structure, equipped with sophisticated tools and wide spaces dedicated to laboratories, sophisticated tools, and functional multimedia classrooms. 5 study courses: Agriculture, Economics, Engineering, Medicine, and Sciences. https://www.univpm.it/Entra/
Academia	I2	ITALY	Alma Mater Studiorum BO	Professor	The University of Bologna has very ancient origins, being the first university in the western world. Its history is intertwined with that of great personalities who worked in the field of science and letters and is an essential reference in the panorama of European culture. The excellence of teaching, cutting-edge research, presence in the area, international openness, and information services: in these and many other areas, Alma Mater promotes and follows the path of innovation today. https://www.unibo.it/it
Academia	I3	ITALY	University of Catania	Professor	There are about 40,000 students enrolled at the University of Catania, the oldest of Sicily, its foundation dates back to 1434. The organization of the teaching is handled today by 17 departments, by the Faculty of Medicine, and by two special didactic units established in the decentralized offices of Ragusa (Modern Languages) and Syracuse (Architecture). A special didactic unit is also the school of excellence "Scuola Superiore di Catania", a higher education centre of the University of Catania conceived in 1998 to select the best young minds and offer them a course of studies including analysis, research and experimentation. https://www.unict.it/
Incubator / accelerator	I4	ITALY	Bioindustry Park Silvano Fumero SpA		"Bioindustry Park offers a full range of services for the companies' growth and development, focusing for 20 years now in the field of Health Life

					Sciences, (thus enhancing research results in the healthcare sector and turn them into technological innovations). The Park offers business location services within an internationally recognized excellence system, thanks to the extensive network of international partnerships and projects, and to the Association of Italian Scientific and Technological Parks (APSTI), the national network of STPs. Also, it offers acceleration and services for startups. Bioindustry Park manages bioPmed, the innovation cluster focused on healthcare industry and life sciences, for which it has also been awarded the European Certification "Gold Label for Excellence of Cluster Management" by ESCA – European Secretariat for Cluster Analysis. A so-called Cluster is a group of players operating in a sector-specific area, and its members are coordinated by a managing organization. Founded in 2009 with the support of Regione Piemonte, the initiative has been funded as part of the Regional Operational program "FESR – POR Piemonte 2007-2013 Attività I.1.2 Poli di innovazione." During its six years since it was started, bioPmed has developed a community of about 400 organizations, including start-ups, small, medium and large enterprises, three local universities, the National Research Council (CNR) and other research institutes and foundations. Over 70 of these organizations, which are all very focused on innovation and collaboration, are today "Full Member" of the bioPmed Innovative Cluster Association, and have set up an interesting network of relations. The Bioindustry Park represents a good practice also in light of its "Bioindustry Park System", comprising scientific services offered within the Park premises by independent scientific laboratories offering professional commercial scientific services and providing companies operating in the life sciences sector with solutions to their R&D departments and acceleration needs. https://www.bioindustrypark.eu/en
Incubator / accelerator	I5	ITALY	The National Cancer Institute - CRO Aviano (PN), Friuli Venezia Giulia Region	TT Officer	The CRO National Cancer Institute (Centro di Riferimento Oncologico) was established in 1981 by the regional government of Friuli Venezia Giulia and began its activities in 1984. It is located in Aviano (PN), in western Friuli (province of Pordenone). Officially recognized by the Italian Ministry of Health in 1990, the CRO works to improve public health by advancing medical knowledge,

					providing outstanding speciality medical care to persons, and preparing tomorrow's physicians, scientists and other health professionals in the field of oncology. It is a public, nonprofit institute operating under the authority of the Italian Health Ministry for the clinical & experimental research functions and shared in the governance by the Friuli Venezia Giulia region as for patient care. CRO's Technology Transfer Office is supported by a grant from the Italian Patent and Trademark Office (UIBM-MISE) and participates to NETVAL and ASTP-PROTON networks that bridge public research and industry. The CRO and namely its Technology Transfer Office (TTO) could be listed between the good practices in close connection to the Bio health sector. CRO TTO's strengthens the economy from collaborations with private by moving results of translational research into societal use. CRO TTO also does IP valorization activities, through technology licensing or support in defining and promoting start-up creation, in collaboration with the Technology Park of Pordenone which hosts most of the entrepreneurial initiatives based on CRO Aviano novel technologies. As IRCCS that ignited 4 of total only 10 spin-off companies from Italian "I.R.C.C.S." research hospitals, CRO acknowledges the importance and difficulties of the entrepreneurial process. CRO TTO coordinates a Working Group under the authority of Italian Ministry of Heath where scarcity of spin-off initiatives is analysed from operational as well as legal perspectives. In February 2020, the Group released "Spin-off: Guidelines for IRCCS". http://www.cro.sanita.fvg.it
Incubator / accelerator	I6	ITALY	The Hive		"It is a private certified incubator by the Ministry of University and Scientific Research according to the Italian legislation of 2013". www.the-hive.it
Incubator / accelerator	I7	ITALY	Cube-Labs		Cube-Labs was founded in 2013 and represents the first Italian platform for participation and transfer of innovative technologies from Academia to large markets, with four offices in Italy between Rome, Milan and Lecce. Through the creation of R&D NewCo's Cube Labs transforms disruptive innovation into enterprises, allowing innovative start-ups and SMEs to embrace a new journey bringing new products to the capital market. Cube-Labs creates, incubates and accelerates technologies in the Life

					Sciences sector by leveraging its network and partnership that allows a close and direct contact with more than 650 researchers, 24 universities and major research institutes in Italy and abroad. Among the international partnerships related to the research and development programme in the European section are: The Ludwig Boltzmann Institute - Wien (R&D pipeline cooperation) and NCBR (R&D program) and PFR Ventures - Poland (Equity program in partnership). Cube-Labs invests directly in its portfolio by creating and developing spin-offs with innovative R&D projects and solid research and track record in the field of interest. Cube-Labs represents a good practice due to its broad network and unique business model in the Italian scenario. Moreover, currently, Cube Labs is one of the most representative firms in the Italian Life Science scenario, controlling a Portfolio of 11 Biotech Spin-Off and has set itself the future goal of reaching 20-25 life science companies within its corporate Portfolio by 2021. www.cube-labs.com
Business	I8	ITALY	Diatech Pharmacogenetics		It is a leading industrial group in Italy in the research and marketing of diagnostic kits for pharmacogenetics tests. Diatech produces personalized drugs and medical products for persons affected by cancer. The sources of its products are scientific publications in the biological, medical and health fields. Diatech Pharmacogenetics operates in the field of molecular medicine and has created a network of associated companies: Diatech s.r.l. is a holding company that holds the capital of the companies Diatech Pharmacogenetics srl, Diatech Lab Line srl, participation in the company BiMind and various real estate activities. www.diatech-meet.it Diatech Labline s.r.l. founded in 2011, it deals with the distribution of products and reagents for molecular and cellular biology laboratories. www.labline.it BiMind S.a.s. a software house that has developed an innovative software package for the computerization of the Oncology and Pathological Anatomy departments. www.bimind.it

Business	I9	ITALY	SOL Group		SOL produces technologies, goods and provides services for the healthcare sector. SOL develops numerous support services for the use of medical gases. It produces gas, technology and provides services for the Chemistry and Pharma industry. SOL continuously improves the characteristics of the services and products offered to these sectors. A wide range of gases and mixtures, of controlled and certified quality and composition; equipment for the distribution and regulation of gas flows or for cryogenics; reliable distribution and delivery logistics: these are all characteristics that see SOL committed to providing a service that meets the needs of its customers daily and are essential elements on which SOL bases the promotion of its products in this sector. All this is a reality with the SOL Group, which thanks to its decades of experience in the field of Health and the continuous contact with all the professional figures in the sector makes its professionalism available to public and private healthcare and assistance structures. The chemical and pharmaceutical sectors are very attentive to the characteristics, quality and certifications of use of the products and equipment used, as well as the reliability of the supply services, on which the outcome of long and expensive production campaigns depends, the quality and competitiveness of their products. http://www.solgroup.com/en
Other	I10	ITALY	Confindustria Lecce Health section		Confindustria Lecce promotes the organization of the entrepreneurs of the Province of Lecce , their solidarity and collaboration in the context of the free society in evolution, aiming, at the same time, to support the awareness of the social and civil values of the business activity. Also, Confindustria Lecce represents the provincial production fabric and associated companies in relations with institutions and administrations, with economic, political, trade union and social organizations. It favours and protects business activities at an economic, trade union and tax level, including through the stipulation of agreements and/or employment contracts and collaboration in the prevention and reconciliation of individual and collective disputes. To achieve this goal, Confindustria promotes relationships and understandings between the associates for the study and resolution of problems of common interest, providing timely information for member companies and offering advice on all issues related to the business world. www.confindustrialecce.it

Academia	I11	PORTUGAL	UBI	Professor	UBI is one of the youngest universities in Portugal, having presently around 8000, nationals and foreigners. UBI offers 30 graduation courses, 59 masters, and 30 doctoral courses in the 5 faculties: Sciences, Engineering, Social Sciences and Humanities, Arts and Literature, and Health Sciences. UBI has 14 research units and 2 associated labs. UBI currently has more than 600 teachers and 270 employees in its five faculties and fourteen departments. UBIMEDICAL is the incubation structure from UBI targeted at accelerating the transference of knowledge and technology to the market in the fields related with health and life sciences, allowing companies to develop research and lab tests needed to commercialize new products. http://www.ubi.pt/en/
Academia	I12	PORTUGAL	ISCTE	Professor	ISCTE - University Institute of Lisbon is a public institution of university education created in 1972. In 2010, the Institute implemented a new organizational structure and became a medium-sized public higher education institution, composed of the following decentralized organizational units: 4 Schools, 16 Departments and 8 Research Units. Degree programmes–88; Number of students-9118 Undergraduate-17; Number of students-4253 Masters-52; Number of students-4048 PhDs-21; Number of students-817
Academia	I13	PORTUGAL	UC	Researcher	With over seven centuries, and celebrating this year its 730th anniversary, the University of Coimbra has a uniquely tangible and intangible heritage, keystone in the scientific culture of Europe and the World, and is a UNESCO World Heritage Site since 2013. The university is organized into eight different faculties according to a wide range of fields, granting academic bachelor's, master's and doctorate degrees in nearly all major fields of knowledge, such as arts, engineering, humanities, mathematics, natural sciences, social sciences, medicine, sports and technologies. It is a founding member of the Coimbra Group, a group of leading European research universities, whose inaugural meeting it hosted. The University of Coimbra has over 20,000 students, and hosts one of the largest communities of international students in Portugal, arguably being the most cosmopolitan Portuguese university.

					www.iscte-iul.pt
Incubator / accelerator	I14	PORTUGAL	BGI	Manager	BGI is an American style, world-class, deep innovation accelerator born from the MIT Portugal Innovation and Entrepreneurship Initiative (IEI). The initiative was a collaboration between the University Institute of Lisbon (ISCTE-IUL), MIT Deshpande Center for Technological Innovation, MIT Entrepreneurship Center, and MIT's School of Engineering. www.bgi.pt
Incubator / accelerator	I15	PORTUGAL	Mello Saúde	Innovation director	José de Mello Saúde develops its activity in the provision of health care in Portugal, with an experience of more than 70 years. Its performance is governed by values such as Respect for the Dignity and Well-Being of the Person, Human Development, Competence and Innovation, which guide a permanent will to be and do better. With a focus on the sustainable development of José de Mello Saúde, innovation accelerates the mission of maintaining a competitive offer, exploring new solutions that generate differentiation and value for clients and professionals. Based on a structured approach to Innovation, José de Mello Saúde captures opportunities that allow the creation of value in the short, medium and long term within the five strategic pillars of its operations. http://www.josedemellosaude.pt/
Incubator / accelerator	I16	PORTUGAL	Beta-i	Manager	Beta-i is an organization created to boost entrepreneurship, and its mission is to foster a true innovation culture. We help new and established businesses grow, by offering 360º innovation services with 6 main areas: Acceleration, Events, Consulting, Open Innovation, Education and Investment. Internationally recognized as one of the leading companies in this field, and for running Lisbon Challenge, one of Europe's most active startup accelerators, since 2010 we have received +5000 applications to our several programs and accelerated over 850 startups that have raised +65M. https://beta-i.com/
Incubator /	I17	PORTUGAL	Made of Lisboa	Manager	The Made of Lisbon platform is a strategic project by CML in the area of

accelerator					Entrepreneurship and Innovation. This platform generates and connects in a network the incubators and accelerators of companies, the Fab Labs, the Coworking Spaces and the Business Angels and Risk Capitals existing in Lisbon. CML acts as a federator and promoter of these actors and initiatives, sharing best practices and strategic partners, promoting and making visible this network or ecosystem on a national and international scale. The portal (madeoflisboa.com) includes a directory with everything you can find in Lisbon. From profile pages of startups and developers to the most important events. In short, it organizes, connects, attracts and informs the community. The directory also includes a set of spots, from incubators, accelerators, coworking spaces, fablabs, creative hubs, homes and investors. Therefore, Lisbon wants to be a starting point for many startups, by betting on a strategy of internationalization and global expansion of the ecosystem. https://madeoflisboa.com/
Business	I18	PORTUGAL	Uphill	Founder	UpHill is a Portuguese startup that develops quality analysis software and advanced training for hospitals. Through the use of their products, health professionals increase the degree of adoption of good international practices. This allows health facilities to increase the quality and safety of care provided. Founded in 2015 at UBI by three doctors, UpHill was distinguished by ANJE with the Young Entrepreneur Award in 2016 and is already present in most private hospitals in Portugal. www.uphill.pt
Business	I19	PORTUGAL	Labfit	Founder	LABFIT is an R&D company (a spin-off from UBI) that provides laboratory services focused on product development and in vitro characterization. LABFIT is owned by two young pharmaceutical women that aim to transfer knowledge and expertise from academic research to the market. Based on the owners R&D activities, LABFIT´s mission is to develop innovative products designed to fit consumer needs regarding dermal and genital health. LABFIT clients regarding the innovative products are both pharmaceutical and medical devices industries as the team develop products to be produced and commercialized as health products to improve health quality.

					www.labfit.pt
Business	I20	PORTUGAL	YDEAL	Director	YDEAL was created by a former medicine student from UBI, Nuno Azevedo, whose specialization is in Urology. With a multidisciplinary consultant team with experts in Medicine, Economics, Informatics, Usability, Design and Communication, YDEAL delivers individually tailored products to the needs of specific stakeholders, addressing different user groups. In addition to their strong portfolio in Prostate Cancer (we developed the online and smartphone versions of the Rotterdam Prostate Cancer Risk Calculator and the new version of PRIAS (Prostate Cancer Research International Active Surveillance), the largest online platform where doctors can manage men with low-risk prostate cancer on active surveillance), YDEAL commercialises other major projects including an eHealth platform that coordinates the national care of patients with chronic kidney failure, and an integrated system for patients that require oxygen therapy, which combines patient monitoring, either in-hospital or at-home, with a patented oxygen gas-valve. www.ydeal.net
Academia	I21	SPAIN	UEE Universidad Economía y Empresa. Oficina de Emprendimiento.UMU	Professor	The University of Murcia has created "umuemprende" (University Entrepreneurship Office), as the body responsible for the design and implementation of its entrepreneurship strategy, generating benefit and creating synergies between the university and its members. https://www.um.es/web/umuemprende/
Academia	I22	SPAIN	UPV/EHU	Professor	The University of the Basque Country applies the IKD (Cooperative and Dynamic learning) method. This student-centred didactics is based on active learning methodologies and enhances both personal and academic skills within trainees. https://www.ehu.eus/es/web/guest
Academia	I23	SPAIN	UGR	Professor	We are an innovative and comprehensive research University, founded in 1531, and built on a long-standing teaching tradition. Its role as a leader in incoming and outgoing student and staff mobility in European and international programmes, and its attractiveness for international students and researchers, make for multicultural campus life and a lively

					cosmopolitan setting. Over the current academic year 2019-2020, 2,600 new international undergraduate students from over 70 countries will complete studies at the UGR, thanks to the diverse range of mobility programmes on offer at our institution. The UGR is the highest-ranked university in the South of Spain and the 4th highest-ranked in Spain, according to the prestigious Shanghai Academic Ranking of World Universities (ARWU 2019). This substantial international standing in both research and education was the reason behind the success of our BioTic excellence initiative, jointly managed by the University, the Spanish National Research Council (CSIC) and the Health Sciences Technology Park. The excellence initiative was built on four pillars of research excellence: Biohealth, Information and Communication Technologies, Earth Sciences, and Heritage, reflecting some of the University's key research strengths. With its fifty supporting partners, the initiative is an excellent example of the University's policy of strong strategic cooperation with public and private, national and international bodies. www.ugr.es
Incubator / accelerator	I24	SPAIN	BIC Granada	Business Development and Networking	BIC Granada promotes university Spin-Offs and technology based start-ups, paying special attention to those related to Health and Life Sciences, providing the conditions needed for the proper development of these enterprises. https://www.bicgranada.org
Incubator / accelerator	I25	SPAIN	Bind 4.0	Coordinator	Bind 4.0 partner companies are market-leading innovators in manufacturing, energy, health and food technology. These Industry 4.0 partners become customers of our startups, offering paid contracts worth up to €150,000 and serving as references. They can also offer access to networks, people, and tools to help build a startup's business. Since the first edition, 70 startups have accelerated their businesses through the program. Bind 4.0 is an acceleration program geared toward tech startups with solutions applied to Advanced Manufacturing, Smart Energy, Health Tech or Food Tech fields. It's a public-private initiative that promotes the

					development of innovative Industry 4.0 projects with top-level organizations and that accelerates the startups through training, high-impact mentorship, and connections to the major industrial players in the Basque Country. https://bind40.com/
Incubator / accelerator	I26	SPAIN	CEEIARAGON	Projects Coordinator	CEEIARAGÓN is a public company attached to the Department of Economy, Planning and Employment whose purpose is to support the development and consolidation of innovative business projects within the industrial sector or advanced services for companies, thus contributing to the generation of wealth and employment of our community. http://www.ceeiaragon.es/
Business	I27	SPAIN	Regemart3d	Founder	REGEMAT 3D is a biotech company pioneer since 2011 in the development of bioprinting systems and regenerative medicine solutions. Their mission is to develop innovative solutions in the area of bioprinting and regenerative medicine towards the clinical application of this amazing technology, we aim to improve people´s quality of life. They are experts in the clinical application of the technology, they have a lot of experience bringing new treatments to patients. Bioprinting shows a huge potential for bringing new solutions. They work with research centres in over 20 countries, working in different applications, from the regeneration of cartilage and skin to the creation of living models for drug development. https://www.regemat3d.com/
Business	I28	SPAIN	vitaHealth	Founder	Vitahealth is a system that predicts future health risks and pathologies on a health risk map, with variables in intensity and probability of occurrence. All based on customer health information. The best online health care system. https://www.vitahealth.app/
Business	I29	SPAIN	IMasMed	Founder	We are able to design and manufacture new products in the field of Biomedical Engineering, due to the know-how of our research team and its experience in product development and manufacture as well as in the quality assurance and certification of medical devices.The strict control of

					the manufacturing process, the direct implication of the partners and the demanding/though quality policy defines i+Med's philosophy and ensures the maximum satisfaction of our clients. i+Med has an innovative character and it can design, develop and manufacture new products in the field of biomedical engineering, thanks to the research expertise of the team and their experience not just in the development of the product and manufacture but also in the quality assurance and medical device certification. https://imasmed.com/

Table 1- Identification of the units of analysis of the case study

2.2 Good practices on advanced studies on innovation or/and entrepreneurship in the BIOHEALTH sector

2.2.1 Educative offer for promoting entrepreneurial competences and processes

In each country, we have selected 3 or 4 academic perspectives to share top practices in the fields of academic courses on innovation and entrepreneurship focused on the Bio Health sector. The next tables illustrate the major outputs received.

Good practice 1 selected for Italy	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
I1 **UNIVPM**	"Every year since 2012 the Università Politecnica delle Marche (UNIVPM) through its Contamination Lab organizes a selection of business ideas presented by students from the five faculties of Agriculture, Economics, Engineering, Medicine, Sciences. In 2018, out of thirty project ideas presented, six business ideas were selected and accepted through a Call. About thirty students belonging to the six proposed business ideas followed an orientation and education course. ,In the end, they were subjected to evaluation during a day expressly dedicated to them. The evaluation took place by a jury made up of representatives of the economic and social realities of the Marche region. A certificate of participation was issued to all participants and cash prizes were awarded for the establishment, start-up and development of the new company. Moreover, UNIVPM offers a course titled: IEB International Economics and Business. I. Aims of the programme To provide the students with a solid knowledge of conducting business in a global environment. To create practical competences in dealing with international	"There is no specific Educational offer for promoting entrepreneurial competences and processes targeted at the bio-health sector. However, the university has a liaison office that supports the development of entrepreneurial projects through assistance and advice in the creation of spin-offs and the formulation of business plans for spin-off new initiatives. It produces Educational offer in terms of conferences and workshops on the protection and enhancement of intellectual property and in terms of exploitation of research through the creation of spin-offs. To facilitate the identification of the skills, resources and research activities of the University, the Service Innovation and Technology Transfer has developed the Research Database, an information system dedicated and accessible online."

	markets by developing effective marketing and commercial strategies. To make the students able to work effectively in foreign and complex organizational situations. II. Content and methodology a. Main functional courses: International Business, International Economics, International Communication, International Banking, Economics of Taxation and Supply Chain and Logistics. b. Main Technical courses: Econometrics, Business Statistic, Budgeting, Country Analysis, Intercultural Relations. c. The methodology will be strongly interactive, to develop concrete competence and operational capabilities in addition to an in depth knowledge. Case discussions, project works, field activities, hands-on exercises will be a relevant part of the programme. III. Professional profile The students graduated from this program will ideally be able to work in the professional roles typical of a local branch or subsidiary of an international company. They will have the responsibility in designing and applying marketing and commercial strategies to succeed in resident markets, facing local and global competition. Skills and Abilities of their role: Entrepreneurship, Autonomy and Adaptability.”	

Table 2 - Identification of Italian good practice 1 on educative offer for promoting entrepreneurial competences and processes

Good practice 2 selected for Italy	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
I2 **Alma Mater Studiorum BO**	"Since 2013, the Alma Mater Studiorum University of Bologna has organized a selection of business ideas presented by students from various faculties through its Almacube, a business incubator. In 2018, thirty business ideas were selected and admitted through a Call and a commission evaluation. About one hundred students attended entrepreneurship education and orientation course. At the end, they were subjected to evaluation with the release of cash prizes for the winners. The projects have been introduced during an Info Day, a public initiative attended by over 5000 people".	"In the Faculties and courses of biotechnology, such as: Agricultural and Food Sciences, Medicine, Pharmacy and Biotechnology, Psychology, Veterinary Medicine. The learning does not stop at the disciplines that are the subject of the course of study, but extends to strategic and transversal skills for instance educational offer for promoting entrepreneurial competences and processes targeted at the bio-health sector, to the knowledge that is crucial for the enhancement of one's potential and resources for the construction of future professional paths."

Table 3 - Identification of Italian good practice 2 on educative offer for promoting entrepreneurial competences and processes

Good practice 3 selected for Italy	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
I3 **University of Catania**	"Numerous courses organized by University of Catania https://www.unict.it/en/education/italian-higher-education-system We can highlight these courses: University Master Courses: This master course aims to reinforce, broaden and hone the skills and expertise of graduates and postgraduates in entrepreneurial processes, utilising and expanding upon previous training to meet the demands of the professional world. There are both 1st and 2nd level University Master courses. Advanced Course: It is a	"In the Faculties and courses of biotechnology there are educational offer for promoting entrepreneurial competences and processes targeted at the bio-health sector. The degree course in Biotechnology aims to train graduates who can fit at various levels in the research and production processes typical of the biotechnology sector. The training course has been designed to acquire knowledge and skills that can be immediately used in the world

	refresher/permanent training course that allows students to develop their entrepreneurial expertise and skills to further improve their professional qualities. To be admitted you must hold a 1st or 2nd level degree. The courses vary in length."	of work, for instance, related to entrepreneurial and management areas. The courses are specifically aimed at achieving the student's educational objectives of the class, in particular, the ability to apply innovative biotechnology, starting from those that are the application areas of the biotech industries and the ability to continuously update, essential in a sector characterized by a rapid increase in scientific knowledge, the three-year graduate in biotechnology will be able to play technical-scientific roles in operational and managerial basic research, medical-diagnostics, agricultural-environmental, pharmaceutical, in bio-industrial production and in the various transformation processes related to them."

Table 4 - Identification of Italian good practice 3 on educative offer for promoting entrepreneurial competences and processes

Good practice 1 selected for Portugal	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
I11 **UBI**	"Graduate degree in management, economy with minor in entrepreneurship, master's degree in: management, economy, management of health units, industrial engineering and management, entrepreneurship; and the curricular unit of entrepreneurship present in some of the courses at the university. Sectors: mostly generalist, industrial and health. Moreover, idea contests are promoted and exist various projects connected to entrepreneurship (for example INESPO, SCIENT and ICT). Moreover, some workshops are organized in regards to entrepreneurship. In all the faculties there is at least a course with the curricular unit of entrepreneurship."	"In the Health Sciences Faculty, in almost all the courses there is a curricular unit of entrepreneurship."

Table 5 - Identification of Portuguese good practice 1 on educative offer for promoting entrepreneurial competences and processes

Table 6 - Identification of Portuguese good practice 2 on educative offer for promoting entrepreneurial

Good practice 2 selected for Portugal	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
I12 **ISCTE**	"Master programmes, course Units mandatory and selective, summer schools, executive education, entrepreneurship centre, incubator, soft skills set, online learning, among others. A new master programme (degree awarding) was created this year and will have the first intake in September 2019. An executive education programme, i.e. the master in health services management, the programme has been part of the educative offer for several years."	"Crossing sector no specific target."

competences and processes

Good practice 3 selected for Portugal	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
I13 **UC**	"Organizes frequently training courses in the areas of entrepreneurship, innovation models, protection and valorisation of results (patents, etc.)."	"There are specific offers targeted to the Health and Biotechnology sectors… Post-graduations and Master's degrees in Biomedicine, Biotechnology and Pharmacy."

Table 7 - Identification of Portuguese good practice 3 on educative offer for promoting entrepreneurial competences and processes

Good practice 1 selected for Spain	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
I21 **UEE**	"Four-hour workshops on entrepreneurial capabilities (we do about 20 per academic year), and other longer programs like: * start the flight (48 hours) * undertake your tfg / tfm (48 hours) * academic entrepreneurs (24 hours) * explorer (more than 100 hours) are transversal programs, directed to the whole university community."	"In this case, we only do workshops of specific entrepreneurial skills in centers such as Faculty of Biology, and less in Medicine and Veterinary Medicine. In the Academic Entrepreneurs program, most participants have been from areas of biotechnology/health, human and animal".

Table 8 - Identification of Spanish good practice 1 on educative offer for promoting entrepreneurial competences and processes

Good practice 2 selected for Spain	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
I22 **UPV**	"Three enterprise creation programs one on each campus: * zitek (vizcaya) * bic berrilan (guipuzcoa) * inizia (araba) Each program carries your enterprise culture program: * generate spin-off * promote the entrepreneurial spirit between students and faculty. Six incubation infrastructures (4 vizcaya: zitek ingenieros, zitek leioa (bio) and zitek portugalete (nautica and naval machines, office and workshops). vizcaya economicas incubadora junior companies araba incubadora de inizia (pharmacy –nutrition and pharma and humanities). Guipuzcoa (korta building entrepreneurship center. chemistry, psychological, computation) training tools: master of entrepreneurship youth entrepreneurship program in collaboration with the Basque government. The scholarship for 40 university projects to make a prototype. Start-innova program, with vocent group, to develop secondary projects. All engineers (4.0), science, technology, navals, farma, humanities, psychology, ict, among others".	"Master of biomedical research with common module of EBT creation pharma nutrition incubator zitek leioa are from that profile in the short building of Guipuzca a lot of what it enters is bio".

Table 9 - Identification of Spanish good practice 2 on educative offer for promoting entrepreneurial competences and processes

Good practice 3 selected for Spain	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
I23 **UGR**	"Numerous courses organized by UGR Emprendedora, such as: Be entrepreneur: Convert your idea into a business model; program UNIVERGEM; entrepreneur talent; convert your TFG/TFM in an entrepreneurial project; social entrepreneurial laboratory; entrepreneurial route for researchers (https://ugremprendedora.ugr.es/categoria-de-programa/formacion-para-emprendedores/)".	Courses aimed at researchers, professors and students of the sector such as: generating entrepreneurial culture in the teaching activity; learning entrepreneurial skills for teaching professionals (https://ugremprendedora.ugr.es/categoria-de-programa/formacion-para-docentes/)."

Table 10 - Identification of Spanish good practice 3 on educative offer for promoting entrepreneurial competences and processes

In the following figure, we can see different sort of good practices regarding educational offers organized by Universities in the countries object of the study (Italy, Portugal and Spain) for promoting entrepreneurial competences and processes in all sectors in general and in Bio-Health sector in particular. The major focus is on the curricular units of entrepreneurship, followed by enterprise creation programs, cross-sectorial teaching and transversal programs.

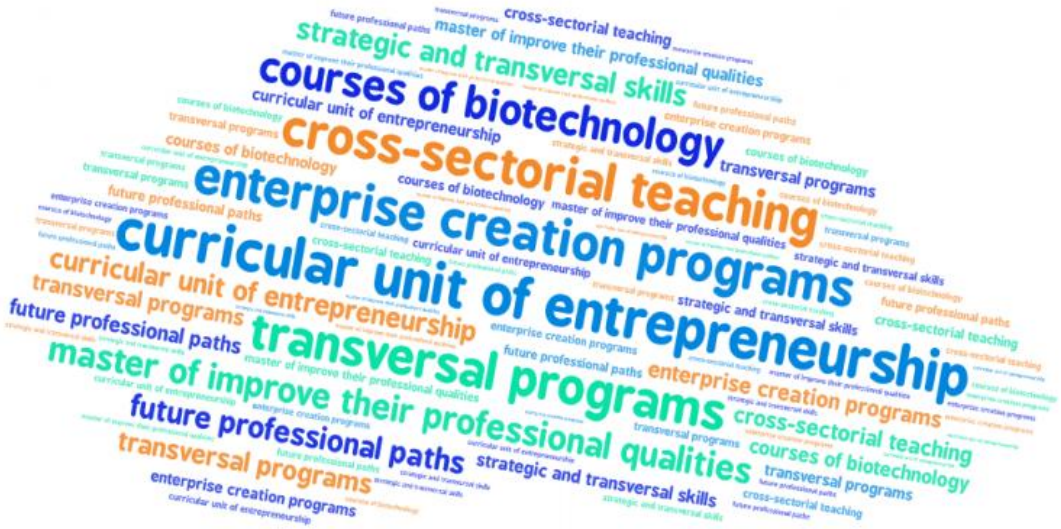

Fig. 6 Most important good practices on educative offer for promoting entrepreneurial competences and processes

2.2.2 Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector

Our interviewees were asked on the existence of advanced studies on innovation and/or entrepreneurship, and specifically if their universities were offering these advanced courses focused on the Bio Health sector. The next tables illustrate the major outputs received.

Good practice 1 selected for Italy	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
I1 **UNIVPM**	"UNIVPM carries out Advanced studies on innovation and/or entrepreneurship in all fields of study, with no differences per sector."	"There are no specific studies for the Bio-Health sector."

Table 11 - Identification of Italian good practice 1 on Advanced studies on innovation and/or entrepreneurship

Good practice 2 selected for Italy	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
I2 **Alma Mater Studiorum BO**	"Research and innovation at the University of Bologna is carried out by over 6,000 teachers, researchers, PhD students and research fellows who operate in a dynamic and multidisciplinary context and is aimed at producing new knowledge, innovation and contributing to their transfer for the benefit economic, social and cultural development. The university offers a program, the L'Open Science that aims to strengthen the dissemination of scientific information on an international scale, to reduce the duplication rate of scientific studies, to strengthen interdisciplinary research, knowledge transfer to companies and transparency for our citizens, to improve the efficiency the use of scientific contributions for educational purposes, to guarantee the conservation of scientific production over time and to favour the correct attribution of intellectual authorship."	"There are no specific studies for the Bio-Health sector."

Table 12 - Identification of Italian good practice 2 on Advanced studies on innovation and/or entrepreneurship

Good practice 2 selected for Italy	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
I3 **University of Catania**	"The University of Catania is the recipient of research funding at the international and national level and it has a long-term involvement in different research programs, both as a coordinator and/or a partner. Regarding the International research, the University participates actively in the Framework Programmes of European Union for Research and it has about two hundred scientific partnerships with Italian and European institutions within the most recent European programmes. These activities allow for the design of Advanced studies on innovation and entrepreneurship transversally for all fields of study."	"There are no specific studies for the Bio-Health sector."

Table 13 - Identification of Italian good practice 3 on Advanced studies on innovation and/or entrepreneurship

Good practice 1 selected for Portugal	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
I11 **UBI**	"We provide Education for entrepreneurship, entrepreneurial intention, succession."	"There is no specific offer for the Bio-Health sector."

Table 14 - Identification of Portuguese good practice 1 on Advanced studies on innovation and/or entrepreneurship

Good practice 2 selected for Portugal	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
I12 **ISCTE**	"We offer Master programmes, course Units mandatory and selective, summer schools, executive education. This educative offer is supported by the entrepreneurship centre."	"An executive education programme, i.e. the master in health services management, programme has been part of the educative offer for several years. MSc in Health Services Management: Integrated in ISCTE Business School, the Master in Health Services Management is a program designed to equip students with the necessary skills to create systems that enable the provision of services that enhance or maintain the health of individuals; deserve the confidence of the people; the technological and demographic protections that occur in society. The full-time Master of Science in Health Services Management provides general management knowledge to health care organizations applying to undergraduates in health or management, with little or no professional experience. It is, therefore, an advanced syllabus suitable for students pursuing a management career in health service organizations."

Table 15 - Identification of Portuguese good practice 2 on Advanced studies on innovation and/or entrepreneurship

Good practice 3 selected for Portugal	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
I13 **UC**	"Organizes the MBA for executives, and the Social intervention Social, Innovation and Entrepreneurship Master course."	"There are no specific offers targeted to the Bio-Health sector."

Table 16 - Identification of Portuguese good practice 3 on Advanced studies on innovation and/or entrepreneurship

Good practice 1 selected for Spain	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
I21 **UEE**	"Transversal, GEM report (regional) and entrepreneurial intention of students".	"There are no specific studies for the Bio-Health sector."

Table 17 - Identification of Spanish good practice 1 on Advanced studies on innovation and/or entrepreneurship

Good practice 2 selected for Spain	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
I22 **UPV**	"Generic. WE have the GEM team. specialized tractor sectors in the country Basque: bio, industry 4.0 and intensive services in knowledge".	"Thesis oriented to transfer processes to understand biosciences, biosensors for video games."

Table 18 - Identification of Spanish good practice 2 on Advanced studies on innovation and/or entrepreneurship

Good practice 3 selected for Spain	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
I23	"UGR emprendedora carries out diverse studies on innovation and entrepreneurship,	"UGR emprendedora carries out diverse studies on innovation and

UGR	such as the Report of the Observatory of academic entrepreneurship, the analysis of the entrepreneurial mind-set of UGR students, Global Entrepreneurship Monitor studies, as you can see in: https://ugremprendedora.ugr.es/sala-de-prensa/estudios-informes-y-publicaciones/"	entrepreneurship, some of them focusing on the bio health sector, such as: https://ugremprendedora.ugr.es/sala-de-prensa/estudios-informes-y-publicaciones/"

Table 19 - Identification of Spanish good practice 3 on Advanced studies on innovation and/or entrepreneurship

In the following figure we can see the different good practices on Advanced studies on innovation and/or entrepreneurship studies carried out by the Universities in the countries object of the study (Italy, Portugal and Spain) in all sectors, and in Bio-Health sector in particular. The most important practices pointed by our interviewees are: L'Open Science Program in Italy, the Global Entrepreneurship Monitoring Report in Spain, the scientific research activities and the international research.

Fig. 7 Most important good practices on advanced studies on innovation and/or entrepreneurship

2.2.3 University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector

Our interviewees were asked if their university carries out regular University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation. The next tables summarize the insights obtained.

Good practice 1 selected for Italy	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
I1 **UNIVPM**	"UNIVPM provides UBC schemes in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), UBC in research (joint R&D, consulting to business, mobility of staff), and UBC in management (governance, shared resources, industry support). The Industrial Liaison Office of the Università Politecnica delle Marche - Innovation and Technology Transfer Service - was established in May 2005 as part of actions aimed to strengthen the cooperation between research structures and territorial production system and improve the research programs of the University, with a high index of innovation through: -Improvement in quantity and quality of the technological offer; -The strengthening of the services offered to researchers and companies; -The development of greater collaboration between academia and enterprises, including through the identification of technology clusters; -Greater visibility and support to new ventures which take origin from the research of the University. It supports the development of entrepreneurial projects through assistance and advice in the creation of spin-offs and the formulation of business plans for spin-off new initiatives. It Produces conferences and workshops on the protection and enhancement of intellectual property and in terms of exploitation of research through the creation of spin-offs. Finally, remark that international students may enrol in programmes and courses in the field of studies of their interest or participate in international exchange programmes at Università Politecnica delle Marche. UNIVPM offers to international students the possibility to participate in the Double Degree programmes. Double degrees are integrated study programmes organized in cooperation with foreign universities and require study periods	"In Bio-Health sector we provide UBC schemes in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), UBC in research (joint R&D, consulting to business, mobility of staff), and UBC in management (governance, shared resources, industry support). UNIVPM participates to the International Master in Marine Biological Resources (IMBRSea), an Erasmus Mundus Joint Master Degree programme organized by nine leading European universities in the field of marine sciences. An Erasmus Mundus Joint Master Degrees is a high-level integrated international study programme delivered by an international consortium of Universities from different countries. The successful completion of the International Master in Marine Biological Resources (IMBRSea) leads to the award of a joint degree".

	abroad at the partner university. After the final examination students are awarded an academic degree by each university participating in the programme".	

Table 20 - Identification of Italian good practice 1 on University-Business cooperation schemes

Good practice 2 selected for Italy	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
I2 **Alma Mater Studiorum BO**	"Alma Mater Studiorum University of Bologna provides UBC schemes in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), UBC in research (joint R&D, consulting to business, mobility of staff), UBC in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and UBC in management (governance, shared resources, industry support). The University of Bologna supports the culture of entrepreneurship, innovation and the enhancement of knowledge, skills, creative ideas and encourage the birth of innovative businesses. Alma Mater supports the creation of spin-offs and start-ups by offering services that facilitate and facilitate the processes of creating new businesses. The University also performs an important system for spurring integration and networking function by allowing accredited spin-offs and start-ups to operate by benefiting from services, concessions and ad hoc synergies with industrial , commercial and financial partners . On the other side, the University's internationalization strategy is based on the recognition and enhancement of the disciplinary variety and ability to network with foreign universities. European projects for education and training are a privileged tool for achieving these objectives, and therefore Unibo actively participates in the actions of the Erasmus + Program".	"In Bio-Health sector provides UBC schemes in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), UBC in research (joint R&D, consulting to business, mobility of staff), and UBC in management (governance, shared resources, industry support)".

Table 21 - Identification of Italian good practice 2 on University-Business cooperation schemes

Good practice 3 selected for Italy	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
I3 **University of Catania**	"The University of Catania provides UBC schemes in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), UBC in research (joint R&D, consulting to business, mobility of staff), UBC in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and UBC in management (governance, shared resources, industry support). Finally, remark that the University of Catania gives foreign students and professors/scholars the possibility to spend up to one-year mobility for study, training and teaching activities within the framework of the Erasmus+ program".	"In the Biotechnological/Health sector, University of Catania carries out regular University-Business cooperation (UBC), especially in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and UBC in management (governance, shared resources, industry support)".

Table 22 - Identification of Italian good practice 3 on University-Business cooperation schemes

Good practice 1 selected for Portugal	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
I11 **UBI**	"For transversal areas, our university provides UBC schemes in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes); in research (joint R&D, consulting to business, mobility of staff); in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and in management (governance, shared resources, industry support)." "Moreover, UBI organizes corporate and/or institutional chairs through UBIExecutive, school of advanced training in collaboration with companies resulting from the collaboration of the University of Beira Interior with entities from various fields, such as business associations and the most important companies in the region. UBIExecutive´s objective is developed courses for professionals, created in close collaboration with companies and adapted to their specific	"The same UBC schemes mentioned are applied and organized in the Bio-Health sector."

	needs. The target audience of UBIExecutive courses are companies, public administration, non-profit organizations and the general public. You will have at your disposal a training offer consisting of programs such as MBA, Open Executive Programs, post-graduate courses that do not confer a degree and training tailored to the needs that may be identified, which may range from business sciences, engineering or health sciences. The actions developed are in the scope of executive direction, directed to professionals in the active. Involving scientific areas of management and economy. A business school was also created. Finally, remark that UBI has student mobility programs with other universities from Europe and out of Europe (Program ICM), mobility through internships."	

Table 23 - Identification of Portuguese good practice 1 on University-Business cooperation schemes

Good practice 2 selected for Portugal	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
I12 **ISCTE**	"UBC in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes); in research (joint R&D, consulting to business, mobility of staff); in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and management (governance, shared resources, industry support)." "Also, ISCTE intends to encourage and strengthen cooperation between the University and enterprises, for that, ISCTE carries out regular University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation, especially in research (joint R&D, consulting to business, mobility of staff), in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and in management (governance, shared resources, industry support). Finally, remark that ISCTE has student mobility	"In the Biotechnological/Health sector, ISCTE carries out regular University-Business cooperation (UBC), especially in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes) and in management (governance, shared resources, and industry support)."

	programs, such as Erasmus + and other mobility programs. So, ISCTE currently maintains Erasmus + partnerships with around 350 higher education institutions in Europe. There are also other student mobility programs in which Iscte participates, such as the Santander Universidades Scholarship Program, the Study in Portugal Network or the Almeida Garrett Program (national mobility). Erasmus Mundus (Degree Mobility) financed by the European Commission, the Erasmus Mundus program favours the creation of master's courses offered by consortia of European universities and universities in third countries. ISCTE has signed more than 200 cooperation agreements with higher education institutions in Third Countries. International students from Iscte partner universities who have already taken the opportunity to do academic mobility or students from non-partner universities have the opportunity to study for one or two semesters at Iscte as Visiting Students (or Free Mover).”	

Table 24 - Identification of Portuguese good practice 2 on University-Business cooperation schemes

Good practice 3 selected for Portugal	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
I13 **UC**	“UC provides UBC schemes in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes); in research (joint R&D, consulting to business, mobility of staff); in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and management (governance, shared resources, industry support).”	“In the Bio-Health, in the area of Biomedicine, pharmaceutical biotechnology and environmental sciences. Start-ups are often created at the institutional College shelter and integrated into partner institutions, as is the case of the Pedro Nunes Institute and Biocant. Companies such as X-Prot and Exogenous Therapeutics are the result of partnerships with Biomedical Research Institutes that belonging to the University of Coimbra.”

Table 25 - Identification of Portuguese good practice 3 on University-Business cooperation schemes

Good practice 1 selected for Spain	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
I21 **UEE**	"UEE provides UBC schemes in research (joint R&D, consulting to business, mobility of staff); in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and at a more general level, in business consulting the focus is on management and information technology issues; In marketing R&D results, there are more diversity of sectors. Finally, remark that UEE has student mobility programs, with Spanish universities, with Europe (Erasmus), United States, and Latin America".	"There are UBC schemes in more diversity of sectors, but not specifically in biotechnology/health as something that prevails, although there are several investigations that are currently in the transfer phase and a specific master course interested in internships in these areas."

Table 26 - Identification of Spanish good practice 1 on University-Business cooperation schemes

Good practice 2 selected for Spain	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
I22 **UPV**	"UPV/EHU provides UBC schemes in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), UBC in research (joint R&D, consulting to business, mobility of staff), UBC in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and UBC in management (governance, shared resources, industry support). In all sectors especially in engineering. Company classrooms are very well developed. Remark that UPV/EHU has student mobility programs such as SENECA, ERASMUS + AND AMERICA LATINAY OTHERS DESTINATIONS https://www.ehu.eus/es/web/nazioarteko-harremanak AND MOBILITY OF PRACTICES: https://www.ehu.eus/es/web/enplegua/mugikortasun-programk"	"In the Biotechnological/Health sector, UPV/EHU carries out regular University-Business cooperation (UBC), especially in research (joint R&D, consulting to business, mobility of staff) and in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship)".

Table 27 - Identification of Spanish good practice 2 on University-Business cooperation schemes

Good practice 3 selected for Spain	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
I23 **UGR**	"UGR provides UBC schemes in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), in research (joint R&D, consulting to business, mobility of staff), in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship) and in management (governance, shared resources, industry support). The University of Granada has an extensive and fruitful international experience and has been at the forefront of Europe in student mobility for years. We have a wide range of international mobility for the university community on five continents. There is currently an offer of more than twenty double, multiple or international joint degrees and we have started teaching experiences in English to enrich the academic offer to local and international students."	"In the Biotechnological/Health sector, UGR carries out regular University-Business cooperation (UBC), especially in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes), in research (joint R&D, consulting to business, mobility of staff)."

Table 28 - Identification of Spanish good practice 3 on University-Business cooperation schemes

In the following figure, we can see the different good practices on University-Business Cooperation (UBC) schemes carried out by the Universities in the countries object of the study (Italy, Portugal and Spain) to foster entrepreneurship and innovation in all sectors and in Bio-Health sector in particular. The most important set of good practices detected are UBC schemes in research, followed by UBC schemes in education, in the valorisation of scientific knowledge and UBC schemes in management.

Fig. 8 Most important good practices on University-Business cooperation schemes

2.2.4 Lessons learned

In summary, the lessons learned on advanced studies on innovation or/and entrepreneurship in the BIOHEALTH sector in the three countries object of our study (Italy, Portugal and Spain), are reflected in the following chart:

	Educational offer for promoting entrepreneurial competences and processes	Educational offer customized to the Bio-Health sector
Good practices selected for Italy	Selection of business ideas presented by students from various faculties. Students belonging to the business ideas followed an orientation and education course. A certificate of participation was issued to all participants and cash prizes were awarded for the establishment, start-up and development of the new company. . University Master Courses: The aim of a master course is to reinforce, broaden and hone the skills and expertise of graduates and postgraduates, utilising and expanding upon previous training to meet the demands of the professional world. . Advanced Course: It is a refresher/permanent training course that allows students to develop their expertise and skills in order to further improve their professional qualities.	Participation in seminars which is configured as structured and cross-sectional teaching. It is compulsory for doctoral students enrolled of the PhD Courses in human Health and in Biomedical Sciences. . Courses of biotechnology:the learning does not stop at the disciplines that are the subject of the course of study, but extends to strategic and transversal skills, to knowledge that is crucial for the enhancement of one's potential and resources for the construction of future professional paths.
Good practices selected for Portugal	. Curricular unit of entrepreneurship present in some of the courses at the university. . Idea contests are promoted and exist various projects connected to entrepreneurship (for example: INESPO, SCIENT and ICT). . Workshops are organized in regards to entrepreneurship. . Trainings in the areas of entrepreneurship, innovation models, protection and valorisation of results (patents, etc.).	. In the Health Sciences Faculty, in almost all the courses there is a curricular unit of entrepreneurship.
Good practices selected for Spain	. Workshops on entrepreneurial capabilities . Longer programs like explorer (more than 100 hours) are transversal programs, directed to the whole university community. . Enterprise creation programs: each program carries your enterprise culture program: * generate spin-off	. Academic Entrepreneurs program, most participants have been from areas of biotechnology / health, human and animal. . Master of biomedical research with troncal module of ebt creation farma nutricio

	* promote the entrepreneurial spirit between students and faculty . Training tools . Master of youth entrepreneurship program in collaboration with the government. . Scholarship for 40 university projects to make a prototype. . Start-innova program, to develop secondary projects.	

Table 29 - Summary of Good practices on entrepreneurial educational offer

	Advanced studies on innovation and/or entrepreneurship	Advanced studies on innovation and/or entrepreneurship in the Bio-Health sector
Good practices selected for Italy	. Advanced studies on innovation and/or entrepreneurship. . L ' Open Science aims to strengthen the dissemination of scientific information on an international scale to improve the efficiency the use of scientific contributions for educational purposes. . Scientific research activities carried out in all departments, by providing research grants for young fellows and reserving a certain amount of its resources to fund research projects. . International research, the University participates actively in the Framework Programmes of European Union for Research.	. There are no specific studies for the Bio-Health sector.
Good practices selected for Portugal	. Education for entrepreneurship, entrepreneurial intention, succession. . Master programmes, course Units mandatory and selective, summer schools, executive education. . Innovation and Entrepreneurship Master course.	. Master of Science in Health Services Management provides general management knowledge to health care organizations applying to undergraduates in health or management, with little or no professional experience. It is, therefore, an advanced syllabus suitable for students pursuing a management career in health service organizations.
Good practices selected for Spain	. Transversal, GEM report (regional) and entrepreneurial intention of students". . Generic. the gem team specialized tractor sectors in the country basque: bio, industry 4.0 and intensive services in knowledge". . Diverses studies on innovation and entrepreneurship, such as the Report of the Observatory of academic entrepreneurship,	. Thesis oriented to transfer processes to understand biosciences ... . Studies about biosensors for video games

Table 30 - Summary of Good practices on Advanced studies on innovation and/or entrepreneurship

	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation	University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector
Good practices selected for Italy	.UBC schemes in education, UBC in research, UBC in valorisation and UBC in management. . To support the development of entrepreneurial projects through assistance and advice in the creation of spin offs. . Conferences and workshops on the protection and enhancement of intellectual property and in terms of exploitation of research through the creation of spin-offs. . To perform an important system integration and networking function by allowing accredited spin-offs and start-ups to operate by benefiting from services, concessions and ad hoc synergies with industrial , commercial and financial partners. . International exchange programmes . Erasmus + Program	. In Bio-Health sector provides UBC schemes in education, UBC in research and UBC in management. . International Master in Marine Biological Resources
Good practices selected for Portugal	.UBC schemes in education, UBC in research, UBC in valorisation and UBC in management. . Corporate and/or institucional chairs through UBIExecutive, school of advanced training in collaboration with companies resulting from the collaboration of University of Beira Interior with entities from various fields. UBIExecutive´s objective is developed courses for professionals, created in close collaboration with companies and adapted to their specific needs. . Regular University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation. . Student mobility programs . Erasmus + Program . Santander Universidades Scholarship Program . The Study in Portugal Network . Almeida Garrett Program . Erasmus Mundus	. In Bio-Health sector provides UBC schemes in education, UBC in research and UBC in management. . Start-ups are often created at the institutional College shelter and integrated into partner institutions X-Prot and Exogenus are the result of partnerships with Biomedical Research Institutes that belonging to the University of Coimbra
Good practices selected for Spain	. UBC schemes in education, UBC in research, UBC in valorisation and UBC in management. . In business consulting the focus is on management and information technology issues; in marketing R&D results, there is	. In Bio-Health sector provides UBC schemes in education, UBC in research and UBC in valorisation.

	more diversity of sectors. . Student mobility programs: Seneca, Erasmus + , Mobility of Practices, etc..	

Table 31 - Summary of Good practices on University-Business cooperation schemes to foster entrepreneurship and innovation

As it can be seen in the table above, in what related to the **Educational Offer for Entrepreneurial Competences and Processes, the three countries** demonstrate to have some **similarities** between them: respondents from both Portugal and Spain state that they have workshops relating to entrepreneurship; both Italy and Portugal have idea contests; Italy and Spain both have Master Courses on Entrepreneurship. As for the **differences**: only Portugal has a curricular unit of Entrepreneurship in some University courses, and Spanish respondents stated to have a scholarship for 40 university projects to develop a prototype.

Bearing in mind the **Educational Offer Customized to the Bio-health sector**, and still observing the table above, we can see that the responses vary and have some **differences between the three countries**. In Italy, PhD Health and Biomedical Sciences students must participate in seminars of cross-sectional teaching. In the Portuguese responses, we see that the Health Sciences Faculty has a curricular unit of Entrepreneurship in almost all courses. In Spain, there is an Academic Entrepreneurs Program, that has most of its participants from the scientific areas of biotechnology and health.

Looking now at the **Advanced Studies on Innovation and /or Entrepreneurship** and starting with the **similarities**, both Italy and Spain refer to the existence of studies and research in the fields of innovation and entrepreneurship. Looking at the **differences** Portugal is the only that refers to the existence of summer schools, executive education and an Innovation and Entrepreneurship Master Course. Respondents from Spain were the only that referred to the execution of a regional report on the entrepreneurial intention of students.

Now regarding the **Advanced Studies on Innovation and /or Entrepreneurship in the Bio-Health sector,** we have three very **different** variants. In Italy, there are no specific studies for the bio-health sector. In Spain, there are some studies related to biosensors and some thesis oriented to the transfer processes. In Portugal, there is a Master's in Science in Health Services Management. Now looking at the University Business Cooperation Schemes to foster entrepreneurship and innovation and starting with the **similarities** all three countries have UBC schemes in Education Research, Valorization and Management; all three also refer the Erasmus+ program and mobility/exchange programs. Respondents from Italy refer to conferences and workshops on the protection of intellectual property. Respondents from Portugal referred to the existence of a Business School that develops courses, in close collaboration with enterprises, for professionals.

Finally, the **University-Business Cooperation Schemes to foster entrepreneurship and innovation in the Bio-Health Sector** and starting with the **similarities** all three countries have UBC schemes in Education and Research. Portugal and Italy add to that UBC Schemes in Management, and Spain has UBC in valorisation.

2.3 Good practices on acceleration programmes in the Bio-Health sector

2.3.1 Startups selection processes for the acceleration/incubation program

Following, we have asked the stakeholders from incubators and accelerators how the companies are selected to participate in the acceleration/incubation programs. Next tables show the major results.

Good practice 1 selected for Italy	Startups' selection processes for the acceleration/incubation program
I4 **Bioindustry Park Silvano Fumero SpA**	"They are identified through the analysis of startup contest winners".

Table 32 - Identification of Italian good practice 1 on Startups' selection processes for the acceleration/incubation program

Good practice 2 selected for Italy	Startups' selection processes for the acceleration/incubation program
I5 **The National Cancer Institute - CRO Aviano (PN)**	"Candidate companies, responding to a call for startup, are selected by an evaluation committee made up of entrepreneurship experts, representatives of the academic/financial world and of the incubator itself. In selecting candidates, the selection committee applies evaluation criteria set out in the calls/calls for start-ups".

Table 33 - Identification of Italian good practice 2 on Startups' selection processes for the acceleration/incubation program

Good practice 3 selected for Italy	Startups' selection processes for the acceleration/incubation program
I6 **The Hive**	"Mainly through calls or defined selections. For a period, they were also selected through a counter, always through selections (no call for tenders). Start uppers are selected through an in-person interview and analysis of the documentation, when present".

Table 34 - Identification of Italian good practice 3 on Startups' selection processes for the acceleration/incubation program

Good practice 4 selected for Italy	Startups' selection processes for the acceleration/incubation program
I7 **Cube-Labs**	"Cube-Labs source of innovation stems from the solid research in the academic and university scenario thanks to a solid long term partnership with I.N.B.B., the largest inter-university innovative consortium in Life Sciences in Italy; which affiliates 24 universities and the CNR and more than 650 among scientists, leaders and researchers. Cube-Labs and INBB undersigned in December 2017 a strategic cooperation agreement giving to Cube-Labs prior access and a first right refusal for all the R&D projects selected and presented by the Life Science Consortium to Cube-Labs. The Scientific Board bases the start-ups' selection process on the presentation of an average of 10-15 projects per month to Cube-Labs attention and the final judgment for acceptance (or refusal) of them is based on a rubric that considers the following parameters: Innovation of R&D on future trends; IPR strength & patentability; TRL and R&D status; Time to market. The Scientific Board is composed of experienced clinicians and scientists that, depending on the above-mentioned parameters and criteria are selected among the I.N.B.B. board of directors and Cube-Labs members."

Table 35 - Identification of Italian good practice 4 on Startups' selection processes for the acceleration/incubation program

Good practice 1 selected for Portugal	Startups' selection processes for the acceleration/incubation program
I14 **BGI**	"Candidates apply through a competitive, open call. Out of an average of 100 applications, 30 to 35 are shortlisted for a 45 min online interview. Based on this interview, 8 to 12 are selected and invited to join the accelerator."

Table 36 - Identification of Portuguese good practice 1 on Startups' selection processes for the acceleration/incubation program

Good practice 2 selected for Portugal	Startups' selection processes for the acceleration/incubation program
I15 **Mello Saúde**	"We scout for startups that have or are developing solutions that fit with our strategic needs, which we identify every year. Our Innovation team meets with the startup team and collects information that we pass on to a business stakeholder, who then decides if our company should partner with the startup."

Table 37 - Identification of Portuguese good practice 2 on Startups' selection processes for the acceleration/incubation program

Good practice 3 selected for Portugal	Startups' selection processes for the acceleration/incubation program
I16 **Beta-i**	"The startups are selected according to the requirements of each program. For open innovation programs, it's about meeting the challenges addressed by Corporates; for our flagship acceleration program, it's according to its potential of growth and the founders' profile."

Table 38 - Identification of Portuguese good practice 3 on Startups' selection processes for the acceleration/incubation program

Good practice 4 selected for Portugal	Startups' selection processes for the acceleration/incubation program
I17 **Made of Lisboa**	"The startups/projects are selected according to the requirements of each program. For incubation application, the entrepreneur will have to fill in and submit an appropriate application form, with the identification, the CV, a brief description of the project to be applied and other relevant documents to the business analysis. Subsequently, a presentation of the project is made and an interview with the promoter(s). This information will be reviewed by the UBImedical team. For the seed capital and pre-incubation, the HealthCUP is intended for the University of Beira Interior community, namely teachers, researchers, scholars, students and alumni of any level and alumni of any level. Individuals over the age of 18, of any nationality, competing individually or as a team, are admitted to the contest. Candidates may also apply for ideas/project promoters who, in compliance with the terms of the previous point, but who have no formal connection with the University of Beira Interior, undertake to settle in the region and to validate and accelerate the idea in the structure of UBIMEDICAL, in case they get awarded. The selection will be performed before the beginning of the program. The jury will take into consideration the following criteria: Quality and viability of the business plan, Promoters' skills, Commitment of promoters to the project, Viability for the acquisition of the necessary funds for the development of the project and Performance of promoters during acceleration program. For the hackathons, it's about meeting the challenges addressed; for the Health Cup our seed capital, it's according to its potential of growth and the founders' profile."

Table 39 - Identification of Portuguese good practice 4 on Startups' selection processes for the acceleration/incubation program

Good practice 1 selected for Spain	Startups' selection processes for the acceleration/incubation program
I24 **BIC Granada**	"We have a provision of conditions for the incubation procedure in the European Centre for Business and Innovation BIC Granada. This Fold includes selection criteria for access to the incubation program. The following aspects are evaluated: Activity Sector, Technology Level (EBT), Degree of need for incubation and incompatibility with other BIC companies Following the assessment, the Committee is proposed to decide whether or not to admit applicant company/Project. Through a request, the first analysis of concordance with the objectives of the incubator and thorough risk analysis".

Table 40 - Identification of Portuguese good practice 1 on Startups' selection processes for the acceleration/incubation program

Good practice 2 selected for Spain	Startups' selection processes for the acceleration/incubation program
I25 **Bind 4.0**	"The BIND 4.0 program is a private-public initiative, unique in this format, which promotes the development of innovative projects in the field of Industry 4.0 with high-level corporates; In short, the main objective is to accelerate international startups through the contract they get with at least one corporate partner of the Program, while offering them a complete training, mentoring, etc. service. Therefore, the startups participating in the Program, previously apply in an open Call and after a selection and evaluation process by the corporate partner."

Table 41 - Identification of Portuguese good practice 2 on Startups' selection processes for the acceleration/incubation program

Good practice 3 selected for Spain	Startups' selection processes for the acceleration/incubation program
I26 **CEEIARAGON**	"When a company comes to our incubator, a Company Plan is made and they are screened for both technical and economic feasibility. Then it is presented to a technical committee formed by several members where is decided if the company has the necessary components for the project to move forward, that is, the promoter team, the business model, growth and scalability, innovation are valued, economic viability . The innovative component of the business project, the training, capacity and knowledge of the market of the project's promoting partners, and the economic-financial structure of the business project are valued."

Table 42 - Identification of Portuguese good practice 3 on Startups' selection processes for the acceleration/incubation program

In the following figure, we can see how the start-ups are selected for the acceleration/incubation program in the countries object of the study (Italy, Portugal and Spain) and what parameters are considered. The most important good practices on Startups' selection processes for the acceleration/incubation program pointed by interviewees were procedures like: open competitive calls, evaluated by selection committees and scientific boards, based on established evaluation criteria, using in-person interviews and following a selection and evaluation process.

Fig. 9 Most important good practices on startups' selection processes for the acceleration/incubation program

2.3.2 Incubator/accelerator's characteristics (staff, sector of activity, processes, services offered, duration of program, startup funding)

Following, we have asked the stakeholders from incubators and accelerators about characteristics incubator/accelerator's staff involved in the acceleration/incubation program are, in which sectors their acceleration/incubation programs focus on, process by which a startup goes through in the acceleration/incubation programs, services which their the incubator/accelerator provides, how long their acceleration/incubation programs are and finally if their incubator/accelerator provides some support or investment to the companies.

Bioindustry Park Silvano Fumero SpA	
Staff	32 FTE. 2 with a scientific background. 1 with a managerial background. 2 women. 1 PhD. Provision of services to companies in the life science and research sector.
Sector	Pharma, diagnostic, biomedical, life science service.
Startups' characteristics	At least 1 year of life (typically), team presence, IP, credible business plan.
Processes	The process by which a startup goes through in our incubation program is like this: 1) technological analysis 2) strategy identification 3) business modelling 4) team building 5) business plan revamping 6) networking We use agile techniques in our process, such as: Lean startups, design thinking, business modelling.
Services	Tutoring, Access to potential investors, Define and develop your initial products, Identify customer segments, Identify resources (capital, employees, etc.), Establish a business model Design and test its scalability, Workspace, Opportunities for networking, Access to university and technology resources and expertise Others: internationalisation.

	The Park offers business location services within an internationally recognized excellence system, thanks to the extensive network of international partnerships and projects, and to the Association of Italian Scientific and Technological Parks (APSTI), the national network of STPs. Besides, it offers acceleration and services for startups. The Bioindustry Park represents a good practice also thanks to "Bioindustry Park System" comprising scientific services offered within the Park premises by independent scientific laboratories (for commercial scientific services and providing companies operating in the life sciences sector with solutions to their R&D departments and acceleration needs).
Duration	Overall accelerator duration:12 months.
Funding	We don´t fund or invest in the companies.

Table 43 - Italian good practices on Incubator/accelerator's characteristics: Bioindustry Park Silvano Fumero SpA

National Cancer Institute - CRO Aviano (PN)	
Staff	Specialist degree / old system; Project Manager / Business Consultant; Female gender; Average age - 36 years; 10+ years in incubation activities; no previous experiences as an entrepreneur.
Sector	ICT & Digital; ICC – Cultural, Creative and Tourist Companies; Environment and Energy; Social Innovation.
Startups' characteristics	The incubator selects certified innovative startups, which meet the evaluation criteria provided by the call for startups, mainly attributable to the innovation of the project, the validity of the team, the economic/financial sustainability of the project, the patentability of the idea/project and the size and market prospects. Average size: micro enterprises Maturity stage: less than 3/5 years Sectors: ICT & Digital; ICC - Cultural, Creative and Tourist Companies; Environment and Energy; Social Innovation.
Processes	Once selected, the startups access a path that is structured in different phases (timing). The path is tailored to the needs of startups and projects followed within the incubator. These courses allow offering free support / entrepreneurial training services to the selected beneficiaries. The main services include: support for drafting business plans/business models, research for financing opportunities, entrepreneurial training, networking, mentoring, support in pitch preparation, dedicated offices/coworking spaces, network of support professionals". We use agile techniques in our process, such as: Lean startups, business modelling and we develop open innovation and hackathon

	initiatives to connect consolidated companies and startups. Cross-border mentoring programs to develop collaborations also on foreign markets.
Services	Financing, Tutoring Access to potential investors, Define and develop your initial products, Identify customer segments, Identify resources (capital, employees, etc .), Establish a business model, Workspace Opportunities for networking, Access to university and technology resources and expertise. Others: Non-repayable grants, Access to specialist advice, Mentoring programs, Internationalization, Entrepreneurial training.
Duration	Overall accelerator duration: between 6-12 months.
Funding	Loans; Special fund for innovative startups: startups can obtain loans at a subsidized rate and without presenting real guarantees up to a maximum amount of € 50,000; companies physically incubated at Friuli Innovazione; Contributions; In the context of specific calls for startups, cash prizes (non-refundable contributions) may be provided; In the current model, companies are not expected to enter venture capital.

Table 44 - Italian good practices on Incubator/accelerator's characteristics: National Cancer Institute - CRO Aviano (PN)

The Hive	
Staff	All graduates; someone with PhD. Type of degree: economics and commerce, management engineering, more technical/specialist degrees. Average of 10 years' experience. Gender: predominantly male. Average age: 40 years. 1 person with previous experience as an entrepreneur. 2 people with previous experience in private companies. The rest of the team (cca 6 people) experience in the incubator.
Sector	Main sector: Life Science, ICT, ICC - Creative Cultural Enterprises. Other sectors: energy and circular economy.

Startups' characteristics	Very different. It depends on the programs that I support, and therefore on the underlying funding. Generally, they come from different fronts: a) people who come from the world of private or public research; b) people who already have a business and want to diversify their proposal; c) people with an entrepreneurial idea from scratch, young and old from any background. They are companies that intend to be innovative and go over time on global markets. The average size is 3-4 founders, they are often in the idea phase therefore without having formally established the company. Average size (> 80%): € 100k-200k turnover. With a product that is not always definitive - some even come with a prototype (cca 50%). Few employees: founding members and collaborators; 5-10 units Maturity phase: TRL 6 or 7 and acceleration.
Processes	Acceleration: selection through specific calls. Participation in a specific call -> 1st selection -> training -> 2nd selection direct following. The calls are both promoted by the interviewed reality and in other calls ("external") in which they are involved. To date, concerning Life Science, the calls are mainly promoted by the interviewed reality. Incubation: a) selection through the counter - those who have an idea send their application/project, which is evaluated, also by calling the interested party, and any subsequent selection for following. b) selection through specific calls. Participation in a specific call for tenders -> 1st selection -> training -> 2nd selection -> following." For developing our program we Mostly use Bill Aulet's MIT technique - Entrepreneur discipline. 24 steps for a successful startup, as co-authors of the process/technique. Then the discipline itself uses other tools, such as the Ostewalder Canvas. Moreover, we are introducing a methodological evolution of the 24 steps for a successful startup (The Entrepreneur Discipline).
Services	Financing, Tutoring, Access to potential investors, Define and develop your initial products, Identify customer segments, Identify resources (capital, employees, etc .), Establish a business model, design and test its scalability, Initial capital, Workspace, Opportunities for networking, Access to university and technology resources and expertise. Others: involvement of beneficiaries in European calls/projects in which the interviewed reality participates.

Duration	Duration: 12 to 36 months.
Funding	Seed capital: between €40k and €70k.

Table 45 - Italian good practices on Incubator/accelerator's characteristics: The Hive

Cube-Labs	
Staff	Cube-Labs accelerates innovative R&D projects and academic start-ups (pre-seed - seed staged companies) in the life science field.
Sector	Pharma, diagnostic, biomedical, nutraceuticals and medtech.
Startups' characteristics	Cube-Labs selects certified innovative start-ups in the life science field, which meet the Scientific Board's evaluation criteria through its strategic cooperation agreement with INBB (giving to Cube-Labs prior access and a first right refusal for all the R&D projects selected and presented by the Life Science Consortium to Cube-Labs). Parameters and criteria listed on page 37.
Processes	CUBE-LABS operates through exclusive commercial agreements for the participation, development and transfer of biotech scientific technologies in the Life Sciences field, to the main markets. Cube-Labs accelerates innovative R&D projects and academic start-ups (pre-seed - seed staged companies) in the life science field. Cube-Labs promotes and implements development of IP by acting as a bridge between the scientific community and commercial markets. In detail: • Incubator of novel technologies selected innovative academia spin-offs; • Business accelerator to network life sciences, market and partners. • Technological transfer platform from start-up phase and growth to go to market phase.
Services	The participating start-ups are provided with an internal CRO, marketing and brand package and IP protection.
Duration	Acceleration may last in the range of 18 months to 48 months and then the exit until 72 Months.
Funding	Cube-Labs builds a bridge between the investment and finance availability of the academic spin-offs (as well as of the incubated innovative SMEs) through direct investment of Cube Labs or Club Deals for the boosting and marketing of the innovationn. The Company also offers specific knowledge and financing options to the spin-offs, thanks to the established business relationshipss with national and international financial institutions.

Table 46 - Italian good practices on Incubator/accelerator's characteristics: Cube-Labs

BGI	
Staff	"Core team: 10+ professionals with an average of 10 years' experience in discipline topics ranging from Finance, Engineering, Software and Marketing/communication. Balanced team in terms of gender. 40% have had prior entrepreneurial experiences. A network of over 200 global mentors/experts."
Sector	"Health tech; Smart cities; Blockchain & AI platforms; blue ocean economy. Acceleration methodologies for Biotech and healthcare differ from other sectors. Both in terms of stage gate processes but also in terms of regulatory affairs and funding. Our programs take into account those specificities."
Startups' characteristics	Strong founding team, including technologists and marketers Deep technology, large market potential (1B€+), highly Scalable, Proprietary technology; the pre-validated solution to a large, prevailing problem (TRL 3 to 6). Sectors: Health tech; Smart cities; Blockchain & AI platforms; blue ocean economy.
Processes	"4 intensive boot camps; 2 in EU and 1 in the US. Other immersive experiences possible, on a case-by-case basis. 3-month structured mentor program. 1 pre-demo day. 1 demo day. Ongoing support post accelerator graduation, average 5 years, or until exit or liquidation. The program is based on MIT's long-tested methodology for early-stage business and growth acceleration. Specifically, it provides an expert weekly mentorship for 3 months, 1 pre-demo day and 1 demo day. Overall accelerator duration for graduation: 1 year (average). Ongoing support post accelerator graduation, average 5 years, or until exit or liquidation. During the acceleration program, three bootcamps are celebrated with professional coaching, two in Lisbon, Portugal and one in Boston, USA. These bootcamps help the startups to understand how the investors think. The main outcome is understanding how to prepare the business to approach an investor, it helped them to have a "feeling" of how their business is related to what an investor wants. Moreover, the acceleration program provides access to a global network of investors, corporations, partners through invitation-only events."
Services	"Financing; Tutoring; Access to potential investors; Define and develop initial products; Identify customer segments; Identify resources (capital, employees, etc.); Establish a business model; Design and test its scalability; Initial capital; Workspace; Opportunities for networking; Access to university and technology resources and expertise; Access to market services."
Duration	"Overall accelerator duration for graduation: 1 year (average)."
Funding	"Pre-seed, typically up to 30k€ / venture."

Table 47 - Portuguese good practices on Incubator/accelerator's characteristics: BGI

Beta-i	
Staff	"Again, we have two streams. For open innovation between corporates and startups, it's more about project managers, industries experts with connections with the ecosystem, and people with track record on management and consultancy. Regarding acceleration, we have a core team of 4 people, all of them with personal experiences as entrepreneur or ecosystem promoter. We have our own methodology to train the whole team and our outside mentors. Besides, Beta-i has people from 10 different countries and the gender balance is almost 50/50%."
Sector	"Fintech, healthtech, blue economy, retail, tourism, public services, energy and so on."
Startups' characteristics	"It also depends on the requirements of each program. Some of them require bigger / more developed startups, some of them require smaller / early stage ones. We're experts in a bunch of industries such as fintech, healthtech, blue economy, retail, tourism, public services, energy and so on."
Processes	"Our acceleration programs are diversified: The Journey is a 5-month program for startups to pilot innovative solutions that can be applied in addressing travel and tourism players challenges; SOL is growing to a multi-vertical approach with specific programs for specific key city challenges. The first to be launched was SOL Mobility; Free Electrons is the global energy startup accelerator program that connects the world's most promising startups with leading utility companies to co-create the future of energy; Protechting is an accelerator focussed on insurance. Powered by Fidelidade & Fosun and supported by Beta-I; SIBSpayforward - 30 years ago SIBS started the startup way to turn into one of the World's top Fintech innovators. Now, it is paying forward, by creating this opportunity: a 2-month program with top methodologies and experts; techcare is a Novartis startup program run in Lisbon in partnership with Deloitte Digital and Beta-i, with a one-week bootcamp with Novartis professionals and affiliated healthcare experts and the possibility of running a pilot with the best solutions to reimagine the future in the healthcare ecosystem; Start_Pulse - Banco Credibom, from Crédit Agricole Group, is opening the doors to collaboration with startups, with the support of Beta-i. We are looking for solutions that can help enhance customer experience and optimize Credibom operational and commercial efficiency; priojumpstart - This intensive program by Prio, the fastest moving energy company in Portugal, will power up a solution, put it face-to-face with who decides and allow to co-create the future of energy and mobility; EDPstarter - acceleration program to get a prototype off the ground and run the pilot with edp, one of Europe's main key players within the energy sector; amorimcorkventures - a 2-month acceleration program for those who consider themselves to be the most innovative startup around with a cork related idea. We select up to 14 startups; DDD - A startup program by Deloitte, supported by Beta-i, focused on digital solutions to disrupt the insurance industry. It is a 3-part program divided into Bootcamp, Accelerator, and Integration. The open innovation programs follow a proper framework, slightly adapted according to clients' needs. We use agile techniques: Google Sprints (Google Ventures), weekly challenges, Kanban and SCRUM, it really depends on the startup necessity."
Services	"Financing; Tutoring; Access to potential investors; Define and develop your initial products; Identify customer segments; Identify resources (capital, employees, etc.); Establish a business model; Design and test its scalability; Initial capital; Work space;

	Opportunities for networking; Access to university and technology resources and expertise.”
Duration	“It depends but no more than 6 months.”
Funding	“We provide seed capital.”

Table 48 - Portuguese good practices on Incubator/accelerator’s characteristics: Beta-i

Made of Lisboa	
Staff	“Position / Roles: Executive Director: Management, Head of Strategy: Mentorship, Investment, Partnership; Head of Finance and Programs: Finances and Acceleration Programs; Head of Operations: Internationalization, HR; Manager: Contact with the Founders/Startups incubated; Content Manager: Marketing, Digital, Communication, Events, External Affairs; Head of PR: Press and Social Media. Gender: 4 Female / 5 Male; Average Age: 35; Prior Experience in Incubation: 1-2; Prior Experience as Entrepreneur: 2-3"
Sector	“Business Products/Services Consumer Products/Services Consulting Design Education Finance Food/Beverage Gaming Hardware Healthcare/Medical/Fitness Industrial/Energy Internet/E-Commerce Investment IT Services Legal Lifestyle/Fashion Marketing/Advertising Media/Entertainment Mobile Real Estate Software Sports Tech Tourism/Travel Transportation Travel Other energy.”
Startups’ characteristics	“Can be either individuals or startups. Our companies are transversal, from RESEACH AND ACADEMIA, BUSINESS and ASSOCIATIONS AND NONPROFIT. We have a community of entrepreneurs from a range of areas: Business Products/Services Consumer Products/Services Consulting Design Education Finance Food/Beverage Gaming Hardware Healthcare/Medical/Fitness Industrial/Energy Internet/E-Commerce Investment IT Services Legal Lifestyle/Fashion Marketing/Advertising Media/Entertainment Mobile Real Estate Software Sports Tech Tourism/Travel Transportation Travel Other energy.”
Processes	“Startups or entrepreneurs apply for the community space and events in the official Lisbon entrepreneurial ecosystem where they can find all the city innovative entrepreneurs pinpointed - and get involved too. It has a Community Directory, Collaborative workspace, innovative entrepreneurs and startup companies. It is a free and open entrepreneur community where anyone can express themselves and cooperate in its construction. This platform is all about you and your startup business, so make use of our feedback tool to stand up for yourself.
Services	“Financing; Tutoring; Access to potential investors; Define and develop your initial products; Identify customer segments; Identify resources (capital, employees, etc.); Establish a business model; Design and test its scalability; Initial capital; Work space; Opportunities for networking; Access to university and technology resources and expertise.”

Duration	"Less than 2 months."
Funding	"We do no not fund or invest in the companies, as well, we don't take any equity."

Table 49 - Portuguese good practices on Incubator/accelerator's characteristics: Made of Lisboa

BIC Granada	
Staff	The staff has a higher university academic training, where the 75% are women, with an average age close to 45 and with more than 15 years of Work experience at BIC Granada. Depending on the maturity of the project, the needs of the project, and the route to incubate and accelerate it, the profile of the staff involved in the program is different. A technician from the organization always participates and, depending on the specific characteristics, expert staff participate in a specific area. All technicians are licensed in different areas of knowledge and with a minimum experience of 10 years.
Sector	Sectors of Biotechnology, Biohealth, Bioinformatics, ICT related to health services or complementary services to bio EBTs.
Startups' characteristics	Mainly, companies based on technology and/or knowledge whose activity is geared towards the Biotechnology, Biohealth, Bioinformatics, ICT related to health services or services complementary to EBTs bio. They are SMEs and innovative technology-based companies, usually or primarily from the BIO/HEALTH sector.
Processes	Business model preparation, access to space if required, connection with local, national and international innovation environment and help in the search for public and private financial resources. The duration of the incubation program is 5 years maximum. Regarding the incubation process, we have a methodology divided into 10 stages or phases, called LabToMarket, in which we work with the project from the result of the research (laboratory), analyzing and defining the aspects that influence the viability to the end of the work during which we will decide whether the company is formed. The sector we are targeting is mainly Biotechnological, therefore, we not have different incubation programs. It is a very peculiar sector, in which there is no basic entrepreneur, but a scientist, who does not possess a business idea, but a very peculiar knowledge, language and times are not the standards of the entrepreneurial ecosystem. For this reason we have developed the LabToMarket methodology, to serve the scientific entrepreneur. Regarding the acceleration process we work with an Expert Pool, depending on the needs of each project.

Services	Financing, Tutoring, Access to potential investors, Identify customer segments, Identify resources (capital, employees, etc .), Establish a business model, Work space and Opportunities for networking.
Duration	Overall accelerator duration:6 months.
Funding	We don´t fund or invest in the companies.

Table 50 - Spanish good practices on Incubator/accelerator's characteristics: BIC Granada

Bind 4.0	
Staff	Graduates / Engineers, project managers / directors, both genders, more feminine than masculine, 43 years of average age with more than 10 years of previous experience in supporting and tutoring technology-based entrepreneurs from public incubators and / or strategic consulting and deal.
Sector	Tech, Advanced Manufacturing, Energy, Health Tech and Food Tech.
Startups' characteristics	Startups with solutions based on 4.0 technologies such as IoT, cybersecurity, additive manufacturing, robotics, Big Data, Artificial Vision, Artificial Intelligence etc. that can be applied to the fields of Advanced Manufacturing, Energy, Health Tech and Food Tech. In the field of health, biotechnology, drug discovery and pharma are out. It focuses on medical devices and digital health.
Processes	The main value of the acceleration program is the project created by the startup and the tractor company that was selected during the 6 months duration of the same. In addition, other support is offered as mentoring, with international mentors specialized in different aspects that startups may need, strategy, financing, commercial action, investment, regulation..., we also organize very specialized training sessions, in the field of bio/health for example of regulatory medical devices in the different European countries and access to the USA MARKET. Phase 1: Open call for startups- (two and a half months) Phase 2: Corporates' assessment - (three and a half months) Phase 3: Program Start; training, mentoring, networking, etc. In addition to the start of the project with the corporate.- 6 months. The program promotes market access for startups, opens them up to the possibility of having a first large customer that serves as a reference for new customers. In some cases, the assigned mentor may use these methodologies if necessary". https://bind40.com/acceleration-program/

Services	Financing; Tutoring; Access to potential investors; Identify customer segments; Work space; Opportunities for networking; Others: Access to market services.
Duration	6 months.
Funding	NO, the project jointly developed between the start-up and the tractor company is financed directly by the tractor company. A contract is established between the two parties with a minimum of 25,000 euros of the project budget. Currently, we have launched the fourth edition of the program and the new vertical of FOOD TECH has been opened. a Venture Club has also been created with 12 funds interested in the type of startups participating in BIND 4.

Table 51 - Spanish good practices on Incubator/accelerator's characteristics: Bind 4.0

CEEIARAGON	
Staff	Human teams formed by men and women with an average age of 45 years, with superior training in Economic Sciences or Engineering, with an average experience of 15 years in management and support of projects of entrepreneurs, and knowledgeable about the characteristics of the phenomenon undertake in our in our reference region.
Sector	We are not closed to any business project that incorporates some innovative feature. In our case we have had projects in the biotechnology, advanced electronics, programming and software, industry 4.0., Energy, …
Startups' characteristics	Young companies, recently created. •Medium-high risk of business failure, depending on the level of innovation in product or production process incorporated by the company. •Human teams with a high degree of preparation and technical competence. •Adequate capitalization in the initial phase in the development of the company.
Processes	After the first contacts and interviews we detect if the project fits with the philosophy of CEEI projects. - Next, we ask for your business plan or descriptive documentation of your business project. - We analyze the documentation, assess different working hypotheses related to the key points of the business project and finish preparing with the entrepreneur his Business Plan. - The next step is to approve the business project in an internal Technical Committee. - Signing of the lease contract for the technical facilities it will occupy in the hatchery (three years with option to extend two more) - Once installed in the incubator, the monitoring phase of the business project begins with the objective of supporting it in its business

	development.
Services	Financing; Tutoring; Access to potential investors; Define and develop your initial products; Identify customer segments; Identify resources (capital, employees, etc.); Establish a business model; Design and test its scalability; Initial capital; Work space; Opportunities for networking; Access to university and technology resources and expertise and others; Marketing and communication.
Duration	We are an incubator so our start-ups can be in our facilities three years expandable up to five.
Funding	We don´t finance our start-ups but we help them to look for capital.

Table 52 - Spanish good practices on Incubator/accelerator's characteristics: CEEIARAGON

In the following figure we can see the most important good practices on Incubator/accelerator's characteristics in the three countries. The most highlighted incubator/accelerator´s characteristics are the support to internationalisation, the labtomarket methodology, the work space, the connection promoted with potential investors, the use of agile techniques. The startups´ sectors most mentioned are pharma, biotechnology and healthtech, are highly scalable, innovative, own a credible business plan, are young companies with a strong founding team. Most of the companies incubated and/or accelerated stay in the incubation for more or less 12 months.

Fig. 10 Most important good practices on incubation/acceleration' characteristics (staff, sector of activity, processes, services offered, duration of program, startup funding)

2.3.3 Lessons learned

In summary, the lessons learned on acceleration programmes in the three countries object of our study (Italy, Portugal and Spain), are reflected in the following chart:

	Startup's selection processes for the acceleration / incubation program	Startups' characteristics	Staff	Sector	Processes	Services	Duration	Funding
Good practices selected for Italy	. Responding to a call for startup. In selecting candidates, the selection committee applies evaluation criteria set out in the calls / calls for start-ups. . Through a counter, always through selections (no call for tenders) . Considering the following parameters: Innovation of R&D on future trends; IPR strength & patentability; TRL and R&D status;	. At least 1 year of life . Credible business plan . Innovative startups . micro enterprises . Maturity stage: less than 3/5 years . The average size is 3-4 founders, . (> 80%): € 100k-200k turnover. . Few employees: founding members and collaborators . Maturity phase: TRL 6 or 7 and acceleration	. Scientific background . Managerial background . . All graduates; someone with PhD. . Average age - 36 years . 10+ years in incubation activities . Person with previous experience as an entrepreneur. . People with	Pharma, diagnostic, biomedical, life science services, ICT & Digital; ICC - Cultural, Creative and Tourist Companies; Environment and Energy; Social Innovation and Circular Economy.	1) technological analysis 2) strategy identification 3) business modeling 4) team building 5) business plan revamping 6) networking .Bill Aulet's MIT technique - Entrepreneur discipline. 24 steps for a successful startup, as co-authors of the process / technique. .Ostewalder Canvas . Agile techniques: Lean startups, design thinking, business	. Tutoring, . Access to potential investors . Define and develop your initial products . Identify customer segments, . Identify resources (capital, employees, etc ...) . Establish a business model . Design and test its scalability . Work space . Opportunities for networking . Access to university and technology resources and expertise .	. Acceleration: between 6-12 months . Incubator:of 18 months to 48 moths and then the exit until 72 months	. Seed capital: between €40k and €70k." . Loans at a subsidized rate and without presenting real guarantees up to a maximum amount of € 50,000. . Cash prizes

	Time to market.		previous experience in private companies.		modelling . Open innovation and hackathon initiatives to connect consolidated companies and startups. .Cross-border mentoring programs to develop collaborations also on foreign markets	Internationalisation . Non-repayable grants . Access to specialist advice . Mentoring programs . Entrepreneurial training. . Involvement of beneficiaries in European calls/projects		

Table 53 - Summary of Good practices on Italian acceleration programmes

	Startup's selection processes for the acceleration / incubation program	Startups' characteristics	Staff	Sector	Processes	Services	Duration	Funding
Good practices selected for Portugal	. Through a competitive, open call. . Scout for startups that have or are developing solutions that fit with our strategic needs, business stakeholder decides if our company should partner with startup. . The startups are selected according to the requirements of each program, entrepreneur will have to fill in and submit an appropriate applicate form, a presentation of	. Strong founding team . Deep technology . large market potential (1B€+) . Highly Scalable . Proprietary technology . (TRL 3 to 6). . Teams between 2 to 20 employees. . Young companies, recently created. . Medium-high risk of business failure	. Professionals with an average 10 years' experience in discipline topics ranging from Finance, Engineering, Software and Marketing / communication. . Balanced team in terms of gender. . Average age is between 27 and 35. .	Mostly fintech, healthtech, blue economy, retail, tourism, public services, energy.	. 3-month structured mentor program, 1 pre-demo day, 1 demo day. Ongoing support post accelerator graduation, average 5 years, or until exit or liquidation. . Grow program: CONNECT, VALIDATE, PILOT and BOOST. .Techcare is a Novartis startup program run in Lisbon in partnership with Deloitte Digital and Beta-i, with a one-week bootcamp with	. Tutoring . Access to potential investors . Define and develop your initial products . Identify customer segments, . Identify resources (capital, employees, etc ...) . Establish a business model . Design and test its scalability . Work space . Opportunities for networking . Access to university and technology resources and expertise . Access to	. Acceleration: between 0-12 months	. Pre-seed, typically up to 30k€ / venture. . Paying customers.

	the project is made and an interview with the promoter(s).		Entrepreneurial experiences and experience in incubation. . experience in innovation management. . A network of over 200 global mentors / experts.		Novartis professionals and affiliated healthcare experts and the possibility of running a pilot with the best solutions to reimagine the future in the healthcare ecosystem.	market services . Financial Compensation for the Pilot.		

Table 54 - Summary of Good practices on Portuguese acceleration programmes

	Startup's selection processes for the acceleration / incubation program	Startups' characteristics	Staff	Sector	Processes	Services	Duration	Funding
Good practices selected for Spain	. Selection criteria for access to the incubation program.Following the assessment, the Committee is proposed to decide whether or not to admit applicant company/Project. . Apply in an open Call and after a selection and evaluation process by the corporate partner. . Company Plan is made and they are screened for both technical and economic feasibility. Then it is presented to a	. SMEs and innovative technology-based companies, usually or primarily from the BIO/HEALTH sector . Young companies, recently created. . Medium-high risk of business failure. . Human teams with a high degree of preparation and technical competence. . Adequate capitalization in the initial phase in the development of the company"	. Higher university academic training. . 40 years of average age . More than 10 years of previous experience in supporting and tutoring technology -based entrepreneurs.	Biotechnology, Biosanitary, Bioinformatics, ICT related to health services, manufacturing, energy, industry 4.0.	. LabToMarket methodology (divided into 10 stages or phases) to serve the scientific entrepreneur. . Phase 1: Open call for startups- (two and a half months), Phase 2: Corporates' assessment - (three and a half months) and Phase 3: Program Start; training, mentoring, networking, etc. market access . Analyze the documentation, assess different	. Tutoring . Access to potential investors . Define and develop your initial products, . Identify customer segments . Identify resources (capital, employees, etc ...), . Establish a business model . Design and test its scalability, . Work space, . Opportunities for networking, . Access to university and technology	. Acceleration: less 6 months . Incubator:36 months expandable up to 60 months	. The company is financed directly by the tractor company. . Venture Club with 12 funds interested in the type of startups

	technical committee				working hypotheses and finish preparing with the entrepreneur his Business Plan. The next step is to approve the business project in an internal Technical Committee. Signing of the lease contract for the technical facilities it will occupy in the hatchery (three years with option to extend two more)	resources and expertise . Access to market services . Marketing and communicatio n		

Table 55 - Summary of Good practices on Spanish acceleration programmes

As it can be seen in the table above, in what related to the **startups selection processes for the acceleration/incubation program**, the **three countries** demonstrate to have some **similarities** between them: in all of them, most of the startups are selected through a competitive, open call and after a selection and evaluation process by the selection committee or by the corporate partner. In Portugal besides, startups apply in an open Call, the accelerators scout for startups that have or are developing solutions that fit with their strategic needs, business stakeholder decides if their company should partner with a startup.

According to the **startup´s characteristics in all countries** have to be innovative startups with a credible business plan, highly scalable and strong founding team with a high degree of preparation and technical competence. Mostly the main **difference** is the maturity stage, while in Italy more the startups have at least 1 year of life and less than 3/5 years, in Portugal and Spain are young companies, recently created with the medium-high risk of business failure. Also in Portugal and Spain, most of the companies are in TRL 3 to 6 while in Italy the companies are in a more maturity phase: TRL 6 or 7 and acceleration.

About **characteristics incubator/accelerator´s staff** involved in the acceleration/incubation program, in the three countries, the staff is composed by people all graduate with higher university academic training and in Italy case someone with PhD. Also, the staff has more than 10 years of previous experience in supporting and tutoring technology-based entrepreneurs. Remark that in Italy the staff is people with previous experience in private companies too.

In Italy and Spain, the average age is 40 years while in Portugal the staff is a little bit younger between 27 and 35 and in all countries, in general, there is a balanced team in terms of gender depends on the incubator/accelerator but not the country.

About the **startups´ sectors**, in the three countries, there are startups from Bio Health sector such as, pharma, diagnostic, biomedical, life science services, healthtech, biotechnology, biosanitary. Remark in Spain, Bioinformatics and ICT related to health services sector manufacturing, energy, industry 4.0. Both in Italy and Portugal there are startups from tourism and energy.

Regarding the **process by which a startup goes through** in the incubator/accelerator´s programs, in **all countries** more or less follow the same process: 1) technological analysis, 2) strategy identification, 3) business modelling, 4) team building, 5) business plan revamping, 6) networking. Nevertheless, **each country uses specific techniques**, such as:

- In Italy, incubators/accelerators use: Bill Aulet's MIT technique - Entrepreneur discipline, 24 steps for a successful startup, Ostewalder Canvas, Agile techniques: Lean startups, design thinking, business modelling, open innovation, hackathon initiatives to connect consolidated companies and startups, and Cross-border mentoring programs to develop collaborations also with foreign markets;
- In Portugal, incubators/accelerators use: intensive bootcamps; immersive experiences possible, on a case-by-case basis; structured mentor programs; pre-demo days and demo days; ongoing support post accelerator graduation, average 5 years, or until exit or liquidation; the acceleration program provides access to a global network of investors, corporations, partners through invitation-only events;

programs in use also comprise the steps of connecting, validating, piloting and boosting; other techniques are tailored programs sponsored by pharma companies, like Novartis (with a one-week bootcamp with Novartis professionals and affiliated healthcare experts and the possibility of running a pilot with the best solutions);
- In Spain, incubators/accelerators use: a LabToMarket methodology (divided into 10 stages or phases) to serve the scientific entrepreneur.

Looking now at the **services** which the incubator/accelerator provides apart from the general services such as: tutoring, establish a business model, workspace, which are offered **by the three countries**, **each country has their services**. So Italian incubators/accelerators mostly provide services around internationalisation, non-repayable grants, access to specialist advice, mentoring programs, entrepreneurial training, Involvement of beneficiaries in European calls/projects. In Portugal, the most cited services are the access to financing; tutoring; access to potential investors; definition and development of initial products; identification of customer segments; identification of resources (capital, employees, etc.); establishment of a business model; design and test products' scalability; workspace; opportunities for networking; access to university and technology resources and expertise; access to market services. In Spain, the most shown set of services provided are: access to financing; tutoring; access to potential investors; identification and access to customer segments; mapping resources (capital, employees, etc.); establishing a business model; workspace and support for networking.

About the **duration of the acceleration/incubation programs**, Italy and Portugal have acceleration programs longer than Spain, that is between 6-12 months, while in Spain most of them last less than 6 months.

Finally, in the three countries, the **startups receive funding** in different ways and stages, normally when the startups are starting-up. In Portugal, the pre-seed, typically corresponds to 30k€, in Italy the seed capital varies between €40k and €70k. In Spain, the company is financed directly by the tractor company.

2.4 Good practices on University-Business cooperation schemes to foster entrepreneurship and innovation in the Bio-Health sector

2.4.1 Technical and practical business support activities, aiming at increasing innovation

In each country, we have interviewed a set of businesses to unveil their perspectives regarding technical and practical business support activities, aiming at increasing innovation and growth capacities perspectives to share top practices in the fields of academic courses on innovation and entrepreneurship focused on the BioHealth sector. Next table summarizes such perspectives.

Good practice 1 selected for Italy	Technical and practical business support activities for innovation and growth
I8 **Diatech Pharmacogenetics**	"Diatech carries out R&D activities within the group and encourages innovation studying and scientific reading articles and publications Moreover, our company carries out contacts and connections with national, European and international experts and professionals, such as MEDICA, the leading international trade fair for the medical sector and TSCO (Thai Society of Clinical Oncology) annual meeting."
Good practice 2 selected for Italy	**Technical and practical business support activities for innovation and growth**
I9 **SOL Group**	"We carry out R&D activities within the group and encourage innovation by setting up new companies. Moreover, our company carries out contacts and connections with national, European and international experts and professionals."
Good practice 3 selected for Italy	**Technical and practical business support activities for innovation and growth**
I10 **Confindustria Lecce Health section**	"We carry out activities to raise awareness and support the technical and practical business with the aim of supporting companies in their growth and development. We carry out, through a dedicated Desk, networking activities with professionals in the field of credit, finance, communication, consulting on organizational models business. Confindustria Lecce accompanies companies in the development and preparation of services based on the real needs of businesses, promoting in-depth studies, as well as debates and conferences on economic, social and institutional issues of general interest and specific to the Lecce industry."

Table 56 - Identification of Italian good practices on technical and practical business support activities for innovation and growth capacities

Good practice 1 selected for Portugal	Technical and practical business support activities for innovation and growth
I18 **UPHILL**	"We have human resources whose main activity is to manage partnerships with research institutions. We don't have yet an individualized department of research with specific metrics. Our company carries out staff mobility actions, including networking and mentoring opportunities with selected experts and professionals in the scope of partnerships or financed actions, like the project 'linksup'."

Good practice 2 selected for Portugal	Technical and practical business support activities for innovation and growth
I19 **LABFIT**	"We have human resources whose main activity is to manage innovation with research institutions. We don't have yet an individualized department of research with specific metrics. Labfit organizes staff mobility actions, including networking activities with specific experts and professionals by participating in scientific events of the speciality, in cosmetic and pharmaceutical industry fairs, or in discussions with experts to assess market needs."
Good practice 3 selected for Portugal	**Technical and practical business support activities for innovation and growth**
I20 **YDEAL**	"Novabase entails specific initiatives to develop internal innovation and growth capacities, by using special methodologies, such as business canvas applied to new products and services. "Regarding mobility actions, including networking/mentoring opportunities with experts and professionals, we have one mobility staff with a retire comprising 2 weeks, to develop new skills."

Table 57 - Identification of Portuguese good practices on technical and practical business support activities for innovation and growth capacities

Good practice 1 selected for Spain	Technical and practical business support activities for innovation and growth
I27 **Regemart3d**	"Development of 3D bioprinting system, development of tissue maturation bioreactors and R&D new medical technologies. We researchers want to innovate, we want to create unique things, in accordance we need a unique system. REGEMAT 3D the world leader in the development of bioprinting technologies and its clinical applications is the only company worldwide that customizes your system to your specific application. Regarding mobility actions, including networking/mentoring opportunities with experts and professionals, we attend at conferences and events in the sector and we realize workshops for researchers of bioprinting. Also, we carry out tutoring students, doctorates, postdocs. : https://www.youtube.com/watch?v=8pcd4cCqjQ8"
Good practice 2 selected for Spain	**Technical and practical business support activities for innovation and growth**
I28 **vitaHealth**	"Customized health software development. Vitahealth generates a diet based on the anthropometric and personal characteristics of the client. All our technology is in in the cloud, accessible from any device with an Internet connection. You will never lose your data."

Good practice 3 selected for Spain	Technical and practical business support activities for innovation and growth
I29 **IMasMed**	"Innovation in R&D processes in the field of biomaterials for biomedicine. Open innovation projects in collaboration with the University of the Basque Country (UPV / EHU). Regarding mobility actions, including networking/mentoring opportunities with experts and professionals, we participate in processes carried out by Bic Araba and at the same time, we collaborate as support in some days of the UPV / EHU and days of learning in Alava. Also, we participate in actions coordinated by the EU and by the Basque Health Cluster."
Good practice 4 selected for Spain	**Technical and practical business support activities for innovation and growth**
I30 **WoldPathol**	"Cross design sessions for product improvement. Analysis of unsolved market trends and approach of new lines of development accordingly. Mentoring opportunities with experts and professionals, for example with Dr. Huw Hughes (Ex-Director General de Zoetis Internacional Inc)."

Table 58 - Identification of Spanish good practices on technical and practical business support activities for innovation and growth capacities

In the following figure, we can see different technical and practical business support activities, that Bio-Health Businesses carry out for innovation and growth capacities in the countries object of the study (Italy, Portugal and Spain). In the majority of the cases, the good practices on technical and practical business support activities for innovation and growth capacities that were more cited were the participation in scientific events, cross design sessions, staff mobility activities, participation in special methodologies, such as the business canvas, participation in international trade fairs and in networking and mentoring initiatives.

Fig. 11 Most important good practices on technical and practical business support activities, aiming at increasing innovation

2.4.2 University-Business cooperation schemes to foster entrepreneurship and innovation

We asked our selected best practices companies what sort of University-Business cooperation schemes to foster entrepreneurship and innovation they were involved. The following table sums up the perspectives.

Good practice 1 selected for Italy	University-Business cooperation schemes to foster entrepreneurship and innovation
I8 **Diatech Pharmacogenetics**	"UBC in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes) and in research (joint R&D, consulting to business and mobility of staff). Normally we use an internal organisation to organise such activities."
Good practice 2 selected for Italy	**University-Business cooperation schemes to foster entrepreneurship and innovation**
I9 **SOL Group**	"UBC in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes) and in research (joint R&D, consulting to business and mobility of staff). Normally we use an internal organisation to organise such activities. The SOL Group is aware that no company organisation should carry out its activity without taking into due consideration the indications and expectations of all its stakeholders. It is the stakeholders who guide our behaviour and drive us to improve continually: for this reason, we keep constantly open channels of communication with all those who can influence our decisions and our actions and whose actions and decisions can be influenced by us".
Good practice 3 selected for Italy	**University-Business cooperation schemes to foster entrepreneurship and innovation**
I10 **Confindustria Lecce Health section**	"UBC in education (mobility of students, curriculum co-design and/or co-delivery, dual education programmes) and in valorisation (commercialisation of R&D results, academic entrepreneurship, student entrepreneurship). We use both external parties and internal organisation to organize such activities. The Health Section of Confindustria Lecce was established in 2006 to deepen the relationships between accredited private structures and the world of public health."

Table 59 - Identification of Italian good practices on University-Business cooperation schemes to foster entrepreneurship and innovation

Good practice 1 selected for Portugal	University-Business cooperation schemes to foster entrepreneurship and innovation
I18 **UPHILL**	"UBC in education (mobility of students); UBC in research (joint R&D, consulting to other business and universities, 2 of our CEOs are researchers and teachers at UBI – University of Beira Interior); UBC in valorisation (commercialisation of R&D results – our research results were transferred into the spin-off creation, academic entrepreneurship). Our company carries out the internal organization of such initiatives but also gets support from external parties which provide some of these. Examples are: Hospital Luz Saúde, Caixa Capital, universities, incubator UBImedical, Startup Lisboa, etc.."
Good practice 2 selected for Portugal	**University-Business cooperation schemes to foster entrepreneurship and innovation**
I19 **LABFIT**	"UBC in education (mobility of students; doctoral programs in the company with UBI support; master students doing their thesis inside the company); UBC in research (joint R&D between our company and UBI and other universities, at the national and international level, consulting to other businesses, mobility of staff - 2 of our CEOs are researchers and teachers at UBI); UBC in valorisation (commercialisation of R&D results - our research results were transferred into the spin-off creation). Labfit organizes some of these schemes but also gets involved in others organized and provided by external stakeholders, like universities, the incubator UBImedical, other startups incubated in our incubator, other pharmaceutical companies, the CCDRC – Regional Development Agency, the Health Cluster, among others."
Good practice 3 selected for Portugal	**University-Business cooperation schemes to foster entrepreneurship and innovation**
I20 **YDEAL**	"UBC in education (mobility of students through internal staff and student internships); UBC in research (joint R&D with UBI and other universities and UBImedical's startups, consulting to other businesses); UBC in valorisation (commercialisation of R&D results through the transference of academic knowledge of our CEO). Regarding these actions, we organize some internally, but also receive input from external stakeholders that provide such schemes targeted at Ydeal and others, for example, the ones provided by UBImedical."

Table 60 - Identification of Portuguese good practices on University-Business cooperation schemes to foster entrepreneurship and innovation

Good practice 1 selected for Spain	University-Business cooperation schemes to foster entrepreneurship and innovation
I27 **Regemart3d**	"UBC in research (joint R&D, consulting to other business and to universities, 2 of our CEOs are researchers and teachers at UBI – University of Beira Interior) and in valorisation (commercialisation of R&D results – our research results were transferred into the spin-off creation, academic entrepreneurship). Normally they use an internal organisation to organise such activities."
Good practice 2 selected for Spain	**University-Business cooperation schemes to foster entrepreneurship and innovation**
I28 **vitaHealth**	"VitaHealth haven´t participated in UBC schemes till now".
Good practice 3 selected for Spain	**University-Business cooperation schemes to foster entrepreneurship and innovation**
I29 **IMasMed**	"UBC in education (mobility of students through internal staff and student internships); in research (joint R&D with universities and other incubated startups, consulting to other businesses); in valorisation (commercialisation of R&D results through the transference of academic knowledge of our CEO) and in management (governance, shared resources, industry support). i+Med actively exploits partnering and collaboration opportunities with universities, research institutions and companies, to complement its expertise and boost the innovation process. Hence, we do believe in mutual trust and recognize the added value of combining experience and complementary competences. We use both external parties and internal organisation to organize such activities."
Good practice 4 selected for Spain	**University-Business cooperation schemes to foster entrepreneurship and innovation**
I30 **WoldPathol**	"UBC in research (joint R&D with universities and startups, consulting to other businesses) and in management (governance, shared resources, industry support)."

Table 61 - Identification of Spanish good practices on University-Business cooperation schemes to foster entrepreneurship and innovation

In the following figure, we can see the most frequent good practices on University-Business cooperation schemes to foster entrepreneurship and innovation for the countries object of the study (Italy, Portugal and Spain) and how these Bio-health businesses organize such activities. As so, the majority mentioned the activities involving UBC in research, in education, in the valorisation of knowledge results and in management. Also of importance are the activities of partnering and collaboration and the open channels of communication.

Fig. 12 Most important good practices on University-Business cooperation schemes to foster entrepreneurship and innovation

2.4.3 Training programs in the company

The selected set of cases were asked if they have cross-training programs among their employees. Cross-training is about learning how to do more than one specific job to become professionally well-rounded. Cross-training enables a staff member (the "visiting staff member") to learn how to execute specific tasks by working with another staff member (the "receiving staff member") for a set period). Next tables present the major outputs received.

Good practice 1 selected for Italy	Training programs to foster entrepreneurship and innovation
I8 **Diatech Pharmacogenetics**	"We haven´t carried out training programs until now."
Good practice 2 selected for Italy	**Training programs to foster entrepreneurship and innovation**
I9 **SOL Group**	"Throughout the Group, training takes place in the field and, where necessary, is itinerant.

	All new employees are followed by a specially nominated company tutor who follows their integration into the company with the most suitable methods and timing. Special training courses, held by internal and external instructors, are arranged annually by each management as part of an annual plan in close collaboration with Personnel Management".
Good practice 3 selected for Italy	**Training programs to foster entrepreneurship and innovation**
I10 **Confindustria Lecce Health section**	"We haven´t carried out training programs until now."

Table 62 - Identification of Italian good practices on training programs to foster entrepreneurship and innovation

Good practice1 selected for Portugal	**Training programs to foster entrepreneurship and innovation**
I18 **UPHILL**	"All employees have initial training, using the cross-training. The receptor staff member is someone responsible for/on the department in which the employee will be integrated. We also create tutorials to facilitate the learning of other members of the organization."
Good practice 2 selected for Portugal	**Training programs to foster entrepreneurship and innovation**
I19 **LABFIT**	"The LabFit team is versatile and, such as, staff are qualified for a variety of tasks. The internal qualification process for conducting tests and other activities begins with the reading of procedures and associated documents and obligatorily includes training by a staff member (observes to do, does with observation, does autonomously and results are compared with those of the technician who qualifies). The qualification plan is defined by the employee who qualifies."
Good practice 3 selected for Portugal	**Training programs to foster entrepreneurship and innovation**
I20 **YDEAL**	"Some training programs are customer made for us, we may have this with different parts and technical workshops, very specific. We receive initial incoming training, using the cross-training, essentially provided by the responsible of the department in which the employee will be integrated. Whenever we start working with a specific technology, we go to the headquarters to have or give training on technology. There is an internal training program (annual) in the company that includes the participation of employees in workshops integrated into international courses and aimed at the acquisition of skills and abilities. The definition of this plan is the responsibility of the administration (with the person responsible for quality) but integrates the information and suggestions of employees regarding the training needs that they identify."

Table 63 - Identification of Portuguese good practices on training programs to foster entrepreneurship and innovation

Good practice 1 selected for Spain	Training programs to foster entrepreneurship and innovation
I27 **Regemart3d**	"Training in commercial, marketing, logistics and administration areas. Tasks related to these departments. Training and structured collaboration between Lab researchers and company engineers".
Good practice 2 selected for Spain	**Training programs to foster entrepreneurship and innovation**
I28 **vitaHealth**	"VitaHealth hasn´t carried out training programs until now."
Good practice 3 selected for Spain	**Training programs to foster entrepreneurship and innovation**
I29 **IMasMed**	"Tasks focused on the procedures and operation of the laboratory and quality system internal. Equipment management and system quality. There are open working groups to develop the different professional skills and in regards to R&D, the reference researchers give workshops at least once a year. Risk prevention, quality, staff R&D: Specific work in a cleanroom, equipment utilization. Also, i+Med takes part actively in International Research Consortiums. The research is an important pillar of our company, for this reason, we look for collaborations with other research centres or companies. i+Med takes part actively in international research consortiums with research teams from universities and specialized companies to innovate in the field of smart nanotechnologies related to biomaterials development for the controlled release of active substances. These collaborations are also set up with customers to solve specific problems and satisfy their requirements".
Good practice 4 selected for Spain	**Training programs to foster entrepreneurship and innovation**
I30 **WoldPathol**	"Training of R&D teams in techniques of other fields to promote the breadth of knowledge."

Table 64 - Identification of Spanish good practices on training programs to foster entrepreneurship and innovation

In the following figure, we can see a different set of good practices identified on training programs to foster entrepreneurship and innovation that Bio-Health Businesses carry out with all their employees to foster entrepreneurship and innovation in the countries object of the study (Italy, Portugal and Spain) and how these programs are developed. The cross-training is the most frequent, followed by tutorials, the nomination of company tutors, definition of internal qualification plans and processes as well.

Fig.13 Most important good practices on training programs in the company

2.4.4 Participation in a "Demo Day" to present a business project to investors

We asked our cases if they have participated in any "Demo Day" to present/pitch their project to investors and the answers collected are presented below.

Good practice 1 selected for Italy	Demo Day experiences
I8 **Diatech Pharmacogenetics**	"We haven't participated in a Demo Day till now."
Good practice 2 selected for Italy	**Demo Day experiences**
I9 **SOL Group**	"We haven't participated in a Demo Day till now, but we have an important initiative is the "Open Factory" events, promoted in Italy by Federchimica, which periodically allow the public (on different occasions: inhabitants, students, authorities, customers, suppliers etc) to visit a production unit and see with their own eyes how complex industrial reality is managed".
Good practice 3 selected for Italy	**Demo Day experiences**
I10 **Confindustria Lecce Health section**	"We haven't participated in a Demo Day till now."

Table 65 - Identification of Italian good practices on demo days experiences

Good practice 1 selected for Portugal	Demo Day experiences
I18 **UPHILL**	"Various, in the scope of the diverse contests and acceleration programs. The first investment round that the company received was in 2019 when the Luz Saúde group invested for the first time in a startup and helped UpHill raise a round of financing of 600 thousand euros, in an operation in which Caixa Capital and Busy Angels also participated. The company's initial investment, however, came from the three young people and "was discreet. As we managed to conceive our solution in a more basic way, it was more an investment in terms of time because we were in the final stretch of the medical course. Even before, in 2016, UpHill won the 18th National Young Entrepreneur Award from the National Association of Young Entrepreneurs, which contributed to an investment of 80 thousand euros in the company. Here we also participated in a demo day."
Good practice 2 selected for Portugal	**Demo Day experiences**
I19 **LABFIT**	"We haven't participated in a Demo Day till now."
Good practice 3 selected for Portugal	**Demo Day experiences**
I20 **YDEAL**	"We have one experience in 2018 where we received a prize called Born from Knowledge AWARDS, which is given by the ANI - National Innovation Agency. Nevertheless, it is our decision and goal to keep the social capital in the initial founders. We do not want any risk capital, outside money or business angel investment. We opt for starting with own funding, family money, using bootstrapping. Then we opted for searching for EU funded projects."

Table 66 - Identification of Portuguese good practices on demo days' experiences

Good practice 1 selected for Spain	Demo Day experiences
I27 **Regemart3d**	"We have participated in some "Demo Days" to present our project to investors, such as Botín, Caixaimpulse, etc."
Good practice 2 selected for Spain	**Demo Day experiences**
I28 **vitaHealth**	"We have participated in one "Demo Day" oriented to the health sector, and rounds with Business Angels."

Good practice 3 selected for Spain	Demo Day experiences
I29 **IMasMed**	"We have participated in different forums of investors and days of investors, although we haven't made use of investors to date".
Good practice 4 selected for Spain	**Demo Day experiences**
I30 **WoldPathol**	"We haven't participated in a Demo Day till now."

Table 67 - Identification of Spanish good practices on demo days experiences

In the following figure, we can see that the most common forums, awards, events where Biohealth Business have presented their business project to investors in the countries object of the study (Italy, Portugal and Spain) were open factory events, national young entrepreneur awards, investors' days and forums, acceleration programs and the contests born from knowledge.

Fig.14 Most important good practices on Participation in a "Demo Day" to present a business project to investors

2.4.5 Participation in publicly funded R&D&I programmes

Lastly, we inquired our companies on their experiences regarding their participation in any publicly funded R&D&I programmes. Tables 29, 30 and 31 summarize the major contributions.

Good practice 1 selected for Italy	Participation in publicly funded R&D&I programmes
I8 **Diatech Pharmacogenetics**	"We have participated in different programs, such as: - EU Grant 2002; - FERS2007 - PORMARCHE2012: https://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/italy/2014it05sfop008 - EC H2020 2014: https://eshorizonte2020.es/ - FERS2015 https://ec.europa.eu/regional_policy/en/information/publications/maps/2014/structural-funds-2014-2020-erdf-and-esf-eligibility-italy MinIndustria IT 2015"
Good practice 2 selected for Italy	**Participation in publicly funded R&D&I programmes**
I9 **SOL Group**	"We have participated in different programs, such as: - H2020: https://eshorizonte2020.es/ - MIUR: https://www.miur.gov.it/ - PORMarche https://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/italy/2014it05sfop008 - Regional funds BY FERS: https://ec.europa.eu/regional_policy/en/information/publications/maps/2014/structural-funds-2014-2020-erdf-and-esf-eligibility-italy"
Good practice 3 selected for Italy	**Participation in publicly funded R&D&I programmes**
I10 **Confindustria Lecce Health section**	"We aren´t involved in publicly funded R&D&I programmes"

Table 68 - Identification of Italian good practices on participation in publicly funded R&D&I programmes

Good practice 1 selected for Portugal	Participation in publicly funded R&D&I programmes
I18 **UPHILL**	"We have had some experiences but till now with few results. We tried to apply to national funds, PT 2020. We applied for a fund called SI2E - Incentives for entrepreneurship in small companies but did not obtain the funding. We also tried an application to a system of R&D in consortia under PT 2020, but with no success. The major explanations received were connected with the few years of experience of the company."

Good practice 2 selected for Portugal	Participation in publicly funded R&D&I programmes
I19 **LABFIT**	"System of incentives for research and technological development - Portugal 2020. Once we started making money in selling, we opt for applying to specific funds in PT 2020. Firstly, an innovation project to buy laboratory equipment and pay more qualified people, to make our team grow and diversify. Afterwards, we applied together with UBI for funding in co-promotion research projects (in the fields of thermal waters and aromatic plants. We are now going to another phase and applying for PT 2020 money to create our plant outside the incubator, to produce a new brand."
Good practice 3 selected for Portugal	**Participation in publicly funded R&D&I programmes**
I20 **YDEAL**	"We have applied for a fund under PT 2020 and it was approved… the project AVISAR, financed by SI2E program. It's important as it funds equipment, human resources and other important expenses for a new area for our company."

Table 69 - Identification of Portuguese good practices on participation in publicly funded R&D&I programmes

Good practice 1 selected for Spain	Participation in publicly funded R&D&I programmes
I27 **Regemart3d**	"We have participated in different programs, such as: - RETOS Collaboration Program ENISA. https://www.enisa.europa.eu/ European Project H2020 https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020".
Good practice 2 selected for Spain	**Participation in publicly funded R&D&I programmes**
I28 **vitaHealth**	"We have participated in publicly funded R&D&I programmes such as SME instrument phase 1, FICHe (future internet challenge), NEOTEC, ENISA". The Future Internet CHallenge eHealth (FICHe) accelerator has launched an open call for applications. All European eHealth small and mid-sized enterprises (SMEs) and startups eager to develop innovative applications in the eHealth domain using FIWARE technology are welcome to apply. They can win up to €217,000 per team, over €500,000 worth of partner services, coaching, PR and other support. https://ec.europa.eu/digital-single-market/en/news/future-internet-challenge-ehealth-smes-and-startups-across-europe
Good practice 3 selected for Spain	**Participation in publicly funded R&D&I programmes**
I29 **IMasMed**	"We have participated in different programs, such as: In the Alava Innova programs, in the Hazitek programs of Gobieno Vasco, in

	Neotec of the CDTI, and in SME instrument phase 1. "We have won several awards such as: https://imasmed.com/en/awards/"
Good practice 4 selected for Spain	**Participation in publicly funded R&D&I programmes**
I30 **WoldPathol**	"We have participated in different programs, such as: - Aragonese Government programs: ADIA and PAIP - MINECO programs: Research and Development Projects (PID) - LIC: Innovation Hotline are grants promoted by the CDTI and - Technology Fund, under the de minimis regime, to support business projects that involve the incorporation and adaptation of innovative technologies at the sector level and that represent a competitive advantage for the company, as well as technological adaptation actions aimed at the introduction into new markets". https://www.cdti.es/

Table 70 - Identification of Spanish good practices on participation in publicly funded R&D&I programmes

In the following figure, we can see different sort of funds which Bio-Health Businesses mostly apply to develop their businesses in the countries object of the study (Italy, Portugal and Spain). These are National and regional funds, Innovation funding such as NEOTEC, ENISA, MIUR and the innovation hotline.

Fig.15 Most important good practices on Participation in publicly funded R&D&I programmes

2.4.6 Lessons learned

In summary, the lessons learned on University-Business cooperation schemes to foster entrepreneurship and innovation in the Bio-Health sector in the three countries object of our study (Italy, Portugal and Spain), are reflected in the following chart:

	Technical and practical business support activities for innovation and growth	University-Business cooperation schemes to foster entrepreneurship and innovation
Good practices selected for Italy	. Contacts and connections with national, European and international experts and professionals . International trade fair for the medical sector: MEDICA . Annual meeting:TSCO . Encourage innovation by setting up new companies . Activities to raise awareness and support the technical and practical business with the aim of supporting companies in their growth and development. . Networking activities with professionals	. UBC in education, in research and in valorisation. . Internal organisation to organise such activities and external parties. . Open channels of communication. . The Health Section of Confindustria Lecce: to deepen the relationships between accredited private structures and the world of public health.
Good practices selected for Portugal	. Staff mobility actions, including networking and mentoring opportunities with selected experts and professionals. . Participating in scientific events of the speciality, in cosmetic and pharmaceutical industry fairs. . Specific initiatives to develop internal innovation and growth capacities, by using special methodologies, such as business canvas applied to new products and services.	. UBC in education, in research and in valorisation. . Internal organisation to organise such activities. . Input from external stakeholders, like universities, the incubator UBImedical, other startups incubated in our incubator, Startup Lisboa, other pharmaceutical companies, the CCDRC – Regional Development Agency, the Health Cluster, among others.
Good practices selected for Spain	. Mobility actions: networking/mentoring opportunities with experts and professionals, attend at conferences and events in the sector, bioprinting workshops for researchers, tutoring students, doctorates, postdocs. . Development of 3D bioprinting system, development of tissue maturation bioreactors and R&D new medical technologies . Customized health software development. . Innovation in R&D processes in the field of biomaterials for biomedicine. . Open innovation projects. . Cross design sessions for product improvement. . Analysis of unresolved market trends and approach of new lines of development accordingly.	. UBC in education, in research, in valorisation and in management. . Partnering and collaboration opportunities with universities, research institutions and companies, to complement its expertise and boost the innovation process

Table 71 - Summary of Good practices on business support activities and UBC schemes

	Training to foster entrepreneurship and innovation	Demo days experiences
Good practices selected for Italy	. New employees are followed by a specially nominated company tutor who follows their integration into the company with the most suitable methods and timing. . Special training courses, held by internal and external instructors.	. "Open Factory" events
Good practices selected for Portugal	. All employees have an initial training, using the cross-training. . Tutorials to facilitate the learning. . Versatile team, staff are qualified for a variety of tasks. . Internal qualification process: observes to do, does with observation, does autonomously and results are compared with those of the technician who qualifies with a qualification plan.	. Demo days in the scope of the various contests and acceleration programs. . Demo day in the National Young Entrepreneur Award. . Demo day in a prize called Born from Knowledge AWARDS which is given by the ANI - National Innovation Agency.
Good practices selected for Spain	. Training in commercial, marketing, logistics and administration areas. . Training and structured collaboration between Lab researchers and company engineers. . Equipment management and system quality. . Open working groups to develop the different professional skills. . In regards to R&D the reference researchers give workshops at least once a year. . Risk prevention, quality, staff R & D: Specific work in cleanroom, equipment utilization . Take part actively in International Research Consortiums. .Training of technologists in techniques of other fields to promote the breadth of knowledge	"Demo Day" oriented to the health sector, and rounds with BA". . Forums of investors and days of investors. . "Demo Day" to present our project to investors, such as Botín, Caixaimpulse, etc..

Table 72 - Summary of Good practices on entrepreneurship and innovation training and demo days

	Participation in publicly funded R&D&I programmes
Good practices selected for Italy	EU Grant, PORMARCHE, H2020, MIUR, Regional funds BY FERS.

Good practices selected for Portugal	SI2E program- Incentives for entrepreneurship in small companies, System of incentives for research and technological development - Portugal 2020, national funds PT 2020, system of R&D in consortia under PT 2020
Good practices selected for Spain	RETOS Collaboration Program ENISA, European Project H2020, SME instrument phase 1, FICHe (future internet challenge) accelerator, NEOTEC promoted by the CDTI, Alava Innova programs, Hazitek programs of Gobieno Vasco, Aragonese Government programs: ADIA and PAIP, Research and Development Projects (PID) and Innovation Hotline (LIC) are grants promoted by the CDTI and the Technology Fund.

Table 73 - Summary of Good practices on publicly funded R&D&I programmes

As we can analyse in the table above, relating to the **technical and practical business support activities for innovation and growth**, there are some **similarities** in all three countries, regarding networking with experts and professionals and the attendance in scientific events, conferences and fairs/meetings. Innovation is also an encouraging measure, such as the open innovation projects in Spain, the scientific initiatives to develop internal innovation in Portugal, or the innovation encouraging by setting up new companies which is held in Italy.

As for **differences**, only Spain analyses unresolved market trends, approaching new lines of development; and in Italy, there is an annual meeting, TSCO.

Regarding the **University-Business cooperation schemes to foster entrepreneurship and innovation**, we can relate some **similarities**. For instance, in all three countries, there is University-Business cooperation in research and valorisation. If we speak only about Italy and Portugal, there is also an internal organisation to develop this cooperation between University and Business.

Looking now at the **training to foster entrepreneurship and innovation**, and starting with **similarities**, all three countries train their employees, but in **different ways**. If in Italy new employees are followed by a specially nominated company tutor to follow their integration, in Portugal there is a cross-training using tutorials to facilitate the training, and in Spain, the training is structured in collaboration with the team that is already working in the company.

Now analysing the **demo days' experiences**, there are three **different approaches**. In Italy, there are "Open Factory" events, but in Portugal, there are demo days in the scope of the various contests and acceleration programs, such as the "National Young Entrepreneur Award" or the "Born from Knowledge Award", which is given by the ANI – National Innovation Agency. In Spain, there are demo days oriented only to the health sector, forums of investors and days of investors, and also demo days to present the projects to investors such as Botín or Caixaimpulse.

Lastly, the **participation in publicly funded R&D&I programmes**, in all three countries there are **differences**. For instance, in Italy, they indicate the EU Grants, PORMARCHE, MIUR and Regional Funds by FERS. In Portugal, they designate the SI2E Programme or the Portugal 2020 incentives. As for Spain, they refer the RETOS

collaboration program ENISA, the FICHe accelerator, among others. As for **similarities**, both Italy and Spain refer to the H2020 European Project.

3. Conclusions

For each of the three major sections comprising the advanced studies, the acceleration programmes and the University-Business cooperation schemes, we have presented the main features of the practice, we have identified the units of analysis of the case study, we have pointed the perspectives of the key actors involved and we have summarized the set of lessons learned.

Regarding the Academia performance in the three countries object of our report, about the educational offer for promoting entrepreneurial competences and processes, in all the faculties there is at least a course with the curricular unit of entrepreneurship. This course aims to reinforce, broaden and hone the skills and expertise of graduates and postgraduates, utilising and expanding upon previous training to meet the demands of the professional world. There are different types of courses, such as four-hour workshops on entrepreneurial capabilities and other longer programs.

Focusing on BIO-HEALTH sector, apart for the specific training on fields like Agricultural and Food Sciences, Medicine, Pharmacy and Biotechnology, Psychology, Veterinary Medicine and others, in almost all the courses there is a curricular unit of entrepreneurship.

The learning does not stop at the disciplines that are the subject of the course of study, but extends to strategic and transversal skills, to the knowledge that is crucial for the enhancement of one's potential and resources for the construction of future professional paths. Also, there are masters of biomedical research with a common module of technology-based companies (ebt) creation.

In respect to the existence of advanced studies on innovation and/or entrepreneurship, most of the Universities carry out advanced studies on innovation and/or entrepreneurship in all sectors. Research and innovation at the University is carried out by teachers, researchers, PhD students and research fellows who operate in a dynamic and multidisciplinary context and is aimed at producing new knowledge, innovation and contributing to their transfer for the benefit of economic, social and cultural development. But there are no specific offers targeted at the Bio-Health sector.

Finally, about University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector, there are UBC schemes in more diversity of sectors, but not specifically in biotechnology/health as something that prevails, although there are several investigations that are currently in the transfer phase.

Regarding incubators/accelerators, they have acceleration programmes with a sectorial focus, preferably linked with high tech businesses in BIO and Health-Tech, and have an array of competences, services which they provide to start-ups, as well as support mechanisms regarding investment needs.

Bio-Health businesses in the countries studied (Italy, Portugal and Spain) carry out R&D activities within the group and encourage innovation studying and scientific reading of articles and publications. They entail specific initiatives to develop internal innovation and growth capacities, by using special methodologies, such as business canvas applied to new products and services, agile techniques and design thinking tools. Also, the

companies carry out activities to raise awareness in the areas that are more technical and practical with the aim of fostering their growth and development.

Bio-Health businesses organize staff mobility actions, including networking activities with national, European and international specific experts and professionals, by participating in scientific events of the speciality or in discussions with experts to assess market needs.

Moreover, most of the businesses are aware that no company organisation should carry out its activity without taking into due consideration the indications and expectations of all its stakeholders so that they are the ones who guide their behaviour and drive them to improve continually. For this reason, they keep constantly open channels of communication with all those who can influence their decisions and their actions and whose actions and decisions can be influenced by them. One of these open channels of communication is with Universities. As so, most of the Bio-Health businesses contacted to carry out University-Business cooperation schemes to foster entrepreneurship and innovation. Bio-Health businesses organize some of these schemes but also get involved in others organized and provided by external stakeholders, like universities, incubators, other startups, other pharmaceutical companies, Regional Development Agencies, Health Clusters, among others.

To have a versatile team, this is, that staff is qualified for a variety of tasks, most of the Bio-Health businesses interviewed, have special training courses adjusted to their employees.

Finally, a remark considering that most of the Bio-Health businesses know the existence of publicly funded R&D&I programmes, but they need help to prepare the documentation needed to apply to these programmes to raise their participation in them. Also, they denoted a need to foster their participation in "Demo Days" to present business projects to investors and attract capital.

With this report, we have realised that we must continue working to improve the array and quality of specialized advanced studies on innovation and/or entrepreneurship in the Bio-Health sector. Furthermore, we also detected space for developing University-Business cooperation (UBC) schemes to foster entrepreneurship and innovation in the Bio-Health sector. Another route for action is supporting the Bio-Health businesses to get funds (programs and investors). BIO-ALL project works to get these objectives.

Appendix A - Questionnaire template for the interviews Tasks 1.2
Appendix B - Letter of project presentation to respondents
Appendix C - Table for data and info collection

Coordinator

University of Beira Interior (PT)

UNIVERSIDADE BEIRA INTERIOR

http://ubimedical.ubi.pt/

Partners

Universidad de Granada (ES)	Università Politecnica delle Marche – UNIVPM (IT)	Istituto Nazionale Biostrutture e Biosistemi (IT)	LABFIT - HPRD Lda (PT)	Asociación Cluster Granada Plaza Tecnológica y Biotecnologica (ES)	CEEIARAGÓN (ES)
https://www.ugr.es/en/	https://www.univpm.it	http://www.inbb.it/en/	http://www.labfit.pt/	https://www.ongranada.com	http://www.ceeiaragon.es/
Friuli Innovazione (IT)	BGI (PT)	PTS Granada (ES)	Cube Labs (IT)	Virtual Angle BV (NL)	INOVA+ (PT)
https://friulinnovazione.it/en/	https://www.bgi.pt/	http://en.ptsgranada.com/	http://www.cubelabs.com/	www.virtualangle.com	https://inova.business/en/